THE SPATIAL-ECONOMIC IMPACT OF HIGH-SPEED TRAINS:

NATIONALLY (THE UK IC 125) AND

REGIONALLY (A BRITISH-FRENCH COMPARISON)

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Chia-Lin, CHEN

School of Planning

The Bartlett Faculty of the Built Environment

University College London

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Declaration of Authorship

I, Chia-Lin Chen confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Chia-Lin Chen

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Abstract

The arrival of high-speed trains (HST) brings an unprecedented time-space shrinkage that could greatly enhance inter-city connectivity. Meanwhile, it offers a major opportunity to reshape uneven spatial-economic development. However, the existing literature has presented a mixed picture. Thus, considerable disagreement on the wider effects of HST remains. This research contributes to the debate with new empirical evidence on two inter-related scales, based on the experience of British InterCity 125/225 and UK/France comparative practice from the West Coast Main Line modernisation and the TGV-Nord. The thesis first demonstrates the quantitative evidence. Then it takes a planning standpoint in examining multi-level government intervention in seizing opportunities presented by HST during the transformation process.

The research findings lead to two major conclusions. Firstly, nationally, HST has had demonstrable and varied effects on cities within 1 hour and 2 hours from London, thus helping to generate renewed economies, but this effect has not been automatic or universal. Within 1-hour distance, HST towns located further afield from London could benefit from exploiting both commuting and intrinsic economic strength in knowledge-intensive activities; while 2-hour HST accessibility could benefit mainly from exploiting knowledge-intensive economic functions. Beyond 2 hours, the effect appears weak. Regionally, major regional cities have been reinforced by a HST hub position, but the effects have not necessarily spread out into surrounding sub-regions. HST needs to be well-integrated with urban and regional transport networks, so a spatial-economic relationship between a regional centre and its hinterland could be fostered to produce and magnify the wider effects. Secondly, transport alone is not sufficient to determine the wider effects in reducing regional inequality. Complementary measures are indispensable. Five conditions are found and highlighted to be vital, namely national political economy, constitutional capacity, planning priority and resources, city type and economic trajectory, and leadership and governance.

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Notwithstanding these many thanks, the usual disclaimer applies: I am responsible for any error or omission found in this thesis.

List of Abbreviations and Acronyms

ACTRA	Advisory Committees on Trunk Road Assessment
AGMA	Association of Greater Manchester Authorities
AGUR	Agence d'Urbanisme et de Développement de la Région Flandre-Dunkerque
ADULM	L'Agence de Développement et Urbanisme de Lille-Métropole
AOTU	Autorités Organisatrices des Transports Urbains
APR	Annual Progress Report
APS	Advanced Producer Services
APT	Advanced Passenger Train
AVE	Alta Velocidad Española
BR	British Railways
CA	Communauté d'Agglomération
CBA	Cost-Benefit Analysis
CBD	Central Business District
CC	Communautés de Communes
CCI	Chamber of Commerce and Industry
CDG	Charles De Gaulle
CIV	Comité Interministériel des Villes
CMDC	Central Manchester Development Corporation
COPIT	Conférence Permanente Intercommunale Tranfrontalière
CPBM	Conférence Permanente du Bassin Minier
CPER	Contrat de Projets État-Région
CTRL	Channel Tunnel Rail Link
CU	Communauté Urbaine
CUD	Communauté Urbaine de Dunkerque
CX	Chief Executive
DATAR	Délégation Interministérielle à l'Aménagement du Territoire et à l'Action Régionale
DCLG	Department for Communities and Local Government
DCMS	Department of Culture, Media and Sport
DETR	Department of the Environment, Transport and the Regions
DIACT	Délégation Interministérielle à l'Aménagement et la Compétitivité des Territoires
DTA	Directive Territoriale d'Aménagement
ECOC	European Capital of Culture
ECML	East Coast Main Line
EGTC	European Grouping of Territorial Cooperation
ELCHEX	East Lancashire Chief Executives Group
ENA	Ecole Nationale d'Administration
EPCI	Les Établissements Publics de Coopération Intercommunale
EZ	Enterprise Zone
F2F	Face-to-Face
GDHI	Gross Disposable Household Income
GDP	Gross Domestic Product
GMCA	Greater Manchester Combined Authority

GMPTE	Greater Manchester Passenger Transport Executive
GONW	Government Office North West
GOR	Government Offices for the Regions
GPU	Grands Projects Urbains
GVA	Gross Value Added
GWML	Great Western Main Line
HS2	High-Speed Two
HSR	High-Speed Rail
HST	High-Speed Train
IC	Inter-City
ICE	Inter-City Express
ICT	Information and Communication Technology
INRETS	Institut de Recherche sur les Transports et leur Sécurité
INSEE	Institut National de la Statistique et des Études Économiques
INTERREG	European Initiative for the promotion of Regional Cooperation
LA	Local Authority
LEP	Local Enterprise Partnership
LDF	Local Development Framework
LGV	Ligne à Grande Vitesse
LMA	Lille Metropolitan Area
LMAA	Lille Metropolitan Area Association
LMCU	Lille Métropole Communauté Urbaine
LOADT	Loi d'Orientation pour l'Aménagement et le Développement du Torritoire
LOF	Loi d'Orientation Foncière
LOTI	Loi d'Orientation sur les Transports Intérieurs
LTP	Local transport Plan
LVMT	Laboratoire Ville Mobilité Transport
MBM	Mission Bassin Minier
MCR	Mega-city Region
MDC	Merseyside Development Corporation
MDHC	Mersey Docks and Harbour Company
MML	Midland Main Line
MOB1	Merseyside Objective One
MRP	Market Renewal Pathfinders
NATA	New Approach to Transport Appraisal
NDC	New Deal for Communities
NES	Nomenclature Économique de Synthèse
NPDC	Nord-Pas-de-Calais
NT	New Town
NUTS	Nomenclature des Unités Territoriales Statistiques
NWDA	North West Development Agency
NWE	North West England
NWRA	North West Regional Assembly
ODPM	Office for the Deputy Prime Minister
ONS	Office for National Statistics
OPRAF	Office of Passenger Rail Franchising
OREAM	Organisation d'Étude et d'Aménagement
ORR	Office of the Rail Regulator

PADD	Plan d'Aménagement et de Développement Durable
PBKAL	Paris-Brussels-Köln (Cologne) -Amsterdam-London
PCA	Principal Component Analysis
PDU	Plan de Déplacements Urbains
PDUIF	Plan de Déplacement Urbain de la Région Ile de France
PLD	Plan Local de Déplacement
PLH	Plan Local de l'Habitat
PLU	Plan Local d'Urbanisme
PMR	Property Market Report
POS	Plan d'Occupation des Sols
PPG	Planning Policy Guidance
PPP	Public-Private Partnership
PPS	Planning Policy Statement
PTA	Passenger Transport Authority
PTE	Passenger Transport Executive
PTU	Périmètre des Transports Urbains
R&D	Research and Development
RA	Regional Assemblies
RAFHAEL	Réseau des Agglomérations de Flandre, du Hainaut, de l'Artois Et du Littoral
RDA	Regional Development Agency
RES	Regional Economic Strategy
RFF	Réseau Ferré de France
RPG	Regional Planning Guidance
RSS	Regional Economic Strategy
RTS	Regional Transport Strategy
QUANGO	Quasi-Autonomous Non-Governmental Organisation
SACTRA	Standing Advisory Committees on Trunk Road Assessment
SCOT	Schéma de Cohérence Territoriale
SCROL	Scotland's Census Results Online
SEM	Sociétés d'Economie Mixte
SIC	Standard Industrial Classification
SD	Schéma Directeur
SDAU	Schéma Directeur d'Aménagement et d'Urbanisme
SIVU	Syndicat Intercommunal à Vocation Unique
SITURV	Syndicat Intercommunal des Transports Urbains de Valenciennes
SNCF	Société Nationale des Chemins de Fer Français
SMCO	Syndicat Mixte de la Côte d'Opale
SMT	Syndicat Mixte de Transport
SOCD	State of the English Cities
SRADT	Schéma Régional d'Aménagement et de Développement du Territoire
SRB	Single Regeneration Budget
SRT	Schéma Regional de Transport
SRU	Loi Relative à la Solidarité et au Renouvellement Urbains
TEN-T	Trans-European Transport Network
TER	Transport Express Régional
TERGV	Transport Express Régional Grande Vitesse
TMP	The Mersey Partnership
TOC	Train Operating Company

TGV	Train à Grande Vitesse
TTWA	Travel-To-Work-Area
UA	Unitary Authority
ULCO	l'Université du Littoral Côté d'Opale
UDC	Urban Development Corporation
UIC	International Union of Railways
UMIST	University of Manchester Institute of Science and Technology
URC	Urban Regeneration Company
UTF	Urban Task Force
VAL	Véhicule Automatique Léger
VOA	Valuation Office Agency
VT	Versement Transport
WCML	West Coast Main Line
ZAC	Zones d'Aménagement Concerté

Table of Contents

List of Figures

List of Tables

Chapter 1 Introduction

1.1 Research Context: Theme and Relevance

This research concerns the relationship between the high-speed train (hereafter HST) and its wider spatial-economic patterns regarding aiding the transformation process of cities and regions. In the broader context, there are three concurrent elements which collectively shape dynamic cities and regions, namely: the competitiveness and unprecedented popularity of HSTs, economic restructuring towards the knowledge economy, and dynamic and uneven urban and regional development. These three contexts are illustrated as follows.

1.1.1 Theme 1: Competitiveness and the Role of High-Speed Trains

Colin Clark's verdict on transport as "the maker and breaker of cities" (Clark, 1958) has been invested with a new meaning in the second half of the twentieth century with the arrival of HST, ushering in "the second railway age" (Banister & Hall, 1993) and causing an unprecedented shrinkage of time and space: "the shrinking continent" (Spiekermann & Wegener, 1994). A fast-expanding commitment to HST has resulted in the explosive growth of HST networks. Since the inauguration of the first HST services in Japan in 1964, around thirteen countries have begun operating HST services, with many more to come. According to the International Union of Railways (Barrón, 2009), there are currently 10,739 km of HST tracks in operation around the world. Meanwhile, another 13,469 km are under construction and 17,579 km are planned. By 2025, it is estimated that the total distance of HST networks will comprise 41,787 km, approximately four times the present length.

HST appears to be more effective and competitive than other transport modes for a medium-length journey because they have an unrivalled reputation for interoperability on conventional lines to the core of cities (concerning door-to-door journey time and distance, see Steer Davies Gleave, 2004). Apart from competitive transport capacity and efficient connections between cities, current pressing issues such as congestion, uneven development and climate change (related to energy issues) trigger more and more government leaders to place HST on the top of their political agenda. Despite the fact that the introduction of HST is controversial and a costly investment, decision-makers have largely anticipated that HST investment is critical in their strategy to achieve sustainable objectives regarding economic growth and environmental visions, in comparison with other transport modes.

1.1.2 Theme 2: Economic Restructuring towards the Knowledge Economy

The industrial evolution of a new "economy" has occurred at different stages throughout human history; it is the point at which the new system diverges from the previous mainstream economy and exhibits a new economic system including the production, distribution, exchange and consumption of goods and services. Since the decline of Fordist manufacturing in major industrial countries from the 1960s, competitive economies have shifted from handling goods to services. Knowledge, a key production element, amid other key forces of information technology, globalisation and consumer demand (Brinkley, 2008), has brought about the explosive rise and dominance of high value, knowledge-intensive activities and the enormous diminution of manufacturing. Consequently, the scope of knowledge intensive activities has been expanding and evolving. Conventionally, they have been widely defined as economic activities involving the intensity of technology such as the R&D expenditure of high and high-medium-technology industries and knowledge-intensive services (see Brinkley, 2006; Eurostat, 2007; OECD, 2007b). However, this technology-oriented ideology for classification appears to be limited and cannot accurately define some of the specialised advanced services (Wood, 2002, p. 4). It is argued that the contemporary knowledge economy should look beyond R&D — from high-tech manufacturing and ICTs, through knowledge-intensive services, to overtly creative industries such as the media and architecture (Kok, 2004, p. 19). Similarly, the knowledge economy is referred to by Scott (2007) as "technology-intensive manufacturing, services of all varieties (business, financial, personal), fashion-oriented neo-artisanal production, and cultural-products industries (including media)" (Scott, 2007, p. 1467).

1.1.3 Theme 3: Dynamic and Uneven Spatial-Economic Development

The very nature of an industrial complex involves trade. In the era of the knowledge economy, trade has expanded exponentially because of the sophisticated division of labour in the production and consumption process and the spontaneous interactivity between them. Trade is conducted in space, which is embodied in cities and regions as the platforms for economic development. "Location and trade are as two sides of the same coin. The forces determining one simultaneously determine the other" (Isard, 1956, p.6). Likewise, Mensch (1975) explains "[i]ndustrial and urban dynamism are two aspects of the same development; they give each other momentum by mutual reinforcement" (Mensch, 1975, p. 45).

From the trajectory of industrial evolution, the historic shift of industrial locations to elsewhere has become the most dynamic process in urban and regional development and "[s]patial realignment of

such activity is tantamount to reshuffling of the ranks of cities" (Isard, 1956, p. 11). We also have witnessed the rise and decline of places, as some locations seem more resilient to changes than others, which are inflexible and disadvantageous for new development. As a result, an increasing gap is resulting in uneven development, which has been occurring at both inter- and intra-regional scales.

At the inter-regional scale, numerous regions have been suffering as a result of economic transformation, with severe unemployment and decline, while some regions have been enhanced with competitive advantages. As capital and labour increasingly concentrate in a few large cities, the degree of mono-centricity grows stronger and hence the gap between regions within a country widens (Hall & Pain, 2006). In the UK, a major gulf has opened between the dynamic South-East England and Greater London and the lagging northern post-industrial regions (Coates, Institute for Political and Economic Governance, & Centre for Urban Policy Studies, 2008, p. 25; ODPM, 2006a, 2006b; TCPA, 2010).

Zooming into the intra-regional scale, in the South-East England, an east-west imbalance in spatial development has been problematic. Most pervasively, intra-regional inequality in the UK exists within post-industrial northern regions. As Danny Doring remarks, there is intra-regional inequality between northern and southern regions. "[I]n the north, there are islands of affluence in a sea of poverty. In the south, the sea is of affluence. And the contrast is growing" (The Economist, 2012). In North-West England, Greater Manchester South (especially the City of Manchester, Salford and Trafford) has successfully transformed itself as the most diverse and buoyant place, in stark contrast to Greater Manchester North and Pennine Lancashire (EKOS, 2008; MIER, 2009a; The Northern Way, 2009b).

However, study of this relationship between industrial restructuring and uneven urban and regional development has focused on the impact of industrialisation on cities and regions rather than the active role of cities and regions in making possible transformation. As Scott and Storper (2003) stress, this missing element within the domain of conventional theories has critical implications for government intervention in tackling regional inequality by promoting positive agglomeration and initiating growth in poorer regions.

1.2 Problem Statement: The Enduring Debate

Based on the aforementioned context, with an unprecedented shrinkage of time and space, HST will inevitably have a long-term wider effect on the geography of economic activities, simultaneously at national (inter-regional), regional (intra-regional)[1] and local (intra-urban) scales. Although the accessibility of HST has been widely promoted and it is anticipated in the political arena that it would benefit deprived regions, uneven development between places has increased. There is considerable disagreement in academia about the effects; in particular, whether HST would widen regional polarisation or reduce it. A quick reasoning for this lies in the fact that the existing literature has presented a mixed picture. In addition, during the development process, the nature of impact could be understood better if the temporal and spatial scales are taken into account. Reducing regional inequality by HST involves public intervention in a long-term process, which is not possible to be guaranteed or easily predicted. A detailed review of the debate and gap over the wider spatial-economic impact of transport investment is presented in section 2.4.

Here, with the limited evidence, this disagreement largely arises due to two different research approaches. In the fields of transport and spatial economics, modelling approaches are adopted to predict transport investment and regional productivity. A typical accessibility-potential model uses measures of distance (or time) to estimate costs for industries in a region, which correspond to the economic measure of aggregated regional GDP (Clark, Wilson, & Bradley, 1969). However, this simple model emphasises "a price-induced change in demand", which fails to take other factors into account (Vickerman, Spiekermann, & Wegener, 1999, p.4). Despite a number of scholars seeking to refine the role of accessibility in regional economies (see the review in Vickerman et al. (1999)), one remaining problem is that this approach is more suitable to handling the movement of goods rather than of services or people, since this group of approaches is rooted in the principle of economic static equilibrium and stresses demand-induced multiplier impacts. Later, imperfect competition models, associated with "new economic geography", move away from equilibrium to suggest that the elimination of transport barriers may result in concentration in core cities, because agglomeration economies overshadow lower transport costs, thus perpetuating the gap between the core and periphery.

In a recent comprehensive review, Puga (2008) adduces several studies to suggest that a combination of market access and labour mobility results in an agglomeration effect under scale economies, implying that when connected by cross-border infrastructure projects, lagging regions expose themselves to fiercer competition from firms in more developed areas. Thus, he argues that

[1] Throughout this thesis, the term inter- and intra- regional impact respectively denotes the national and regional impact.

the first French TGV between Paris and Lyon led to the relocation of headquarters from Lyon to Paris, while the Spanish Madrid-Barcelona AVE may consolidate the spatial relocation of headquarters towards the capital (Puga, 2002; Vives, 2001). Nonetheless, these approaches which are cost-oriented, demand-driven and past-dependent fail to consider the dynamic nature of urban and regional development associated with different government intervention. Small wonder, then, that they suggest a weak or even negative relationship (Hall, 2009b).

An alternative approach is based on empirical evidence. In the early stages, Bonnafous (1987) conducted an empirical study at the firm level which contradicted Puga's (2002 and 2008) claims. Most empirical studies adopt a control group of places without HST services in order to study HST effects. In Japan, Hirota (1984, cited in Brotchie, 1991 and Sands, 1993a), Nakamura and Ueda (1989, cited in Brotchie, 1991 and Sands, 1993a), and Amano and Nakagawa (1990, cited in Sands, 1993a) all found higher population growth in cities with a Shinkansen service than in those without it. However, Sands (1993b) casts doubt on the causal direction. Employment growth was reported in these studies too, but there were differential effects: the effect was greatest in service industry employment, including knowledge-based industries, and this was true even when the simultaneous expansion of the expressway network was controlled for (Brotchie, 1991). Overall, these studies demonstrate faster growth rates of population and economic effects (i.e. employment and economic activity) for cities on HST routes than those which are bypassed, based on a time series before and after the HST services. However, these effects were largely concentrated in tourism-related activities. Although Nakamura and Ueda (1989) find a high correlation between high growth rates in information-exchange employment and the presence of HST stations and an expressway, it remains unclear what the differential impact between these HST cities are and whether HST could bring about wider spatial-economic impact on less-developed places. One related problem is the intra-regional impact of HST; such an issue has been largely ignored because the focus has been placed on the impact on individual cities rather than a group of cities within a region.

From the limited research conducted so far, major regional cities are largely found to benefit from the agglomeration economy brought about by HST, but for some intermediate stations the impact has been marginal. Other factors in relation to the wider impact of HST have been pointed out by many studies. In Mannone's PhD thesis (1995), it is found that the TGV-Sud-Est line was just one of a number of factors in locational decision-making by business (Gourvish, 2010). Harman (2006) indicates that the design of new lines, the patterns of routes and services operated, and the economic structures and plans of the cities served are important. Preston and Wall (2008) suggest external factors and supportive planning policies are relevant. But how the wider impact of HST could spread into neighbouring sub-regions is hardly explored in current academic work and is subject to scepticism.

1.3 Research Aims, Questions, and Focus

The current research aims to offer a critical contribution to the controversial debate on the wider impact of HST on dynamic spatial-economic development. The paucity of empirical evidence regarding this aspect encouraged this new empirical research which is intended to provide hard evidence of the wider impact of HST, focusing on the strategic relationships between HST opportunities and the active role played by cities and regions through government intervention.

The main research question contains descriptive and explanatory elements: whether, to what extent and how would the arrival of HST assist the restructuring process of wider spatial-economic patterns towards the knowledge economy and, consequently, reduce regional inequality over time?

In order to answer this main question, three sub-questions are presented below.

Sub-question 1	**What is the potential relationship between HST and the development of the knowledge economy?**
	•How are the terms "the knowledge economy" and "knowledge-intensive activities" defined? •What are the locational characteristics of knowledge-intensive activities? •How can their spatial patterns be explained? •What is the role of infrastructure in dynamic urban and regional spatial-economic development towards the knowledge economy?
Sub-question 2	**Whether and to what extent has HST accessibility boosted a knowledge economy and led to a reduction in regional inequality?**
	This question is answered at two spatial scales (inter- and intra- regional) using quantitative findings which are based on hypotheses generated from Sub-question 1.
Sub-question 3	**How could the impact of HST be spread as widely as possible throughout a region by government intervention, which could ultimately reduce regional inequality?**

These three research sub-questions involve two elements of enquiry from the geographer's and planner's perspectives: (1) wider spatial-economic impact of HST and (2) the role of government intervention in the transformation process. Four hypotheses were developed to be tested for the quantitative part of research, mainly for the first enquiry. Hypotheses for the second query (associated with the third sub-question) were developed tentatively and revised during the research process.

Aim One- The First Enquiry: The Wider Spatial-Economic Impact of HST

Based on the literature review introduced in Chapter 3, the simple hypothesis is that the rapid growth of services, especially the most advanced and value-added knowledge intensive sectors (A. Jones, Lee, Williams, Clayton, & Morris, 2008), is assisted not only by pervasive ICT, bringing "the death of distance" (Cairncross, 1997, 2001), but also by infrastructure that assists face-to-face contact in knowledge-generating processes (Andersson, 1985; Törnqvist, 1983) involving tacit knowledge (M. Polanyi, 1958) which is increasingly costly to transmit over long distances (Audretsch, 1998; Von Hippel, 1994). Goddard (1973) demonstrates that in London telephone contacts were used for initial "programmed" or routine communication, while face-to-face communication was used for key discussions with "unprogrammed" features and uncertain consequences. Moreover, Graham and Marvin (1996) adduce evidence that face-to-face business contact has been increasing at an approximately identical speed to telecommunications traffic over the last century.

This suggests that innovative and creative activities cluster in order to benefit from agglomeration economies (Audretsch, 1998; Audretsch & Fledman, 1996; A. Marshall, [1890] 1972); increasingly, a sophisticated division of labour (Mensch, 1975) produces specialised economic activities clustered in different locations. Such innovative activities cluster in the largest cities, while routine-oriented ones decentralise (Hall, 2006; Hall and Pain, 2006; Llewelyn Davies Planning, 1996). However, due to the increasing coordination between specialised and routine activities, forces of decentralisation and re-concentration will operate within polycentric mega city-regions to place limits on the process of decentralisation, related to critical time limits from the central city (Hall, 2006). A polycentric spatial structure could avoid the over-concentration of economic activities in mono-centres and possibly reduce intra-regional inequality. In order to realise the vision of polycentric spatial patterns, transport needs to perform a critical role on the inter- and intra-regional scales. For inter-regional development, major international airports or HST hubs have reinforced the faster-growing mega city-regions (Hall, 2006). HST could particularly benefit companies or organisations which value time and the advantage of crucial linkages between major cities. For intra-regional development, intra-regional connectivity is important through either the extension of HST or the improvement of the intra-regional network.

For the inter-regional study, two hypotheses arise. **Hypothesis One** assumes that HST will induce faster economic growth in the cities it serves, through a reduction in train times and additional frequency of service, with a vital role played by critical time limits. **Hypothesis Two** opines that HST cities will enjoy faster growth in service industries dealing with information, especially knowledge-based activities.

At the intra-regional level, hypotheses need to adjust to the spatial scales in question. **Hypothesis Three** suggests that the arrival of HST in sub-regions will potentially strengthen economies and employment in the knowledge economy over time. **Hypothesis Four** is that there will be differential effects among these sub-regions. Within two-hour accessibility from the National Capital, HST sub-regions could boost economies as polycentric sub-centres with the regional core. Within one-hour accessibility from the national capital, HST sub-regions could potentially develop decentralised inter-dependent functions and commuting roles. The prospects for economic transformation of non-HST sub-regions could be challenged, but they will not necessarily lose out as long as their intra-regional accessibility can be strategically improved.

Aim Two- The Second Enquiry: The Role of Government Intervention in the Transformation Process

With regard to persistent and uneven regional development, the existing literature suggests that, although public intervention is necessary to address the failure of market-led approaches which tend to reinforce the uneven trend rather than reversing it, transport alone is not sufficient; other conditions are needed. The review of existing literature shows that the controversy over the wider impact of HST could be attributed to a methodological divide, theoretical debate and different professional concerns over the relationship between transport and its wider impact on urban and regional development. The second part of the research concerns how the wider impact of HST could reduce regional inequality, which is closely associated with the role of government intervention from a planning perspective and yet is ignored in the study of HST impact.

A close examination of a comparative case study of two poorer regions was chosen to provide insights into this issue. An analytical national space-economy planning framework is first developed to understand the national difference between planning approaches which are shaped by government systems (and restructuring) and transport and spatial -economic policies. This national planning approach will interact with and affect local intervention in determining the wider impact of HST, so the role of government intervention in seizing the opportunity for HST to possibly reduce intra-regional inequality will be embodied in the transformation process. The UK-France comparison shows that the French state-led approach with its decentralisation process suggests conducive conditions, whereas the British market-led approach results in constrained and disadvantaged conditions for local intervention. These two empirical investigations are tentatively guided and based on in-depth interviews and policy analysis, which could further identify the interaction between national and local conditions and assist the comprehension of differential impact between two regions and within two regions.

1.4 Research Strategy

1.4.1 Methodology

As previously mentioned in section 1.2, there is still sharp and continuing disagreement regarding the wider spatial-economic effects of HST on cities and regions. The dispute stems from two different approaches. Well-developed modelling approaches lead to the discouragement of the potential transformation of a less developed city or region and do not appreciate the role of strategic planning approaches and actions taken by cities and regions. This situation is well described by Holt-Jensen (1980), who argues that

> *"[m]odels were constructed which gave an apparent explanation, but were misleading or directly fallacious in so far as they failed to take account of those underlying explanations of the actual social situation which themselves may be amenable to change. It is possible to argue that such explanatory models tend to support the existing conditions of society" (Holt-Jensen, 1980, pp. 67-68).*

On the other hand, even though individual case studies have adduced empirical evidence to the contrary (for an early study see Bonnafous (1987)), it is impossible to form a conclusive judgement due to the lack of such studies since the early 1990s. Most studies have used only fragmented and anecdotal evidence. In order to better understand the wider impact of HST on potential regional development, this research has adopted the empirical approach, with a combination of quantitative and qualitative methods.

1.4.2 Research Design and Justification

A hypothetico-deductive method (Walliman, 2006) which combines inductive and deductive approaches is used in the current research. Although modern HST systems began in Japan, this study emphasises European experiences. The justification is found in historical dimension and diversity which could yield critical insights through a comparative perspective: not only because Europe has the longest history in developing HST networks, but also because, within a relatively small geographical proximity, western European countries have developed their own HST approaches in different ways since the 1960s.

For practical reasons, it is not feasible to conduct a cross-European comparative study in depth. The UK is typical of Europe with regard to its market-led and upgrade approach to HST, while France is a good example of a state-led and new dedicated HST approach. Therefore, this thesis is

based on the British context and finds merit in a UK-France comparative case study of two post-industrial regions respectively served by the two HST approaches in order to gain insight into how the opportunities offered by HST are perceived and seized by studying the interaction between different levels of governments in different contexts.

A HST system comprises transport connectivity among major cities in a nation. This study focuses on inter-regional and intra-regional scales by conducting a survey of British InterCity 125/225 for inter-regional effects, and a finer-grained and deeper-probing comparative case study of two regions to gain insight into intra-regional impacts. The objects of dependent variables for the inter-regional impact study are major cities served by HST or non-HST lines. Regarding the intra-regional study, objects of dependent variables are regions and divided sub-regions in order to grasp the change of regional inequality.

1.4.2.1 An Inter-regional Study: A Survey of British InterCity 125/225

In the first phase of the study, a survey was conducted on the UK InterCity125 (representing 125mph, the equivalent of 200 kph). The findings are reported in Chapter 4. This lower-speed version of HST, which has operated for more than thirty years, provides an obvious candidate for empirical examination of its effect on cities since there has been no research about its spatial-economic impacts. Two groups of towns (with and without HST services) were used to examine spatial-economic impact at the inter-regional level; the non-HST towns were selected as a control group. To overcome the issue of selecting comparable data limitations, more than one line was studied in both categories. Six London-based railway routes were chosen, all over 150km in length: two HST lines and four without HST. These six embrace 26 local authorities and 27 railway stations, which form the units of analysis in the study.

In response to **Hypothesis 1 and Hypothesis 2**, the independent variables are the changes of rail services with regard to train times and frequencies. In general, passenger statistics are treated as commercially confidential and so are not generally available. Hence, train times are employed to present the effects of time-space shrinkage, while train frequencies are used to reflect demand for different routes. The dependent indicators are the proxies for these variables of economic strength and structural change: Gross Value Added (GVA), (un)employment, available property values and economic structures.

1.4.2.2 An Intra-regional Study: A Comparative Case Study

The second phase of research shifts to the wider intra-regional impact of HST; namely, to what extent, and how the benefits of HST could result in spill-over effects for the major regional city, as

well as its surrounding sub-regions, rather than creating "the increasing peripheralization of the periphery" (Spiekermann & Wegener, 2008, quoted in P. Hall, 2009b, p.65).

A comparative case study of two post-industrial regions was selected. Manchester and its sub-regions in North West England, UK and Lille and its sub-regions in Nord-Pas-de-Calais, France were chosen. Both have similar industrial trajectories, challenges, and HST opportunities, but are associated with two different HST approaches (the West Coast Main Line (WCML) modernisation versus the new dedicated TGV-Nord line). For more than thirty years, the UK has been maintaining its incremental approach by upgrading mainline services for major inter-city links, although its first new HST line (CTRL) arrived in 2007. The UK is facing a critical point for decisions to be made, namely whether or not the new HST infrastructure should be taken forward for future generations. With the growing constraints on the transport infrastructure network, the next stage of HST development, branded "High- Speed Two" (hereafter HS2), a new dedicated line running at 300 kph, has been supported by all political parties and approved by the Department for Transport in January 2012. In contrast, France is the first European country to adopt a new HST approach by building its new dedicated HST network over the same period of time. The comparative case study provides valuable implications for HS2 in the UK through empirical examination of the different HST approaches and experiences in two national/ local contexts.

In order to understand the intra-regional effects, both regions were divided into several sub-regions. First of all, the relationship between differential transport accessibility and economic performance for sub-regions is identified through the descriptive statistics of quantitative data. Similar independent and dependent variables for the inter-regional study are applied to answer **Hypothesis 3** and **Hypothesis 4**. The difference lies in the fact that independent transport variables for this part of the research are evaluated on two scales -i.e. the relationship between sub-regions and national capital versus sub-regions and regional capital - in order to discern the direct HST impact on transport services. Quantitative findings are presented in Chapter 5. Following this, the final stage of research seeks to understand the nature of government intervention in the transformation process with qualitative approaches in the form of a proposed analytical framework, policy analysis and semi-structured interviews conducted with experts (decision makers and academics) who have been deeply involved and have closely observed the transformation process.

1.5 Chapter Organisation

The following chapters in this thesis are assembled in a logical order to best answer the research questions raised at the outset. Besides the research methodology (Chapter 2), there are two main parts. Part one focuses on the wider impact of HST in two spatial scales with the first theoretical framework (Chapter 3) and quantitative empirical evidence which could contribute to the current debate over HST with an inter-regional survey of British InterCity 125/225 (Chapter 4) and an intra-regional comparative study between Manchester and Lille sub-regions (Chapter 5). Part two emphasises the nature of government intervention in the process. It begins with an analytical framework generated from the literature review (Chapter 6) and two chapters on the transformation process of the two regions (Chapter 7 and 8), followed by a synthesised discussion of an overall UK-France comparison (Chapter 9). Concluding remarks, summary of key findings and future research are embraced in the concluding chapter (Chapter 10). Each chapter is organised as follows:

Chapter 2 introduces the research methodology which underlies the theoretical and empirical approaches in order to answer the main research question concerning the wider impact of HST on regional inequality. In the first major section, regarding the debate and research gap, the wider impact of transport investment is reviewed through a series of key theoretical discussions, including the relationship between transport and regional development, types of wider impact from temporal and spatial perspectives, as well as ex-ante and ex-post studies. The weaknesses of rational models used by decision-makers and the assumption of imperfect competition argued by a school of "new economic geography" are fostered by ignorance of the dynamic and hard-to-predict nature of the course of regional and urban development. Thus, the second major section positions the methodological stand and aims to contribute to the debate by providing empirical evidence for better understanding of the wider impact of HST in assisting the transformation process of cities and regions, since this aspect has been neglected in the literature. Issues of regional inequality are present in multiple spatial scales. This study focuses on inter-regional and intra-regional scales, so a survey of the British InterCity 125/225 for inter-regional effects and a UK/France comparative study for intra-regional effects is explored. In order to better understand the wider impact of both, quantitative and qualitative research methods are used, including data collection (the identification of the unit of analysis, dependent and independent variables and the conduct of semi-structured interviews), and consequent data analyses (descriptive statistics, interviews and policy analysis). In the last section, the research strategy and phases are illustrated.

Chapter 3 institutes a theoretical framework that directs the quantitative part of the empirical data collection and analysis to answer the first sub-research question. The term knowledge economy is

firstly defined, then the locational characteristics of knowledge-intensive activities are distinguished. Secondly, the factors leading to both centralisation and decentralisation of spatial patterns are disentangled, and the role of infrastructure that contributes to the spatial-economic landscape is identified. The final section thus proposes a conceptual framework of the spatial economy of HST in the era of the knowledge economy.

Following the research methodology and the first theoretical frameworks, the focus turns to the theory-informed empirical findings. *Chapter 4* introduces the background and the rationale of this study and the first empirical evidence comprising quantitative data on the inter-regional scale, focusing on the wider impact of HST through 30 years of experience of the British InterCity 125/225. It begins with two key research hypotheses and details research methods, namely the selection of HST and non-HST lines, units of analysis, variables and data collection. Based on these criteria, the second section presents the results of independent variables (train times, train service patterns and frequencies) and dependent variables (wider spatial-economic patterns) including economic strength (area, population, (un) employment, GVAs/ GDHIs) and economic restructuring reflected in office rental values and services and knowledge-intensive employment. Travel-to-work data and population and employment data around the stations are supplemented to assist the interpretation. The third section interprets a restructured British economic geography shaped by the arrival of HST with a classification into three train time zones: one hour, one-two hours, and over two hours.

Chapter 5 presents the second part of the empirical findings with the spatial focus shifted to the intra-regional impact of HST. Similar to *Chapter 4*, this chapter is mainly devoted to quantitative evidence to answer the "whether and to what extent" questions in this research. It draws on a comparative case study of two HST lines serving two post-industrial regions: one is the modernisation of the WCML for Manchester and its sub-regions within NWE, UK; the other is the TGV-Nord for Lille and its sub-regions in NPDC, France. The opening section provides an overview of the two HST approaches and two regions selected. The second section examines research methods in detail. Despite the application of similar variables, due to data availability and the observed time periods in the two countries, necessary adaptations are made, including the unit of analysis, variables and data collection. The third and the fourth sections respectively entail the findings from two cases, covering the differentiation brought about by the arrival of HST between inter-regional accessibility with national capitals and the intra-regional accessibility with the regional capitals, as well as inter-regional and intra-regional economic performance and economic restructuring over time. The concluding section brings together all the findings with a synergetic discussion and indicates the benefits, to a large extent, are reaped by the regional cities, but not necessarily the nearby sub-regions.

Chapter 6 employs the analytical framework to answer the third sub-research question that underlies government interaction on different spatial scales in seizing the opportunity of HST for potential transformation. In order to understand the nature of government intervention in the process, this chapter presents a national spatial-economic planning framework in order to understand how local government intervention in relation to spatial-economic change and opportunities has resulted in different forms of impact. The section begins by exploring the dimension of the national political economy regarding the role of state intervention, state views on government intervention and transport investment. The second section reviews government systems and restructuring by examining the way in which the institutional form is restructured by the national state, which could possibly affect intervention at local government levels. The third section investigates urban and regional planning policies including both transport and spatial-economic policy in tackling uneven regional development. The last section proposes a synthesised framework with each element suggested in this framework. A close examination of British and French planning approaches result in the comprehension of national differential conditions which underlie the two regions' transformation process presented in the two empirical chapters.

Chapter 7 and *Chapter 8* are respectively devoted to scrutinising the in-depth transformation process in these two post-industrial regions. Both regions have experienced a major transformation since the 1980s, so they deserve a full chapter to cover this process. The interactions among different government tiers and varying reactions from sub-regions are especially emphasised in an attempt to understand national differences and the significant role of government intervention in making any changes possible.

Chapter 9 focuses on a synthesised discussion of a model of government intervention for the wider impact of HST through the comparative case study in two parts. The first part synthesises five conditions which are found to be critical. The second half compares the two national HST approaches with two practical projects of HST investment and HST services and examines the way HST is exploited for intra-regional development through hub strategies, intra-regional and sub-regional rail networks, and the interlocked and indispensable non-transport initiatives.

Chapter 10 first illustrated concluding remarks and summary of key findings. Based on lessons learnt from this research, implications for future research are suggested. The last section is devoted to a final thought.

Chapter 2 Research Focus and Methodology

2.1 Introduction

This chapter explores the focus and methodology of the current research. In section 2.2 and 2.3, the definition, development and competitiveness of HST are outlined as a basis for this subject. Section 2.4 examines the debate around two methodological approaches towards the study of HST impact, the relationship between transport and regional development and the research gap which underlies the rationale for this thesis. In section 2.5, the continual methodological debates in social science are discussed and clarified in order to justify the current research design comprising a survey and a comparative case study in order to combine quantitative and qualitative approaches to gain a deep understanding of the complexity of the impact of HST. Research phases are illustrated in section 2.6 and the research methods for the quantitative and qualitative approaches are explained in section 2.7. Lastly, section 2.8 sums up key elements of the methodology of this study.

2.2 Defining HST and HST Development throughout the World

High speed is a relative concept. French steam technology achieved 144 kph in 1889, German electric locomotives 210 kph in 1903, German petrol trains 230 kph in 1931, French electric locomotives 331 kph in 1955, the TGV *Sud-Est* 381 kph in 1981, the TGV-*Atlantique* 515 kph in 1990 (Whitelegg, Hultén, & Flink, 1993), a Japanese magnetic levitation train set a world record of 581 kph in 2003 (Takatsu, 2007), and more recently, the TGV-*Est* established a new TGV record speed of 574 kph in 2007.

The European Union definition, in Directive 96/48 (European Commission, 1996), proposed a speed of at least 250 kph on specially-built lines and 200 kph on upgraded high-speed lines. Campos and De Rus (2009), analysing data on 166 HST projects from 20 countries, distinguish four HST models: the exclusive exploitation model, the mixed high-speed model, the mixed conventional model and the fully mixed model. This, together with the taxonomies of the European Union (European Commission, 1996) and the International Union of Railways (UIC, 2008) definitions, illustrates the evolution of the modern HST.

It is widely accepted that HST began with the Japanese Shinkansen Tokaido line between Tokyo and Osaka on 1st October 1964, with an initial speed of 210 kph. By 1992, the maximum speed had risen to 270 kph, reducing the time for the 515.4 km Tokyo-Osaka trip to 3 hours 10 minutes and making a day return trip feasible (Takatsu, 2007). Because the existing overcrowded railway

had a narrow gauge (1.067m), the Shinkansen had to be built as a totally new dedicated high-speed system on the international standard gauge (1.435m).

In 1981, the French TGV *Sud-Est* line came into service between Paris and Lyon, France's second largest city, operating at 270 kph to produce a travel time of only 2 hours for the 450-km journey (Arduin & Ni, 2005). In this instance, due to the slow speed of the existing nineteenth-century conventional lines carrying a congested and mixed traffic of freight and passengers, a dedicated high-speed line was again adopted, even though there was no gauge problem as in Japan (P. Hall, 2009b). However, the line began and ended on the existing railway network (Arduin & Ni, 2005). Then, the German ICE was introduced commercially in 1991 between Hamburg and Munich via Frankfurt or Würzburg (Sands, 1993b), using a combination of existing tracks at speeds of 200-250 kph, together with 427 km of newly-built segments operating at speeds of 320 kph. The original ICE design envisaged a mixture of passenger and freight services, but this has been abandoned in favour of traffic segregation with the introduction of two new passenger-only ICE lines, Cologne-Frankfurt and Cologne-Hannover-Berlin (Ebeling, 2005).

In 1992, the first Spanish AVE line started commercial operation between Madrid and Seville at speeds of 320 kph over 700km. As in Japan, an incompatible rail gauge on the traditional network (here, a broad gauge[2] of 1.668m) made it necessary to overlay a new dedicated line with a standard gauge (1.435m) (Givoni, 2006) which has been progressively extended from Madrid to Barcelona. In 2012, a link through the Pyrenees with the French railway system was constructed, as part of an EU Commission programme to achieve a Trans-European Network. After rapid expansion of HST, Spain overtook France and achieved the largest new HST network in Europe in 2010.

In contrast, many HST systems have been developed on upgraded conventional lines. In the UK, during the process of developing modern British HST systems in the 1960s, as building new lines was not feasible because of "an impossible financial task" (Barnett, 1993, p.165), the InterCity sector of British Rail was expected to hold greater interest and potential for high-speed services without the need of state aid. This was particularly the case for the two longest main lines, the West and East Cost Main lines (WCML- 642 km (401miles) and ECML- 629 km (393miles)), connecting major provincial cities in Northern England and Scotland with London (Barnett, 1993). Two British HST technological approaches were developed: the Advanced Passenger Train (APT-tilting train) project and the High-Speed Train, a faster and cheaper interim approach using diesel traction (the latter was named InterCity-125). In 1976, the UK InterCity125 (representing 125mph, the equivalent of 200 kph) was "the first European upgraded high-speed line" (P. Hall,

[2] It has been argued that a mistaken 1844 decision to implement a broad gauge dismissed the possibility of integrating the Spanish railways with the European network (Gómez-Mendoza, 1993, p. 52).

2009b, p. 59) with diesel traction running at a maximum speed of 200 kph from London to Swansea on the Great Western Main Line (GWML), designed by the far-seeing engineer Isambard Kingdom Brunel in the 1830s. In 1978, the UK's East Coast Main Line (ECML) was likewise equipped with diesel-hauled HSTs from London to Edinburgh and in 1991 by an electric version branded InterCity 225, which however has never been able to operate at the planned speed of 225 kph due to the lack of in-cab signalling. Although the tilting train technology later proved to be achievable in Sweden and Italy, the APT project authorised in 1968 and intended to be used on the WCML was abandoned before entering revenue service in 1982 (Barnett, 1993), which resulted in the pioneering IC125 service on the GWML as a lasting success and the postponement of high-speed service on the WCML until December 2008.

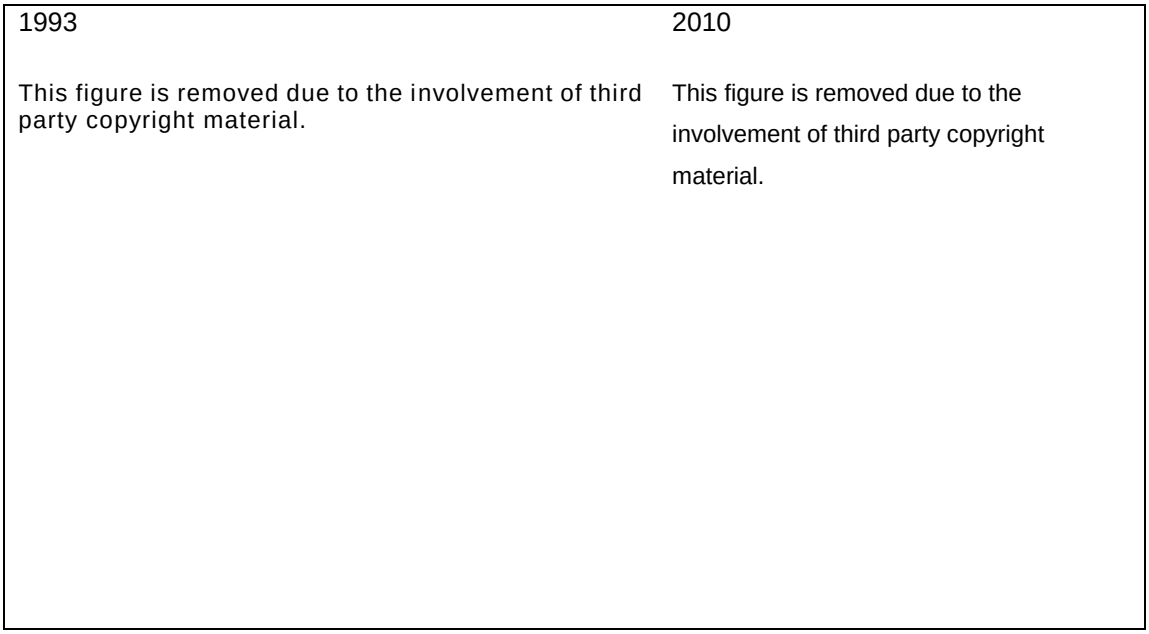
The Italian Pendolino (ETR-450) and Swedish X2000 are two examples of tilting trains on conventional lines, developed to solve the problems of negotiating curves at high speeds, running at a maximum speed of up to 210 kph on the X-2000 and 250 kph on the Pendolino (ETR-450). The Pendolino technology has been applied to the UK's WCML since December 2008, operating at a maximum speed of 200 kph between London and Glasgow. France likewise developed a TGV *Pendulaire* with a maximum speed of 300 kph (UIC, 2003; quoted in Givoni, 2006) and capable of operating on both high-speed TGV lines and conventional lines, but it was not brought to completion.

However, in commercial practice, the pursuit of speed has to be reconciled with other aspects such as frequency and stopping patterns. On the Shinkansen, the provision of intermediate stations for a lower-speed stopping service enhanced traffic, suggesting that an overall reduction of journey time is more important than travelling at high speed between two stations (Takagi, 2005). The Swiss Railways' Rail 2000 concept illustrates this point, emphasising better connections at transport hubs (Takagi, 2005) with the slogan "not as fast as possible, but as fast as necessary". This model, however, demands surplus platform space in order to accommodate concentrated interchange needs within short periods in each hour.

In the early 1990s, the HST development reached a new milestone. The proposal for a European HST network (Community of European Railways, 1989) was intended to materialise "the shrinking continent" (Spiekermann & Wegener, 1994). Figure 2-1 shows the visualisation of estimated time-space effects in Europe as a result of the rail network. Concerning the inter-operability of different national networks, the EU regulatory framework (Directive 91/440) was created to permit open-access operations on European rail lines, which ensured non-discriminatory track access for all independent train operators. The opening of the Channel Tunnel in 1994 inaugurated the first cross-border international HST service operated by Eurostar between London, Paris and Brussels. The Trans-European Transport Network (TEN-T) was further defined in 1996 (Directive 96/48/EC). The core PBKAL HST network, connecting several

capital cities (Paris-Brussels-Köln (Cologne) -Amsterdam-London), to which was added Frankfurt, became a PBKFAL network after the arrival of LGV (*Ligne à Grande Vitesse) Est-Europe* in 2007. This PBKFAL network was completed when Amsterdam and Cologne were further connected in 2009. However, there is a growing worry that the more the rail line range extends, the higher the possibility that HST services will tend to serve larger urban centres and bypass smaller and less profitable places (P. Hall, 2009b).

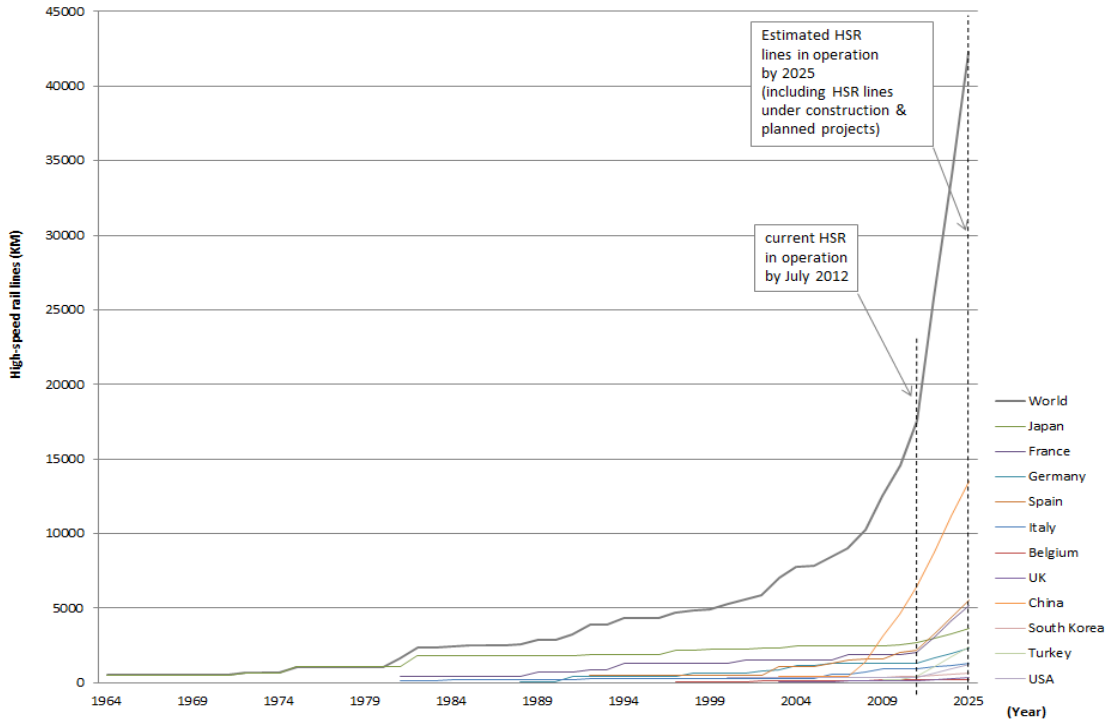
Figure 2-1 The Envisaged Time-Space Maps of the Rail Network in Europe (1993 vs. 2010)



Source: Spiekermann and Wegener (1994)

Beyond Europe, in the first decade of the twenty-first century, a new wave of HST development surged in Asia. Above all, with the commitment by a state-owned monopoly, the Chinese HST network developed at an unprecedented scale and speed. From 2007 to 2011, nearly 10,000 km of HST lines were laid (Chen, 2012). Now China has the largest HST network in the world. By 2025, the total global length of HST network will more than double in length from the current 17,547 km to 42,312 km (UIC High Speed Department, 2012) as shown in Figure 2-2.

Figure 2-2 High-Speed Train Lines in the World



Source: UIC website (July 2012)

2.3 The Competitiveness of HST

The time-space effects of HST travel could potentially alter economic geography. For medium- to long-distance journeys, HST offers unrivalled possibilities through interoperability on conventional lines to the cores of cities. Steer Davies Gleave (2004) suggest that for distances under 150 km HST provides no advantage over conventional trains. Between 150km and 400km, rail (including HST) is faster than air city centre-to-city centre. Between 400 km and 800km, HST offers the fastest mode for personal travel up to four and half hours (270 minutes); beyond 800km, air travel is faster (Pepy & Leboeuf, 2005; Pepy & Perren, 2006) (see Figure 2-3). Therefore, Japanese and European experience suggests that HST should handle 80-90 per cent of traffic up to about 500 km and about 50 per cent up to about 800 km (P. Hall, 2009b). And, at the maximum practicable present speed of 350 kph, the competitive rail range could potentially extend to 1500 km (1000 miles), bringing journeys like Paris-Madrid or London- Zürich within the commercially-feasible range (P. Hall, 2009b). However, in practice, the range is limited by speed restrictions in densely- populated areas or in tunnels or long bridges, for reasons of safety, capacity

and noise (UIC, 2008). Furthermore, low-cost airlines continue to weaken the competitive power of HST through aggressive price competition and smart marketing (P. Hall, 2009b)[3].

Figure 2-3 The Competitive Advantage of High-Speed Trains

Source: Steer Davies Gleave (2004, p.23)

2.4 The Debate and Gap over the Wider Spatial-Economic Impact of HST

With the impressively direct impact of time-space shrinkage, HST lines would not only efficiently solve the constraint of transport capacity but also fulfil a broad objective, beyond transport, for regional economic development and thus reducing regional inequality. A classic example is the recent development of high-speed rail in the UK. HS2 has been expected to support regional economic growth and prosperity (Department for Transport, 2010) and to rebalance the long-term north-south divide (House of Commons, 2011). Likewise, economic growth and development is also the major goal for urban transit systems. Mackett and Edwards (1998) study a number of urban transport systems around the world. "To stimulate development" was found to be the most popular objective underlying the decision-making on developing these systems, preceding "to

[3] In November 2009, EasyJet was offering a £60 return fare between London Gatwick and Montpellier for people travelling in April 2010. The rail websites were not yet open for reservations. By February 2010, the standard class fare was expected to be at least 40% higher.

improve public transport" and "to reduce traffic congestion" (quoted in Balcombe et al., 2004). Yet, the wider impact of HST is debateable. The counter argument is that regional inequality will be widened because many places have experienced worsening divides, not only between successful central regions and unsuccessful peripheral areas but also within the peripheral regions.

In order to understand better the impact of transport investment, it is essential to make a distinction between different types of impacts. Table 2-1 shows various types of transport impacts i.e. temporary vs. permanent as well as direct vs. indirect. Generally speaking, the permanent direct impact on exploitation of transport capacity and time saving for users' benefits is the major cause for transport investment, while the permanent indirect impacts such as the consequences of re-location decisions of people and firms, and the cumulative effects on economic development in cities and regions are the main objective of investment (Oosterhaven & Knaap, 2003). The debate and focus of this thesis rest exactly on this permanent & indirect (wider) spatial-economic benefits of transport investment.

Table 2-1 Types of Effects of Transport Investments

Source: Oosterhaven and Knaap (2003)

In this section, a broad literature review of transport impact on urban and regional development is presented to understand the HST debate. Section 2.4.1 looks at the relationship between transport investment and regional development. Section 2.4.2 reviews the theoretical literature on impact analyses and summarises various types of wider impacts through temporal and spatial perspectives. Here, the assumption about the extent of influence of HST is made, which should be different from urban transit systems which have been studied over the past 30 to 40 years. In addition, conceptual and methodological issues of impact studies are highlighted. Section 2.4.3 reviews key approaches and findings from current HST studies. Finally, Section 2.4.4 identifies the lack of an alternative approach to better understand the wider effects of HST.

2.4.1 The Relationship between Transport and Regional Development

Before exposing the current research gap in the literature on the impact of HST, it is essential to place this type of study in a broader context, as there has been a long-lasting theoretical debate about the role of transport infrastructure in economic development. The neo-classical approach regards transport infrastructure as an exogenous variable for economic growth. Such an argument holds the opposite view to the endogenous growth theory, which suggests that public goods are fundamental and conducive to the production process of economic activities (Rietveld, 1989). Thus, investment in public goods such as education, health and transport would generate positive externalities and trigger spill-over effects for economic development.

Likewise, these two contesting views persist regarding the relationship between transport and regional development. The neo-classical approach had long concentrated on a-spatial approaches, namely macroeconomic variables and processes (Scott & Storper, 2003). Consequently, classical spatial equilibrium theories discourage government intervention. The notion of this theory argues that regional disparity (divergence) is unavoidable, but is not permanent. Market factors would result in a counterbalance process towards equilibrium (convergence). The underlying rationale is that, on the one hand, divergence results from changes in demand and supply in both domestic and foreign markets, which would favour regions with desirable products or services, but would harm regions without competitive capacities. On the other hand, with the assumption of perfectly mobile capital and labour, convergence would be achieved by the relocation of firms and labour regarding costs and wages: lower wage costs trigger firms to move into regions of high unemployment, whereas labour tends to move to other regions to pursue higher wages. Consequently, unemployment increases and wages fall in prosperous regions because firms move out and labour moves in (Prestwich & Taylor, 1990). However, this classical spatial equilibrium theory cannot explain why uneven economic geography has been the norm and basic fact of economic history as far back as human society has been recorded. As Prestwich and Taylor argue "we are dealing with a continual process whereby growth regions periodically emerge, either because of shifts in the trade cycle or because of new technological developments, and each has an associated change in resources requirements which, in turn, have particular spatial attributes" (Prestwich & Taylor, 1990, p.98).

As early as the mid-1950s, a few scholars had developed spatial disequilibrium theories and indicated that the need for public intervention is indispensable. Swedish economist Gunnar Myrdal (1957) developed a concept, "a process of cumulative causation", which indicated that a self-reinforcing process occurs in a growth region; once emerging as a leader, the leading position would be strengthened and maintained over an intermediate period of time through economies of scale and localisation. The "backwash" effects are used to describe the negative effects on other

regions which could not compete with the growth region to attract the majority of skilled labour, capital and commodities. As a result, a "dual economy" persists and widens the gap between the prosperous vs. declining (stagnating) regions. Myrdal (1957) argues that the rebalancing of inequality could be achieved through the cost of labour, affluent resources and the development of markets in these stagnating regions. In order to address the imbalance, government intervention is needed. Although initially Myrdal tends not to assume the role of government intervention in this process, he accepts that intervention may be needed to overcome the backwash effects of the growth region towards regional convergence (Prestwich & Taylor, 1990). Around the same time, a similar paradigm, namely the inter-regional income inequality model, was developed by American economist Albert Hirschman (1958). He uses polarisation effects to describe the widening difference between regions and stressed the need for government intervention. If "trickling down" effects which diffuse from the growth region are not strong enough, government action is needed to intervene (Prestwich & Taylor, 1990).

Further elaboration is given by Friedmann (1966). Through his study of regional development in Venezuela, a centre-periphery model was employed to explain the relationship between the core region and the rest of the country. The rest of the country is peripheral to the core region, in that that there is an influx of capital, labour and raw materials from the periphery. Friedmann argues that divergence could be counteracted through a functional-integration hierarchy of cities and towns where groups of urban regions are formed because urban areas are centres of major economic growth. Ultimately equilibrium would be achieved. What Friedmann proposes here is an ideal hierarchical urban system regardless of administrative boundaries for either a nation or a functional region. However, this process is not automatic. How could functional-integration city regions be formed without any government intervention? Friedmann points out that a "supply constraint" would limit a region's ability to respond to increased demand for exports (Dawkins, 2003, p.140). Similarly, more recently, Scott and Storper (2003) stress that "[r]egional economic commons" of physical and relational assets are regarded as critical to achieve economic growth in poorer regions. In order to achieve synergy of these assets, they particularly point out two issues which need to be highlighted. Firstly, positive externalities tend to be undersupplied without public intervention because private sectors prefer a free-rider approach to risk taking. Secondly, negative externalities would be generated if significant moral hazard occurred and nothing was done to address problems. Consequently, uneven patterns persist.

This manifestly suggests that the market-led approach cannot lead to rebalanced regional development and public-led government intervention is needed. In particular, the public-led approach with supply-oriented intervention such as transport infrastructure is a necessary condition for regional competitiveness. The underlying rationale is aptly described as "[r]egional development is not only the result of private production factors such as labour and capital but also

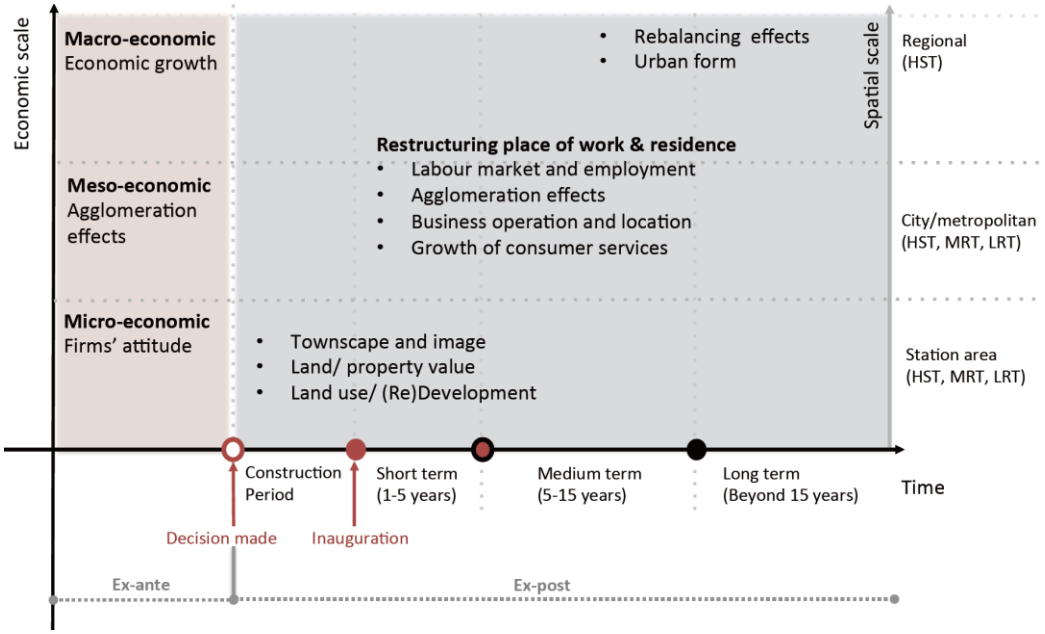
of infrastructure. Improving infrastructure leads to a higher productivity of private production factors. Conversely, a neglect of infrastructure leads to a low productivity of the other production factors" (Rietveld, 1989, p.255). However, empirical studies so far have shown a mixed picture. Many infrastructure projects have been exemplified as failures without sufficient response from the private sector. Empirical studies of endogenous growth effects are "certainly far from conclusive and can offer conflicting results" (Button, 1998, p.156). For instance, by studying UK and Western Europe, Hart (1993) suggests that road building is not a key determinant for growth. Likewise, Banister and Berechman (2000) use Liverpool as a relevant example to illustrate the fact that the expansion of the road network in the 1960s and 1970s did not mitigate decline in Liverpool, with severe losses of population and jobs. Similarly, in the research project "*Can Rail Save the City? The Impact of Rail Rapid Transit and Pededtrianisation on British and German cities*", Hall and Hass-Klau (1985) reach a similar conclusion that the construction of an urban rail transit system in Liverpool in the 1970s could not have saved Liverpool from decline.

A fundamental message emerges, namely that public intervention in transport alone could not absolutely lead to economic development. As Blonk argues "Transport is a catalytic force; it is both an agent vital for industrial growth and an agent of decline where economic resources and conditions and human endeavour are insufficient to meet competition of outside areas." (Blonk, 1979, p.331). Again, Button argues that "[a]ll this is not really very encouraging from the perspective of public policy. Many decisions still have based as much on faith as on the basis of scientific principles. It is difficult to conclude that we really know much more now about regional growth than we did thirty years ago" (Button, 1998, p.157).

2.4.2 Types of Wider Spatial-Economic Impacts of Transport Investment

The nature of wider spatial-economic impacts needs to be further analysed with two perspectives, namely temporal and spatial (associated with types of rail systems). Figure 2-4 summaries various kinds of impacts through time and across space during the development process, which involves two types of evidence (ex-ante and ex-post) in relation to the expected impacts. Detailed reviews are reported in section 2.4.2.1 and 2.4.2.2.

Figure 2-4 Various types of impacts of transprot investment over the development process



Source: author

2.4.2.1 The Temporal Perspective

Ex-ante Analyses

From the temporal dimension, there are two major kinds of impact study, namely ex-ante and ex-post. In the group of ex-ante studies, a wide spectrum of theoretical models has been developed to forecast the relationship between transport investment and economic growth, largely at the macro (aggregate) level. In order to improve the estimation, more and more integrated models are developed to combine economic potential approaches with transport network models. Several scholars have given broad introduction to those models (Banister & Thurstain-Goodwin, 2011; Iacono & Levinson, 2014, forthcoming ; Oosterhaven & Knaap, 2003). However, there is no consistent classification among them. Here, in line with a classification of three different levels (Macro, Meso, and Micro) defined in Banister and Thurstain-Goodwin (2011) as a framework to incorporate major analytical models, namely macro (production function models, accessibility and potential models, regional input-output models, LUTI/SCGE models), meso (agglomeration economies), and micro (firms' attitude of decision-making).

Production Function Models

Macro production function analysis tracks economic productivity over time. The role of government intervention in transport investment is regarded as a factor of production alongside with traditional production factors e.g. labour, capital. Such approach is denoted as follows.

$$Y_r^t = f(L_r^t, K_r^t, Infrastructure\ stock_r^t)$$

The level or change of domestic output (Y) results from labour (L) and (K) per region or nation per time period, several components of – or the total stock of – infrastructure (Oosterhaven and Knaap, 2003).

Aschauer (1989) and Munnell (1990) measure the contribution of public capital to aggregate economic productivity (GDP). Both studies have found enormous returns to public capital and argue that declines in spending on infrastructure as a share of GDP during the 1970s and 1980s might have been a cause for the decline in the productivity observed over that period. However, subsequent research largely rejects these claims (Garcia-Mila, McGuire, & Porter, 1996; Gramlich, 1994; Holtz-Eakin, 1994; Nadiri & Mamuneas, 1998). In addition, there are three main limitations in this approach. One, other factors are ignored (Iacono and Levinson, 2014, forthcoming; Banister and Thurstain-Goodwin, 2011). Second, the direction of causality is difficult to detect because a long series of data (both time series and regions) is hardly available (Banister and Thurstain-Goodwin, 2011; Oosterhaven and Knaap, 2003). Thirdly, measurements of the infrastructure stock in individual regions fail to analyse the actual supply of infrastructure services in order to decide specific individual projects e.g. the type and the location for their productivity contribution. Consequently, no definite conclusion could be made and findings of macro production elasticity of infrastructure vary dramatically among various studies (Oosterhaven and Knaap, 2003).

Accessibility and Potential Models

Accessibility and potential models could address the inability of multi-regional analysis in production function models discussed earlier. Accessibility is measured by the reduction of travel time or cost made possible by the new transport investment.

$$Accessibility_r = \Sigma_s \; Y_s \, f(c_{rs})$$

f is a downward sloping (gravity or preferably entropy) function of the communication cost between region r and region s (Crs) (Oosterhaven and Knaap, 2003).

$$Potential_r = Y_r \; \Sigma_s \; Y_s \, f(c_{rs})$$

The potential model is proportional to the total flow of traffic from region r, which in its turn is proportional to the total size of the economy of region r (Oosterhaven and Knaap, 2003).

The economic potential concept provides an approximation of significant change in accessibility for regional economies. Evers and collaborators (Evers et al.,1987; Evers and Oosterhaven, 1988) incorporate border dummies and a modal split parameter into a multi-sectoral potentials model to estimate the employment impacts of a proposed high speed rail connection from Amsterdam to Hamburg (Oosterhaven and Knaap, 2003).

Regional Input-Output Models

Regional input-output (IO) models deal with structural economic relationships i.e. inter-industrial linkages through intermediate deliveries of goods and services. The basic calculation is made with "chain of effects" (direct, indirect, and induced) of expenditures on output, employment, and income. For instance, IMPLAN and RIMSII (economic impact models) are both expenditure-driven IO models. REMO (regional economic models) translate the impact from a transport investment project into regional economic performance via effects on business cost and productivity **(**Iacono and Levinson, 2014, forthcoming). However, the limitation of the multi-regional interaction IO models is the operational difficulty due to data limitation (Nijkamp & Poot, 1987).

LUTI/SCGE Models

The aforementioned models do not have a spatial dimension which could evaluate the differences when the same infrastructure may be constructed in different locations. Two spatially detailed models, namely land-use/ transportation interaction (LUTI) and spatial computable general equilibrium (SCGE), provide the solution for this purpose (Oosterhaven and Knaap, 2003).

LUTI and SCGE have their relative niches for impact studies on different spatial scales. LUTI models employ a *system dynamics* type of modelling to predict future growth and are suitable to

analyse policy scenarios at the level of large urban conglomerations. On the other hand, SCGE models which are developed from the CGE[4] provide a theoretically more satisfying approach to simulate interregional trade and location, using utility and production functions with substitution between inputs (Lee, Haghani, & Byan, 1995; Oosterhaven & Knaap, 2003). SCGE models reflect the spatially-differentiated prices among locations which affect production and household welfare when changes to transportation networks (Iacono and Levinson, 2014, forthcoming). Iacono and Levinson (2014) argue that SCGE models are gaining in popularity because of their ability to simulate large intra- or inter-regional transport improvement as well as its adaptability to emerging theories and concepts in urban and regional economies and transportation, such as monopolistic competition underlying patterns of specialization and trade (Bröcker, Korzhenevych, & Schürmann, 2010; Krugman, 1991) and agglomeration economies and associated productivity gains (D. Graham & Kim, 2008; Rice, Venables, & Patacchini, 2006; Venables, 2007).

At the meso level, agglomeration effects signify that the geographical proximity of firms to each other could give rise to wider economic benefits, which could arise from the intra-firm level and scope economies at a location or from inter-firm externalities (Banister & Berechman, 2000; Chinitz, 1961). The contribution of transport to the level of concentration lies in the relocation decision made by firms and people from lower to higher productivity areas. Agglomeration economies are traditionally regarded as externalities and not included in a standard cost-benefit analysis. Venables (2007) significantly develops a theoretical model to determine the relationship between transport provision and agglomeration. Graham (2007b) further develops the argument about the positive relationship between increasing return to agglomeration and the increasing accessibility to economic mass. Two sets of analysis are involved, namely the urbanisation effects (based on settlement size) and the localisation effects (based on employment density). Graham (2007a) argues that the effect of agglomeration externalities is not trivial in the context of transport appraisal: 10-20% additional benefit could arise from increasing return to economic mass. The latest research by Chatman and Noland (2013) track the relationship between transit service and physical agglomeration measured by employment density, and then relate the results to productivity e.g. average wage and per capita GMP. The findings show that "estimated wage increases range between $1.5 million and $ 1.8 billion per metropolitan area yearly for a 10 per cent increase in transit seats or rail service miles per capita" (Chatman & Noland, 2013, p.1). Hence, they argue that current benefit-cost evaluations may underestimate the benefit from transit improvement, especially in large cities with existing transit networks.

[4] Computable General Equilibrium (CGE) models simulate the behaviour of supply, demand, and prices in interacting markets within the economy.

At the micro level, ex-ante research is often conducted at the firm level regarding the influence of transport improvement and accessibility on its location decisions. The concern to minimize transport cost has become progressively less important than other costs such as labour costs (Dicken, 1986). Regarding the impacts from specific types of transport investment, Oosterhaven and Knaap (2003) argue micro survey with firms provide more insights. However, they also warn that answers from micro survey at firm level may naturally vary with the factors of country, context, and sector of economic activities. When more and more factors are taken into account, a questionnaire method becomes cumbersome.

Ex-post analyses

Once the decision on transport investment is made, the development process officially begins. The analyses of impacts need to take the temporal perspective further into account in more detail since some types of impacts occur immediately or in a short term, whereas some tend to take place in a medium-to-long term. Based on the experience from the Jubilee Line Extension (JLE) Impact Study (P. Jones, 2014; P. Jones, Hanley, Mackett, & Titheridge, 2009; Jubilee Line Extension Impact Study Unit, 1999), three time periods are suggested to observe impacts, namely before the opening of services, short term, and longer-term. In line with Figure 2-4, Table 2-2 showed the major kinds of impacts and the indicators summarised from several ex-post studies of urban transit systems. There has been extensive empirical literature of impact studies on urban transit systems from the 1970s. Indicators depend on data availability and need suitable alternatives in different contexts. The methods for measurement are mainly twofold i.e. quantitative number crunching (securing secondary datasets from relevant national institutes and applying with either statistical modelling or descriptive statistics) and a more qualitative survey with questionnaires and case studies.

Table 2-2 Wider Economic Impacts of Urban Transit Systems

Key impacts	Indicators
Land use & development	•Changes in use of existing properties, the level and intensity of development and the use of land in areas around stations •Changes in commercial and industrial use of floor space •Gain/loss of open space •Changes in retail floor area •The additional dwellings (planning applications/ completions)
Land/ property value •Commercial & industrial property value •House prices	•Changes in the capital (Transaction sale prices) and rental values of properties and land
Townscape and image	•Changes in the quality and fabric of the built environment •Changes in the level and distribution of pedestrian activity around stations •Changes in the perceptions and images of the local area
Growth of consumer services	•Changes in tourism and other consumer activities (such as retail)
Business operation & Location	•Changes in the attitudes of business operation •Changes in business location •Changes in the investment behavior of suppliers/operators
Agglomeration effects	•Changes in company turnover •Changes in average wages, for that company or industry sector •Changes in GVA per filled job
Labour market & employment	•Changes in employment activity/trends/location •Changes in the number of jobs within 20, 30 and 45 minutes by public transport •Changes to the socio-economic characteristics of the resident population •Changes in attitudes to area as an employment base
Urban form **(The pattern of urban growth)**	•Multi-centric development along certain areas •Local interventions and incentives used to guide the development

Source: A list of references in the footnote[5].

Firstly, before the opening of services, three kinds of impacts could occur, namely land use/ (re)development, land/property value, and townscape and image. This is also a critical timing when proactive public and private intervention could be firstly perceived. For instance, it was found that as soon as the JLE investment was confirmed, this encouraged land use development through planning permission and construction projects, which subsequently catered for increased employment and residents in those areas (P. Jones, et al., 2009). Banister and Thurstain-Goodwin (2011) suggest four periods of timing for best capturing land value change, namely "before the decision to build", "prior to opening", "immediately after opening", and "further downstream".

[5] (Antwi, 1993, 1995; S. Crocker et al., 1999; Department for Transport, 2009; Forrest, Glen, Grime, & Ward, 1992; Forrest, Glen, & Ward, 1995, 1996; P. Jones, et al., 2009; Jubilee Line Extension Impact Study Unit, 1999; Law, 1991; Law et al., 1994; RICS Policy Unit, 2002) (Babalik, 2000; S. Crocker, 1994 ; Henneberry, 1996; Pickett & Perrett, 1984; Townroe & Dabinett, 1994)(Cervero & Landis, 1997; Dabinett, Morrell, & Vigar, 1994; Dundon-Smith, 1994; Fairweather, 1991, 1994; Fairweather & Law, 1992; Fairweather & Roberts, 1992; Gore, 1994; Grieco, 1994; Pope, 1994; Vigar, 1995)

Hedonic pricing approaches[6] have largely been adopted to statistically analyse the effects of urban transit systems on land/property value (both residential and commercial) (Lari et al., 2009). In addition, during this period, the construction of a new station could lead to reshaping the townscape and the image of the city around the station area and then change the perception of a place. An attempt to apply Hedonic pricing methods to the effects of HST on residential property value was made by Andersson et al. (2010) in the southern Taiwan. They conclude that "the estimated functions show that HSR accessibility has at most a minor effect on housing prices".

Secondly, the opening of new transport services physically facilitates new interaction and possibilities between places for business, work, or leisure, involving a process of restructuring place of work and residence. Four kinds of impacts have been observed, namely growth of consumer services (retail, tourism, etc.), business operation and location, agglomeration effects (GVA/ firms' turnover), and labour market and employment (investment and economic structure). These effects could progressively take place from short to medium, even long term, which varies with specific contexts and other complementary factors.

Thirdly, reshaping urban form and addressing spatial disparity will need a long term to transpire. However, the longer the period, the more difficult will it be for data collection to be available and harmonised over time, and causality could be attributed although this issue of causality could also be difficult within a short time period. Next, how much time (how many years) could be regarded as a long term is not possible to standardise. Third, there is an underlying assumption in Figure 2-4, which is a cumulative effect of rebalancing the inequality.

However, this stage may never been reached if there is no active public intervention as well as enthusiastic investment from the private sector. The case could be presented as a decay model of impact (see Figure 2-5) which addresses how long it will take to see a diminishing of effects from transport investment. According to JLEISU (1999), if there is no institutional intervention or new changes in the process, a decay model of impact would prevail. In order to exploit and substantiate the impact, active intervention is essential. A hopefully positive net effect will involve an active infrastructure policy which will be typically motivated either by the pattern and size of the regional redistributive effects or by the expected size of the national generation effect (Oosterhaven & Knaap, 2003).

[6] In Hedonic pricing methods, land/property price depends on a wide range of attributes among which accessibility (the distance to rail stations among other transport modes) is particularly relevant here. The effect then is determined by statistical output.

Figure 2-5 The "Decay" Model of Impact

Source: Jubilee Line Extension Impact Study Unit (1999)

So far, the research findings have presented a mixed picture and the majority of existing ex-post impact studies on urban transit systems have been short-term, within a few months or less than 5 years since the inauguration. Most findings show a modest effect. For instance, after the inauguration of Manchester Metrolink in 1992, not much evidence on the office market or on retailing is found (Law et al., 1994). Nor was the discernible effect on house prices (Forrest et al. 1996). Similarly, Sheffield Supertram services opened in 1996. Crocker et al. (1999) show the jobs actually created by the transport investment was actually much less than the claimed quantity in the appraisal for the funding application.

Given that unpredictable economic recession and fluctuation may temporarily disguise the real impact, definite evidence will take several more years before a fair verdict could be reached. The case of the BART system in California aptly illustrates this point. Knight and Trygg (1977) report that five years after its inauguration in 1972, development impacts along BART were generally minor. There was no evidence that a new transit system would increase the overall level of development of a metropolitan area. They stress that available evidence showed that rapid transit improvements can stimulate new development around the stations, but transit alone is not enough. Four general factors were determined to be needed for land-use impact i.e. local government policies, regional development trends, available land, and physical constraints of the site. They concluded that "Rapid transit will not automatically revitalize and reshape our cities, but it can do much - if we can learn to understand that role and the others which must accompany it" (Knight & Trygg, 1977, p.246). 20 years later, an update of BART impact study research was reported by

Cervero and Landis (1997). They argue that "BART played a fairly modest, though not inconsequential, role in shaping metropolitan growth and land-use patterns". They generally provide similar findings to those original impact studies that land-use impacts have been largely localised around downtown San Francisco and Oakland and certain suburban stations. They maintain that BART did little to stem the tide of freeway-oriented suburban employment growth. Those places where local redevelopment authorities intervened to provide various financial incentives and assistance with land assembling have demonstrated notable changes around the station. Thus, stronger public policy initiatives will be needed to channel future regional growth to BART corridors (Cervero & Landis, 1997, p.309).

2.4.2.2 The Spatial Perspective

Apart from the temporal perspective, the nature of the impacts varies with the type of passenger rail systems since the potential spatial range of influence is associated with locational and operational patterns e.g. speed, frequency, time-space shrinkages although some features could be shared across types. Passenger rail systems, either heavy rail or light rail, involve the movement from one place to another with vehicles running on steel-made fixed tracks and stations involves three types of patterns i.e. node (point), corridor (line), and a wider geographical area (territory). Thus, three major spatial scales could be discerned, namely local (station area), intra-urban/regional, and inter- urban/regional.

Inter-city (inter-regional) transport connectivity, such as high-speed rail (the niche lies in the competition with air and motorway) will potentially have spatial-economic effects on the regional (national) scale, in addition to its intra-urban/ local effects, while a urban transit system, such as MRT, LRT, etc., would naturally have wider economic impacts on a smaller spatial scale. Feitelson and Rotem-Mindali (2014, forthcoming) found two major spatial scales used for assessing investment of MRT and LRT are macro (metropolitan or city-wide) and micro (effects around stations).

The identification of relevant geographic scale is critical for selecting the appropriate types of analyses (Banister & Berechman, 2000). The wider impact of MRT/LRT has been seen quite localised in particular areas and, in some cases, as a matter of shifting development from one place to another rather than on a regional or national scale (Balcombe, et al., 2004). As for HST, the spatial impacts could be visually localised if a new station is retrofitted or created through a deliberate development strategy combining transport planning and land use. Hence, other factors such as location of the station, as well as local intervention on development around the station will be critical. Besides that, most importantly, the arrival of inter-city connectivity by HST can only play a major role in serving a wider territory through integrating local transport networks (MRT/

LRT or other systems) to exploit its wider impacts for a region. The differential spatial thinking and potentials between HST and urban transit needs to be applied. "High speed lines are unlikely to have local accessibility benefits separate from connecting local transit lines because there is little advantage for most people or businesses to locate near a line used infrequently (unlike public transit)" (Levinson, 2012, p.291).

Moreover, service catchments will not be identical between different transport systems. A HST station will have a wider catchment than a MRT or LRT/ or regional rail station. In the impact study of the Jubilee Line Extension, the observed catchment area was at the outset set at 1000m. Previous literature has established that the catchment area for commercial land use is measured about 500m smaller than residential use (1000m) (P. Jones, 2014, forthcoming), while for measuring HST impact in Japan, the catchment was set at 5000m (Murakami & Cervero, 2010).

2.4.2.3 Conceptual and methodological issues of impact study

Either ex-ante or ex-post impact analyses has their strengths and limitations. On the one hand, simplified forecast modelling approaches apply historical datasets as an essential exercise in predicting future patterns. When it comes to demand forecast for transport investment for decision making, the theoretical assumption is always sketchy and controversial. There are three issues which increasingly loom large. One, demand forecasting is inaccurate and often results in overestimation. Flyvbjerg et al. (2005) reveal that "for 9 out of 10 rail projects, passenger forecasts are overestimated; the average overestimation is 106%" (Flyvbjerg, Skamris Holm, & Buhl, 2005, p.131). Second, with technological breakthrough, potential work productivity on train challenges the traditional assumption of time saving for rail services (P. Hall, 2013b, forthcoming). Third, in the case of UK, calculation of wider impacts derived from economic modelling do not include regeneration/rebalance/redistribution effects at the local level. Mackie and Worsley (2013) admit that "[t]his is a topic which is important politically but where there is least consensus on what should be included, how it should be measured and where within the appraisal it should be picked up".

On the other hand, two major ex-post methods have their own limitations. Empirical statistical modelling demands a large number of data on the same spatial scales over time. This is especially problematic for a long-term empirical study due to the lack of data comparability and availability. With respect to ex-post case study and descriptive statistics, there have been a few long existing conceptual and methodological issues which need to be further discussed, namely other supplementary factors, other contributing factors, timing for observing development process, and causality.

Firstly, although the transport improvement could potentially lead to economic growth and development, the overall picture from existing literature is mixed. It is worthwhile reiterating that transport investment on its own will not usually induce development; instead, it forms a part of an intervention package. If nothing else is complementarily done, the impact could be negative due to imperfect competition and draining away effects. Whitlegg (1994), argues that, in fact, many economies have lost jobs as a result of increases in road infrastructure due to the draining away of activities from central to out-of -town locations. Grieco (1994) argues that the assumption of this relationship is largely uninformed by empirical evidence and that there is a need for more detailed and systematic empirical research. In addition, Balcombe et al. (2004) usefully summarise the role of urban transit systems during the developmental process as follows.

- It provides a modern, efficient way for residents to reach jobs outside the area.
- It provides access into the area for workers, shoppers, and those on leisure trips.
- It demonstrates a commitment to the area by various levels of government.
- It provides a useful theme for marketing the area.
- It would need supplementary policies to start the process, such as incentives of tax reductions or reductions in planning restrictions (Balcombe, et al., 2004, p.134).

Secondly, there may be other contributing factors which could produce similar results in parallel. As JLEISU (1999) argued that where changes are correctly identified, they may not necessarily be impacts that can be properly attributed to the new transport services, i.e. they may have been caused by other factors. This issue is especially critical in advanced West Europe from the 1960s and 1970s onwards when rail industries declined in an age of an expanding road network and explosive growth of car ownership. Crocker et al. (1999) argue that new road construction has had a stronger impact on industrial and commercial development proposals than Supertram and concluded that 12-15% of the land use change in those areas could be attributed to Supertram (quoted from Balcombe et al.,2004).

Thirdly, the development process is complex and evolving, which will be affected by various factors (policies, economic fluctuations, leadership etc.) over time. JLEISU (1999) and P. Jones (2014) argue that the enhanced understanding of the various processes of change in the Jubilee Line Extension Study demonstrated that monitoring changes based on “before” and “after” two points in time, as previous research has tended to adopt, does not necessarily represent various

types of changes in the underlying state of the system. Therefore, there should be more comprehension of context-specific information, more targeted collection of data, and more realistic expectation of various impacts which are likely to take place at different stages of processes.

Lastly but not least, bringing together the previous three issues, distinguishing the causality of transport investment among various factors over the development process is inherently difficult. JLEISU (1999) suggests a combination of quantitative and qualitative approaches for conducting an impact study. There may be some correlation found through the analysis of quantitative data. However, some attributable impacts will only be identified by qualitative approaches such as interview or policy analyses. Such qualitative work is, therefore, an integral part of the methodology, allowing a more complete understanding of the process of change and the relationship between public transport infrastructure investment and economic activity.

2.4.3 Current HST Impact Studies

2.4.3.1 Ex-ante Forecasting Approaches

The first methodological group for the study of the impact of HST is based on the modelling approach, which is largely applied in the fields of transport and spatial economics. The concern lies in the relationships between transport infrastructure and economic development, determined by accessibility and costs. "Accessibility is not simply a desirable good by itself, but a means to an end, in this case economic activity and social cohesion" (Vickerman et al., 1999, p. 13). Transport infrastructure is treated as a proxy for accessibility, which is also a proxy for costs incurred. The assumption is that improvement in accessibility would lead to an increase in competitiveness and a rise in regional productivity and welfare (ibid.). A typical accessibility-potential model uses measures of distance (or time) to estimate costs for industries in a region, which corresponds to the economic measure of aggregated regional GDP (Clark, Wilson & Bradley, 1969). However, this simple model emphasises "a price-induced change in demand", which doesn't take other factors into account (Vickerman et al., 1999, p. 4). These drawbacks have been considered by successive scholars devoted to refining the role of accessibility in the regional economy.

A thorough review offered by Vickerman et al. (1999) illustrates progressive refinements of the measurement of accessibility, including an attempt to translate changes in regional economic potential into changes of employment, the modification of time-based measures, distance-based measures, impact studies with input-output analysis, and imperfect competition models. Vickerman et al. (1999) argue that time-based and spatial dimensions of measurement could generate misleading conclusions about the impact of transport provision owing to sectoral aggregation. The application is more suitable to handling traditional goods than services or the

movement of people, since this approach is rooted in the principle of economic static equilibrium and stresses the impact of demand-induced multipliers. Neither a variety of potential models nor impact studies could comprehend the dynamic reality with the assumption of constancy. With regard to the imperfect competition model, despite the fact that it moves away from the equilibrium assumption, the main argument suggests that the elimination of transport barriers may result in concentration in large cities because agglomeration economies overshadow lower transport costs. The inevitable result is a self-perpetuating gap between the core and the periphery. Following this thread, it is not surprising that, through a simple supply-driven regional econometric model, Sasaki et al. predict and conclude that a "denser Shinkansen network will not necessarily contribute to regional dispersion" (Sasaki, Ohashi, & Ando, 1997, p.77).

The aforementioned imperfect competition model features in a comprehensive review recently conducted by Puga (2008), who furthers the debate over HST accessibility and regional inequalities. He adduced several studies associated with "new economic geography" to illustrate the point that a combination of market access and labour mobility results in an agglomeration effect under scale economies, whereby large markets become larger since they excessively attract more firms and labour. Hence, in line with this view, it has been argued that the implication for the effects of transport infrastructure is that "[c]ross-border infrastructure projects connecting lagging regions with key markets make it easier for firms in lagging regions to reach new customers but also expose them to fiercer competition from firms in more developed areas" (Puga, 2008, p. 117). In the case of HST investment, Puga suggests that, instead of reducing regional inequalities, benefits are likely to favour major nodes and are unlikely to promote the development of new activities in minor nodes or in locations in between nodes. In addition, he argues that, unlike road infrastructure, HST is not oriented for goods transport; rather, HST may have a stronger impact on the location of business services and headquarters. For instance, it has been suggested that the construction of the French TGV connecting Paris with Lyon led to the relocation of headquarters from Lyon to Paris. Similarly, the Spanish Madrid-Barcelona HST may consolidate the spatial relocation of headquarters towards the capital (Puga, 2002; Vives, 2001).

Instead of tending to generate negative output out of ex-ante studies, agglomeration economies as wider economic impacts in the context of high-speed rail have attracted much attention in recent years. Graham and Melo (2010) Traditionally, agglomeration effects emphasise the intra-urban or regional drivers of productivity generated through locational proximity in a large urban setting. The objective is to assess whether agglomeration effects could be generated in the context of inter-city interactions. The basic assumption is that transport investment can influence on the micro-foundations of agglomeration, and no obvious characteristics of the sources or mechanisms of agglomeration discussed in the literature that would limit their generation over long-distance. Therefore, the argument linking transport to agglomeration could hold in long-distance case if

spatial interactions between economic agents are made more efficiently. Increasing returns would be expected. They find there is a considerable amount of long-distance interactions between TTWAs, arguing that this suggests HSR could have an important effect on the level of connectivity between firms and workers. Therefore, the distance decay gradient is adopted to infer flow changes from the improvement of time saving. Given that a long-distance mode share for rail of about 7%, and that 8.56% are inter-TTWA trips, their findings show that a transport investment which can affect 25% (50%) increase in travel speeds demonstrates minor potential agglomeration benefits of 0.006% or £8.29 million (0.0011% or £15.80 million). They conclude that "while urban economic theory does not preclude the existence of agglomeration benefits across inter-regional distances, the empirical evidence suggests that these may be very small indeed" (Graham and Melo, 2010, p.37).

2.4.3.2 Ex-post Empirical Approaches: Quantitative and Qualitative Methods

In contrast to a large number of HST impact studies conducted by ex-ante approaches, ex-post types of impact studies based on precious empirical evidence are still relatively few. Three major types of research on wider impacts have been conducted, namely socio-economic effects at the local authority level or a wider catchment area around the station, business operation at the firm level, and accessibility effects in a wider territory.

The first and the most common type is to interrogate the wider socio-economic effects, such as population, employment, property value etc. In the 1980s, ex-post HST impact studies largely focused on the Japanese experience of the Shinkansen. Such studies adopt a control group of places without HST services, based on the comparison of economic performance before and after the introduction of the HST services. Hirota (1984, as referred to in Brotchie, 1991 and Sands, 1993a), Nakamura and Ueda (1989, as referred to Brotchie, 1991 and Sands, 1993a), and Amano and Nakagawa (1990, as referred to in Sands, 1993a) all find higher population growth in cities with the Shinkansen service than in those without it. For instance, Hirota found growth rates of HST cities (1.6%) are higher than non-HST ones (1.1%). Nakamura and Ueda (1989) find a high correlation between high growth rates in information-exchange employment and the presence of HST stations and an expressway. Employment growth is reported in these studies too, but the outcomes vary: the effects were greatest on service industry employment, including knowledge-based industries, and this was true even when controlled for by the simultaneous expansion of the expressway network (Brotchie, 1991). In summary, these studies demonstrate faster growth rates of population and economic effects (i.e. employment and economic activity) for cities on HST routes than those that are bypassed.

A recent empirical evidence came from Murakami and Cervero (2011), based on job and labour market from 40-year Shinkansen experience within a wider catchment 5km around the stations. The Tokaido Shinkansen line proves to the world the most successful HSR corridor serving 378,000 passengers per day and capturing 82% of the intercity passenger flows between Tokyo and Osaka in 2009 (Murakami & Cervero, 2010, p.8). The empirical findings on corridor-level job distributions, cross-industrial typologies, and station-level density gradients suggest that the new HSR project is likely to induce knowledge- and service-based business agglomeration benefits, but these are mostly limited to large, globally connected cities. Growth could also shift to HSR-served edge cities, airports, and leisure-entertainment hubs at the expense of small intermediate cities.

However, the causality is difficult to prove. Sands (1993a) casts doubt on the causal direction. Similarly, by studying Ashford in South East England, Preston and Wall (2008) show the opening of Ashford International station has coincided with 11% population growth, 6% increase in employment, and 3% increase in housing prices; But they maintain that given the aggregate nature of the data used, attribution of causation is difficult. Moreover, they argue that city type is a factor for explaining the limited result in Ashford which is a medium-sized market town similar to Calais-Fréthun, Haute Picardie, Le Creusot or Macon Loché, and not a regional centre like Lille, Lyon, or Seville. Hence, they predict that the arrival of domestic HSTs in 2009 would further draw Ashford into London's commuting belt, approximating the effect in Ciudad Real.

In line with city type, an associated series of empirical studies examine the impact on different types of HST cities. They suggest that HST influences different kinds of cities in different ways. Ureña et al. argue that the size of intermediate HST cities and their distance from the metropolis (usually the capital city of the country) strongly condition the effects of HST (Ureña, Menerault, & Garmendia, 2009). HST services appear to reinforce large regional cities (Harman, 2006; Steer Davies Gleave, 2008), like Lyon (Bonnafous, 1987; Payre, 2010), but for smaller HST cities, outcomes differ. Spanish researchers found that Ciudad Real, within one hour of Madrid by HST, transformed itself from a previously-isolated small regional city to become a sub-centre within a polycentric mega-city functional region (Garmendia, de Ureña, Ribalaygua, Leal, & Coronado, 2008), through a sizeable rise in commuting into the capital plus reinforcement as a regional university and business centre (Harman, 2006).

The second kind of research is at the firm's level to understand the location of industries. This type of research is rarely conducted. Regarding the impact of the first TGV line, Bonnafous (1987) uses a mixed method of quantitative and qualitative approaches to conduct two surveys at the micro-scale firm level in the Rhône-Alps regions respectively in 1980 (ex-ante) and 1985 (ex-post) in order to compare the changes of business behaviour and motives for travel between Paris and Lyon. This was an early study, conducted two to three years after inauguration of the first TGV service. Although this is not the evidence of economic growth at the local authority/ or regional

level, this view from businesses at the micro level provides insight into the relationship between HST accessibility and business operation.

As early as the late 1980s, he has found, Parisians had increased their journeys to the Rhône-Alps region by 52% for business travel against 144% made by inhabitants of the Rhône-Alps region, which seems to imply that the inhabitants of the Rhône-Alps exploit this expanded market by TGV more intensively than Parisian competitors who seem to enjoy their own market. As Bonnafous (1987) states that "these figures point to the fact that there was no reason to fear a "rapprochement" with Paris, a fear I , myself, had overestimated" (Bonnafous, 1987, p.136). Interestingly, in contrast to Puga's (2008) claim for aggregated regional development, that easy accessibility to Paris for specialised service industries in the Rhône-Alps region meant there was no need for Lyon firms to relocate to Paris, while their Parisian rivals did not feel the need to expand their activities to Lyon.

The third type of study is about the accessibility effect brought by HST and is explored on multi spatial scales. The aforementioned existing empirical studies of HST effects have been largely investigated at one spatial level, in particular the urban level. Increasingly, a multi-level analysis has been advocated (Harman, 2006; Ureña, et al., 2009). A group of Spanish and French scholars, Ureña et al. (2009), adopted a comparative case study approach to take specific circumstances and contexts into account. Three particularly large intermediate cities, namely Córdoba and Zaragoza in Spain and Lille in France, were chosen in order to study HST effects simultaneously at the national, regional, and local levels and mutual multilevel territorial implications of HST in these three cities. Based on existing literature, they hypothesised that at the national level, HST offered these large intermediate cities new locational advantages due to improved connectivity with capital cities, which should attract high-level activities. At the regional level, they adopted Plassard's (1991) argument that a contradictory relationship would be induced between a regional core city's national/ international connections and its regional connection with neighbouring small cities. So the regional city-system was hypothesised to be restructured with the arrival of HST. Two scenarios could happen: small regional cities may either become closer to a regional city or a capital city. At the local level, they hypothesised HST as a catalyst for creating new city images and urban projects. In addition, they wondered whether these projects were undertaken with the aim of reinforcing the national and regional roles of these large intermediate cities in order to make the best of the opportunity brought by HST or purely pursue local objectives. They present empirical evidence at all three levels regarding the extent to which HST opened up new complementary and contradictory possibilities for urban development. In particular, they suggest the importance of planning in both political and technical contexts. On the one hand, political

agreements[7] at different spatial scales about how HST should be introduced are vital to make the most of the transport investment. On the other hand, the specific technical context (the layout of the network, the travel-time between large cities, the gauge and compatibility of rail track) condition HST's regional performance. Similarly, a recent paper authored by Martínez and Givoni (2012) analyses the accessibility impacts on winners and losers as a result of the proposed HS2 Phase one. They compare accessibility changes on the HSR network and beyond the HSR line, revealing that the accessibility benefits from the proposed line are relatively limited concerning the geographical spread. Therefore, they conclude that any examination of a HSR line must consider a wider geographical area than just the cities, and must consider integration between transport networks, in particular between HST and conventional rail networks. They highlight that "the case for a HST line in the UK from a regional accessibility perspective is questionable" (Martínez & Givoni, 2012).

Lately, an extensive worldwide sample study was conducted by International Union of Railways (2011) to assess the implications of HST for urban and regional development. They aimed to reach a definite quantitative conclusion regarding the impact of HST. Following criteria for selection, five countries (Japan, France, Germany, Italy and Spain) with similar HST experiences were chosen. Within each country, selected cities were divided into two kinds: HSR cities and non HSR cities (termed as "twin city" in this report). The selection of cities to be studied is based on population, type of station, employment rate, distance to relevant cities, or city profiles. The key reason for this research design is an attempt to reduce the complexity of factors which affect urban and regional development, apart from the main aspect of HST. But the selection of suitable "twin-city" was problematic from the outset, as it is difficult to find two comparable cities which have a different profile regarding HST availability. A preliminary qualitative analysis was used as an introductive and descriptive element leading to the next step for major quantitative analyses of social and economic data with a time series, correlation coefficients, principal component analysis (PCA) and regression analysis. However, research findings did not achieve the initial research aim. The report concludes that, in qualitative terms, HST can change the image of a city in a positive way e.g. through an enhanced profile of modernity and innovation, or the transformation of the area surrounding HST stations through new development and land usage, but these involve some important preconditions and circumstances such as direct access to motorways, commuter distance to the next metropolis, short distances to city centres, available land for development in city centres, socio-economic profiles, or the political cooperation of various institutions. Quantitative findings suggest that there is better development in HSR cities than in non-HSR cities according to several analyses, but this has not been confirmed as yet. The outcomes differ regarding countries

[7] E.g. different types and levels of investment, public authorities and participants, a new high-quality transport system, public-private cooperation and regional planning.

and other aspects, so "a valid impact of HSR has not yet been noted" (International Union of Railways, 2011, p.3).

So far, the evidence from different studies on the wider effect of HST is mixed (Givoni, 2006). However uncertain as it seems to be, one thing is certain. HST alone is not sufficient to achieve the expectation of wider effects. Many other factors and conditions are needed too. The timing is relevant. At the time of economic crisis, nothing spectacular was expected to take place. Most importantly, the role of public intervention and strategic planning is critical. In an early study, Bonnafous (1987) argues that government intervention and certain restructuring policy in depressed industrial areas play larger role in affecting the location of economic activities than the factor attached to the transport system, in the case of HST. He further argues that the TGV is only exceptionally a determining factor; while very often, the availability of the TGV is regarded as a "bonus". Banister and Berechman (2000) argue that "the presence of a buoyant local economy that can take advantage of the new opportunities offered by the high-speed rail accessibility" (Banister and Nerechaman, 2000, p.282). Similarly, Preston and Wall (2008) conclude that "where the HST has only led to modest changes in accessibility, feeder services to the HST hub are limited and supportive urban and regional policies are lacking, then socio-economic impacts are likely to be modest, as exemplified by Ashford's experience to date" (Preston and Wall, 2008, p.420). Furthermore, Murakami and Cervero (2010) also conclude, from their Shinkansen experience that "the spatial redistribution effects of California's HSR investment need not be a simple "zero-sum" game. When leveraged through far-sighted, proactive public policies, increased agglomerations that take form through redistribution can indeed have "generative" economic qualities, to the benefit of the state at large" (Murakami and Cervero, 2010, p.2).

2.4.4 The Gap: Towards A Planning Approach Operating on Two Inter-related Spatial Scales

An overall review of the literature on the impact of HST reveals that, thus far, existing studies have rarely attempted to address the reduction of inequality with the arrival of HST and have not provided persuasive or explanatory evidence.

On the one hand, it is difficult to understand the complexity of the wider effect of HST through these general modelling approaches which are concerned with cost and equilibrium and fail to differentiate the dynamic uneven nature of development over time. Neither is it possible with the theory of imperfect competition, which tends to predict the dominance of agglomeration economies in large cities or regions and, thus, there is no positive implication available for regional policy with regard to poorer disadvantaged cities or regions.

On the other hand, the current empirical method is largely quantitative-led. These studies generally attempt to measure social-economic changes as the effects of HST through a time series featuring before and after the arrival of HST and a distinction between HST and non-HST cities. In addition, in some studies, the typology of HST cities (the size and time-space effects brought about by HST) is taken into account to evaluate the development effect of HST. However, the latest UIC worldwide sample study of the impact of HST has confirmed the difficulty of generalising on this topic. A qualitative-led method was applied in Ureña et al. (2009) which deepened the understanding of complex HST effects with a multi-level analysis through a comparative case study of three HST cities. However, at the regional level, the investigation focused on the relationship between these small regional cities with the national capital, rather than the inequality and interaction within the region.

Concerning the wider impact of HST on reducing regional inequality, three aspects are lacking in the current literature. Firstly, there is an acute shortage of empirical research addressing the wider spatial-economic impact of HST in reducing inequality on both the inter-regional and the intra-regional scale. The investigation and focus have been placed on individual cities rather than a group of cities including disadvantaged peripheral cities within the country or within regions. So far, a few warnings have been given regarding the polarisation within regions. Troin (1995) and Menerault and Barre (1997) suggest that the arrival of HST results in sharply reduced frequency of conventional long-distance train services, which is disadvantageous for intra-regional relationships. Moreover, Bruyelle and Thomas (1994) predict that a worsening in regional polarisation would be likely to occur due to a limited number of well-served, nodal locations after the arrival of new transport links. But, most importantly, empirical evidence has not yet proven these assertions: whether and how the benefit of HST would be spread as widely as possible, rather than being concentrated in a few advantaged places.

Secondly, despite it being widely reiterated that public intervention is needed to address regional inequality and transport is a necessary, but not sufficient condition, the role of government intervention regarding HST investment has not yet been explored. Decision-making about HST investment is generally at the national level. Perspectives towards HST investment may vary at different governmental levels and in different national contexts. A comparative approach involving two countries has merits in understanding how the difference in national context will cause wider effects at the local level, which will be invisible in a single-context study. As Hall (2009b) suggests, building a new high speed train links could reshape a country's economic geography. Nevertheless, in a nation with a market-oriented ideology, a visionary and long-term view of infrastructure planning could hardly be adopted by the government to structure the nation. In the UK, Marshall notes that "[w]e actually know infrastructure should be a vital part of planning's

instruments, but governments do not want to grasp this in our marketised world" (T. Marshall, 2009b, p.488).

Thirdly, in relation to the second point, a multi-level interventionist approach using an in-depth qualitative method has been lacking. How would the different ideology at the national level propose diverse urban and regional policies which would affect government intervention at regional and local levels? Could this national framework be conducive or detrimental to possible transformation of disadvantaged places? How do reactions at the local level vary, and result in different outcomes?

Overall, in order to deepen the comprehension of the wider impact of HST on urban and regional inequality, this thesis will contribute to the current literature with a new empirical study, presenting evidence at two inter-related scales (inter- and intra-regional) from a planning perspective. The aim is not only to try to measure whether and to what extent HST results in a wider impact, but also to understand in depth the role of government intervention in the diverse effects on urban and regional development.

2.5 Methodology and Research Design

2.5.1 The Methodological Issues in Social Science

Contemporary social science has been developing based on a constant stream of dialectics regarding the ontology[8] and epistemology of the real world. Walliman provides a clear introduction to ontology and epistemology. Ontology is about "the theory of social entity and is concerned with what there exists to be investigated" while epistemology is "concerned with how we know things and what we can regard as acceptable knowledge in a discipline" (Walliman, 2006). Naturally, different ontological views lead to their epistemological views as well as their methodological choices (Walliman, 2006); nevertheless, Aunger has surprisingly found that "epistemology can vary independently of ontology" (Aunger, 1995, p.108).

Generally speaking, two contrasting epistemological paradigms in social science are positivism and interpretivism (Table 2-1). As Kuhn argues ,"paradigms provide scientists not only with a map but also with some of the directions essential for map-making" (Kuhn, 1998 [1970], p.100), it is

[8] There are two distinctive views in ontology, namely objectivism and constructionism. Objectivism denotes social phenomena which are context-independent, whereas constructionism signifies social phenomena are in a constant state of change because they are totally reliant on social interactions which take place.

critical to bear in mind that the paradigm will guide research design and choices of methods. A positivist approach pursues the universal law of the real world based on experiences and observation. Popper (1998 [1963]) argues the criterion for securing scientific knowledge is falsifiability, refutability, or testability based on deductive reasoning in generating hypotheses to verify theory. In contrast, an interpretivist approach emphasises ideas which are used to interpret the social world.

Table 2-3 The Comparison between Two Paradigms in Social Science

	Dimensions	Positivism	Interpretivism
1	Society	Ordered. Governed by a uniform set of values and made possible only by these values.	Conflicted. Governed by the values of people with access to power.
2	The role of social science	Discovering the universal laws of society and human conduct within it.	Discovering how different people interpret the world in which they live
3	Philosophical basis	Realism: the world exists and it knowable as it really is. Organisations are real entities with a life of their own.	Idealism: the world exists but different people construe it in very different ways. Organisations are invented social reality.
4	Epistemological stance	"Objective" (separation between observer and observed)	"Subjective" (interpenetration of perception and interpretation)
5	Logical form (way of reasoning)	Deductive Theory testing (theory > data)	Inductive Theory building (data > theory)
6	Research goals	Description/generalisation/ prediction/ casual effects	Understanding/ causal mechanism
7	Model of causality	Regularity of correlation	Mechanisms generate outcomes
8	Temporal framework	Static (i.e. equilibrium assumed)/ abstract	Processual / historical
9	Methods of understanding	Identifying conditions or relationships which permit the collectivity to exist. Conceiving what these conditions and relationships are.	Interpretation of the subjective meanings which individuals place upon their action. Discovering the subjective rules for such action.
10	Data collection methods	Survey, formal interviews/ questionnaires	Participant observation, interactive interviewing, introspection
11	Analytic methods	"Quantitative"	"Qualitative "
12	Units of analysis	Variables	Themes/ motifs
13	Population/ Scale	Large (macro-scale)	Small (micro-scale, local)
14	Sampling	Representational	None or ad hoc
15	Criteria for assessment	Validity/ replicability	Contextual equivalence/ authenticity /stimulus for social action

Source: adapted from Aunger (1995) and Walliman (2006)

These two distinct paradigms respectively reflect the underlying concerns. Bennett and Elman (2006) summarise two basic epistemological concerns: "effects of causes" versus "causes of effects". Both have their representative methodologies. They argue that the conventional quantitative approach emphasises "effects of causes", as such a view drives researchers to make systematic efforts to demonstrate how much an outcome, on average, results from a cause. Therefore, pure quantitative research crunches numbers with statistical methods. In contrast, a qualitative methodology aims to discover "causes of effects" in order to explain the outcome of small-N case studies. Thus, qualitative approaches tend to investigate the complex social world, such as "path dependence, tipping points, interaction effects, strategic interaction…" (Bennett & Elman, 2006, p.457).

However, conflicts arise when one approach intends to teach and correct the other with its superiority. The most controversial work is "Designing social inquiry- scientific inference in qualitative research" authored by King, Keohane, and Verba (1994). From the perspective of the positivist tradition, they argue that there are two styles of research and one logic of inference. "Our view is that these differences are mainly ones of style and specific technique. The same underlying logic provides the framework for each research approach. This logic tends to be explicated and formalised clearly in discussions of quantitative research methods" (King et al., p.3). In a word, it is clear from their statement that only through the shared rules of scientific inference, that are largely used by quantitative research, can non-statistical research become more reliable.

Their view has sparked strong criticism. Mahoney denounces this view of quantitative superiority which often regards qualitative research as lacking precision and not being deserving of the term scientific method (cited in Brady & Collier, 2010). Also, it is claimed that King et al. (1994) dangerously conflate epistemological and methodological logic (George & Bennett, 2005). Moreover, causal effects are preferred to a causal mechanism, with the emphasis on the "logic of confirmation" through hypothesis testing, rather than the "logic of discovery", which pays little attention to causal complexity. Most importantly, the methodological conflicts are largely derived from a fundamental difference in beliefs. Although King et al. realise most research is hybrid in character, they neither appreciate the importance of the qualitative approach in its own right and the limitations of the quantitative approach, nor attempt to propose a way to combine qualitative approaches with quantitative. This persistent methodological debate and the attempt to bridge the divide have been central issues in "Rethinking social inquiry" edited by Brady and Collier (2010). A more balanced view is provided to assess the strength and weakness of both qualitative and quantitative approaches and the complementary role of alternative methodological approaches.

2.5.2 Research Design

From the review of methodological debates in social science, it appears that the aforementioned methodological debate of HST studies in section 2.4 is inherited from the constant debate in social science. This thesis aims to understand the dynamic spatial-economic development brought about by the arrival of HST, asking questions such as whether, to what extent, and how about the wider impact of HST. Apart from the measurement of HST effects, it probes how the opportunities of HST are perceived, in particular, the role of government intervention in this process. Therefore, the methodology adopted for the current study will involve both quantitative and qualitative approaches to obtain evidence on the two inter-related scales featured. Before moving on to a discussion of research design, it is essential to firstly define the terms "region" and "sub-region".

Defining "Region" and "Sub-region"

Patrick Geddes' *Cities in Evolution* (1915) aroused the need for regional/local planning to deal with urban expansion. This period of development could be labelled "city-regional" planning, which is different from "regional" planning under national territory. In the textbook of *Urban and Regional Planning*, Hall (2002b) distinguishes two scales of planning: the national/regional scale and the regional/local scale (city-region).

Regional/national planning emerged as a pressing issue after the Great Depression in the late 1920s in Western Europe (P. Hall, 2002b). The definition of "region" is elusive by nature, as the concept of a region involves several different aspects which are difficult to capture in an era of widespread globalisation. Keating (1998) provides at least three approaches to establishing a definition, namely administrative, economic and cultural. Firstly, an administrative or provincial level of region is a formal governmental institution, which normally complies with statistical divisions. However, to what extent regional institutions secure their devolved functions from the central state to exert their political power varies with nations. Secondly, from an economic perspective, a functional city region reflects the close interdependence among a network of cities based on their functional attributes, the travel to work pattern, and market linkages. With technological development and globalisation, this functional metropolitan region extends far beyond fixed administrative boundaries. Thirdly, from a cultural aspect, regions can be defined through history, language and a sense of regional identity. The geographical scale for a cultural region may vary dramatically and regional development is dynamic and complex. "These varying definitions of the region not only do not always coincide, but they may be in conflict with each other" (Keating, 1998, p.. 10).

In this research, a region is defined as a component of national division. Regional performance is measured and studied based on an administrative (statistical) unit because this unit contains

consistently available statistical figures over time to comprehend changes. The constitutional capacity of a region varies in different countries. It could be a mere administrative division for statistical usage rather than a real government body, like current English regions except for London (from 2000). In France, regional divisions emerged in the mid-1950s as "programmed" regions in the national plan and evolved in status and gained legitimate responsibility from 1982 onwards. A region has a democratic foundation via directly elected representatives, as well as regional competence in economic development, regional spatial planning, secondary education facilities and vocational training (Colomb, 2007). In this instance, the concept of a sub-region is a further sub-division within a region, but this does not necessarily comply with a division of local government. The geographical sizes of sub-regions are not identical, since their delineation is made based on economic, historical and geographical features, as well as data availability.

Two Spatial Scales: A Survey at the Inter-regional Level and A Comparative Study at the Intra-regional Level

The considerations which were taken into account for this research design are as follows. Firstly, HST which connects major cities in a country potentially restructures national economic geography, so observations are focused on whether and to what extent the arrival of HST could revive large or medium regional cities and reduce inequality on the inter-regional scale. These observations take a combination of historical and comparative perspectives into account. For historical reasons, a country which has long-term experience in developing HST lines is more suitable for observation than a country which has just begun to develop HST. The comparative perspective is implemented through the selection of railway lines (HST and non-HST) and major cities or towns on both groups of rail lines. A conceptualised theoretical framework is constructed in relation to the research context and question. Units of variation focus on the relationship between changes in transport connectivity (independent variables) and economic changes (dependent variables). The operational indicators for transport and economic variables are then generated for data collection and analysis.

The second spatial framework in question shifts to the intra-regional scale. A comparative case study which combines quantitative and qualitative approaches is adopted. As Tarrow (2010) pinpoints, quantitative and qualitative data are being intertwined within the same study more and more frequently. The qualitative part can play a complementary role to quantitative approaches (Bennett & Elman, 2006). The combination of qualitative and quantitative methods could deepen the understanding of the research question with triangulation effects. Tarrow advocates that qualitative data could be used "to interpret quantitative findings, to get inside the processes underlying decision outcomes, and to investigate the reasons for the tipping points in historical time-series" (Tarrow, 2010, p. 109-110). With regard to the quantitative part, the variables and

indicators are similar to those in the inter-regional study, but units of observation are centred on a region and all sub-regions within it. The quantitative figures assist in identifying situations before and after the arrival of HST among HST and non-HST sub-regions within the region. Then, quantitative findings serve as a departure point for the qualitative section of the study. The qualitative part focuses on teasing out the complex nature of the impact of HST through a comparative case study between two regions respectively in two national contexts, which can offer a deeper understanding of wider HST effects.

A Comparative Case Study

There has been considerable exploration regarding the strengths and limitations of single case studies (George & Bennett, 2005; Gerring & MyiLibrary, 2007; Yin, 2003), but less guidance has been found on small-N in depth comparative case studies (Abu-Lughod, 2007). Four supporting arguments underlie the comparative case study approach:

1. A carefully designed comparative case study is invaluable for studying complex socio-economic systems (Hatakenaka, Westnes, Gjelsvik, & K. Lester, 2006).
2. As Gerring argues, "All knowledge is comparative…In order to understand one thing, we must know neighbouring things" (Gerring, 2001). Comparative analyses could be conducive to evaluating and improving practice and policy on the basis of enhancing comprehension about one system to question its practices and values (Breuillard & Fraser, 2007).
3. A comparative case study could generate objective research evidence through reasoning in two ways; a deductive result out of possible and careful generalisation, and an inductive view of understanding individual situations and transformation processes (Pol, 2002) to transcend the limitation of simply descriptive empiricism (Harloe, 1991). Therefore, a comparative case study involves both quantitative and qualitative analyses to reinforce the generalisation of findings and qualitative understanding of each "unaverage clue" (Jacobs, 1961). For this kind of well-matched comparative case study, it is argued that "the circumstantial similarities help highlight the differences in terms of paths taken as well as paths not taken" (Hatakenaka, et al., 2006, p. 4).
4. A systematic comparative case study could not only reduce the parochialism of social scientists, but also illuminate variables that remain invisible in the single case study. "[A] causal path that leads across levels of analysis, acknowledging the different contribution each level makes to explaining similarities and differences" (Abu-Lughod, 2007: p.403).

Nevertheless, given that similar cities and regions still differ from each other, the intrinsic limitation and methodological issues of comparative research could not be ignored. The most

important issue is the confirmation of conceptual or functional equivalence across countries for specific research aims (Armer, 1973). In addition, the equivalence of measurement, languages and sampling is largely dissimilar (Provan, 1993). In order to tackle this issue, it is suggested that when conducting robust statistical analyses, efforts must be made towards "collecting reliable and similarly based data" (quoted in Provan, 1993, p. 18).

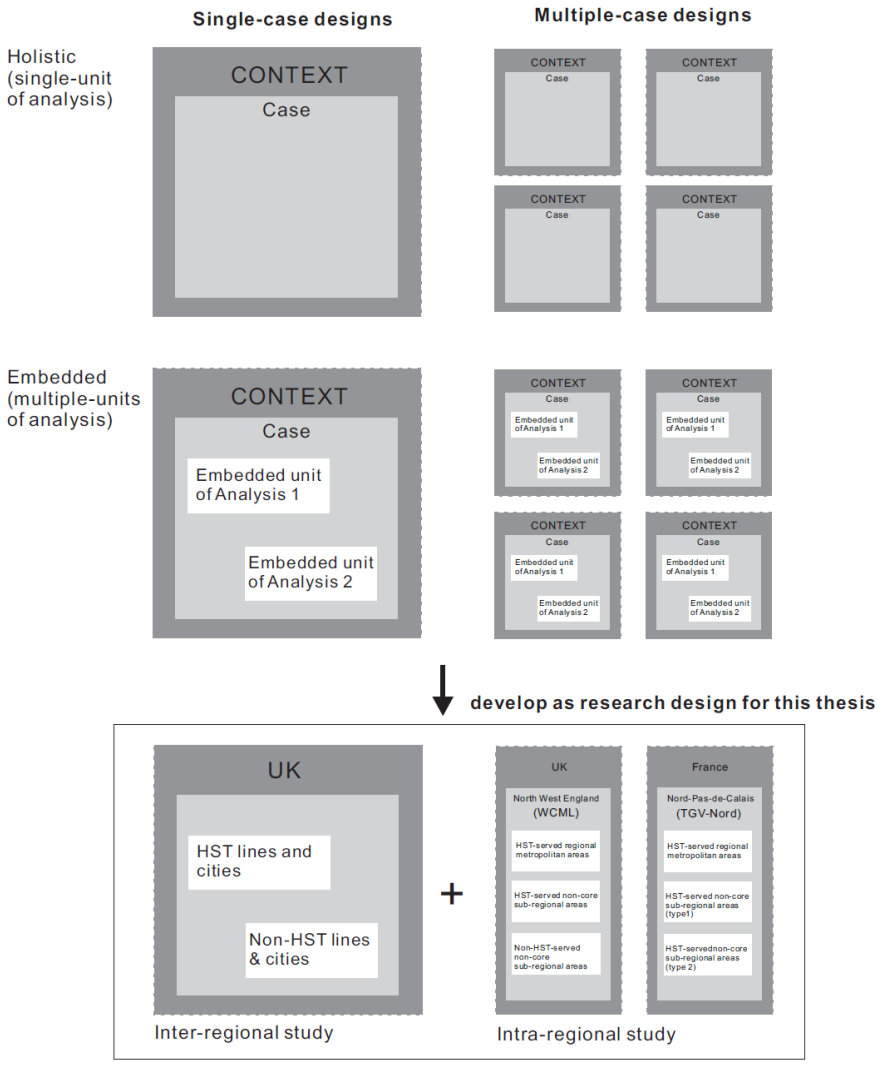
Selection for the Inter- and Intra- regional Study

In line with these concerns, this research emphasises European experiences. This selection is justified by historical reasons and diversity, which could yield critical insights through a comparative perspective. This is not only because Europe has been developing the HST network for the longest period, but also because, within a relative geographical proximity, western European countries have been developing their own HST approaches in different ways since the 1970s, as reviewed in section 2.2. Thirty years on, more and more countries are encountering critical moments of decision-making when developing their HST network for future generations. For a practical reason, it is not feasible to conduct a cross-European comparative study in depth. This thesis, therefore, is based on the British context, since the UK invented the railway and adopted an upgrade approach for HST services in the 1970s. Now, the British government has decided to develop future HST with HS2 projects building new dedicated HST lines. Inter-regionally, the 30-year experience of the British InterCity 125/225 is chosen to understand how British economic geography has been shaped by the upgrade approach. Then, intra-regionally, a comparative case study of two post-industrial regions with two HST approaches (the WCML modernisation versus the new dedicated TGV-Nord line) is further selected to measure the intra-regional impact and to gain an insight into how the opportunities offered by HST were perceived by the interaction between different levels of governments in different contexts. The country selection of a UK-France comparison is critical because both are typical examples of two HST approaches. The current comparison of two HST approaches in two regions will provide valuable implications for the UK when developing HS2 for a possible rebalancing of British space economy.

The two selected regions are Manchester and its sub-regions in north-west England (NWE), and Lille and its sub-regions in Nord-Pas-de-Calais (NPDC), France. Both regions[9] have similar industrial trajectories, challenges and HST opportunities, but are associated with two different national political economic and HST approaches (see Figure 2-4 below).

[9] Frendreis (1983) suggests two strategies for comparative research: the most similar systems and the most different systems. Both designs attempt to isolate relevant and irrelevant variables and permit the co-variation to be found.

Figure 2-6 An Illustration of the Current Research Design at Two Spatial Scales



Source: adapted from Yin (2003: p.40)

The first consideration is the industrial trajectory. Despite the fact that the industrial revolution arrived much later in France than Britain, NPDC, together with the Lorraine region, was the cradle of the French industrial revolution (Colomb, 2007). In the second half of the 19th century, the textile industry in the Lille-Roubaix-Tourcoing area was the second largest in the world, next to Manchester in Lancashire (Fraser and Baert, 2003). From the 1970s onwards, the deindustrialisation process hit NPDC and the textile industry in the Lille-Roubaix-Tourcoing area was no exception (Colomb, 2007). A similar process also occurred in Manchester and the north-west. At the zenith of the cotton industry in Lancashire, Manchester took the position as the capital of the North from York, and eclipsed London (Smith, 1994). In 1830, cottons accounted for

more than half the amount of British domestically-produced exports (Hall, 1998, p. 314). However, the worldwide Great Depression in the 1920s and 1930s hit the northern cotton industry hard, and this situation was left unchanged when the economic upturn occurred in the late 1930s (Smith, 1994, pp. 20-22). Moreover, when massive deindustrialisation prevailed in many British cities in the 1970s, Manchester and Lancashire were unavoidably hit again, especially those mill towns north of Manchester (e.g. Oldham, Bury, Blackburn, Burnley) in contrast to towns south of Manchester such as Warrington, Stockport and Trafford with more diversified economies (The Northern Way, 2009b, p.12).

The second concern is the similar challenge faced by both regions with regard to the increasingly widening inequality between the major city and the surrounding sub-regions after economic restructuring transformed the economic climate into a dynamic knowledge-based system. The wealth and strength of Manchester was built on the cotton industry, which was operated in an interwoven network- "a unique synergy" (Hall, 1998, p. 344) between Manchester and its surrounding towns in the county of Lancashire. Similarly, Lille was the commercial centre for the Lille-Roubaix-Tourcoing textile industries. The steel and coal mining area (Valenciennes, Douai, Lens, Béthune) around the southern part of the conurbation supplied energy resources for textile industries. As the previously close relationship established between major regional cities and their hinterlands for production purposes evaporated, these hinterlands suffered more than their regional core cities when adapting during the process of economic restructuring.

The third consideration is the similar time-space range offered by HST for both routes, Lille-Paris and Manchester-London. The same time-space effect will be potentially realised between London and Manchester when HS2, a new generation of 300kph HST, is finally implemented in 2032. Lille, the capital of NPDC on the northern border of France, 226 km from Paris, has been within a time-space distance of one hour by the new TGV-Nord since 1993. Manchester, 320 km away from London, was the first industrial city in the world when the industrial revolution occurred in England. From 2004 onwards, Manchester, in the north-west, has been served by Virgin Pendolino on the upgraded WCML. The rail journey is two hours between London and Manchester by current Pendolino trains. As mentioned earlier, the comparison will critically reflect the variance in current HST effects between the two contexts and, in turn, provide valuable implications for future HS2.

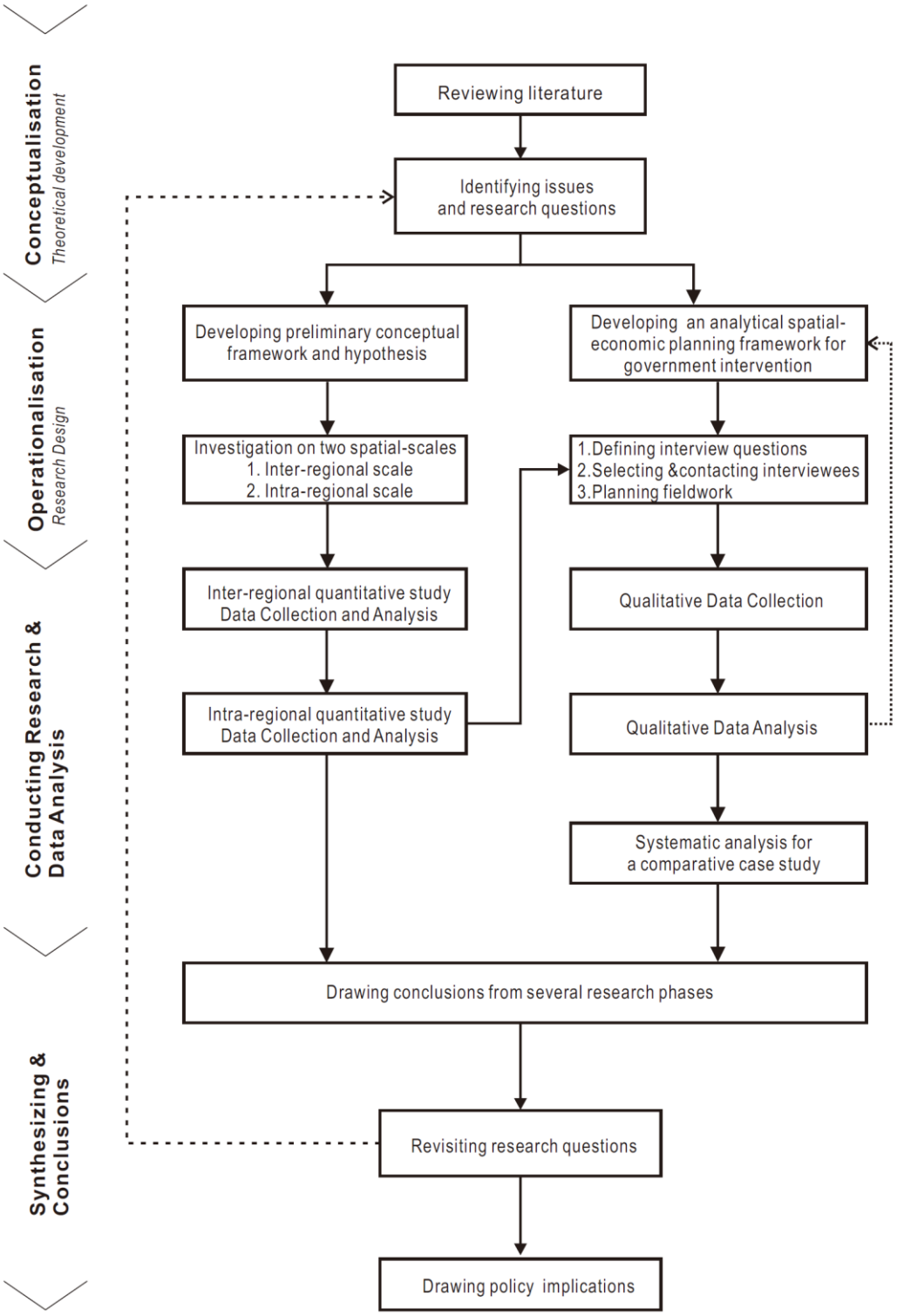
Despite these three aspects of similarity, the two HST lines, namely the modernised WCML and the new dedicated TGV-Nord line, were implemented at the national level under two different political economies in the period from the 1980s to the 2000s. The UK's market-led approach versus France's state-led approach brought about a series of reforms which constructed the national spatial-economic approaches for urban and regional development. In order to deepen understanding of the wider impact of HST in reducing regional inequality, how the diverse

national frameworks for government intervention and in what ways the different local intervention affected the wider impact of HST are important in this qualitative part of the research.

2.6 Research Phases

The whole research process has four major phases, namely conceptualisation (from literature review to theoretical framework), operationalisation (from variables to the measurement of indicators), conduct of the research (data collection and analysis), and synthesising with conclusions (Figure 2.5). Since the whole research investigation is conducted at two spatial scales and combines quantitative and qualitative methods for a comparative case study, the first three phases were carried out repetitively until the final synthesis. The process began with the quantitative part (a survey and the first part of the comparative case study), followed by the qualitative section (a second part of the comparative case study). It is important to note that the qualitative research process is non-linear and entails constant reflection and reframing of the study, including the revision of interview questions as the knowledge and understanding of the author increased over the research process.

Figure 2-7 Research Phases



Source: author

2.7 Research Methods

2.7.1 The Quantitative Approach

The quantitative approach aims to measure the wider impact of HST over time. The first step of this research was to review all existing literature in relation to research concerns and to conceptualise the theoretical framework, which is introduced in Chapter 3. The theoretical framework was further developed with operational variables (dependent and independent) and indicators for measurement.

2.7.1.1 Data Collection

Transport changes by rail (journey time and frequency) and economic changes (economic strength and structure) were two major groups of data to be collected. All the indicators and data collection comply with time-series reflecting "before" and "after" situations for the observed units of analysis. In the inter-regional study, the context is based in the UK. Data for transport changes were drawn from British Railway timetables. Data for economic indicators were taken primarily from original government documents and databases. As for the intra-regional study, data collection for a comparative case study involved two national contexts: the UK and France. In the British region, data resources are similar to the inter-regional study; however, the time series for observing the change in the WCML modernisation cover three periods that are much more recent (1998, 2004, 2008), so the availability of data differed. In the French region, transport data referred to Thomas Cook's and SNCF's railway timetables. Economic data were mainly drawn from *L'Institut national de la statistique et des études économiques* (INSEE). More details of dependent variables, indicators and data sources are illustrated in Chapter 4 and 5.

2.7.1.2 Data Analysis

Descriptive statistics are the major method used to analyse transport and economic changes in places. The indicators of urban and regional performance are measured in comparison with the national average to understand whether places have benefitted from transport changes and how these evolutions have been reflected in spatial-economic landscapes. In the inter-regional study, in compliance with **Hypothesis one and two**, findings of the survey were expected not only to draw an important distinction between two groups of towns regarding their status with and without HST services, but also to note whether there is any different performance within the towns with HST stations or not, based on a critical time limit for cities which are distant from London. In the

intra-regional study, **Hypothesis three** is a combination of hypothesis one and two within a regional context, and is expected to understand changes among HST and non-HST sub-regions. **Hypothesis four** is intended to measure the diverse effects of HST within a region to understand to what extent economic inequality is associated with transport inequality.

2.7.2 The Qualitative Approach

The qualitative section of the research is regarded as necessary and complementary to the quantitative findings in order to gain a deeper understanding of the complexity of the wider impact of HST. It plays a key role in the comparative case study at the intra-regional scale in order to grasp dynamism in the local context when encountering HST opportunities from a planning approach. Therefore, a comparative national spatial-economic framework is established in Chapter 6, based on UK-France national conditions (including different national political economies, governmental systems and restructuring, urban and regional planning approaches). It enhances the comprehension of national and local interaction and the transformation processes which have taken place. In addition, interviews are conducted to assist in interpreting the role of government intervention in dynamic urban and regional performance.

2.7.2.1 Data Collection

Three main resources that cover the times series before and after the introduction of HST services in both contexts are listed below. In addition, experiences throughout the process are discussed accordingly.

1. Documentation: systematic searches for relevant documents (government reports, proposals, previous research findings, publications, minutes of meetings, online media websites and others).

2. Face-to face in-depth interviews: semi-structured interviews with key informants are the major qualitative research activity used to attain primary research findings in compliance with the analytical framework and national conditions. The development of both regions is relatively well-documented. All interviewees' perspectives significantly contribute to generating a "big picture" that transcends any one single portion of data. The original information from interviewees was recorded electronically.

3. Direct observation: field work in both regions was conducted to observe local conditions in person; for example, did the local atmosphere have a sense of decline or revival?

2.7.2.2 Conducting Interviews

1. Design of the questionnaire: a series of semi-structured (standardised & open-ended) questions were used for the interviews. The standardised feature is to ensure comparability between the two cases, whereas the open-ended approach is to allow interviewees to express any views which they feel are vital. In order to allow for the recounting of precious experiences and to deal with unexpected issues raised by the interviewees during the process, the style is "free-flowing" in order to allow participants to adopt an open and adaptable manner so they could fully or partially answer the questions, according to their nature and priorities. The initial questionnaire was adapted slightly a few times based on reactions from participants after the first group of interviews in order to avoid biased or unclear questions (to see the questionnaire used for the interviews, refer to Appendix 1).

2. The selection criterion for interviewees for this study is expert-based, including key academics, key government officers and advisors in both private and public sectors who are acquainted with national and local contexts and involved in key decision-making processes. The key point of the interviews is to better understand the complex regional development after the arrival of HST. The rationales (or ideologies) which underlie actions taken or lack of action in relation to HST opportunities among different government tiers (national, regional, local) and among different local levels are of critical importance. Interviewees were thus selected from different government tiers and various local authorities to gain more balanced and contested views of both advantaged and disadvantaged places. One aspect which is worth noting is that the role of transport in possible transformation is still not very commonly appreciated. Initial attempts to contact regeneration planning or economic development departments in local authorities for interviews were usually transferred to transport departments because the research title contains the term "transport".

3. The technique used to contact interviewees mainly involved snowballing and identification from existing literature. Apart from one interview for the French case which was conducted over the telephone, discussions were conducted in a face-to-face manner. In total, there are 35 in-depth interviews for the two cases (22 interviewees for the British case and 13 interviewees for the French case (a list of interviewees is provided in Appendix 2)). For the French case, all interviews were conducted in English with French-speaking natives who are proficient in English. Most interviewees were selected for a particular spatial scale, but some know both local and national contexts well.

4. The process of the interviews: immediately before interview, each participant was asked to agree that the discussion could be recorded. All interviewees consented to this request, but it is worth noting that recording may make some people uncomfortable. Of the 35 interviewees, one mentioned that he had to be careful about what he said because the conversation was being recorded. The time taken for each interview was intended to be 45-60 minutes. In reality, many interviews were considerably longer than initially planned.

2.7.2.3 Data Analysis

The strategies used for qualitative data analysis comply with three principles: relying on a comparative national spatial-economic framework (established in Chapter 6), the recognition of constraint and enabling conditions, and the development of a case study description. In order to implement the strategies for analysis, the specific analytical techniques involved pattern matching (the spatial-economic patterns before and after the HST services), explanation building, time-series analysis and cross-case synthesis (Yin, 2003). The research findings lead to a deeper understanding of the complex nature of the wider impact of HST and provide critical policy implications.

Analysis of data collected from interviews and policy analysis involves four major processes. Firstly, the transcribing process was completed after each interview with a full-length transcription. Secondly, the labelling process identified themes, issues and thoughts in separate paragraphs with multiple labels per paragraph. Thirdly, the ordering process involved sorting paragraphs into separate documents according to themes and sub-themes for both regions. Finally, the analysis process required two levels of comparison: both within the two regions (Chapter 7 and Chapter 8) and between the two regions (Chapter 9) to seek commonalities, divergences or conflicting points of view. In addition, insights between the themes were generated with the identification of relationships and assisted in building typologies and generalisations for complex and dynamic transformation processes in cities and regions.

2.8 Chapter Conclusions

To sum up, beginning with a brief introduction to HST development and its competitiveness, this chapter articulated the research focus through a critical review of the existing literature about the wider impact of HST on urban and regional development. With the increasing expansion of HST development in the world and the growing inequality between places, both methodological (predicative or empirical) as well as disciplinary (transport economics or urban and regional planning) debates are contentious. In order to better understand the wider impact of HST in reducing regional inequality, a planning perspective is required, as it is necessary to regard HST as an opportunity and to make the most of it through multilevel strategic planning. The identification of the current research gap was of assistance when framing the key research question and selecting the adopted methodological approaches.

A traditional divide in methodology in social science has been increasingly bridged by mixed methods. In order to answer the research question posed, a combination of quantitative and qualitative approaches and a mixed selection of research design (a survey in the UK and a comparative case study of two post-industrial regions in the UK and France) is designed to aid comprehension of wider HST effects. The quantitative findings form the first step of the research process, followed by the qualitative inquiry relying on documents and critical interview insights to depict the complex picture formed by the seizure of HST opportunities for cities and regions. Following the formalisation of this research programme, the next chapter embarks on a theoretical framework to understand the relationship between the role of HST and dynamic spatial-economic development.

Chapter 3 Establishing A Spatial-Economic Framework for High-Speed Trains

3.1 Introduction

This chapter focuses on establishing a theoretical framework for the space economy of HST as a basis for conducting empirical quantitative studies, which are presented in Chapter 4 and Chapter 5. In order to understand the potential spatial-economic impact of HST, it is essential to establish the relationship between industrialisation and urbanisation and then to hypothesise the role of HST played in the dynamic interchange between them. Industrial changes could lead to urban transformation, and strategic HST investment with allocation of HST stations and networks could potentially provide necessary physical infrastructure in the process of economic restructuring towards building a knowledge economy. In this chapter, existing literature and theories are reviewed to generate hypotheses associated with the first sub-research question (SRQ1) posited in Chapter 1:

SRQ1: What is the potential relationship between HST and the construction of a knowledge economy in dynamic city-regional development?

Four further sub-questions are derived as follows:

SRQ1-1. How should the terms "*the knowledge economy*" and "*knowledge-intensive activities*" be defined?
SRQ1-2. What are the locational characteristics of knowledge-intensive activities?
SRQ1-3. How can spatial patterns of knowledge-intensive activities be explained?
SRQ1-4. What is the role of infrastructure in dynamic urban and regional spatial-economic development in the era of the knowledge economy?

There are five major sections within the chapter. Section 3.2 reviews the effect of economic restructuring in the era of the knowledge economy in order to grasp the essence of innovations for the knowledge economy and to define the terms the knowledge economy and knowledge intensive activities (SRQ1-1). In section 3.3, dynamic city-regional economic geography is examined to understand where knowledge intensive activities are agglomerated and the evolution of two kinds of agglomeration economies (SRQ1-2). In section 3.4, an explanation is sought for the spatial-economic patterns through examining existing literature comprising different theoretical approaches (SRQ1-3 & SRQ1-4). Finally, section 3.5 discusses the role of infrastructure (in particular the debate between e- and transport connectivity) in dynamic urban and regional development in order to hypothesise the conceptual framework for the space economy of HST.

3.2 Economic Restructuring towards a Knowledge-based Economy

The cyclical pattern of capitalism, with its long waves of economic fluctuations every 50-60 years, has been widely accepted. So far, five long waves have been firmly identified (see Figure 3-1). The pattern can be outlined as follows; the economic downturn usually occurs soon after an overheated peak and is accompanied by a series of economic crises. These events result in a stage of recession, which is then followed by depression. When the event reaches the trough of the process, it starts to recover and growth occurs on the upswing until the next wave begins. Nevertheless, the causal mechanism and the trigger point of a new wave are fiercely disputed without definite agreement (Delbeke, 1984; P. Hall, 1985; P. Hall & Preston, 1988; Schumpeter, 1964). The debate rests upon two major approaches: whether the wave forms because of external technological change with subsequent commercialised innovations or results from the internal conflict of the capitalist economic system (Hall, 1985). It is beyond the scope of this research to examine the detail of this debate, but there is an apparent contradiction between the Marxist view on the collapse of capitalist systems and the cyclical long wave theory (Skousen, 2009).

Whilst reading this thesis, it is necessary to appreciate that massive de-industrialisation in advanced countries from the 1970s onwards co-existed with the rise of weightless information technology such as silicon chips; this has been classified as the driver of the fifth economic long wave (P. Hall, 1985). As industrialisation and urbanisation reinforce each other (Mensch, 1975), the spatial-economic impact on cities and regions will be profound. The role of HST will hinge on two major developments. On the one hand, over the course of approximately 50 years, the theory of innovations underlies dynamic and complex economic restructuring with new types of activities and results in changes in all aspects of society. On the other hand, the locational logic of these high-value knowledge intensive activities is critical.

Figure 3-1 Long (Kondratieff) Waves

Source: Montgomery (2007, p.7)

3.2.1 Theories of Innovations

Long waves are frequently termed as Kondratieff waves. Technological invention was identified by Kondratieff as the cause of economic development. Through the detailed analysis of commodity prices, Kondratieff attempts to relate the falling rates of profit regarding commodity prices to technological exhaustion and therefore the rise of cyclical economic crises and changes causes the inherent existence of long waves in capitalist development (Montgomery, 2007). However, except for proof of long waves coexisting with technological change, Kondratieff does not clearly provide an account of causal mechanism or "any explicit commitment to the role of innovation" (Perez, 1983, p. 358). It was not Kondratieff, but Schumpeter whose novel interpretation of long waves inspired a number of later-generation scholars to enrich this spectrum of theories about the role of innovation in economic restructuring and urban development.

Schumpeter advances Kondratieff's long wave theory and makes a distinction between the role of innovations and inventions in the propulsion of economic restructuring (Schumpeter, 1964, 1982 [1939]). These innovations, the engine of "creative destruction" result from "new men", entrepreneurs' innovative commercialisation of technological invention in all aspects of the economic realm e.g. new products, new method of production, transport, newly created markets and new forms of industrial organisations. For Schumpeter, innovation is defined as "the setting up of a new production function. This covers the case of a new commodity, as well as those of a new

form of organization such as a merger, of the opening up of new markets, and so on" (Schumpeter, 1964, p. 425) (Schumpeter, 1982 [1939] p. 87Book1).

According to Schumpeter (1964), there are two notable features of innovations. Firstly, the bunch of innovations is not isolated, occurring unevenly in time, and tending to cluster in the wake of other successful innovations. Secondly, innovations centre on certain economic activities and their surroundings. Furthermore, he emphasises this kind of innovation has to be significant enough to "disrupt the existing system and enforce a distinct process of adaptation" (Schumpeter, 1964, p. 75).

Schumpeter laid the foundation for his successors to mould their views into a more complete theory of innovation. Perez (1983) questions the relationship between the diffusion of new technology and economic development and argues that Schumpeter's explanation of cyclical behaviour is based on the self-regulating organism within the economic realm, where the social condition and institutional framework are influenced by techno-economic restructuring rather than being regarded as equivalent factors. She maintains that the long waves of economic development are not just economic phenomena, but also involve disharmony under the existing socio-institutional framework. Hence, she posits that there are two subsystems under the capitalist system; namely, a techno-economic subsystem and a socio-institutional subsystem. According to Perez, a new techno-economic paradigm such as the ecological movement could give rise to social organisational change. The principle of this new technological style is material-saving. Possible development would be expected in terms of reducing waste, downsizing products, demanding services rather than products, and replacing much physical transportation with telecommunication. Then, occupational profiles would be altered by new skills, which would give rise to income redistribution. In turn, a new pattern of demand would be generated to request new products (Perez, 1983, p. 373).

Moreover, Perez emphasises that social and institutional innovation can provide a good way to find appropriate solutions to calm turbulence or find a better way forwards (Perez, 1983, p. 372). The socio-institutional innovations she proposes consist of three levels. Socio-institutional innovation at the level of the firm is referred to as organisational changes, which are included in Schumpeter's theory of innovation. Perez's exclusive contribution lies in the proposal of indispensable innovations of regulation at the international and national levels. She identifies "the Bretton Woods Agreement" and "the Marshall Plan" as examples to respectively illustrate how to regulate inter-country trade and investment and how to instigate international investment and markets at the international level. Furthermore, at the national level, education and health system

reforms are both great resources for employment, resulting in income redistribution (Perez, 1983, p. 370).

Similarly, Piore and Sabel (1984) accentuate the development that industrial technology reflects and pivots on socio-institutional circumstance and recognise that the existing institutional framework (structure of market and political circumstances) might be incompatible with the development of flexible specialisation. "Technology had to be flexible in both a narrow and a broad sense. It had to permit quick, inexpensive shifts from one product to another within a family of goods, and it had to permit a constant expansion in the range of materials worked and operations performed, in order to facilitate the transition from one whole family of products to another. Institutions had to create an environment in which skills and capital equipment could be constantly recombined in order to produce a rapidly shifting assortment of goods. As a precondition of this, firms were discouraged from competition in the form of wage and price reduction, as opposed to competition through the innovation of products and processes" (Piore & Sabel, 1984, p. 30).

Likewise, given that the introduction of new technology brings about major economic and social transformations, Freeman (1985) envisages a range of new systems are going to emerge, namely "entirely new industries, new types of capital goods, components, materials, new skills at all levels, new management attitudes and systems, new education and training systems, new occupational and industrial classifications, new design and development systems, new legislation, and new forms of finance, company organization, and ownership" (Freeman, 1985, p. 606).

Above all, economic restructuring involving the diffusion of innovations ranging from technological to a series of widely related and induced socio-institutional would profoundly disturb the existing systems and engage with a rather complex process. The importance of social-cultural conditions and governmental responses can never be over-emphasised on the grounds that, from a long-term perspective, strategic governmental policies could be devised and implemented to transform through the lesser degree of disturbance in wider society in such ways as "generat[ing] the entrepreneurial figures, in the training and aptitudes of its workforce, in its capacity to develop patterns of consumption, and in the ability of the state to provide the necessary infrastructural and regulatory framework" (P. Hall & Preston, 1988, p. 266).

3.2.2 Defining the Knowledge Economy and Understanding Its Evolution

Since the decline of Fordist manufacturing in major industrial countries in the 1960s, there has been a gap for another form of economy to take its place. In the book "*post -industrial society*",

Bell (1973) takes the lead in pointing out that people in developed countries are primarily involved in the manipulation of ideas rather than things. Similarly, it is broadly agreed that the competitive advantage of creating wealth is more directly and significantly based on the production, distribution and utilisation of intangible assets like knowledge, skills, and innovative potential than before and therefore requires a shift of focus "from handing goods to the intangible information and knowledge" (Quah, 1999) or "from physical dexterity and skills to mental processing ability" (Bryson, Daniels, Henry, & Pollard, 2000, p. 2). Although the intangible features of knowledge and the knowledge economy could not be defined precisely (Brinkley, 2006), the knowledge economy has been exploited extensively to describe the most viable alternative for economic development in the 21st century.

However, the development of the knowledge economy is not a sudden occurrence; instead, it has been evolving over a period of time (Brinkley, 2006; David & Foray, 2002). Yet, the creation and diffusion of economic knowledge has grown at a larger scale and a faster pace. There have been several associated forces, among which there are three in particular i.e. the rapid advance of technology, globalisation, and consumer demand (Brinkley, 2008) .

Firstly, the gradual formation of technological convergence from three different branches of technological development, namely telecommunication, electronics and computing, has brought about the possibility of and flexibility to transmit digitised information which reconstructs any kind of message and also makes visual communication practicable (Daniels, 1985; P. Hall, 1998). This technological invention as the precondition for Schumpeter's creative destruction stimulates entrepreneurs' innovations. For instance, the development of online retailing services for any kind of goods and services further encourages the development of highly intelligent, just-in-time logistic services and reverse logistics (De Brito & Dekker, 2003). Another example is Dell's business model of build-to-order-production, which reflects the fact that information technology has been applied innovatively to facilitate the interwoven interaction of production and consumption activities (Kraemer, Dedrick, & Yamashiro, 2000). Also, new technology has been progressively and creatively merged into artistic fields in movies, TV, music and multimedia etc. "The implications are still exploding around us" (P. Hall, 1998, p. 5). Secondly, with massive deregulation of international trade and the increasingly extensive global infrastructure network, globalisation has expanded markets, assisted profit-seeking capitalistic businesses to locate their manufacturing in low-cost places, and intensified the competition between places. Thirdly, the increase in consumer demand has facilitated the development of the knowledge economy. As Daniels (1982) argues, the growth of service industries has been partly associated with availability of disposable income and leisure time for individual households. Now demand has demonstrated a

shift towards the consumption of services, in particular, those related to knowledge based industries (Brinkley, 2008).

In addition, government intervention could play a key role in developing the knowledge economy. German experiences demonstrate how to pioneer a new kind of industry "cleantech - energy and ecology-related industries" which would inevitably involve enormous research and development and is expected to be a boom sector of the 21st century. In accordance with the Renewable Energies Act of 2000, wind, solar and water power now account for 12 per cent of all German electricity consumption (P. Hall, 2008b). Similarly, in the UK, cultural or creative industries have been strongly encouraged by the Department of Culture, Media and Sport as strategies for economic regeneration (DCMS, 2007). Hall (2000) indicates that "[n]ations and cities have passed at extraordinary speed from a manufacturing to an informational economy and from an informational economy to a cultural economy" (P. Hall, 2000, p. 640). But the production side of cultural or creative industries has been argued to be much weaker than the consumption side of these industries and needs to be developed more adequately in order to strengthen the "production of culture" (Pratt, 2004, 2008).

These evolutions have clearly explained the remarkable phenomenon that is the dramatic restructuring of the economy and labour market towards a knowledge-intensive orientation. The explosive rise and dominance of high value-added services and the enormous diminution of physical manufacturing has been witnessed, which explains the massive decline of manufacturing in the developed world since the 1960s (Daniels, 1982, 1985; Daniels & Moulaert, 1991; J. N. Marshall et al., 1988). The definition of knowledge intensive activities is discussed in the next section.

Defining Knowledge Intensive Activities

In parallel to the evolution of the knowledge economy, the definition of knowledge intensive activities has been expanding. Initially, it was narrowly confined to the field of manufacturing industries associated with science and technology. For example, the OECD maintains a classification of high-technology, medium-technology and low-technology manufacturing sectors based on their relative R&D expenditures or R&D intensity (ratio of R&D expenditures to gross output) (OECD, 1996). But growing complexity, competition and uncertainty led to high demands for ideas, response to changes and the seeking of new possibilities in the production process. For instance, intense competition and diverse market demands evoke buoyant demands for "professional services" (Wood, 2002, p. 6), such as production consultancy, marketing, human resources, research, design, management and administration, information and communications, and many other advanced non-manufacturing services before and after new products have been

decided and taken shape. Wood (2002) questions whether the adoption of a technology-oriented ideology fails to usefully distinguish knowledge intensive services.

Later, this was extended to include knowledge intensive services (telecommunications, finance and insurance, business activities, education and health sectors) (see Brinkley, 2006; Eurostat, 2007; OECD, 2007b). But there are still innovative, advanced services that are not included in this expanded category, as it does not encompass the rapid growth of various cultural or creative industries. Kok (2004) summarises that "the knowledge society is a larger concept than just an increased commitment to R & D. It covers every aspect of the contemporary economy where knowledge is at the heart of value added — from high-tech manufacturing and ICTs through knowledge intensive services to the overtly creative industries such as the media and architecture" (Kok, 2004, p. 19). Similarly, Scott (2007) refers to key sectors such as "technology-intensive manufacturing, services of all varieties (business, financial, personal), fashion-oriented neo-artisanal production, and cultural-products industries (including media)" (Scott, 2007, p. 1467). In the research output of *Ideopolis* by the Work Foundation, cultural and creative industries are included in a broader picture of the knowledge economy to reflect the dynamic reality (A. Jones, et al., 2008). In summary, a synergy of these arguments underlies the identification of knowledge intensive activities in this study comprising three types: (1) financial and business services; (2) high-tech and medium-high tech manufacturing (science and technology); (3) cultural and creative industries. Education and health are not regarded as a default kind of knowledge intensive activity. Instead, they are measured in this study as a separate kind of sector, namely "public services", which could be presented as a contrast to the knowledge intensive activities in which capital is invested privately. Locational characteristics of these knowledge intensive activities are examined next.

3.3 Dynamic City-regional Economic Geography and the Location of Knowledge Intensive Activities

Cities and regions, the platforms for economic growth and development, are developing in a constantly dynamic process and reflecting the spatial landscape of industrial evolution. The industrial evolution of a new "economy" has occurred throughout different stages of human history, and involves diverging from the previous mainstream economy and exhibiting a new "structure or totality of relations of production, distribution, exchange and consumption of goods and services" (Watts, Johnston, Gregory, & Pratt, 2000, p. 200). As Florida describes,

> *"[e]very phase or epoch of capitalism has its own distinct geography, or what economic geographers call the "spatial fix" for the era. The physical character of the economy—the way land is used, the location of homes homes and businesses, the physical infrastructure that ties everything together—shapes consumption, production, production, and innovation. As the economy grows and evolves, so too must the landscape" (Florida, 2009).*

Concomitant with increasing de-materialisation and spatial dispersal of manufacturing and routine services, knowledge intensive activities cluster in large cities in order to benefit from face-to-face (F2F) contacts. However, they tend to agglomerate in different parts of city regions based on different functions. The locational preferences of three knowledge intensive activities are discussed as follows.

Financial and Business Services

Spatial concentration remains vital in the financial and business services sector due to a combination of the new capacity of mobility and specialised division of labour; however, the location of clustering varies according to the level of function. Sassen argues that "[t]oday there is no longer a simple straightforward relation between centrality and such geographic entities as the downtown, or the central business district" (Sassen, 2001, p. 122). Within financial services, three types of firms corresponding to their locational patterns can be identified. The degree of agglomeration in the city centre increases from the first type to the third type. The first type is referred to as highly standardised products or services, which do not involve complicated contracting and subcontracting networks; therefore, locational flexibility increases inasmuch as the operation can be maintained with lower costs. Secondly, representative firms are involved in the global economy by outsourcing to highly specialised services, which has formed an increasingly complex headquarters function. Thus, they are likely to be located wherever there are highly networked services benefiting from spatial agglomeration for production. The third type of firms is relatively place-bound among these three kinds and are involved in intensive transactions with "other such firms in kindred specialization" under time pressures because their products and top-level professionals are hypermobile (Sassen, 2001, p. 123).

However, as the degree of uncertainty and the intensity of knowledge increases, locational flexibility decreases. In the case of London, the restrained capacity for growth in the traditional CBD (City of London) benefits the redevelopment of Canary Wharf, located three miles away, as an alternative destination for banks. Sixteen of the biggest banks in the UK have employees on both sides. In July 2012, Canary Wharf employed 44,500 bankers and was the largest gathering of bankers in Europe, compared with 43,300 in the City of London (Jenkins & Hammond, 2012). Besides the competition between these two locations, it reflects the importance of this type of business being located together in close proximity in the large city centres for top-level financial activities.

Science, Technology and Research Industries

This grouping of economic drivers could be largely attributed to the science-technological revolution, which further developed due to diffused innovations. The innovative development of information technologies has revolutionised the economic process and structure, transformed regional wealth, and influenced all aspects of human life.

The classic example of Silicon Valley has been widely appreciated as a model to enhance national or regional competitiveness, such as the EU National Systems of Innovation project. It has been imitated and adjusted in other contexts, but not all succeed. In the work of 'Technopoles of the World', Castells and Hall (1993) identify three types of techno-pole representing the 21st century phenomenon of the industrial complex. The first is those based on innovative milieu, combining R&D and manufacturing. The next type of techno-pole is termed science cities wherein the focus is on research without direct territorial linkage to manufacturing. The third type refers to those aiming at inducing new industrial growth, regarding jobs and production, attracting high-technology manufacturing firms to a privileged place. Although there are different types of techno-poles, they share a locational pattern in that they are not necessarily located in city centres; instead, they are located in privileged spaces with a good quality of life and good transport linkage with an easily accessible distance to and from neighbouring large cities.

Creative and Cultural Industries

As for creative and cultural industries, Hutton (2004a, 2004b, 2006, 2008, 2009) demonstrates this new economy clusters in the inner city of a metropolitan core. In comparison with the CBD, the inner city is usually referred to as a large zone since it incorporates industrial premises (for craft production, manufacturing warehouses or distribution) or working-class housing; however, the universal and precise configuration of these inner city zones is not identifiable and varies from place to place (Hutton, 2008). These diverse and new territorial forms of industrial production in the inner city are epitomised by four types of space, namely: extensive new production districts, compact new economy clusters, signifying new economy precincts and incipient new industry districts and sites (see Hutton, 2004a). In comparison with larger international financial and business firms, or technology-science-research institutions or corporations, these cultural and creative industries, attracted by relatively low rent in inner city areas, tend to be small in size and highly knowledge intensive in a creative combination of art and technology.

The functional difference related to locational flexibility also occurs in cultural and creative industries. By studying the U.S. motion picture industry, Storper & Christopherson (1987) reveal that a split locational pattern varying in functions emerged between the 1960s and 1980s:

sub-contracting firms and employment became more concentrated in Los Angeles, while filming dispersed elsewhere. They argue that the firms which increasingly concentrated in Los Angeles were involved in specialised services, demanding non-routine and frequent external transactions (business hunting and the negotiation of contracted work) in order to differentiate constant product output. The process of conducting these transactions (deals) often requires F2F contact since they are hard to carry out at a distance. In contrast, once crucial issues such as finance, scripts, crew, equipment, props and locations have been decided, the shooting of films does not involve a high level of specialised external transactions and, hence, has higher location flexibility.

The agglomeration of the knowledge economy mentioned above in different parts of the wider city region involves two forms of agglomeration economy and their evolution. A more in-depth review of these two forms of agglomeration economy is presented in Appendix 3.

3.4 Understanding the Spatial Patterns of the Knowledge Economy

The economic geography of innovation is constantly restructured. Historically, the rise of innovative cities has been noted in different periods. In "*Cities in Civilization*", Hall (1998) identifies that there have been three main thrusts of economic significance for cities or regions. Firstly, in the golden ages of great cities such as Athens (500-400 BC), Florence (1400-1500), London (1570-1620), Vienna (1780-1910), Paris (1870-1910) and Berlin (1918-1933), their grandest and most civilized societies were based on a mode of artistic and philosophical creativity. The second group of cities illustrates an alternative mode of innovative milieu, wherein major technological advancement and consequent new products, new industries and new modes of production were created. This includes the first industrial city, Manchester (1760-1830), which was the commercial hub for the surrounding cotton mills and formed a prosperous cotton industry. Furthermore, the production of steel consolidated the leading position of shipbuilding industries in Glasgow (1770-1890), the invention of the automobile resulted in the boom of the car industry in Detroit (1890-1915), and the rise and clustering of information technology created centres of excellence in San Francisco/ Palo Alto/ Berkeley (1950-1990). Thirdly, the combination of art and technology created golden ages for Los Angles (1910-1945) and Memphis (1948-1956). In the trajectory of developing a knowledge economy, spatial-economic patterns have presented uneven pictures and reshaped the urban hierarchy (P. Hall, 2002a) . A typical example is the gap between northern post-industrial core cities and the south-east region in England around London (ODPM, 2006a, 2006b). Likewise, the decline of Detroit (Schifferes, 2007) reflects the mismatch between the changing economy and once-dominant manufacturing cities. Therefore, the focus of this section shifts to comprehension of the space-economy patterns of the knowledge economy.

3.4.1 Revisiting Neo-classical Location Theories

The search for an explanation essentially resorts to a school of thought: neo-classical location theory. Neo-classical location theorists have elaborated the locations of three basic and conventionally classified economic sectors, namely primary, secondary and tertiary industries.
The notion of neo-classical location theories concerns the optimal location for economic activities based on transport costs. Regarding the first two economic sectors, in the classic work "*Der isolierte Staat*" in 1826, Thünen postulates a model for agricultural cities, in which with entirely uniform land, human settlement would develop in the centre of the land and be surrounded by concentric rings of agricultural usage. The economic rent of agricultural land decides land usage distancing from the centre i.e. the closer to the central city, the higher the value. In 1909, Alfred Weber devised a varignon frame to determine the location of manufacturing industries. The spatial relationship between markets, raw materials and factories is represented by a locational triangle. The ideal industrial location would be situated in the centre of the frame, which is controlled and pulled by three strings representing three variables of different weights in accordance with transport costs e.g. the costs of transporting raw materials to the factory or products to marketplaces (Weber, 1929).

Concerning service industries, Christaller (1966 [1933]) proposes a central place theory in the form of an urban hierarchy to model the distribution of settlement according to the range of goods and services provided. An evenly distributed population, uniform income, perfect information and equal movement in all directions were assumed as given conditions and transport costs would be in proportion to distance. There are different levels of central places in the hierarchy. A lower level of central places would provide the most frequently used and uniform kinds of goods and services to its surrounding areas, whereas a higher level of central places would provide a less frequently used and more diverse range of goods and services to serve larger markets because the distance between central places and human settlement would decide the frequency of travel.

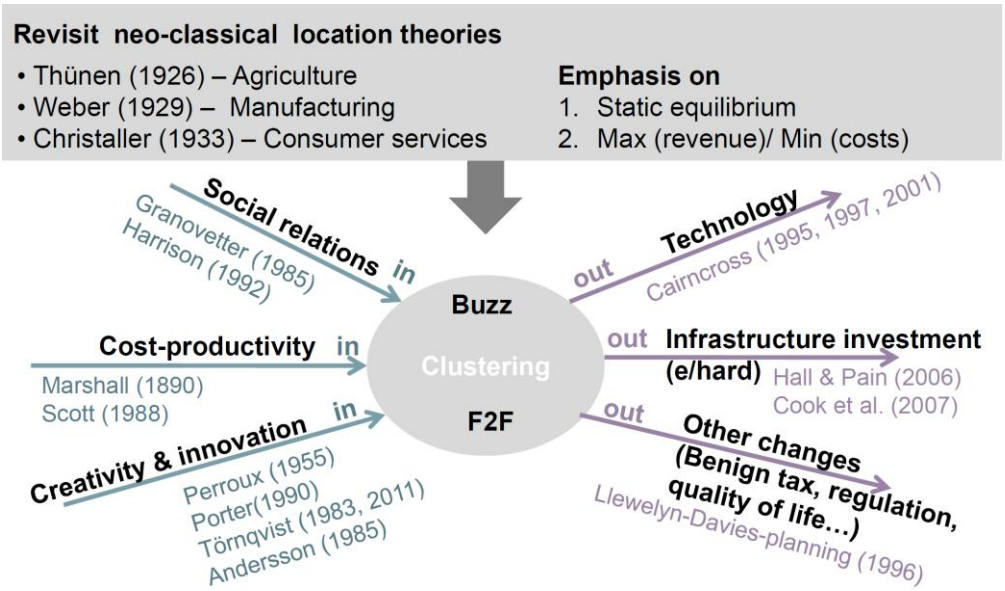
However, Christaller's central-place theory could not effectively explain the location of knowledge intensive activities. It has been argued that the insight of the central place theory accounts for the location of consumer services rather than producer services because consumer services for final demands are more likely to be distributed based on the distribution of population (Daniels, 1982, p. 33). Similarly, more recently, a study about the location of financial services echoes this argument. Parr and Budd (2000) utilise central-place theory to study the relationship between the functional hierarchy of financial services and the spatial structure of the urban system. They identify four levels of financial activities (from the top-level to the most routine and standardised) and four tiers of urban centres primarily based on urban population. Their findings

show that, with regard to urban centres involved in financial services, the financial central-place system did not comply with the existing urban hierarchy based on urban population. For instance, in the urban hierarchy (based on population), London was situated at the top of the urban system (N) alone, followed by a second tier (N-1) of cities, including Birmingham, Manchester, and Glasgow. Cities in the third tier (N-2) embraced Leeds, Bristol, Newcastle, Cardiff, Belfast and Edinburgh. However, when it came to importance in financial functions, although London was still unrivalled at the top, Edinburgh would definitely be ranked as the second tier (N-1) of cities, whereas Manchester and Glasgow would be more appropriately placed in the third tier (N-2) alongside Leeds, Bristol, Belfast, Cardiff and Newcastle. Birmingham would be better downgraded to the lowest level in terms of its role in the financial system (Parr & Budd, 2000, p. 608). In general, these neo-classical location theories emphasise the equilibrium of systems and static positions determined by minimum costs and maximum revenues, which cannot provide a promising explanation of the dynamism of knowledge intensive activities.

3.4.2 Disentangling Clustered Development

The review in section 3.3 showed that knowledge intensive activities tend to cluster. The clustering of economic activities entails not only spatial concentration, but also interwoven linkages among these economic activities, which is not a new phenomenon and has drawn the interest of researchers since the work of Marshall ([1890] 1972). Traditionally, discourses of agglomeration economies concern cost-productivity reasoning such as ‘industrial complex' (Scott, 1988b), ‘industrial districts’ (Pyke, Becattini, & Sengenberger, 1990), ‘nodes' (Amin & Thrift, 1992). Later studies have been enriched with alternative perspectives related to the concept of social embedding (Granovetter, 1985; B. Harrison, 1992) and creativity and innovation such as ‘clusters’ (Porter, 1990), knowledge creation (Malmberg & Maskell, 2002), “buzz” and “face-to-face contact” (Storper & Venables, 2004), ‘creative milieux’ (Törnqvist, 1983, 2011), and others. At the same time, with the development of information technology, the product-profit cycle, the reorganisation of the industrial structure and the enhancement of physical transport systems, decentralisation discourses have provided alternative explanations of dynamic spatial-economic development. The two counter forces of centralisation and decentralisation are constantly at work in the era of the knowledge economy. Figure 3-2 summaries disentangling factors affecting knowledge intensive clustering. These centralisation and decentralisation forces are discussed next.

Figure 3-2 Factors Affecting Knowledge Intensive Clustering



Source: author

3.4.2.1 Concentrating Factors

Cost-Productivity Approaches

Beyond neo-classical theory, which concerns minimising the collective costs of access and maximising total revenues, productivity stems from a dynamic balance between division (external economies) and integration (internal economies) of labour, which override the price effects of spatial clustering. In the context of swift technical change and the growing importance of skills, development progresses most rapidly in a spatial concentration of diverse firms and labour.

Based on the observation of British industrial regions in Sheffield and Lancashire, Marshall's ([1890] 1972) classic theory of industrial agglomeration focuses on external economies and provides three main advantages from a common group of factors of production (input sharing including land, labour, capital, energy, and transport), namely a large pool of specialised labour, a wide range of specialised suppliers, and the prevailing industrial atmosphere. 'Pecuniary external economies' is further identified to suggest that additional new investments made by certain firms contribute to multiplier effects and the profitability and expansion of other companies (Scitovsky,1963, cited in B. Harrison, 1992, p.472).

Here, the shared pool of resources comprises both physical and social infrastructure from which individual firms could benefit (B. Harrison, 1992). In particular, the shared services are notable for their contributions to vibrant economic growth (B. Harrison, 1992, p. 475). Harrison (1992) argues the role of the co-operative association provides an important source for Marshallian external economies through financial, technical assistance, training and marketing services and supports for member firms within the region. He raises an example of one representative Italian region, Emilia-Romagna, among many others. After World War Two, the privately-led co-operative movement successively appeared in this region in terms of agriculture, construction, food processing, distribution, light manufacturing, transportation, and trade associations. Since the early 1970s, many Italian regional governments have been inspired by these cooperative movements and associations and have launched small business programmes, in current terminology, called "public private partnerships", not only aiding specific sectors, but also providing cross-sector services (B. Harrison, 1992, p. 475).

Apart from the benefits of shared resources and investment leading to lower costs and higher productivity, Scott (1988b) approaches the agglomeration phenomenon from the a-spatial dynamic division of labour based on transaction costs and examines how this relationship shapes spatial patterns. He points out that there are three main types[10] of division of labour, namely technical division of labour within firms (vertical integration), social division of labour between firms (vertical or horizontal[11] disintegration), and spatial division of labour. In line with the operational logic of capitalism, the sophisticated division of labour in the dynamic production system reflects the pursuit of economies of scale (Scott, 1988b, p. 30). Economies of scale could be achieved with a technical division of labour within a firm or through a production complex of firms by market transactions (Storper & Christopherson, 1987, p. 105). On the other hand, the division of labour coexists with transactional interconnections. The more tasks are subdivided, the more transactional interconnections between fragmented parts are created. The implementation of such transactional interconnections generates transaction costs (Williamson, 1975, 1979, 1985), which are calculated and assessed to determine the critical point[12] (Coase, 1937) whether specialised tasks should resort to the internalisation or externalisation of transactional activities and which should do so[13].

10 There might be several specialised and geographically separate branches owned by a large firm in the first type, whereas the second is associated with the split of a large firm into independent and individually owned workshops.

11 Horizontal disintegration comes into existence owing to a temporary excess of work, which normally could be done in-house.

12 Coase (1937) argues "[a] firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market" (Coase, 1937, p. 395).

13 This internalisation or externalisation of transactional activities can also be expressed by internal economies and diseconomies of scope (Scott, 1988b, p. 34)

This externalisation of transactional activities involves multiple subcontracting operations, what Scott calls "industrial complex" and "a system of input-output transactions" (Scott, 1988b, p. 33). The demand for linkages between input-output transactions varies from industry to industry and also gives rise to the spatial division of labour within firms. Scott (1988b) suggests that the scale and attributes of linkages affect locational patterns. When linkages are numerous, small in scale, un-standardised, unstable or in need of personal intermediation, they tend to locate near their linkage partners because of high distance-dependent cost per unit of flow. In contrast, when linkages are large in scale, standardised, stable and easily manageable, there is a relatively low transaction cost per unit of flow. In other words, these routine input- output transaction activities are free to detach themselves from linkage partners and to be located at greater distances from them.

Overall, in this school of thought, explanations for independent small firms locating in proximity to each other are associated with shared access to shared commons (labour supply, specialised suppliers, finance and physical and social infrastructure) and extensive inter-firm and inter-industry linkages. These linkages could operate in 'a decentralised factory without walls' (B. Harrison, 1992, p. 475), with spatial division of labour within firms on a regional scale to exploit external economies based on their functions. In the long run, it is expected that the reinforcement of these advantages would benefit individual plants and overall lead to lower costs and higher productivity.

Social Relationship Approaches

When exploring the spatial agglomeration of economic activities, it is clear that a socially-embedded aspect has been ignored in classical and neo-classical economic theories. Polanyi points out that the disconnection between economic behaviour and social relations in industrial capitalism has existed and widened since the mid-18th century (cited in B. Harrison, 1992, p.476). Granovetter (1985) recognises the extent to which economic behaviour is embedded in the structure of social relation in modern industrial development. He notices the weakness of both 'under-socialised' and 'over-socialised' explanations in their disregard of 'on-going process' and the 'embeddedness' of such social relationships. Hence, he emphasises that 'an on-going process' unlike 'once-for-all influence' is unceasingly constructed and reconstructed through interactions. Moreover, embeddedness is reflected in building trust and discouraging malfeasance by concrete social networks.

Harrison (1992) centres on Granovetter's concept about the on-going process and the embeddedness of social relations, arguing that this social aspect has been ignored in explaining the agglomeration of industrial districts. He cites Lorenz's (1988, 1989) studies of subcontracting relationships among the mechanical engineering firms located in towns around Lyon, France, proposing that social embeddedness evolves within a regional industrial agglomeration economy in order to secure four interactions, namely proximity, experience, trust and collaboration, and to enhance regional economic growth. 'Proximity promotes the 'digestion' of experience which leads to trust which promotes re-contracting (and the sharing of common support services) and ultimately enhances regional growth' (Harrison, 1992: 477). However, Harrison admits the possibility of deeply unstable structures within these industrial districts due to the potential violation of intellectual property rights. Furthermore, he offers an example given by Granovetter (1985) about the tendency of firms in a co-operatively competitive network in which strong social embeddedness exists to avoid this sort of legal cases.

Innovation and Creativity Approaches

In line with economic restructuring, from handling goods to information and knowledge, the discussion of agglomeration economies has been largely elaborated around the ingredient of competitiveness: "knowledge spill-over" of the importance of innovation and creativity, which could lead to regional renewal.

Schumpeter's (1964, 1982 [1939]) theory of innovation in the propulsion of economic restructuring was later developed into a discourse on dynamic regional growth. Perroux's (1955) growth pole theory contributes to link innovations with the creation of agglomeration economies. Perroux (1955) proposes innovations in certain industries and products would develop on a different trajectory, affect other firms and industries through "backward and forward linkages", and generate faster economic growth. As Perroux (1961) states, "[t]he fact, crude but solid, is this: growth does not appear suddenly everywhere at once; it manifests itself in growth poles, with variable intensity; it spreads by diverse channels and with variable final effects for the total economy" (Perroux, 1961, p.143). In compliance with this argument, a locale in which innovations take place would grow faster than the average of all localities or regions through multiple linkages and price effects, and this momentum would be diffused and enhanced, which in turn shapes the complex of connected industries and attracts further waves of investment (as cited in Harrison, 1992, p.473).

Similarly, competitive industries represent that Porter's (1990) model of national competitive advantages are not distributed evenly in all economic sectors. Rather, they are linked and clustered

through horizontal and vertical relationships including rivals, suppliers and consumers in geographical concentration. Porter (1990) argues that the most important advantage for geographical concentration is the chance to improve and innovate, since geographical concentration allows interchange, cooperation, efficiency and specialisation among industries, ensuring faster information flow and faster response to emerging needs, attracting talented people and encouraging spin-offs.

The concept of creativity associated with a "place" are particularly developed by two Swedish geographers (A. E. Andersson, 1985; Törnqvist, 1983, 2011). First of all, both elaborate the creative mechanism on the basis of personal creativity and beyond. Four concepts i.e. information, knowledge, competence and creativity are essential to define creativity. Information and knowledge are the two fundamental elements, differing in degree. Information is regarded as the most elementary state, while knowledge is structurally ordered information. Competence involving capacity and ability is treated as embodied knowledge. Creativity has the highest order as the synergy of the three concepts. Based on these four concepts, the creative process could be applied widely to design, research, development and many other areas. Törnqvist (2011) highlights that creativity is a slippery concept which is applicable to wide-ranging areas and disciplines. With strong supporting literature, a fundamental assumption is that "creative processes make similar demands on settings and their characteristics regardless of the discipline involved" (Törnqvist, 2011, p. 26).

Secondly, a concept of "creative milieu" is used to express the creative process unfolding in a place. In a recent publication "*The Geography of Creativity*" Törnqvist (2011) offers a systematic analysis on "the concept of place" which is illustrated with different geography settings, namely large-scale settings e.g. regions, smaller setting e.g. cities and towns, and the core of the creative process e.g. organisations and firms' level (Törnqvist, 2011, p.26). The term "creative milieu" is defined to be the qualities of a place which becomes known for- where people who live and work along with their thoughts and ideas. Individuals, working both independently and collaboratively, make the discoveries and inventions (Törnqvist, 2011, p. 25).

In all creative milieux, the common element is competence embodied in people. The multiplicity and variation of competence indicates the necessity for a number of diverse talents, specialisms, fields or disciplines for a significant synergy, since uniformity and homogeneity do not seem to provide a proper climate for creative processes. External and internal communications are both important, but vary in functions which would demand different media. Advanced telecommunication technology could only externally transmit well-structured and routine information, whereas non-routine information requires direct personal contact internally. He

further illustrates the importance of communication density in a physical milieu to ensure the quality and originality of communication. Creativity flourishes fast as different specialists and competences are concentrated at "a meeting-place". "Geographical proximity offers security and flexibility… The mechanical equipment is simple and allows for greater adaptability" (Törnqvist, 1983, p.104).

The creative milieu could be exemplified by deliberate planning of R&D villages and metropolitan milieu. By studying Silicon Valley, Törnqvist found that four key factors underlie a creative milieu, namely competence, multiplicity, variation and communication. "[T]he creative milieu is frequently diverse in culture and rich in original competence in addition to possessing good communication facilities both internally and externally" (Törnqvist, 1983, p.104-5). Additionally, Andersson (1985) proposes "creative regions" by studying Vienna for its ample evidence of creativity in scientific and artistic achievements between 1890 and 1930. He argues communication is crucial in comprehending the fundamental role of metropolitan regions in the creative process. In his model, a creative region would be the centre for communications between different types of competences (specialists): inter-nation, culture, politics, and science within walking distance between these institutions in the extremely dense urban fabric wherein permanent communication between each competence is enabled to form an intricately-interwoven network.

Tacit Knowledge through 'Telecommunication' and 'Face-to-Face Contact'

In addition to key causes of clustering of development such as transaction costs/ productivity, trust, innovation and creativity, tacit knowledge is also a shared element. Polanyi (1966) makes an original attempt to distinguish two intangible attributes: 'tacit' and 'codifiable' (or explicit) knowledge. He stresses that "we can know more than we can tell" (M. Polanyi, 1966, p.4). The difference between them lies in "the degree of formalisation and the requirement of presence in knowledge formation" (Howells, 2002, p. 872). In general, codifiable knowledge is transmittable in formal and organised formats. The pervasiveness of ICT has allowed more and more work to be conducted without locational constrains, transmitting codified knowledge remotely between places without social interaction. In contrast, tacit knowledge is uncertain, unstable and context dependent (Pinch, Henry, Jenkins, & Tallman, 2003, p.375). The less explicit (or codified) feature of knowledge will increase the difficulty of absorption without the "learning by doing", "learning by using", and "learning to learn" processes (Howells, 2002). The marginal cost of transmitting tacit knowledge increases with distance (Audretsch, 1998). Similarly, it is demonstrated that sticky and uncertain knowledge is best transmitted and generated through vital F2F interaction, with frequent and repeated contact (Audretsch, 1998; Von Hippel, 1994).

Nevertheless, the classification of the two broad types should not result in the isolation of codified and tacit knowledge. Rather, the linkage and continuum between tacit and explicit (or codified) knowledge is indivisible. For instance, explicit knowledge still has to be interpreted by tacit knowledge (M. Polanyi, 1966, p.7). Moreover, Goddard (1973) demonstrates in a working sequence of arranging business that telephone contacts are utilised for initial "programmed" or routine communication, while face-to-face meetings are carried out for key discussions which have "un-programmed" features and uncertain consequences. Likewise, Amin and Thrift (2002) argue that these two types of knowledge should not be viewed as mutually exclusive; instead, they function in a reinforcing manner.

The indispensable role of face-to-face contact in generating tacit knowledge is reaffirmed in Storper and Venables (2004), which attempts to emphasise the advantages and fundamentals of face-to-face contact in dense urban milieux. The general term "Buzz" represents four key functions of F2F contacts namely: communication technology, trust and incentives in relationships, screening and socialising, and rush and motivation. Firstly, "F2F" is treated as an effective communication technology for non-codifiable information (tacit knowledge) in contrast to "telecommunication". F2F enables high frequency and rapid feedback, with visual and body language cues from participants, which are not available through other forms of communication. Secondly, F2F improves transparency, clarifies information, detects lies and minimises the incentives for one partner to free ride or manipulate the other, which is the basis for constructing human relationships and consequently enhances trust. Thirdly, F2F could be conducive to identifying potential professional partners or collaborators through screening procedures, including loss of individual anonymity, judging and being judged and acquisition of shared values in the short term. In the long-run, the development of networks and their members progresses through the process of socialisation to share a pool of knowledge about members' competence. Here, the features of networks need to be discerned. Storper and Venables (2004) point out that in the construction of social and professional networks, F2F is often necessary, but does not necessarily lead to the co-location of these members. A network of international academic professions could be reinforced by F2F in conference venues rather than co-location, while for other activities networks are highly localised with context-dependent information, and could only be maintained within spatial proximity. For parts of financial services and high technology industries, local networks overlap with broader scale networks. Lastly, F2F communication could psychologically motivate better and greater efforts such as imitation and competition stimulated by the performance of others.

3.4.2.2 Decentralisation Forces

However, agglomeration economies are subject to diseconomies such as cost, inconvenience and congestion. The relocation of economic activities might result in the development of nearby smaller clusters which are still situated within a reasonable distance from the well-established centre (Llewelyn Davies Planning, 1996). Four factors might affect this dynamic and unstable balance between concentrating and dispersing factors, namely: technology, investment in infrastructure, product-profit cycle and reorganisation of economic structure, and other changes as a result of public intervention.

Technology

Firstly, technology plays an influential role in all aspects of human settlement and brought about the possibility of change. In the era of the knowledge economy, two kinds of technology are critical. On the one hand, advanced information and computer technology (including software design) have largely increased the efficiency of dealing with repetitive data processing and the flexibility of locational patterns for these kinds of routine functions. Since the late 1980s, the pervasiveness of ICT has brought about dramatic changes to all aspects of human life. More and more work could be conducted remotely wherever accessibility to long-distance telecommunication is available and affordable.

On the other hand, progressive transport technology has shrunk the space-time boundaries and expanded the reachable range. It also introduces new possibilities, as well as threats to the existing spatial-economic patterns. From a historical point of view, the first railway age (railroadization[14]) resulted in profound developmental effects with the rise and decay of cities. The motorway age arrived with the growth of car ownership and the expansion of the motorway network, which significantly led to urban sprawl with the rise of new types of economic activities growing outside traditional cities and further deterioration of the railway networks. The second railway age took off with the aim of lifting the increasing pressure of congestion on existing transport systems which had inhibited the efficient connectivity between major cities and economic growth. Thus, the first new dedicated HST line was inaugurated in Japan in 1964 and a series of HST developments in Western Europe began in the 1970s. These multi-site operations have been increasingly implemented and now routine functions could operate in metropolitan peripheries or accessible

[14] A quote from Schumpeter (1982 [1939], 1964) vividly captures the significant impact of railroadization. "... Expenditure on, and the opening of, a new line has some immediate effects on business in general, on competing means of transport, and on the relative position of centres of production. It requires more time to bring into use the opportunities of production newly created by the railroad and to annihilate others. And it takes still longer for population to shift, new cities to develop, other cities to decay, and, generally, the new face of the country to take shape that is adapted to the environment as altered by the railroadization" (Schumpeter, 1964, p. 432; 1982 [1939] p. 168Book1).

provincial cities (Llewelyn Davies Planning, 1996). However, the growth of HST development was challenged by the rise of low-cost airlines in the 1990s and also conditioned by different national policies.

Due to the rapid development of ICT, the locational factor seems less dominant. There has even been a prediction of "the death of distance" (Cairncross, 1995, 1997, 2001) i.e. places do not matter anymore due to the wide spread of ICT and the consequent potential of locating anywhere. However, there have been considerable counter-arguments and evidence to indicate that ICT could not replace face-to-face contact. Törnqvist (1983) notes that the revolutionary development of telecommunication engineering could not replace personal contact for creativity and points out, based on existing evidence, the need for consultations and direct personal contact has taken off along with the increase in long-haul transportation and telecommunications. Similarly, Graham and Marvin (1996) suggest that face-to-face business contact has been increasing at approximately identical speed to telecommunications traffic over a century ago since the dissemination of the electric telegraph and the invention of the telephone. The evidence reinforces the argument in section 3.4.2.1, backing two indispensable ingredients required for the creation of tacit knowledge. Hall argues that "telecommuting supplements rather than supersedes face-to-face interaction" (P. Hall, 2003). In the *Polynet* study, overwhelmingly, interviewees from APS firms stress the point that "information highways will never replace physical highways" (P. Hall & Pain, 2006, p.107). In the book *Cyburbia*, this view is supported.

> *"Just as friendships cannot be forged on online social networks alone, neither […] can the flow of information information around an electronic loop ever replace real intelligence, strategy or leadership. Information can be transferred into digital bits and passed around at dizzying speeds. Knowledge isn't so portable. It takes a little little longer to be worked up and can only be ferried around by someone who knows what they are talking about" about" (Harkin, 2009, p. 251-252).*

F2F contacts could be ensured through either close proximity (walking distance) or travel within a reasonable distance by transport. The relationship is the major decisive factor. The Polynet study (2006) reveals the degree of proximity for APS to other actors varies with different sectors, size, scope of firm, but some common principles were identified. For regional players, the client relationship is the key, so closeness to clients is more important than F2F between regional offices. For international players which are located in first level and major centres, relationships between firms are reported to be more formal and less personal. Closeness to other sectors by co-location in First City Global APS clusters is as important as proximity to clients. These relationships are reflected in spatial-economic patterns and the need for mobility. It is reported that there is vital "mobility for front-office, client-facing staff, both within the regions and at an international scale" (Hall and Pain, 2006, p.110).

However, without investment and commercialisation, both e- and physical communication technologies can only be an item of technological breakthrough rather than be the backbone and carriers for spatial-economic development. As reviewed in section 3.2, the reoccurrence of long waves has been claimed to be the cause of technological inventions and, simultaneously, follow-up innovations. Therefore, both need to be embodied and developed in the form of communication infrastructure catering for the demand of people and economic activities.

Investment in Infrastructure

Secondly, as mentioned above, continual investment in both e- and hard- communication infrastructure is essential to materialise the potential to which technology could give rise. E-infrastructure could enhance telecommunication globally while a better balance of agglomeration economies could be spatially distributed in a wider city regional territory with the improvement of transport connectivity between multiple economic centres (both large and small). The development of new innovations and economic activities could be curtailed if transport systems are not efficient. This point is manifestly concluded in the Polynet study.

> *"…failure to continue to invest in transport infrastructure could prove the big stumbling block for future APS regional growth, as inefficiencies are a barrier to the most important form of regional knowledge flow: highly-skilled staff travelling into, out of and without the regions for face-to-face contact" (Hall and Pain, 2006: p.110) .*

Similarly, through the study of financial services in the City of London, Cook et al. (2007) accentuate transport as an extremely important concern of business, as inefficient transport infrastructure is beginning to discourage commuting and business travel (Cook et al., 2007, p.1342). Improvement in transport is a necessary condition for a new type of economic development in places created by new transport opportunities. Nevertheless, transport itself is not a sufficient condition to ensure positive developmental effects, as pointed out in section 2.4 which explores debateable wider effects of transport and the relationship between transport investment and regional development.

Product-Profit Cycle and Reorganisation of Economic Structure

Thirdly, the product-profit cycle theory (Markusen, 1985; Vernon, 1966) explains the relocation of economic activities through a product-evolving process in relation to growth rate, profitability, degree of concentration and location. The diminishing of growth rate and profit margin gives rise

to the relocation of standardised production processes to low-cost locations outside the original agglomerated core, but still generally within the same region. In the maturity phase, due to a saturated market and increasing competition, the solution for firms is to compete either by cost-cutting or by collusive agreement to share the market. The decentralisation of production occurs further afield, often to developing countries or depressed older industrial regions with surplus cheap labour. However, this product-profit cycle of production does not stress the spatial impact of the reorganisation of the production system. Storper and Walker (1989) argue external location factors or simple technical changes are overemphasised in the neoclassical and product-profit cycle discourses, which do not explain industrial decentralisation. Instead, they maintain that both relocation and changes result from technological change and the reorganisation of a production system rather than using locational changes as "a spatial means of effecting factor substitution" (Storper & Walker, 1989, p. 84).

Other Changes Caused by Public Intervention

Fourthly, other changes brought about by public intervention can affect relocation, including the benign tax and regulatory environment, quality of life and other measurements (Llewelyn Davies Planning, 1996). More than one CBD exists in many large city cores or nearby zones. In London the rise of a new CBD in Canary Wharf suggests the effects of diseconomies and a conservative policy in the City of London gave impetus to redevelop the post-industrialised docklands (Daniels & Bobe, 1993). In addition, the conservation policy of constraining development in historical city centres has also resulted in the rise of another development node. In Paris, owing to the cap on building height and the demand for office space in the capital, the strategic CBD of *La Défense* in the *Hauts-de-Seine département*, to the west of Paris, has developed since the end of the 1950s to not only compete with Paris municipalities but also evolve into functional unity. Similarly, but located in the same municipality , the conservation policy in the historical core of the city of Amsterdam brought about a new CBD development on the south fringe of the city named Zuidas Amsterdam. Likewise, some financial companies in the City of London have indicated the rigorous regulation was becoming burdensome and indeed unmanageable (Cook et al., 2007:1342).

3.4.2.3 Path Dependence

However, not all places are equally conducive to new opportunities. Theories of path dependence argue that existing situations hinder some places from adapting to economic changes. Fothergill and Gudgin (1982) studied the unequal growth of urban and regional employment change in the UK to argue that inherited structural characteristics could explain the low rate of formation of new

firms in certain places when their traditional industries faced decline. In their analysis, they identify the problems for places like Tyneside, Clydeside, Derby, Loughborough[15], and Lincoln in the Midlands are that "their heritage of large manufacturing plants does not provide a suitable environment for generating entrepreneurs and new firms. Almost as a result of their success in generating large-scale industry in the past, their cities and towns are now locked into a situation of increasing dependency on the fate of their remaining large employers or on injections of new industry from outside" (Fothergill & Gudgin, 1982, pp. 132-133). Likewise, in the book of "The Upas Tree", Checkland argues that the past prosperity of the shipping industry in Glasgow results in "a cumulative and interlocking problem" for economic regeneration (Checkland, 1976, p. 62).

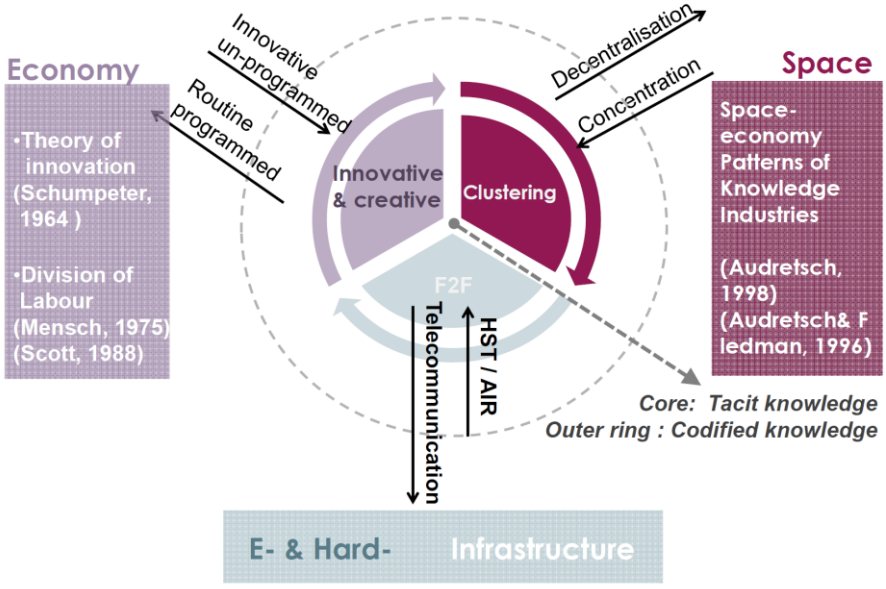
In a more recent study, Simmie et al. (2008) similarly argue that history matters. All industrial development goes through four main phases, namely: path-formation, path creation, path dependence, and path decay. There are two kinds of vital knowledge regarding whether path dependence or path creation occurs, namely absorptive capacity (the knowledge of identification, assimilation and exploitation) and the local innovation system (the knowledge of creation, adoption and commercialisation). They studied the relationship between path dependence and innovation in British city-regions and unveil two categories of results: 'lagging' cities and 'leading' cities. There are common features within each group. In the lagging-group category, cities (Middlesbrough, Newport, Norwich, Swansea and Wakefield) possess weaknesses derived from their specific industrial histories. In contrast, leading cities such as Aldershot, Cambridge, Northampton, Oxford, Reading and Warrington are free of industrial heritage. They argue that the varied performance of city regions could be attributed to "the aggregate ability of the different city-region economies to generate or adopt new economically valuable knowledge", requiring "continual indigenous innovation combined with the ability to absorb and adopt new knowledge from elsewhere" (Simmie, et al., 2008, p. 11).

[15] Thanks to the university, there's a flourishing innovation centre of businesses in Loughborough.

3.5 Towards A Conceptual Spatial-Economic Framework for HST

Bringing together information to answer the first sub-research question posted at the outset, in the era of the knowledge economy, economic restructuring entails the technical division of labour by the separation of knowledge-intensive and routine activities with the exploitation of flexible specialisation (vertical and horizontal disintegration). Meanwhile, this technical division of labour gives rise to the spatial distribution of labour at work places. Knowledge intensive activities are usually agglomerated in large city cores for creativity, productivity, forging trust, competition and cooperation to combat the highly uncertain and changing nature of businesses, but routine activities tend to be less confined to urban compactness and therefore decentralise from centres. To create tacit knowledge and increase coordination between knowledge-intensive and routine activities, virtual communication (external and internal) and F2F contacts are indispensable. A key requirement for F2F resulted in varying locational characteristics of specialised and routine economic activities. They range from co-locating economic activities to a more strategic and flexible locational distribution of relevant activities whose economic functions could be maintained by F2F contacts and not necessarily by co-location. Figure 3-3 illustrates a conceptual spatial-economic framework for HST.

Figure 3-3 The Synergy: A Conceptual Spatial-Economic Framework for HST



Source: author

It is suggested that improved accessibility of both e- and physical links between major centres and secondary centres could crucially assist a monocentric region to become a better integrated Mega-city Region (MCR). With the advanced development of ICT and the improvement in transport connectivity, forces of decentralisation and re-concentration operate within increasingly expanding city-regions to place limits on the process of decentralisation, related to critical time limits from the central city (Hall, 2006). The expansion of the city boundary has given rise to the new phenomenon of polycentric MCRs in an either morphological or functional sense (P. Hall & Pain, 2006). The new phenomenon of the MCR functionally connects and integrates a range of major centres and sub-centres in a hierarchical order through crucial transport and communication infrastructures beyond the fixed administration boundary. Hall and Pain (2006) observe the origin and the characteristics of MCRs and point out that the MCR phenomenon results from a long-term process of extensive decentralisation from large metropolitan areas to neighbouring new, old and smaller places. These places are independent entities within the MCR, which mean that the majority of people live and work locally. Although they are apart spatially, they are functionally well-linked, physically clustering around some larger cities, and gaining huge economic advantages from the division of labour. For example, flows of people and information are transferred between places through a network of highways, high-speed train lines and telecommunication cables. Different MCRs vary in degree. Among eight studied MCRs, only the South East England MCR with a morphologically polycentric structure presents genuine functional relationships between secondary urban centres (see Figure 3-4) in contrast to other MCRs that appear mono-centric with morphologically polycentric structures.

Figure 3-4 South East England MCR (Commuting patterns in 2001)

Source: Hall and Pain (2006, p.38)

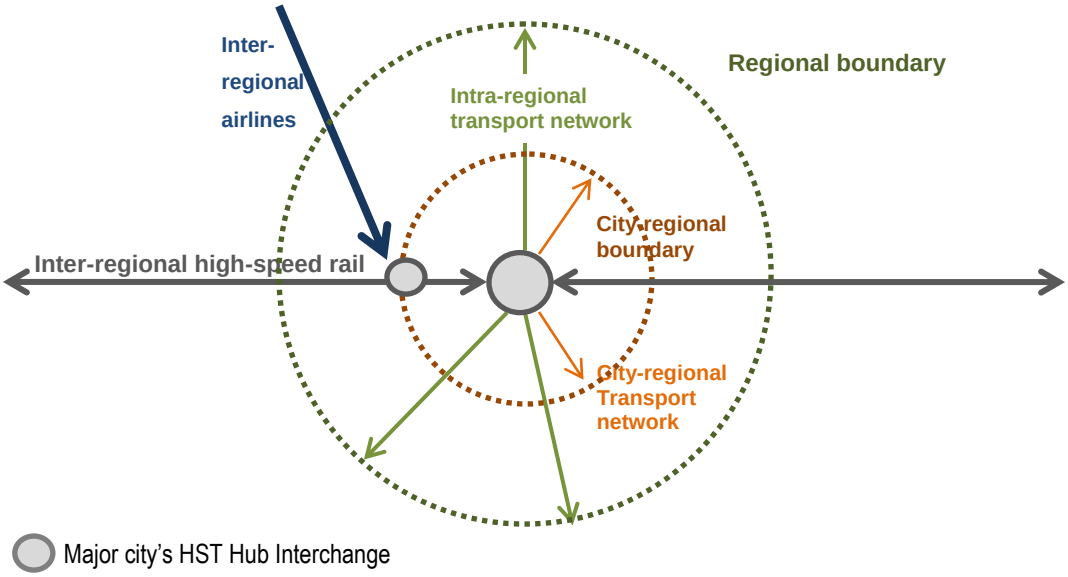
Similarly, for other British city- regions outside London, a *City Relationship* study (The Northern Way, 2009c) is conducted with a case study of five city-regions (Leeds, Liverpool, Manchester, Sheffield, and Newcastle). For each, the draw of the economic centre, labour market relationships and firm relationships were analysed to identify different places that play different economic roles within a city region: whether they are dependent, interdependent, independent or isolated. Figure 3-5 shows the research finding of Manchester City Region. The key conclusion is that "a deeper appreciation of different roles and influencing factors can support policy makers in maximising benefits from city relationships. Promoting growth in the economic core has the potential to benefit other cities and towns of a city region, provided there is investment in links to the economic centre" (The Northern Way, 2009c, p.43).

Figure 3-5 Manchester City Region and its Wheel of City Typologies

This image is removed due to the involvement of the third party copyright material. Source: The Northern Way (2009b, p.22 & p.5)	This image is removed due to the involvement of the third party copyright material.

The implication from the review demonstrates that transport performs a vital role to ensure critical F2F contacts within the MCR and beyond. It varies with city types. The important transport modes for secondary centres are regional infrastructure, motorways and fast rail. For first and other major cities, intra-urban and international accessibility are vital (Hall and Pain, 2006: p.110). Here, transport connectivity embodies a two-sided feature encountered at major transport hubs: at the external level, high-speed (air or HST) hub centralisation fosters knowledge intensive activities; at the internal level, improved transport linkage (intra-regional rail, intra-urban, or motorways) should be simultaneously available to allow decentralisation of routine activities from the major city or commuting into the major city for more employment opportunities within a reasonable time-distance. Similarly, this indicates the need to consider networks. As Vickerman has noted, "Development opportunities from new networks will occur at locations with good access to the new network and which provide nodal connections to other networks" (Vickerman, 1997, p.35). Figure 3-6 presents a conceptual map of a major city's HST hub interchange.

Figure 3-6 A Conceptual Map of A HST Hub Complex around A Major City and Its Sub-regions for Regional Development



Source: author

As reviewed in section 2.3, HST is most competitive for medium-long distance travel (150-800 km). HST could effectively enhance connectivity between the capital city and major regional cities at the national (inter-regional) scale and international scale (in the case of the European HST network). Meanwhile, for MCRs, albeit with different sizes, HST could potentially give rise to the spatial expansion of functional polycentric MCRs. In order to achieve a wider impact of HST in reducing regional inequality, two levels of effects are necessary, namely inter-regional and intra-regional.

- With regard to the inter-regional impact, HST could particularly benefit companies or organisations which value time and the advantage of crucial linkages between major city cores when building a knowledge economy. A great opportunity arises for post-industrial, well-established regional cities which were suffering from economic restructuring, so there could be a consequence of reducing inter-regional inequality.

- Concerning the intra-regional impact, the regional city tends to be the major destination of HST services. It is unlikely that all sub-regions could be served by HST. As long as a sub-regional city is connected to a national HST network, that city will have direct trains to the national capital. Then it will become part of an expanded MCR of the national capital city aided by the improvement of HST. Critics have argued that there will be a conflict between the national and regional perspectives. The challenges for non-HST sub-regions are greater, but they will not necessarily lose out as long as some strategic intervention takes place. Whatever scenarios it may be, it will depend on how the importance of city relationships in a region is perceived and shaped by public intervention.

Given the huge potential of HST suggested by the review, it is also true that some places could be disadvantaged even if transport improvement has been made. HST and other complementary transport improvements are not sufficient for reducing regional inequality. The further investigation of the wider impact of HST will involve in-depth qualitative research with a comparative case study, as outlined in Chapters 6, 7, 8, 9. For now, based on the literature review, the four proposed hypotheses for the quantitative part of the research in Table 3-1 will be tested in Chapter 4 and Chapter 5.

Table 3-1 Hypotheses for the Quantitative Part of Research

Inter-regional wider impact of HST	***Hypothesis 1*** HST will induce faster economic growth in the cities it serves, through reductions in train times and additional frequency of service, with an important role played by critical time limits.
	Hypothesis 2 HST cities will enjoy faster growth in service industries dealing with information, especially knowledge-based industries.
Intra-regional wider impact of HST	***Hypothesis 3*** The arrival of HST in sub-regions will potentially strengthen economies and employment in the knowledge economy over time.
	Hypothesis 4 HST sub-regions will experience varying effects. The prospects for the economic transformation of non-HST sub-regions could be slight, but they will not necessarily lose out as long as some strategic intervention takes place.

Source: author

3.6 Chapter Conclusions

In this chapter, a review of dynamic spatial-economic development in the era of the knowledge economy provides an essential comprehension of the mutual relationship between economic restructuring and urban (regional) development. The essence of the knowledge economy involves the creation of weightless tacit knowledge, through both virtual communication and F2F contacts. Knowledge intensive activities tend to cluster in the dense city core, but the diseconomies of clustering development complicate the picture. After reviewing the centralisation and decentralisation factors, it is clear that the more advanced the knowledge economy, the more sophisticated the technical (knowledge intensive vs. routine activities) and spatial (decentralisation and centralisation) division of labour that could be involved in the ever-expanded MCR, with a backbone of e- and physical communication infrastructure. Under the circumstance of the increasingly coordinated and networked development, HST will undoubtedly play its role in enhancing physical connectivity between major cities. However, given that uneven regional and urban development has increased, it is necessary to examine the wider impact of HST both at the inter-regional and intra-regional scales by using the hypotheses proposed in section 3.5

Chapter 4 The National Impact: A Study of the UK's InterCity 125/225

4.1 Introduction

This chapter introduces the first empirical evidence of the wider impact of HST, based on the experience of the British InterCity 125/225 since its inception in the mid-1970s. These first empirical findings were established to answer sub-research question two (SRQ2) at the inter-regional level, with two hypotheses proposed.

> ***SRQ2:*** *Whether and to what extent has HST accessibility boosted a knowledge economy and led to a reduction in regional inequality?*
>
> ***Hypothesis 1*** assumes that HST will induce faster economic growth in the cities it serves, through reductions in train times and additional frequency of service, with an especially important role played by critical time limits.
>
> ***Hypothesis 2*** is that this process has varying effects: HST cities will enjoy faster growth in service industries dealing with information, especially knowledge-based industries.

This chapter is divided into four parts. In section 4.2, the background and rationale for this study are introduced to set the scene and expectation. Next, in section 4.3 research methods including detailed research design, units of analysis, variables and datasets are illustrated. Following these basic principles for collecting data, section 4.4 presents the results, including the effects on train times, train patterns and frequencies and wider spatial-economic patterns (economic strength and economic restructuring). In section 4.5, the discussion focuses on the synthesis of transport change and economic change to interpret the wider impact of InterCity 125/225 on British economic geography. Lastly, section 4.6 draws implications and conclusions and leads on to the intra-regional study.

4.2 Background and Rationale for Study

When Japan Rail introduced its first new generation of Shinkansen HST services in 1964, British Rail was embarking on a modernisation plan in 1963, due to a severe operational deficit and the obsolete physical condition, in reshaping the British Railway network (British Rail Board, 1963). Fast train services were not included in the reshaping programme since they made a substantial contribution to system cost although British Rail, as a whole, was suffering serious revenue deficit.

It was believed that further profitability from fast train services could be achieved with improved services.

Back in the 1960s, British Rail had realised that long distance travel for inter-city journey would remain preferable to road, providing continual attention was paid to the speed, reliability and comfort of trains. Similarly, for distances less than about 200 miles, fast and semi-fast trains services would remain more competitive than air. Therefore, special concern was paid to three long-haul rail services which competed fiercely with air e.g. London-Manchester, London-Newcastle, and London-Scotland. Consequently, the first modernisation work made to the long-distance rail services was introduced with the Blue Pullman services between London and regional major cities e.g. Birmingham, Manchester and Swansea (British Rail Board, 1963, p.13). However, their speed did not yet qualify them because their maximum speed was below 200 kph (125 mph). Additionally, it was also noticed that suburban services for daily commuting into the major provincial cities, in particular for London, would be operating continually to essentially serve commuters in and out of those metropolitan areas (see Figure 4-1).

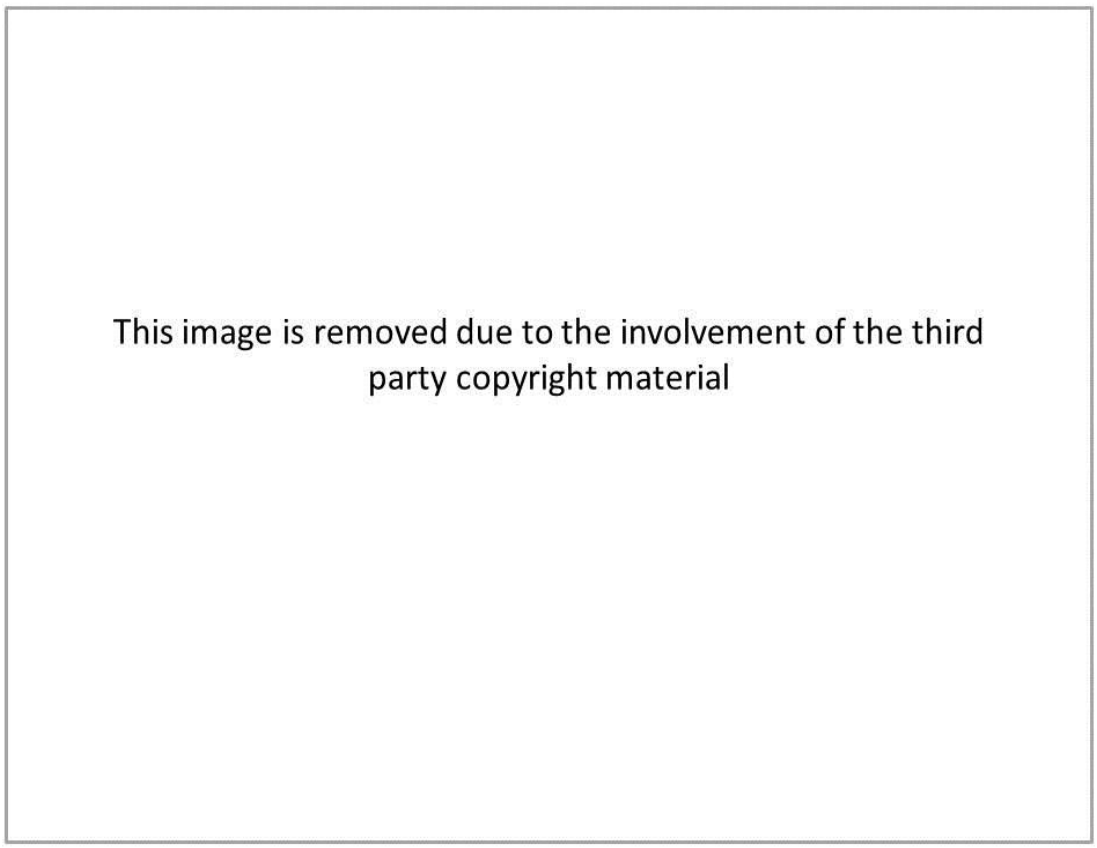
Meanwhile, in the early 1960s, the UK was engaged on the initial stage of constructing its modern motorway network. Although the road building blueprint had first appeared in 1946, the first section of motorway, Preston Bypass was finally completed in 1958. From then on until the beginning of the 1980s, during approximately 25 years, the development of motorway and road construction went through its golden age in several stages, albeit with a whole series of debates and concerns during the process (see Figure 4-2 for the motorway network by the end of the 1970s).

The launch of IC125 in 1976 branded as "this is the age of the train" was a success, rewardingly improving the image of British Rail. In fact, the arrival of IC125 straddled the turning point of arresting the decline of rail passenger journeys against the expansion of the road network and the rise of car ownership (detailed table in Appendix 4), as well as of restriction in road building in the post-1973 Oil Crisis period. Public inquiries of several proposed road schemes were disrupted, which triggered the criticism of the decision-making procedure and methods of road appraisals. In the same year, 1976, an independent review, the Leitch Committee, was announced to investigate the road appraisal methods and a review of the procedure of holding public inquiries. The subsequent White Papers on Road Policy in 1978 and 1980 showed an adjusted road programme in the light of the Leitch Review towards "less emphasis on a network of long-distance motorways and more emphasis on small-scale bypasses" (Starkie, 1982, p.143). Although Starkie (1982) argues that in the short term one major conclusion of the Leitch report was not accepted, since motorway schemes were still evident, it was indeed approaching the end of the road building programme in retrospect.

Figure 4-1 Passenger Traffic Station Receipts of British Railways in the early 1960s

Source: British Railway Board (1963)

Figure 4-2 Motorways in England and Wales, December 1978



Source: Starkie (1982, p.141)

As already suggested in Chapter 2, there are two types of HST systems and the upgrade of conventional rail systems is largely ignored because it has relatively modest effects in time-space shrinkage compared with newly built HST lines. In the national context, developing new dedicated HST lines was not a promising option (for a more detailed introduction to the development of the upgraded HST system in the UK: refer to section 6.4.2). Whether and to what extent have wider impacts from this type of HST improvement been made on British economic geography is a

question which has never been investigated in the context of the UK. The UK's IC125 and 225 services are actually the oldest HST services in Europe, with thirty years of operation, so they provide an obvious candidate for empirical examination of their impact. Regarding the wider spatial-economic impacts of HST, as the literature review in section 2.4.2 manifests, the temporal and spatial perspectives are expected to be explored in the analysis of findings on the long-term effects (restructuring place of work and residence) and wider spatial effects beyond station areas. In addition, since the IC125 did not involve the creation of new HST stations (except for Bristol Parkway), the impact on existing rail stations was also measured as an additional item.

4.3 Research Methods

4.3.1 Research Design and Units of Analysis

In order to test these hypotheses, a basic classification of two groups of cities or towns is firstly applied, namely one with HST and the other without HST services. Non-HST towns are treated as a control group. HST impact on major cities at the national level involves the improved connectivity between London and other major cities. Therefore, rail routes were chosen from London-based long-distance lines to investigate inter-regional impact.

Six London-based railway routes were chosen, all over 150 km in length: two HST (Routes A and B) and four non-HST (Routes C, D, E and F) lines. The two HST lines are major rail routes linking London with Wales as well as Scotland with the longest history of running the IC125: the Great Western Main Line (GWML) from London to Swansea and East Coast Main Line (ECML) connecting London and Edinburgh. The eccentric location of London in south-eastern Great Britain essentially entails shorter rail routes linking London with the east and south; this feature also underlies the four lines without HST, which run from London to Bournemouth, Norwich, King's Lynn, and Margate[16]. In total, the six selected tracks embrace 26 local authorities and 27 railway stations, which form the units of analysis in the study. Details are shown in Table 4-1 and Figure 4-3.

[16] Of the six selected routes, Route A, B, C, and D have explicit London terminal stations, namely London Paddington station, King's Cross station, Waterloo station and Liverpool Street station respectively. In contrast, Routes E and F have more than one London terminal station. On Route E, railway journeys from London to Cambridge or King's Lynn may start from either London Kings Cross station or London Liverpool Street station. As for Route F, there are three alternatives, namely London Victoria, Charing Cross and Cannon Street stations. Please note that Margate has been served by domestic HST services since December 2009. In this study, the impact of domestic HST services on these Kent towns within this study is not included to avoid confusion.

Table 4-1 Unit of Analysis: Studied Routes, Distance, and Local Authorities

Two groups	Six studied routes	Length		26 Local authorities
		miles	km	
With HST	A: London - Swansea	192	307	Reading, Swindon, Bristol*, Newport, Cardiff, Swansea
	B: London – Edinburgh	393	628	Peterborough, Doncaster, Leeds, York, Darlington, Newcastle, Edinburgh
Without HST	C: London – Bournemouth	108	172	Basingstoke and Deane, Winchester, Southampton, Bournemouth
	D: London – Norwich	115	184	Chelmsford, Colchester, Ipswich, Norwich
	E: London – King's Lynn	97	155	Cambridge, King's Lynn and West Norfolk
	F: London - Margate	94	150	Ashford, Canterbury, Thanet

Note: * Here, just shortly prior to the inauguration of InterCity 125 from London to South Wales, Bristol parkway station was built in the 1970s to serve Bristol on the route, but is actually located in South Gloucester local authority. So here we selected Bristol as the major local authority HST serves.

Source: author

Figure 4-3 The Routes and Major Stations Selected for Study

Source: author

There is an inherent difficulty in selecting comparable groups and towns for study. For instance, major settlement corridors tend to be more likely served by HST and motorway. One may argue whether the city type or motorway rather than HST services makes the difference in the economic performance. In order to avoid confusion, more than one line in both categories and the accessibility by three major transport modes were studied. The reason why some longer-distance routes were not chosen for the category of non-HST routes is that their rail services are literally operated as semi-HST services. For instance, although the WCML modernisation did not achieve speeds of up to 125 mph until December 2008, its operational speed had reached 110 mph. Likewise, the Midland Main Line (MML) provided IC125 services soon after the early 1980s, but ran at speeds of up to 110 mph prior to this.

It is worth stressing that this research design is different from UIC (2011) which attempted to measure the regional impacts of HST through selecting a pair of "twin cities"- two individual cities (one with and the other without) to discern the HST impact. There are two major reasons. Firstly, UIC (2011) has admitted that it is somehow difficult to select comparable twin cities. Secondly, the selection of several cities on HST or non-HST lines could allow flexibility, looking beyond a rigid HST vs. non-HST distinction. By so doing, attention could be paid to the differing effects within HST and non-HST towns despite being on the same routes, such as the time-space effects of 1h, 1-2h, or over 2h from the Capital which may manifest themselves from the findings or any other possible factors. In line with this design, the impact of HST could be better interpreted from the difference between HST and non-HST towns.

4.3.2 Variables and Data Collection

Independent and dependent variables were developed to measure the strength of places before and after the introduction of the IC125/225 HST services. Independent variables based on British passenger timetables were the changes in train times brought about by the IC125/225 technological breakthroughs, as well as train patterns and frequencies. Patterns and frequencies were analysed since they were normally arranged first and adjusted later according to real demand, which could reflect the relationship between London and units of analysis and is thus conducive to the interpretation of wider spatial-economic effects. In addition, in order to understand and control other potential factors e.g. accessibility through other transport modes, the availability of other modes, the opening date of a motorway and the journey time by road are carefully examined in these cities.

Dependent variables measure economic strength and service development, especially the knowledge economy. Data for these indicators were drawn primarily from original government

documents and databases, including decennial Census reports, property market reports[17] from the Valuation Office Agency (VOA), datasets from the Office of National Statistics (including official labour market statistics in NOMIS), Scotland's Census Results Online (SCROL), and State of the English Cities (SOCD). At least two time series were required in order to examine the changes over time representing the period before the inauguration of IC125 services in 1976 and, more recently, 2006. The relationship between dependent variables, indicators and data sources is illustrated in Table 4-2.

Table 4-2 The Relationship between Dependent Variables, Indicators and Data Sources

Variables (Derived from hypotheses)	Key indicators		Data sources Before	After	Supplementary indicators
1 Economic strength	GVA			ONS (1995,2006)	GDHI (1995,2006) Population (1971-2001) Area (1971-2001) Travel-to-work data by modes and by distance (1981-2001) **Around the station:** Population density (1971-2001) Employment (1981-1991)
	Employment		Census (1971)	Census (2001)	
	Unemployment		Census (1971)	Census (2001)	
2 Services & Knowledge economy development	Office Rental Values		PMR (1970/71)	PMR (1982,2006)	
	Economic Structure	Group A, B, C, D		NOMIS (1981,1991,2001)	
	Service Employment	1 Finance, IT, & Other Business Services		NOMIS (1995,2006)	
		2 Distribution, Hotel, and Restaurants			
		3 Public Administration, Education, and Health			
	Knowledge Intensive Employment	1 Medium & High Technology		SOCD (1995,2006)	
		2 Knowledge Intensive Services			

Source: author

Gross Value Added (GVA) per head, employment and unemployment were used to measure the evolution of local economic strength. GVA is a critical indicator, but the unavailability of figures before 1995 has meant that employment and unemployment figures from the 1971 Census report are used as proxies to present the basic strength of localities prior to the IC125 services. Although boundary alterations[18] in British administrative authorities led to the incomparability of 1971Census data with those following, exceptions including the figures of population, employment, and unemployment are presented in reworked tables accordant with the revised boundaries in some 1971 Census County Reports (Office of Population Censuses and Surveys,

[17] In property market reports, the figures for office rental values were derived from property transactions completed (Valuation Office Agency, 1982).

[18] The boundary changes in England and Wales were effective from 1st April 1974 according to the Local Government Act 1972, while in Scotland they were introduced three years later on 1st April 1977 in accordance with the Local Government (Scotland) Act 1973.

1972) and therefore it is possible to discern changes between 1971 and 2001[19]. However, two points must be noted. Firstly, because employment and unemployment figures from census reports were based on place of residence rather than workplace, they do not reflect the economic strength of a locality if the majority of people worked away from home. Secondly, despite this limitation, unemployment figures are more reliable than employment figures, since the unemployment rate excludes the student population from the denominator (the whole economically active population), while the employment rate is the proportion of all employed and self-employed persons, using the whole working-age population (including working-age students) as the denominator. Hence, a university city with a high percentage of students may well show a lower employment rate.

Additionally, six supplement indicators, namely Gross Disposable Household Income (GDHI), areas, population changes, travel-to-work by transport modes and distance, population density around the station (0.5km, 1km and entire LA), and employment change around the station (0.5km, 1km, and entire LA) were incorporated to assist the interpretation of spatial-economic patterns over time through the changing mobility between workplace and place of residence and the redistribution of activities in the context of existing rail stations.

Concerning economic restructuring and the development of services and the knowledge economy, four economic groups are defined, namely group A (manufacturing, construction and electricity), group B (commerce, transport and all other services), group C (public services), and group D (knowledge-intensive services). Figures for service employment from NOMIS and knowledge-intensive employment from SOCD were obtained. As services have grown in importance, the different characteristics of services for places are highlighted and information-exchange services (distinguishing between those that are private-led and public-led) and services dealing with goods are distinguished. Also, two kinds of knowledge industries have been identified, namely medium and high technology, and knowledge-intensive services. Nevertheless, again the data for service employment and knowledge-intensive employment for the pre-IC125/225 period was not attainable from 1971 Census data. Consequently, office rental values of localities in property market reports that are available back to 1970 were used as a proxy to analyse the initial strength of local service development prior to IC125/225 services, as it is very evident that not only HST services, but also other factors might also affect the change of rental values- for example, development plans, legislation changes, the acquisition of planning permissions, and so on.

[19] According to the Local Government Act 1992, another stage of government reform creating new unitary authorities came into force between 1996 and 1998. In this study, three local unitary authorities including York, Swansea, and Cardiff therefore gained much larger areas within their boundaries. In particular, in the case of York, the new unitary authority area (27199 hectares) comprises the previous York City area (2946 hectares) and parts of the former districts of Harrogate, Ryedale and Selby. This leads to the incomparability of census figures between 1971 and 2001 at the local authority level for York. Alternatively, for comparison the relatively comparable figures for the York urban area were used.

There are inevitably spatial and temporal discontinuities in the data collection. Spatially, not all indicators were either generated for the same geographical units or are available for all places. Four closely related, but different geographical units exist within the data: the ward level, local district/unitary authority level, Nomenclature of Units for Territorial Statistics- level 3 (NUTS3), and travel-to-work areas (TTWAs). In general, the ward level is the smallest among the four levels. This level has exhibited quite frequent changes over time, and it is difficult to directly measure long-term change at this level from 1971 to 2001. The only exception is a 1971-2001 set of comparable deprivation scores developed by Dr. Paul Norman (2010) from University of Leeds. Within this recreated dataset, the change of population density 1971-2001 at the ward level is used in this study. Changes in employment at the workplace (10% sample) around the station in 1981 and 1991 census are used to supplement the understanding of the distribution of economic activities.

Apart from these two datasets at the ward level, the local district/unitary authority level is fundamental and the most stable and, in this study, is available for indicators like population, employment, unemployment, travel-to-work by transport modes and distance, services employment and office rental values.

The NUTS3 unit is only used for GVA and GDHI and is created by the European Office for Statistics (EUROSTAT) as a standardised and European-wide spatial unit for statistical production, which is geographically coarser and broader than the local authority level. Since it approximates the performance of individual local authorities to that of larger sub-regions, several local authority areas share the same figures, which might lead to inaccuracy.

Moreover, the figures for knowledge-intensive employment were available from the SOCD database in three geographical units: primary urban areas, TTWAs and core city regions. With the aim of understanding the wider spatial-economic impacts, TTWAs, developed as approximations to self-contained labour markets, are used because the figures are available for more places in this research than only core city regions or intensive urban settlements and are also more helpful in interpreting local strengths as centres of employment beyond the administrative boundaries.

Temporally, some indicators were newly devised for specific aspects and are not available over the entire 30-year period. For instance, indicators like GVA, GDHI and knowledge-intensive employment were not available until 1995. What is more, figures for office rental values from 1970/71 Property Market Reports (PMRs) should be treated carefully since the systematic comparable tables like those in 1982 and 2006 PMRs were not obtainable and the figures were actually extracted from the descriptive valuations of office rental ranges for places. Great efforts were made to deal with these problems, ensure the validity and reliability of the data, and interpret them with due caution.

Due to the lack of data availability over a long period of time, the method for quantitative analysis is mainly descriptive for synthesising and interpreting from various data resources. There are two major stages of analysis. The first step is the quantitative analysis of these figures collected in section 4.4 and the next step is the summary of principle component analysis and qualitative analysis for interpretation in section 4.5.

4.4 Results

4.4.1 Effects on Train Times

Table 4-3 shows the change in train times for weekday services between 1974/75 and 2006. The train times demonstrated here are based on the London-outbound services since the London-inbound services normally do not reveal significant differences from the outbound except for a few extra minutes of recovery time allocated to London-inbound train services for timekeeping. In addition, weekday rather than weekend services were analysed since they relate to routine economic activities in localities. Moreover, concerning the complex compromises involved in providing upgraded HST services, the figures for the fastest and average train times were juxtaposed.

After the introduction of IC125 services, the reduction in train times on HST lines is noticeable, especially for stations further afield from London, and time-space shrinkage shows stronger effects on the ECML than on the GWML. On the GWML, the fastest train times were reduced by 7- 27 minutes (8-38 minutes is the average reduction in train times): Swindon became accessible within one hour of London, Cardiff within 2 hours, and Swansea within 3 hours. The synergy of the diesel IC125 and later electric IC225 services on the ECML brought the fastest train-time reductions of 15-80 minutes (20-84 minutes for the average reduction in train times). The time to Peterborough decreased to within 50 minutes. Doncaster and York became reachable in less than 2 hours. Leeds was brought closer by about 20 minutes (2 hours 10 minutes in 2006, though the fastest train was less than 2 hours immediately after electrification in 1991). Train times to Darlington and Newcastle changed to within 3 hours and Edinburgh in 4 hours and 10 minutes.

In contrast, on lines without HST, train times were not greatly reduced as a result of electrification; instead, times literally increased for some stations such as Bournemouth (3 minutes), Cambridge (10 minutes from Liverpool street station), Canterbury West (1 minute), Ramsgate (3 minutes), and Margate (19 minutes from London Victoria station). The reduction in the fastest train time was 2-9 minutes (1-16 minutes is the average reduction in train-time). The only exception of note is the change in train times from London King's Cross station to Cambridge and King's Lynn on Route E. A section of this route shares ECML tracks (from London to Hitchin), resulting in a reduction

of 28 minutes; the other branch from London Liverpool Street station to Cambridge and King's Lynn conversely shows an increase in train times. These two contrasting effects on Route E should be recognised as an extraordinary condition on non-HST route sections rather than being completely excluded from the non-HST routes.

Table 4-3 Change in Train Times (1974/75 vs. 2006)

Distance			Stations	1974/75		2006		2006	1974/75- 2006	
				(min)		(min)		(h)		(min)
mile	km			Fastest	Average	Fastest	Average	zone	Fastest	Average
36	58	A	Reading	33	35	26	27	< 1H	-7	-8
77	124		Swindon	69	80	52	59	< 1H	-17	-21
112	179		Bristol (Parkway)	98	108	82	85	< 2H	-16	-23
119	190		*(c.f. Bristol Temple Meads)*	*(110)*	*(125)*	*(100)*	*(104)*	*(< 2H)*	*(-10)*	*(-21)*
134	214		Newport	118	132	102	111	< 2H	-16	-21
145	232		Cardiff Central	137	150	118	127	<=2H	-19	-23
193	308		Swansea	200	216	173	178	<=3H	-27	-38
76	122	B	Peterborough	61	68	46	48	< 1H	-15	-20
156	250		Doncaster	125	145	86	102	< 2H	-39	-43
186	297		Leeds	150	182	128	144	>=2H	-22	-38
189	302		York	145	166	105	118	<2H	-40	-48
233	372		Darlington	184	206	138	151	< 3H	-46	-55
269	430		Newcastle	212	232	169	183	<=3H	-43	-49
393	629		Edinburgh	330	356	250	272	>=4H	-80	-84
48	76	C	Basingstoke	45	56	43	51	< 1H	-2	-5
67	106		Winchester	63	75	58	64	<=1H	-5	-11
75	120		Southampton Airport (Parkway)	74	78	65	76	>=1H	-9	-2
79	127		Southampton (Central)	72	95	72	83	<2H	0	-12
108	173		Bournemouth	100	133	103	117	<2H	3	-16
30	48	D	Chelmsford	34	36	30	34	< 1H	-4	-2
52	83		Colchester	53	57	49	56	< 1H	-4	-1
69	110		Ipswich	70	76	63	72	>=1H	-7	-4
115	184		Norwich	115	125	112	115	<2H	-3	-10
38	59	E	*(c.f. Stansted Airport (from Liverpool st.))*	-	-	*(40)*	*(47)*	*(< 1H)*	-	-
56	89		Cambridge *(from Liverpool St.)*	67	72	77	82	>=1H	10	10
58	93		Cambridge *(from King's Cross)*	75	90	47	52	< 1H	-28	-38
97	155		Kings Lynn *(from Liverpool St.)*	127	129	124	126	>=2H	-3	-3
99	159		Kings Lynn *(from King's Cross)*	-	-	95	99	<2H	-	-
59	95	F	Ashford *(from Victoria, CX, &Cannon St.)*	65	80	59	78	<=1H	-6	-2
74	118		Canterbury West *(from Victoria & CX)*	83	101	84	99	<2H	1	-2
89	142		Ramsgate *(from Victoria,CX,&Cannon St.*	102	123	105	126	<=2H	3	3
94	151		Margate *(from Victoria)*	144	149	163	163		19	14
			Margate *(from CX &Cannon St.)*	-	-	125	146	>=2H	-	-

Source: British Passenger Timetables (May1974 - May1975 and June-December 2006)

Notes:

1. CX represents Charing Cross station.
2. This timetable does not include the change made by the introduction of domestic high-speed rail services by Southeastern between London and several towns in Kent from December 2009, which significantly alters the journey time from these towns to and from London along Line F in this study.

4.4.2 Effects on Train Service Patterns and Frequencies

Using the same criteria for analysing train times above, train patterns and frequencies are presented in Table 4-4, reflecting service changes from London on weekdays from 1974/75 to 2006. For these HST towns, the frequency of services has generally increased over time. Places within a one-hour train time show the highest frequency: around 46-70 trains in 2006 in contrast with 16-29 trains in 1974/75. Beyond one hour, frequency also displays considerable growth, but with relatively smaller numbers with 18-43 trains in 2006 against 6-18 trains in 1974/75. Nevertheless, some changes are worth noting. Doncaster shows a nearly fourfold increase, with 43 weekday trains from London in 2006 against 9 trains in 1974/75. In addition, Bristol is served by two stations: Bristol Temple Meads located in Bristol city centre and Bristol Parkway, built in the early 1970s on the northern edge of the Bristol city-region as one of the main intermediate stations on the GWML from London to Swansea. Over 30 years, Bristol Parkway station has grown in importance on the transport network: the frequency to Bristol Parkway has more than doubled with 28 trains, slightly fewer than Bristol Temple Meads with 31 trains per weekday.

Similarly, these non-HST lines have shown apparent increases in frequency over time for most towns, but at different stages. In 1974/75, of four non-HST lines, towns on Route C (London-Bournemouth) and F (London-Margate) already showed a close relationship by train with London except for Margate (13 trains) - around 29-46 trains per weekday, such as Canterbury west (29 trains), Ramsgate (29 trains), Basingstoke (32 trains), Ashford (35 trains), Winchester (36 trains), Southampton (46 trains), and Bournemouth (46 trains). In contrast, Route D (London-Norwich) and E (London-King's Lynn) show fewer trains from London, about 8-16.

Table 4-4 Change in Train Frequencies (1974/75 vs. 2006)

Distance			Stations	1974/75	2006	1974/75-2006
mile	km					(change)
36	58	**A**	Reading	29	67	38
77	124		Swindon	26	70	44
112	179		Bristol Parkway	13	28	15
119	190		*(c.f. Bristol Temple Meads)*	*(22)*	*(31)*	*(9)*
134	214		Newport	18	29	11
145	232		Cardiff Central	18	29	11
193	308		Swansea	14	19	5
76	122	**B**	Peterborough	16	46	30
156	250		Doncaster	9	43	34
186	297		Leeds	11	24	13
189	302		York	12	28	16
233	372		Darlington	11	25	14
269	430		Newcastle	13	26	13
393	629		Edinburgh	6	18	12
48	76	**C**	Basingstoke	32	52	20
67	106		Winchester	36	64	28
75	120		Southampton Airport (Parkway)	14	48	34
79	127		Southampton (Central)	46	48	2
108	173		Bournemouth	46	32	-14
30	48	**D**	Chelmsford	8	98	90
52	83		Colchester	16	91	75
69	110		Ipswich	16	55	39
115	184		Norwich	14	33	19
38	59	**E**	*(c.f. Stansted Airport (from Liverpool st.))*	-	*(74)*	-
56	89		Cambridge (from Liverpool St.)	14	4	-10
58	93		Cambridge (from King's Cross)	16	19	3
97	155		Kings Lynn(from Liverpool St.)	6	3	-3
99	159		Kings Lynn(from King's Cross)	-	19	-
59	95	**F**	Ashford (from Victoria, CX, Cannon St.)	35	64	29
74	118		Canterbury West (from Victoria,CX)	29	32	3
89	142		Ramsgate (from Victoria,CX)	29	33	4
94	151		Margate(from Victoria Station)	13	1	-12
			Margate(from CX and Cannon St.)	-	13	-

Source: British Passenger Timetables (May1974 - May1975 and June-December 2006)

Notes:

1. CX represents Charing Cross station.

2. These figures are counts of daily frequencies.

3. This timetable does not include the change made by the introduction of domestic high-speed rail services by Southeastern between London and several towns in Kent from December 2009, which significantly alters the journey time from these towns to and from London along Line F in this study.

In 2006, one-hour towns on Routes C and F were further intensively linked to London with more than twenty additional trains, including Basingstoke (52 trains), Winchester (64 trains), and Ashford (64 trains). Towns beyond a one-hour distance on Routes C and F, however, only showed relatively modest increases, even declines, in train frequency. Margate was given just one

additional train[20], and Southampton, Canterbury and Ramsgate gained an additional 2-4 trains. Bournemouth, conversely, shows a reduction of 14 trains. On Route D, train frequencies rose dramatically, for Chelmsford and Colchester in particular with 98 and 91 train to London, more than twelve and five times the frequency of 1974/5 respectively. To a lesser degree, Ipswich and Norwich show 55 and 33 trains per weekday in 2006 in contrast to 16 and 14 in 1974/75. With regard to Route E, Cambridge and King's Lynn had been served by two branches (from King's Cross and Liverpool Street), but the line departing from King's Cross station took over most services from London Liverpool Street station. Cambridge experienced reduced services, 23 trains in 2006 as opposed to 30 trains in 1974/75, while 22 trains to King's Lynn in 2006 more than doubled the frequencies found in 1974/5.

In addition, train linkages between London centres and London airports located outside Greater London were enhanced by high frequency trains from London. Southampton Airport Parkway station had 48 trains from London in 2006 against 14 trains in 1974/75. Similarly, after the completed modernisation of Stansted Airport in 1991, the Stansted Express was developed to provide frequent services from London, comprising 74 trains in 2006.

Before the arrival of HST on route A and B in 1976, the British motorway system had been rapidly expanded by the early 1980s and these cities under study had been served by motorway already. Although the reduction of time saving is not as great as the new built HST, the comparison of journey time by rail and road, the journey time is still much shorter than car driving (see Table 4-5 and Figure 4-4). The overall transport improvement in train times and frequency is demonstrated in Figure 4-5, which shows that the relationship between London and HST (left-hand side) and non-HST cities (right-hand side). It clearly shows that within 1 hour from London, either HST or non-HST cities, train frequency has been significantly increased over thirty years, with some exception such as Cambridge and a much higher degree in these non-HST towns.

[20] In 1974/75, only one terminal station, London Victoria, served the route from London to Margate; by 2006, London Victoria station had been replaced by London Charing Cross station to serve Margate and just one train left from London Victoria to Margate (there was also only one train per weekday from London Cannon station to Margate). This adjustment to train services accounts for the negative figure of train frequency (-12 trains) to Margate from London Victoria station in Table 4-4.

Table 4-5 The Comparison of Accessibility to and from London by Train, Car and Air

Lines	Rail Stations	By Train Time min	By Train Distance miles	By Car Time min	By Car Distance miles	Time difference between train and car (min)	Motorways directly to London	Completion of motorway	Airport to London
A	Reading	27	36	61	44	-34	M4	1971	-
	Swindon	59	77	81	94	-22	M4	1971	-
	Bristol (Temple Meads)	104	119	125	119	-21	M4, M32	1966	O
	Bristol (Parkway)	85	112	125	119	-40	M4	1966	O
	Newport	111	134	147	139	-36	M4	1966	-
	Cardiff	127	145	158	151	-31	M4	1977-1980	O
	Swansea	178	193	191	187	-13	M4	1972	O
B	Peterborough	48	76	107	86	-59	A1	1970	-
	Doncaster	102	156	178	171	-76	M1	1961	O
	Leeds	144	186	201	195	-57	M1	1968	O
	York	118	189	217	211	-99	- M1+A64	-	-
	Darlington	151	233	247	248	-96	A1(M)	1970	O
	Newcastle	183	269	281	283	-98	A1(M)	1970	O
	Edinburgh	272	393	405	405	-133	A1	1970	O
C	Basingstoke	43	48	68	52	-25	M3	1971	-
	Winchester	58	67	82	68	-24	M3	1971	-
	Southampton (Central)	72	79	98	81	-26	M3,M27	1972 1983	O
	Southampton (Parkway)	65	75	98	81	-33	M3,M27	1972 1983	O
	Bournemouth	117	108	121	108	-4	- M3+A3	-	O
D	Chelmsford	34	30	60	40	-26	- A13	-	-
	Colchester	56	52	82	65	-26	- A12	-	-
	Ipswich	72	69	100	82	-28	- A12	-	-
	Norwich	115	115	138	116	-23	- M11+A11	-	O
E	Cambridge (from KX)	52	58	78	62	-26	M11	1980	-
	Cambridge (from Liverpo	82	56	78	62	4	M11	1980	-
	King's Lynn	99	97	139	109	-40	- M11	-	-
F	Ashford (International)	78	59	75	56	3	M20	1981	O
	Canterbury (West)	99	74	82	62	17	- M2+A2	-	O
	Ramsgate	126	89	102	78	24	- M2+A229	-	O
	Margate	146	94	98	76	48	- A2+M2	-	O

Source: 1.British Passenger Timetables, 2.Google Maps.

Notes:
1. The figures of transport mode by road in this table is calcuated by google maps.This This is expected to be the shortest and fastest route. Also, the journey times shown in the road mode are average off-peak driving times.. These times should be only used as a guide and do not allow for unforseen traffic delays, rest breaks or fuel stops.
2. The rail timetables for cities in Kent County presented the rail services before the domestic high-speed rail Javelin service provided by Southeastern Trains from December 2009.

Figure 4-4 The comparison of Journey Time by Rail vs. by Road (source: author)

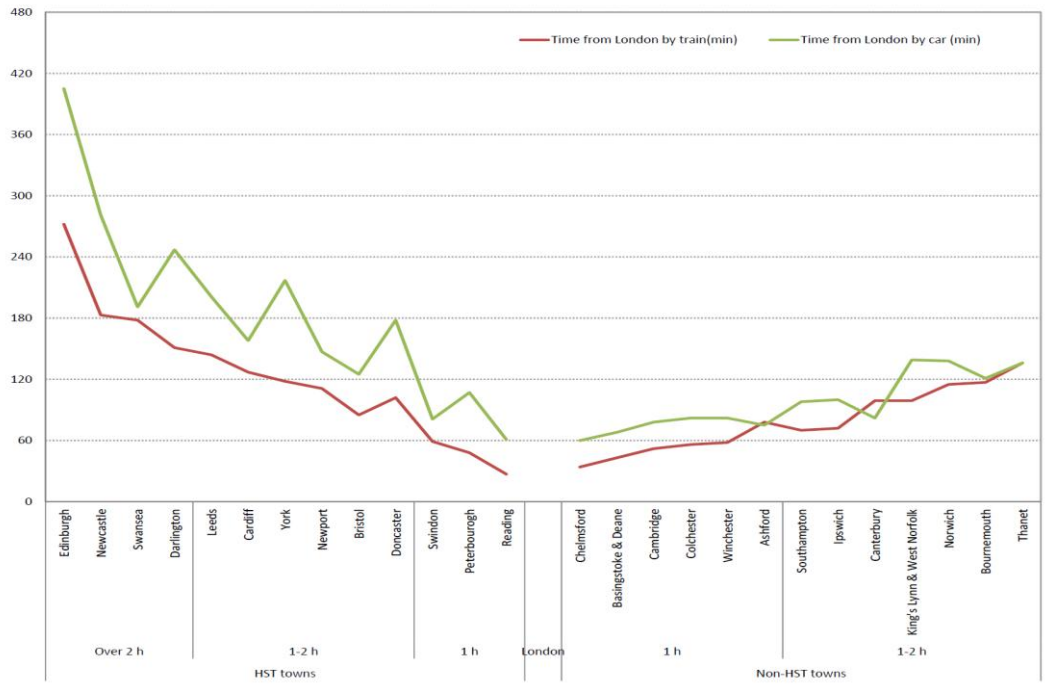
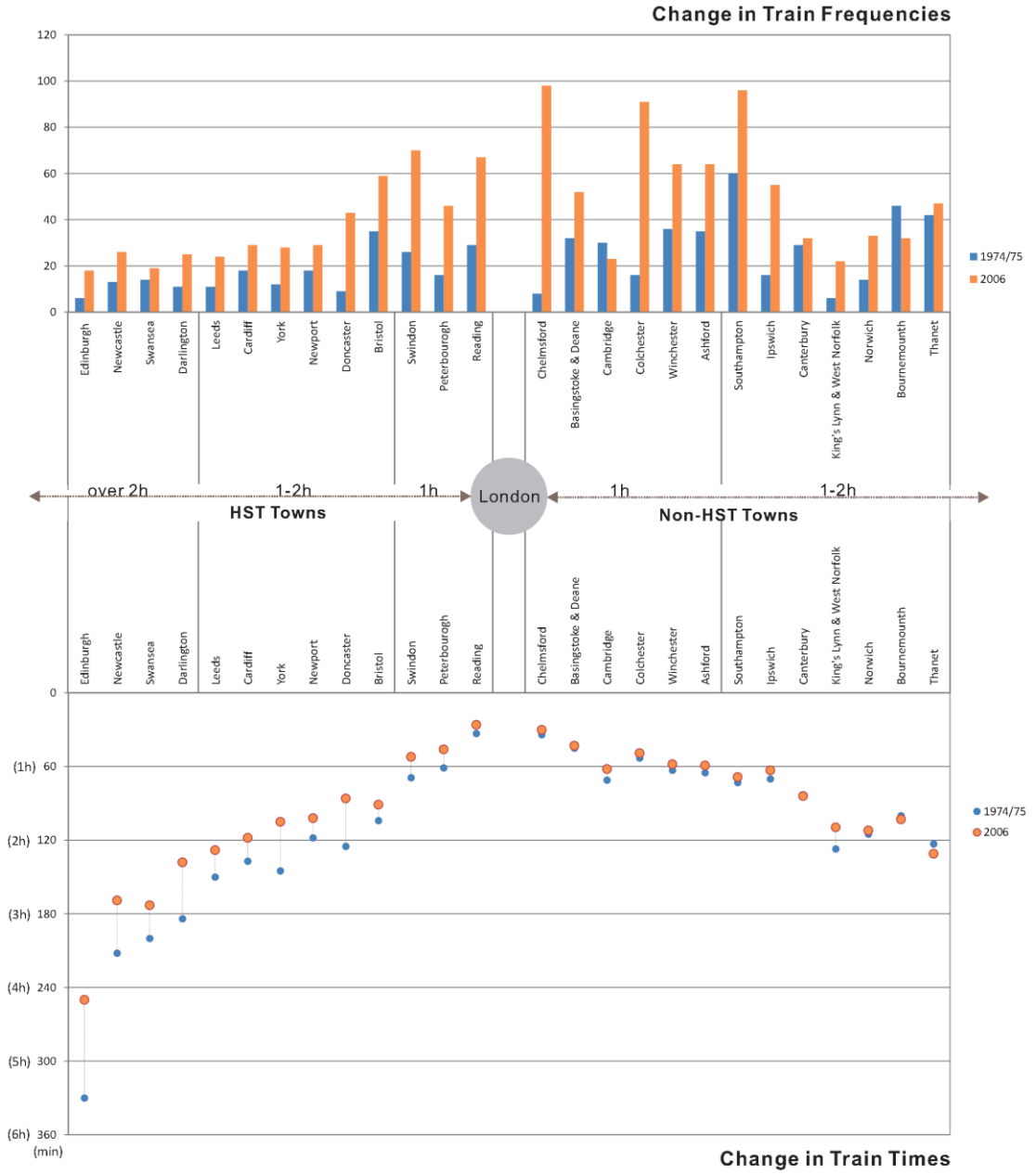


Figure 4-5 A Summary of Improved Rail Services with London: Changes in Train Frequencies and Times



Source: British Passenger Railway Timetable (May 1974 - May 1975 and June-December 2006)
Notes: The change of train times is calculated with the change of shortest journey times on train.

4.4.3 Effects on Wider Spatial-Economic Patterns

Against the two hypotheses posed in the previous section, the findings of the impact of HST on the economy are now presented, beginning with economic strength followed by services and effects on the knowledge-intensive economy. For each dependent variable, HST and non-HST towns are juxtaposed so as to better discern the different impact.

4.4.3.1 Impact on Economic Strength

As mentioned in the methodological section, records of a key indicator, namely Gross Value Added (GVA), are not available until 1995, so unemployment and employment changes were first used to measure long-term economic strength before and after IC125 services. In addition to the analysis of these two indicators, identification of areas and population change is useful to assist comprehension of economic change, especially whether inevitable changes in areas are in inverse proportion to population change over time. Table 4-6 shows areas, populations, employment and unemployment change over thirty years between 1971 and 2001.

Areas and Population / Unemployment and Employment

Most towns did not experience major boundary changes, but York, Cardiff, Swansea and Reading were exceptions, with increases of over 5 % in area. Regarding population change, notably, both HST and non-HST towns within one hour of London showed huge increases in population in contrast with the reduction in London: Swindon grew by 29.2 %. However, the most striking figures came from Peterborough and from Basingstoke & Deane, which increased by nearly 50 %, around eight times higher than the GB average of 5.8 %. However, Reading's population increase of 7.6 % was smaller than its percentage increase in area (9.6 %). Interestingly, among the 2-hour towns, a noticeable increase is also true for non-HST towns except for Ipswich, Norwich and Southampton, but here the percentage population increases were smaller. Instead, 2-hour HST towns demonstrated population decline or a slower increase than the national average, except for York (urban area) and Cardiff. Leeds declined by 3.2 % and Bristol by 10.8 %, in line with London, which recorded a 10.3 % decline in population. Despite an increase in Cardiff, its growth was less than its expansion in area. Over-2-hour towns decreased in population, except for Swansea, which recorded a growth in population of one-third against an increase of more than 50 % in area.

Table 4-6 Changes in Area, Population, Employment and Unemployment (1971-2001)

			Areas change	Population change		Employment change		Unemployment change
			1971-2001	1971-2001		1971-2001		1971-2001
			%	%	counts	%	counts	%
		GB		5.8	3,125,389	2.7	1260256	-0.07
		London		-10.3	-280,255	-2.1	-474367	1.81
	TrainTimes	**LAs**						
HST Towns	Over 2 h	Edinburgh	1.2	-5.9	-27907	0.3	-2,788	***-2.74***
		Newcastle	1.4	-15.8	-48740	-5.4	-36,372	***-0.16***
		Swansea	54.4	***17.6***	33448	-1.7	5,630	0.34
		Darlington	-0.6	-0.1	-75	***3.5***	-253	0.96
	1-2 h	Leeds	-1.9	-3.2	-23529	0.2	-23,515	***-0.37***
		Cardiff	*15.8*	***6.2***	17755	0.3	1,750	***-1.38***
		York	*6.9*	***31.2***	-	-	-	-
		Newport	-5	0.1	164	0.4	-2,935	0.51
		Doncaster	-2.3	2	5738	0.4	225	0.38
		Bristol	0.1	-10.8	-46042	***3.4***	-21,133	***-0.49***
	1 h	Swindon	*3.7*	***29.2***	40699	***7.7***	28,428	***-0.69***
		Peterbourogh	*2.9*	***47.8***	50443	***3***	23,588	0.63
		Reading	*9.6*	***7.6***	10157	***4.9***	9,056	***-0.14***
	London							
Non-HST Towns	1 h	Chelmsford	-1	***27.7***	34032	***5.8***	21,270	0.25
		Basingstoke & Deane	-0.5	***47.5***	49155	***8.8***	33,709	***-0.49***
		Cambridge	0	***10.1***	10023	1	3,484	0.47
		Colchester	-1.5	***31.9***	37640	***7.1***	21,710	***-0.84***
		Winchester	0.2	***24.9***	21359	***8.5***	13,459	***-1.94***
		Ashford	0	***29.8***	23578	***9.4***	14,363	***-0.77***
	1-2 h	Southampton	2	1.1	2327	-1.1	-3,747	***-0.59***
		Ipswich	-2.2	-5.1	-6243	***5.9***	-1,194	0.37
		Canterbury	-0.5	***22.8***	25148	***8***	12,074	***-1.71***
		King's Lynn & West Norfolk	1.1	***23***	25313	***5.3***	12,081	***-1.72***
		Norwich	0.1	-0.4	-535	0.3	-3,227	0.88
		Bournemouth	-0.1	***6.2***	9575	***10.3***	6,509	***-1.31***
		Thanet	0.2	***10.4***	11901	***9.8***	5,825	***-0.83***

Sources: ONS/ GROS/ NOMIS

1. ONS (then OPCS) (1971 census: Table 2 and 18)
2. General Register Office for Scotland
3. NOMIS (1981Census: Table 1,5, and 7; 1991Census: Table S01, S08; 2001Census: Table T07, CAS028)

Notes:

1. * here, figures in York urban area were used for comparison between 1971 and 2001 because York unitary authority coming into existence in 1996 and incoporating parts of neighbouring districts into a larger boundary leads to incomparable in local authority level. More details refer to footnote 16.
2. Following the 1st April 1974 boundary changes, three local authorities in this research were involved in renaming. First, a new district called Thamesdown was created from the former Swindon Municipal Borough (MB) and Highworth Rural District (RD). Figures for Thamesdown have been used in this table for proper comparison. Swindon Unitary Authority was formed in 1997 from the whole of the former Thamesdown area. Secondly, King's Lynn District and Basingstoke District were subsumed into District King's Lynn and West Norfolk and District Basingstoke and Dean respectively.
3. Local Authority Thanet District covers the three main settlements, namely Margate, and Ramsgate Municipal Boroughs (MB), and Broadstairs Urban District (UD).
4. For 1971, the age for commencing work was 15. For 1981 and subsequent years the age of work commencement was 16.

GVAs/ GDHIs

In addition to unemployment and employment, more recently, the availability of two indicators, namely Gross Value Added (GVA), a key indicator of local economic performance, and Gross Household Disposable Income (GDHI), the wealth of resident populations, provide further account

of local economic strength and its geography. Table 4-7 shows figures for GVAs and GDHIs over time from 1995 to 2006. For HST-accessible towns, GVA per head is higher than the national average for cities within 2 hours of London (including all three one-hour towns), except for Newport and Doncaster, whereas GVAs for over-2-hour towns are lower, except for Edinburgh. On the other hand, towns within one hour of London have relatively high GDHI values, except for Peterborough. Paradoxically, GDHIs for 2-hour towns with high GVAs are actually lower than the national average, and decreasing over time. Of the over 2-hour towns, people in Edinburgh are wealthier than the national average; others are poorer.

In comparison, for towns without HST services, the contrast between GVAs and GDHIs is conspicuous. In general, GVA values were lower than the national average for places within one hour of London (except for Cambridgeshire) and for places in the 2-hour ring, except for Southampton, although Cambridgeshire had a slightly lower index (99 in 2006) than the national average. However, the figure for Bournemouth & Poole has to be interpreted carefully, since the inclusion of Poole in the NUTS3 area would tend to diminish the GVA value; the figure for Bournemouth on its own might be much higher. In contrast, GDHIs of towns within the one-hour ring were generally higher than average levels. For 2-hour towns, the picture is rather mixed. Only Kent County Council and Bournemouth & Poole were richer than the national average in 2006. For places like Thanet, Ipswich, Norwich, and King's Lynn and West Norfolk, neither GVA nor GDHI figures exceeded the national average.

Table 4-7 Headline Gross Value Added (GVA) Per Head and Gross Disposable Household Income (GDHI) Per Head Indices at Current Basic Prices

				GVA /head		GDHI /head	
				1995	2006	1995	2006
			GB	100	100	100	100
			London	***153***	***165***	***121***	***125***
	Train Times	**LAs**	**NUTS3**				
HST Towns	Over 2 h	Edinburgh	*	***156***	***162***	***114***	***114***
		Newcastle	Tyneside	87	93	87	85
		Swansea	*	79	81	91	88
		Darlington	*	98	90	88	87
	1-2 h	Leeds	*	***115***	***115***	97	91
		Cardiff	Cardiff & Vale of Glamorgan	***107***	***106***	94	92
		York	*	***112***	***102***	***102***	95
		Newport	Monmouthshire & Newport	90	98	95	84
		Doncaster	Barnsley, Doncaster and Rotherham	66	69	84	85
		Bristol	*	***134***	***134***	96	93
	1 h	Swindon	*	***152***	***148***	***105***	***104***
		Peterbourogh	*	***114***	***127***	98	95
		Reading	Berkshire	***132***	***152***	***117***	***115***
	London						
Non-HST Towns	1 h	Chelmsford	Essex CC	83	84	***109***	***109***
		Basingstoke & Deane	Hampshire CC	93	98	***111***	***112***
		Cambridge	Cambridgeshire CC	***103***	99	***110***	***110***
		Colchester	Essex CC	83	84	***109***	***109***
		Winchester	Hampshire CC	93	98	***111***	***112***
		Ashford	Kent CC	86	83	***103***	***103***
	1-2 h	Southampton	*	***118***	***110***	89	80
		Ipswich	Suffolk	96	86	98	97
		Canterbury	Kent CC	86	83	***103***	***103***
		King's Lynn & West Norfolk	Norfolk	87	83	95	90
		Norwich	Norfolk	87	83	95	90
		Bournemouth	Bournemouth & Poole	88	99	99	***106***
		Thanet	Kent CC	86	83	***103***	***103***

Source: ONS

Notes:

1. Place type: NUTS3
2. * indicates the name of NUTS3 unit is the same as local authority level.

Travel-to-Work Patterns

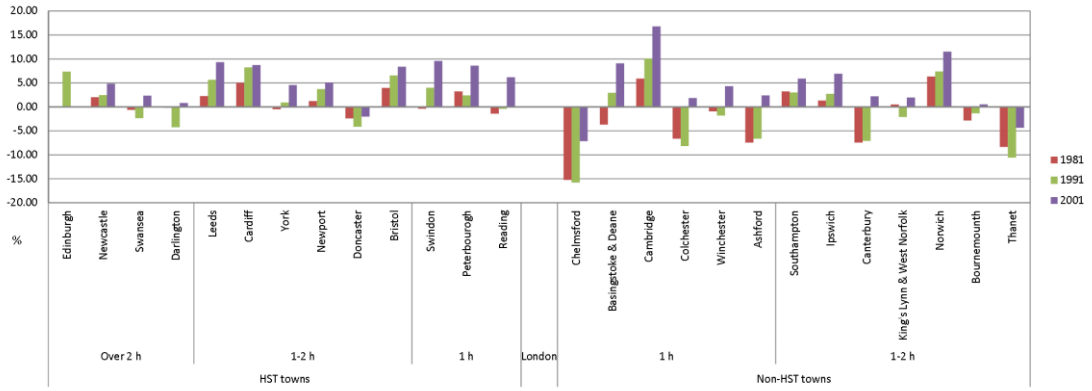
Travel-to-work data were additionally collected to better understand the spatial patterns related to economic performance. Two types of travel-to-work (TTW) data are collected, namely by distance and by transport mode. In addition, two ways of classification of TTW flow datasets at the local authority (LA) level are available i.e. workplace employment and home location of employees. TTW by distance based on workplace employment denotes how far employees who work in this local authority travel to work. Likewise, TTW by distance based on employee residential location indicates that how far employees who live in this local authority travel to work.

As a general trend, over time, the TTW by distance has increased significantly (more detailed figures are reported in Appendices 5, 6, 7, & 8). The classification of TTW distance in census data is not identical every decade. It has gradually evolved with more selections and longer distance. Therefore, in order to measure the change over time 1981-2001, the TTW by distance is sorted into four categories, namely within 5km, 5-9km, 10-19km, over 20km.

Firstly, concerning TTW by distance, since long-distance commuting has grown over time, figures in all 26 LAs have all correspondingly reflected a noticeable decline in the first two categories (<5km and 5-9km) and a sharp increase in the fourth kind (>20km). Here, the difference[21] in percentages of employment TTW over 20km between two kinds of commuting flow in each LA is used as a proxy indicator to distinguish the changing character of places between HST and non-HST towns. A local authority which has economic strength will potentially attain a positive value, which means the place where draws employees farther than 20km away from workplace, instead of letting residents commuting more than 20km to work elsewhere. Otherwise, the value could be negative. Over the 30 years, these 26 cities as workplaces have shown higher percentages of employees who travel to work over 20km, but the pattern of residents' TTW over 20km does not show a clear trend. Overall, it suggests that HST towns have increasingly shown long distance (over 20km) net in-commuting. Figure 4-6 shows the difference between workplace and place of residence. Three 1h HST towns have shown the highest growth rates as workplaces in contrast to 1h non-HST towns. The exception is Doncaster which shows higher outwards than inward commuting flow over 20km. In the non-HST towns, the picture is sketchy. Chelmsford has the strongest outward TTW pattern. But Cambridge, Southampton, Ipswich, and Norwich are exceptions to show high inward commuting flow as workplaces. Generally speaking, well-established (sub-) regional centres have shown a steady positive value in gaining more inward commuting flow over time since 1981 because of their wider labour markets.

[21] The value results from this formula the workplace employment detaches resident employment both are in the over 20km category.

Figure 4-6 The Percentage of Travel-to-Work Employment over 20km (Workplace minus Place of Residence) (1981-2001)



Source: NOMIS (1981, 1991, 2001 Census data)

Secondly, concerning TTW by transport mode, Figure 4-7 shows the contrasting patterns regarding train usage to and from the 26 LAs in this study. Generally speaking, non-HST towns have more commuting by train to work than HST towns because more of the former are in the London commuter catchment area; Chelmsford has the highest percentage of all. Of the HST towns, Reading is the place most attractive to in-commuters, followed by Cardiff and Leeds.

Figure 4-7 The Percentage of Travel-to-work Employment by British Rail (Workplace vs. Place of Residence)

Employment Density vs. Population Density around the Station

Similar to the TTW data, data on employment density and population density around stations (0.5km, 1km, entire LA) were collected to comprehend the patterns of impact around the existing stations. More detailed figures are found in Appendices 9, 10, 11 & 12. Over time the population density has dropped around the stations in HST towns but has increased in non-HST towns, which implies a changing character of place for work and residence. In addition, findings of employment volume and density show that employment growth occurred in all the LAs, but outside the immediate station areas (i.e. that employment has decentralised), implying the difference between new and existing stations. Although all stations existed before the arrival of IC125/225, Bristol Parkway station opened in 1972 on a greenfield site outside Bristol city centre was relatively new. Therefore, the wider effects around the station are easily felt. Elsewhere, the effects are different from the scenario had new HST stations been built. Both findings led to the suggestion that the places with HST services tend to attract economic activities around the station rather than housing development, which may be more popular in non-HST cities because more of them are located within the London commuter catchment area.

In summary, an examination of GVAs, GDHIs, areas, population, unemployment and employment supplemented by data of TTW and population/employment density, enhances a better understanding of the extent to which IC125/ 225 affected local economic strength over thirty years. With regard to towns within one hour from London, both HST and non-HST towns have shown dramatic population increase with good economic profiles from census data; in other words, a low rate of unemployment and high employment. However, employment and unemployment figures alone might not provide a decisive insight into the facts when the workplaces and residences of the local population are not identical. Fortunately, GVA and GDHI figures assist to fill this gap. The main distinction between these one-hour HST and non-HST towns is economic competitiveness indicated by GVAs, supplemented by GDHIs of resident wealth. The HST towns one-hour from London show a competitive economic performance that is much higher than the national average. In contrast, although the majority of these one-hour non-HST towns (Cambridge is the exception) show positive employment change in census data, their lower-than-national average GVAs and higher-than-national average GDHIs suggest that, over time, the massive influx brought high-income residents rather than high-value jobs. Non-HST towns grew through the arrival of commuting populations who worked outside the local areas; hence, it suggests the census figures for employment and unemployment fail to distinguish the weaker local economies.

Of the 2-hour HST towns, the coexistence of population decline with a reduction in unemployment and higher-than-average GVAs for Bristol, Leeds and Cardiff suggest they had progressed via outreaching city-region development, following a similar trajectory to London. In other words, their economies were expanding while people were moving out. It is well known that London's

economic growth fuelled the development of a huge surrounding mega-city region. It seems possible that Bristol, Leeds and Cardiff have been following the same pattern on a smaller spatial scale, but not for all 2-hour HST towns. However, the disadvantaged figures for towns over-2-hours except for Edinburgh suggest that the impact of HST might not be as strong as for those towns within 2 hours. On the other hand, most 2-hour non-HST towns seem to have developed in a similar vein as one-hour non-HST towns, but the longer travel time from London reduced their attraction to commuters for residential purposes.

4.4.3.2 Impact on Services and the Knowledge-Intensive Economy

In this section, the results of three indicators, office rental values, service employment and knowledge-intensive employment, are used to depict the wider spatial impact of HST on economic activities.

Office Rental Values

Table 4-8 shows changes in office rental values over three periods: 1970/71 (Valuation Office Agency, 1971), 1982 (Valuation Office Agency, 1982) and 2006 (Valuation Office Agency, 2006). Over time, the increasing strength of places outside London as locations for service development has become evident. The office rental ranges in 1970/71 PMR suggest that London had higher office rental values than elsewhere, with figures from £2.5 to £11 per square feet (psf) (£0.23/m^2/ann- £1.02/m^2/ann) and from £1.5 to £5 psf (£0.14/m^2/ann-£0.46/m^2/ann) respectively for inner and outer London areas, in contrast to other locations with figures from £0.75 to £1.5 psf (£0.07/m^2/ann-£0.14/m^2/ann). However, there was no wide gap between HST and non-HST towns. Office rental values in HST towns were generally in the range from £0.75-£1.5 psf (£0.07/m^2/ann-£0.14/m^2/ann) against £0.5-£1.5 psf (£0.05/m^2/ann-£0.14/m^2/ann) for non-HST towns; both well below both inner and outer London. This might highlight that in 1970/71, except for London, no other places show an overwhelming attraction for office development for service industries.

However, 1982 PMR office rental values reveal a notable shift. Two locational categories can be distinguished: town-centre[22] and out-of-town. In both these categories, office rental values for all three one-hour towns exceeded the England and Wales average (excluding London), but were still lower than inner London except Reading. Office space in Reading was valued at £149/m^2/ann in

[22] In the Property Market Report, office rental values are divided into three types. Two types (type 1 and 2) are located in the town centre, including the suites developed in the last 10 years and those over 1,000 sq.m and 150-400 sq.m, and type 3 refers to converted suites located out-of-town. The figures in the town centre column represent an average value range for types 1and 2.

the town centre and £86/m^2/ann out-of-town; much higher than £85/m^2/ann in the town-centre and £64/m^2/ann in outer London. Half of the 2-hour HST towns had higher office rental values in both town-centre areas and out-of-town than the England and Wales average, except for York and Doncaster, while Newport had higher office rental value than the average for out-of-town, despite the fact that the value of town-centre office space was still lower than average. Among the over 2-hour towns, only Newcastle surpassed the England and Wales average in its town centre, and Edinburgh exceeded not only the Scottish average in both town centre and out-of-town, but also the England and Wales average for outside town centre office values, which equated with the England and Wales average for the town-centre. Likewise, in 1982, a general enhancement could be noticed in many non-HST towns. All the one-hour towns had increased office rents, which were higher than the England and Wales average, both in town-centre and out-of-town areas; however, they still could not compete with London. The exception was Basingstoke & Deane, which slightly exceeded the outer London out-of-town level with £65/m^2/ann and closely followed the outer London town-centre level with £78/m^2/ann. In 2-hour towns, rents were not all higher than the England and Wales average for both town centres and out-of-town. Southampton and Bournemouth had higher than, or at least equal to, values compared with the average for both town centres and out-of-town, whereas only Norwich and Canterbury had higher than average values for town-centre and out-of-town locations, respectively.

Table 4-8 Change in Office Rental Values

				town centre		off town centre	
			£ psf	£/m^2/ ann		£/m^2/ ann	
			1970/71	1982	2006	1982	2006
		England and Wales	-	43	150	34	113
		Scotland	-	41	***175***	***37***	***136***
		Inner London	2.5-11	***169***	***418***	***119***	***308***
		Outer London	1.5-5	***85***	***199***	***64***	***168***
	Train Times	**LAs**					
HST Towns	Over 2 h	Edinburgh	-	***43***	***290***	***50***	***205***
		Newcastle	1.25-1.38	***45***	***210***	30	90
		Swansea	0.75-0.95	37	105	30	90
		Darlington	-	(Durham) 40	130	25	105
	1-2 h	Leeds	1-1.5	***49***	***223***	***35***	***185***
		Cardiff	1.5	***53***	***178***	***47***	***155***
		York	-	22	***165***	22	105
		Newport	-	29	148	***35***	***130***
		Doncaster	-	20	148	15	100
		Bristol	-	***46***	***250***	***42***	***200***
	1 h	Swindon	1.125-1.25	***68***	113	***54***	***115***
		Peterbourogh	0.975-1.25	***48***	120	***35***	105
		Reading	1.5	***149***	***223***	***86***	***125***
	London						
Non-HST Towns	1 h	Chelmsford	-	***65***	***208***	***45***	***170***
		Basingstoke & Deane	1.25-1.5	***78***	***160***	***65***	***120***
		Cambridge	-	***63***	***198***	***50***	***190***
		Colchester	1-1.25	***55***	118	***40***	***120***
		Winchester	-	-	-	-	-
		Ashford	1.25	-	-	-	-
	1-2 h	Southampton	1.5	***43***	***228***	***40***	***150***
		Ipswich	-	35	90	30	85
		Canterbury	1-1.5	36	88	***40***	95
		King's Lynn & West Norfolk	-	-	-	-	-
		Norwich	1.125	***53***	140	30	95
		Bournemouth	0.5-1.5	***45***	***180***	***54***	100
		Thanet	-	-	-	-	-

Source: VOA

Notes:

1. The property market report (PMR) in general is released twice a year. The figures in this table were sourced from the versions of March 1982 and July 2006. The figures shown here are the result of rework on property market reports. The value represented for town centre is the average of type 1 and 2 , while the value for offices outside town centre is used to demonstrate type3 only.
2. The decimal fractions here had been rounded up and down.
3. The figures of office rental values in 1970/71 property market report are not comparable with PMR 1982 and 2006. Here they are used as an indication of the circumstances of office development before IC125.
4. The figures of England and Wales have excluded the figures of London.

In comparison with these values in 1982, which suggest a transitional process of office decentralisation across the country, the 2006 office rental values in many cities increased significantly above the England and Wales average, and some even proved more attractive than outer London, although the heart of London remains a unique enclave. With regard to for HST towns, one-hour from London, Reading's core shows its strength with £223/m^2/ann, higher than £199/m^2/ann in outer London, while its out-of-town rents remained weaker than outer London. However, Swindon and Peterborough were less popular than in 1982. Most 2-hour towns had higher values than the England and Wales average except for Newport and Doncaster town centres, while outside town centres only York and Doncaster were below the average. The increase in office rent in York's town centre reflects the fact that it is perceived as being more attractive than the average. Most surprisingly, Bristol and Leeds among 2-hour-towns, and Edinburgh of the

over-2-hour-towns, had become more expensive in both the town-centre and out-of-town areas than outer London. Newcastle was similar to York, with extraordinarily high central office values of £210/m^2/ann and much lower values outside the centre. Concerning non-HST towns, in 2006, all one-hour towns had higher-than-average office rents with the exception of Colchester. Chelmsford exceeded the levels in outer London centres. Although Cambridge closely followed the values for outer London centre, it shows higher out-of-town levels than London. For 2-hour towns, only Southampton and Bournemouth recorded above average levels, in particular Southampton, which showed the highest town centre rents among the non-HST towns.

Overall, this analysis adduces convincing evidence to support the hypothesis that, over time, the increasing popularity of office development outside London has allowed Reading to demonstrate real competitiveness in service-industry development, while core-city regional capitals like Bristol, Leeds and Edinburgh have enhanced their strength in the service sector; not only in their centres, but also outside them. In a similar manner, according to burgeoning office rental values, non-HST towns also show considerable popularity in office development, especially one-hour towns.

Economic Restructuring/ Service and Knowledge-intensive Employment

Following the decentralisation of service activities out of London suggested by the office rental values, before examining service activities, Table 4-9 shows changes in economic restructuring 1981-2001. In comparison with the national average, the most contrasting result is the growth of knowledge intensive activities in HST towns and the growth of public services in non-HST towns, in particular in those 1-2hour from London.

Table 4-10 demonstrates employment changes between 1995 and 2006 in three types of service industries: financial, information technology and other business services (hereafter Type-S1); distribution, hotel and restaurants (hereafter Type-S2); and public administration, education and health services (Pubic Services) (hereafter Type-S3). In order to distinguish the most representative[23] type of services for units of analysis, the highest percentages of economic activities in 1997 and 2006 are highlighted; these figures are also beyond the GB average. Among HST towns, within the category of one-hour towns, Type-S1 services show stronger representation than other services in both 1995 and 2006. For two-hour towns, there was a mixture of services. Bristol had the most dominant economic activities in Type-S1 services for both time-series, Leeds developed from Type-S3 services in 1995 towards Type-S1 services in 2006. York, Cardiff, Newport and Swansea were Type-S3-led economies from 1995 to 2006. Over-2-hour towns show strong representation in Type-S3 services in 1995 and 2006, except for Edinburgh and Darlington.

[23] Many towns had more than one type of service employment that exceeded the GB average, but in order to demonstrate the different effects, only the largest percentage which achieved this is highlighted in this table.

Between 1995 and 2006, Edinburgh experienced more growth in Type-S1 services in 2006 than Type-S3 services in 1995, whereas Darlington had a higher percentage of Type-S2 services in 1995, then a higher percentage of Type-S3 services in 2006, which was lower than the GB level. On the other hand, service industry employment for non-HST towns presents a mixed picture from 1995 to 2006. Compared with the GB average level, these towns show higher percentage employment in Type-S3 services; for instance, Cambridge had a sizeable employment representation (43.1%) for Type-S3 services, except for Ashford (Type S2), Basingstoke & Deane (from Type S2 to Type S1), Bournemouth (Type S2) and Norwich (from Type S3 to Type S1). Generally speaking, towns connecting to London with HST services appear more attractive to private services rather than public services, while towns became less attractive to private investment when HST train times from London increase, in which circumstance government intervention appears to play a stronger role in local economic development. Train times on the routes of most non-HST towns were relatively lengthy in relation to their distance from London, and their apparent representation in public services suggests a lesser attraction to private services.

Table 4-9 Change in Economic Structure

				A Manufacturing, energy, and construction	B Commerce, transport, and personal services	C Public services	D Knowledge intensive services
			1981-2001 change	1981-2001 change	1981-2001 change	1981-2001 change	1981-2001 change
			count	%	%	%	%
		GB	-	-14.5	1.0	2.1	7.0
	TrainTimes	LA					
HST towns	Over 2 h	Edinburgh	-	-	-	-	-
		Newcastle	15852	-14.5	-0.4	1.9	***8.1***
		Swansea	7943	***-15.1***	-1.6	***5.6***	7.0
		Darlington	4165	***-17.0***	***2.6***	***5.4***	5.6
	1-2 h	Leeds	29432	***-16.9***	-0.9	***2.7***	***10.3***
		Cardiff	13069	-7.9	-3.6	-1.0	6.0
		York	6920	***-14.6***	-1.0	***2.6***	***8.3***
		Newport	5708	-10.0	-4.5	***3.7***	***7.6***
		Doncaster	10204	***-21.3***	***6.8***	***6.1***	4.6
		Bristol	19236	-13.4	-5.7	2.0	***11.7***
	1 h	Swindon	6713	-13.1	0.6	-1.4	***11.0***
		Peterbourogh	6290	***-21.9***	***2.8***	***4.1***	***11.5***
		Reading	7439	-14.1	-2.0	-0.8	***12.2***
	London						
Non-HST towns	1 h	Chelmsford	5419	***-18.2***	***4.7***	***3.1***	6.2
		Basingstoke & Deane	4812	***-15.1***	***3.1***	-6.7	***15.3***
		Cambridge	5828	-10.9	-5.6	2.1	***9.5***
		Colchester	5218	-8.9	-1.8	0.4	6.7
		Winchester	3841	-2.8	-1.7	-9.4	***11.4***
		Ashford	2853	-9.5	***3.7***	0.9	4.6
	1-2 h	Southampton	10157	-12.9	-5.5	***4.4***	***9.0***
		Ipswich	5577	***-17.4***	***2.2***	***3.9***	6.3
		Canterbury	3804	-6.8	-3.4	***5.5***	1.8
		King's Lynn & West Norfolk	4254	-4.9	-2.5	***4.1***	4.4
		Norwich	8116	***-15.3***	-2.2	***5.4***	***7.2***
		Bournemouth	5160	-5.7	-12.7	***5.4***	***7.1***
		Thanet	3221	-7.5	-6.6	***7.8***	1.1

Source: NOMIS (1981, 1991, 2001 Census data), EDINA (1981, 1991, 2001 ward boundary data)
Notes:
1. 1981 Census: SWS Table 10_ Employment status by industry division and class by sex 10% sample (SIC 80)
2. 1991 Census: SWS Table WB9 Industry divisions and classes (SIC 80) (Persons with workplace in each zone - 10% sample)
3. 2001: Table S132 (standard tables) sex and industry by occupation (workplace population) no ward data, so employment within 5km & 1km around stations are not available.
4. For economic structure in 1981&1991, groups A-D are respectively sums of several economic activities (SIC80) as following details: Group A (Division 1-5 i.e. Classes 11-49 and 50); Group B (Classes 61-79,98, 99); Group C (Classes 91,92, 93, 95, 96) ; Group D (Classes 81-85, 94, 97, 00)
5. For economic structure in 2001, groups A-D are respectively sums of several economic activities (SIC92) as following details: Group A (Division C,D,E,F); Group B (DivisionG,H,I); Group C (Division L,M,N) ; Group D (Division J,K)
6. Figures which are higher than the national average are highlighted with bold and Italics.

Table 4-10 Change in Service Employment

			S1			S2			S3		
			Finance, IT and other business services			Distribution, Hotels, and restaurants			Public administration, education, and health		
		%	1995	2006	change	1995	2006	change	1995	2006	change
		GB	17.8	21.2	3.4	23.6	23.4	-0.2	24.3	26.9	2.6
	Train Times LAs										
HST Towns	Over 2 h	Edinburgh	26.1	***31***	4.9	19.9	19.7	-0.2	***29.2***	30	0.8
		Newcastle	19.1	23.1	4	18.6	18.3	-0.3	***36.5***	***37.7***	1.2
		Swansea	13.1	19.8	6.7	26.9	24	-2.9	***33.5***	***38***	4.5
		Darlington	12.9	14.5	1.6	***25.7***	24	-1.7	25.6	24.8	-0.8
	1-2 h	Leeds	20.5	***26.9***	6.4	22.8	20	-2.8	***25.2***	26.8	1.6
		Cardiff	20.4	25.4	5	18.6	19.6	1	***29.7***	***30.4***	0.7
		York	12.2	17.3	5.1	25.5	26.7	1.2	***29.9***	***30.2***	0.3
		Newport	14.3	20.7	6.4	22.5	21.1	-1.4	23.6	***29.7***	6.1
		Doncaster	9.7	12.8	3.1	25.9	23.3	-2.6	***27.2***	***30.4***	3.2
		Bristol	***28.9***	***30.2***	1.3	20.7	21	0.3	23.9	29.1	5.2
	1 h	Swindon	***21.6***	***25.3***	3.7	23.4	25.3	1.9	15.4	18.7	3.3
		Peterbourogh	***19.1***	***26.9***	7.8	25.2	22.9	-2.3	17.6	23.4	5.8
		Reading	***25.3***	***29.6***	4.3	22.9	23.9	1	23.5	24.3	0.8
	London										
Non-HST Towns	1 h	Chelmsford	17.3	19.5	2.2	24.5	22.8	-1.7	***33.6***	***32***	-1.6
		Basingstoke & Deane	23.4	***26.7***	3.3	***26.4***	24.6	-1.8	17.2	18.9	1.7
		Cambridge	20	24.3	4.3	18.8	18.6	-0.2	***41.4***	***43.1***	1.7
		Colchester	15.8	17.7	1.9	25.3	26.1	0.8	***34.8***	***31.1***	-3.7
		Winchester	23	24.6	1.6	21.4	18.8	-2.6	***38.2***	***34.5***	-3.7
		Ashford	15.5	17	1.5	***26***	***26.3***	0.3	24.7	24	-0.7
	1-2 h	Southampton	24	25.6	1.6	19.7	20.9	1.2	***30.4***	***31.9***	1.5
		Ipswich	16.1	21.5	5.4	22	23.2	1.2	***28***	***31.9***	3.9
		Canterbury	11.3	11.7	0.4	27.1	28	0.9	***37.8***	***40.2***	2.4
		King's Lynn & West Norfolk	9.4	10.7	1.3	25.7	26.2	0.5	***27.2***	***29.5***	2.3
		Norwich	24	***32.4***	8.4	22.7	22	-0.7	***26.5***	24.4	-2.1
		Bournemouth	24.7	25.1	0.4	***30.4***	***29.7***	-0.7	25.4	28.5	3.1
		Thanet	10.1	10.7	0.6	25.9	27.4	1.5	***35.7***	***36.1***	0.4

Source:NOMIS (accessed 5th July 2010)

Notes:

1. Place type: Local Authority

Besides service industry employment, a specific indicator for knowledge-intensive activities could shed light on knowledge-intensive development. Table 4-11 illustrates change in knowledge-intensive employment in travel-to-work areas over the period 1995-2006. However, this indicator was not available until 2008 and the data refer to only 56 English cities with populations over 125,000, so specific figures for knowledge-intensive employment for several places are not available. Based on the limited data, Reading exhibits a significant uplift, with knowledge-intensive services accounting for more than half of all employment, while Swindon and Peterborough also show strength in both medium and high technology and knowledge-intensive business services. Limited data from the State of English Cities database suggests that one-hour towns are highly knowledge-intensive, while 2-hour towns are also performing above the average, but are stronger in knowledge-intensive services except for Doncaster. For over-2-hour towns, the only available data for Newcastle shows less-than- average performance. For non-HST towns, only Cambridge exceeded national average figures for both

high and medium technology and knowledge-intensive services in 1995 and 2006. In 2006, it achieved nearly 60 % knowledge-intensive employment against an average of just under 35 %. Among 2-hour non-HST towns, Bournemouth, Southampton and Norwich prove quite knowledge-intensive, especially for knowledge-intensive services. In brief, despite data limitations, this indicator further assists the clarification of the development in the knowledge economy, with and without HST services, and the knowledge-led economy of one-hour high-speed towns appears strong. Nevertheless, for HST towns, Doncaster and Newcastle show weaker knowledge-intensive development with lower than average performance. For non-HST towns, the limited data show some local economic structure oriented to knowledge-intensive activities, which needs further discussion based on a combination of other indicators in the next section.

Table 4-11 Change in Knowledge Intensive Employment

			Medium and High Technology			KIBS			Total Knowledge Intensive Industries		
		%	1995	2006	change	1995	2006	change	1995	2006	change
		GB	**8.9**	**6.7**	**-2.2**	**18.9**	**23.7**	**4.8**	**31.7**	**34.9**	**3.2**
	Train Times	**TTWA (LA)**									
HST Towns	Over 2 h	Edinburgh	-	-	-	-	-	-	-	-	-
		Newcastle	8.4	6.3	-2.1	17.8	22.2	4.4	29.5	32.8	3.3
		Swansea	-	-	-	-	-	-	-	-	-
		Darlington	-	-	-	-	-	-	-	-	-
	1-2 h	Leeds	6.4	3.7	-2.7	***24***	***30.5***	6.5	***34.5***	***38.7***	4.2
		Cardiff	-	-	-	-	-	-	-	-	-
		York	3.3	1.5	-1.8	18.5	***26.3***	7.8	23.7	31.1	7.4
		Newport	-	-	-	-	-	-	-	-	-
		Doncaster	7.9	4.4	-3.5	11.9	14.8	2.9	21.9	20.4	-1.5
		Bristol	6.6	6.3	-0.3	***27.7***	***30.6***	2.9	***39.8***	***42.9***	3.1
	1 h	Swindon	***18.9***	***16.2***	-2.7	***21.8***	***27.1***	5.3	***45.1***	***47.2***	2.1
		Peterbourogh	***15.6***	***8.3***	-7.3	***20.2***	***28***	7.8	***40.7***	***41.5***	0.8
		Reading	8.2	6.3	-1.9	***33.6***	***50.1***	16.5	***52***	***69.6***	17.6
	London										
Non-HST Towns	1 h	Chelmsford	-	-	-	-	-	-	-	-	-
		Basingstoke & Deane	-	-	-	-	-	-	-	-	-
		Cambridge	***14.4***	***11.2***	-3.2	***32.6***	***40.2***	7.6	***54***	***59.8***	5.8
		Colchester	-	-	-	-	-	-	-	-	-
		Winchester	-	-	-	-	-	-	-	-	-
		Ashford	-	-	-	-	-	-	-	-	-
	1-2 h	Southampton	7.8	5.7	-2.1	***27.4***	***30.9***	3.5	***41***	***41.9***	0.9
		Ipswich	6.8	4	-2.8	14.5	19.1	4.6	23.8	26.5	2.7
		Canterbury	-	-	-	-	-	-	-	-	-
		King's Lynn & West Norfolk	-	-	-	-	-	-	-	-	-
		Norwich	5.8	4.8	-1	***22.1***	***29.3***	7.2	***32.1***	***38***	5.9
		Bournemouth	***9.3***	***7***	-2.3	***24.7***	***25***	0.3	***38.4***	***35.9***	-2.5
		Thanet	-	-	-	-	-	-	-	-	-

Source: SOCD

Notes:

1. Place type: TTWAs (Travel To Work Areas)

2. The average figures denotes the average of 56 cities in SOCD datasets.

3. In the State of English Cities (SOCD) dataset, the knowledge intensive industries were classified into 5 types, namely medium-high-tech industries, high technology sectors, narrow definition of knowledge intensive business services, wide definition of knowledge-intensive businesses, and the creative industries. Here this table had been reorganised into three categories. Medium and high technology denotes the first two manufacturing sectors. KIBS indicates the sum of narrow and wide knowledge-intensive business services. The figures in total knowledge intensive industries represent the aggregation of the five types of knowledge intensive industries.

4.5 Discussion

Table 4-12 summarises a series of key principal components which were presented and analysed in section 4.4. It is difficult to separate clearly the influence from a combination of other factors influencing the areas it serves. City types and motorway accessibility are implicit conditions. HST cities are also well-served by motorways by 1980s and the employment volume is comparably large since they are major cities. Non-HST cities are generally smaller in size. In addition, GDA/ GDHI, economic restructuring, office rental value, and population growth are used here to highlight the findings and the role of IC125/225 has played during the process. The results does not present a clear-cut pattern which shows the absolute result from the arrival of HST, which findings have been born in mind since the beginning of this study. Instead, the key task in this study has been trying to use these findings to understand a larger picture, beyond the individual cities. A reshaped economy geography could be possible through the arrival of HST among London, provincial cities, and various other small-to-medium towns and cities.

Table 4-12 A Summary of Principal Component Analysis

			Population	Area (HA)	Time from London by train (min)	Time from London by car (min)	Distance from London (miles)	Motorway access	Time difference between train and car (min)	City Type	GVA	GVA	Change in economic structure group D	Change in economic structure group C	Office rental value (centre)	Office rental value (centre)	GDHI	GDHI	Change in population growth rate
			2001	2001							1995	2006	1981-2001	1981-2001	1982	2006	1995	2006	1971-2001
	Train Times	**LA**																	
HST towns	Over 2 h	Edinburgh	448624	26373	272	405	405	yes	-133	✪	●	●	-	-	●	●	●	●	×
		Newcastle	259536	11344	183	281	283	yes	-98	✪	△	△	●	×	●	●	△	△	×
		Swansea	223301	37609	178	191	167	yes	-13		×	×	●	●	×	×	×	×	●
		Darlington	97638	19747	151	247	248	yes	-96		×	×	×	●	×	×	×	×	×
	1-2 h	Leeds	715402	55173	144	201	195	yes	-57	✪	●	●	●	●	●	●	×	×	×
		Cardiff	305353	13690	127	158	151	yes	-31	✪	△	△	×	×	●	●	△	△	●
		York	181094	27199	118	217	211	No	-99		●	●	●	●	×	●	●	×	●
		Newport	137011	19044	111	147	139	yes	-36		△	△	●	●	×	×	△	△	×
		Doncaster	286666	56799	102	178	171	yes	-76		△	△	×	●	×	×	△	△	×
		Bristol *	380615	10961	95	125	119	yes	-40	✪	●	●	●	×	●	●	×	×	×
	1 h	Swindon	180051	23009	59	81	81	yes	-22		●	●	●	×	●	×	●	●	●
		Peterbourogh	156061	34338	48	107	86	yes	-59		●	●	●	●	●	×	×	×	●
		Reading	143096	4040	27	61	61	yes	-34		△	△	●	×	●	●	△	△	●
	London																		
Non-HST towns	1 h	Chelmsford	157072	33679	34	60	40	No	-26		△	△	×	●	●	●	△	△	●
		Basingstoke & Deane	152573	63381	43	68	52	yes	-25		△	△	●	×	●	●	△	△	●
		Cambridge	108863	4070	52	78	62	yes	-26		△	△	●	×	●	●	△	△	●
		Colchester	155796	32910	56	82	65	No	-26		△	△	×	×	●	×	△	△	●
		Winchester	107222	66097	58	82	68	yes	-24		△	△	●	×	-	-	△	△	●
		Ashford	102661	58062	78	75	56	yes	3		△	△	×	×	-	-	△	△	●
	1-2 h	Southampton*	217445	4984	70	98	81	yes	-28	✪	●	●	●	●	●	●	×	×	×
		Ipswich	117069	3942	72	100	82	No	-28		△	△	×	●	×	×	△	△	×
		Canterbury	135278	30885	99	82	62	No	17		△	△	×	●	×	×	●	●	●
		King's Lynn & West Norfolk	135345	142877	99	139	109	No	-40		△	△	×	●	-	-	△	△	●
		Norwich	121550	3902	115	138	116	No	-23	✪	△	△	●	●	●	×	△	△	×
		Bournemouth	163444	4618	117	121	108	No	-4		△	△	●	●	●	●	△	△	●
		Thanet*	126702	10330	136	136	78	No	0		△	△	×	●	-	-	△	△	●

Source:1. Her Majesty's Stationery Office (HMSO) 2. NOMIS (accessed 5th July 2010), 3.General Register Office for Scotland

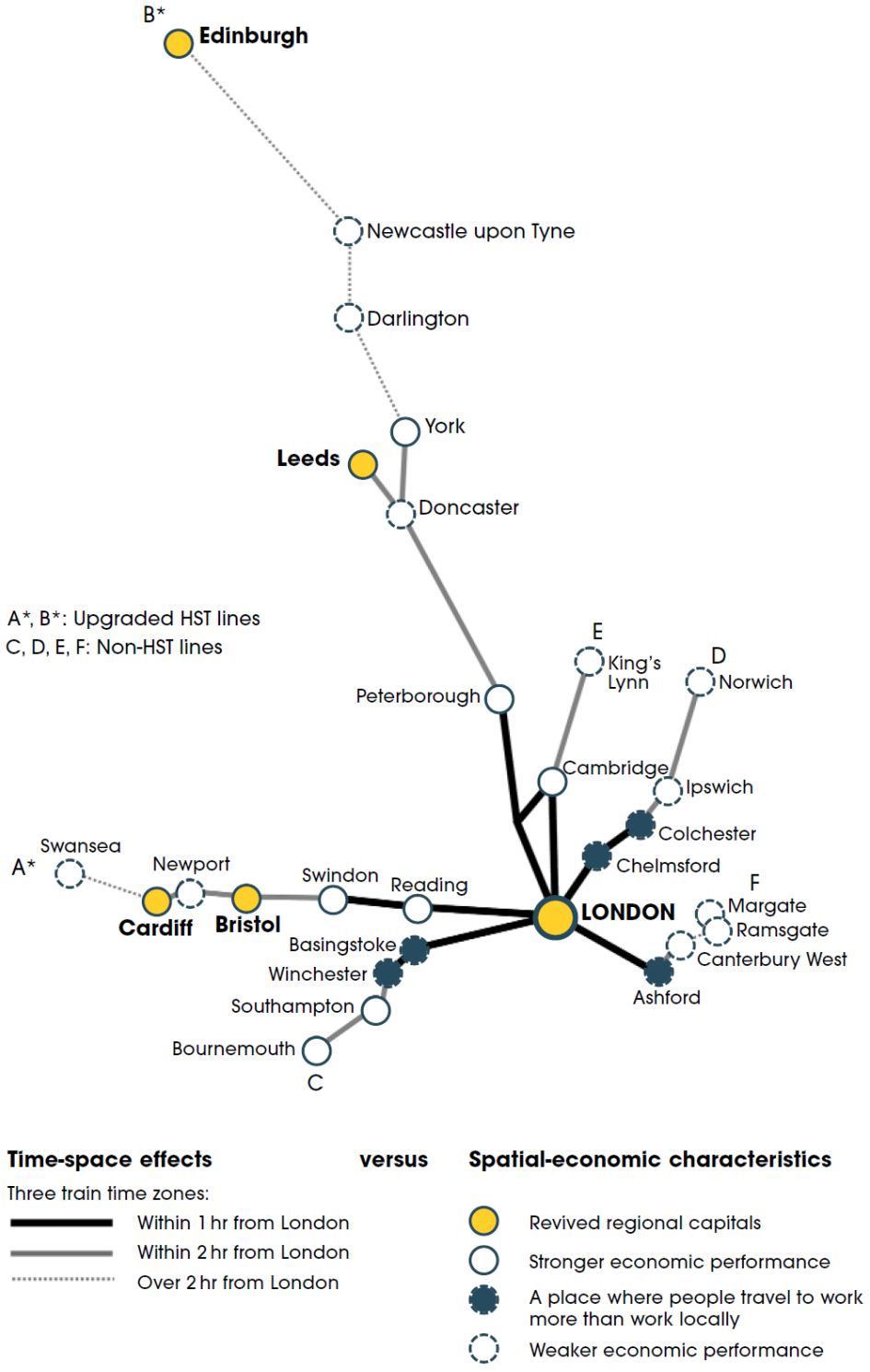
Notes:

1. Place type: Local Authority
2. Train times from London by rail used the average rather than the fastest.
3. * denotes these cities have more than one major stations to and from London. The time by rail for the city is the average of all stations. For instance, the rail time between Bristol and London is the average of London- Bristol Temple Meads and London- Bristol
4. ✪ represents regional capitals.
5. "Green" represents the improvement is better(or higher) than the national level and "Red" means the change is worse (or lower) than the national level.
6. Regarding figures of GDHI and GVA, since NUTS3 is a corse unit, for some cities, the measurement NUTS3 is larger than the LA boundary, so the figures needs to be compared with caution. Those LAs which have the same NUTS3 boundary are denoted with black round dots ; while those NUTS3 larger than LAs are highlighted with△ .

The Interpretation of the wider impact of IC125/225 on British Economic Geography

The starting hypothesis was that the dramatic time-space impact of HST, coupled with the rapid development towards the knowledge economy and its agglomeration in major metropolitan areas, could work to reduce regional uneven development, measured by the increased strength of local economies and rapid growth of service employment, especially in knowledge-intensive sectors. Given the impact of the upgraded UK IC125/225 on time-space, shrinkage would inevitably not prove to be as impressive as that found from newly built HST lines. The inherently modest time-space effects can still be discerned by analysing HST and non-HST towns; despite the longer routes of the former, they demonstrate stronger time-space shrinkage. For instance, HST services enable Peterborough (122 km) and Swindon (124 km) to appear in the category of one-hour towns from London, in contrast to towns which are an equivalent distance from London but are without HST services, such as Southampton (127 km), Canterbury (118 km), and Ipswich (110 km), which remain in the two-hour ring. Additionally, changes in train patterns and frequencies aid the interpretation of spatial-economic effects. Corresponding to two hypotheses, two key indicators were analysed for comprehension of the spatial-economic impact of HST. The evidence assembled from all indicators may assist in reaching a balanced verdict. Figure 4-8 shows a summary of findings: time-space effects versus spatial-economic impact of UK high-speed train services on cities.

Figure 4-8 The Spatial-Economic Impact of UK High-Speed Train Services- Summary of Findings



Source:author, published in Chen and Wray (2011)

As evidence gathers, HST services appear to have reinforced the trend towards the knowledge economy and, as discussed, the impact on British economic geography could be categorised into three influential train time zones: one-hour, two-hour, and over-two-hours from London. Towns within a one-hour period of London have become part of a major population-inflow belt, as the long-term progress of London's metropolitan sprawl has produced a travel-to-work phenomenon. There is a growing inconsistency between the places where people do business and create value, and where they actually live and spend their income. Nevertheless, their varying economic strength, as presented by GVAs and GDHIs, implies that the HST has affected their spatial economy. The contrast between HST and non-HST towns suggests that, with growing mobility and time-shrinkage from London resulting from HST connectivity, London directly exports its GVA. Places with HST services show spillover effects of high value-added activities from London, with reverse commuting from London to these decentralised locations starting to happen, whereas non-HST towns demonstrate the local service activities to which London's GVA contributes: people who work in London export their GDHI by living outside it. Furthermore, evidence from office rental value and service spectra further suggests specialised activities.

Within the 1-hour ring from London, the attraction of towns for office development has been enhanced over time. These three HST towns demonstrate their strength in private and knowledge-intensive activities, albeit distinctive types of knowledge-intensive industries. Relatively high percentages of medium- and high-technology knowledge-intensive activities in Swindon and Peterborough did not necessarily require office space as the basis of their operations, which may explain why the highest office rental values occurred in Reading while Swindon and Peterborough did not exceed the national average. In contrast, public services dominated non-HST towns; this condition suggests that it is difficult for them to develop a knowledge economy without faster train accessibility from London. Non-HST towns like Chelmsford, with rental values higher than the national average, and outer London, however, fail to provide GVAs higher than the national average, which suggests that these office developments might be, to a large extent, attributed to routine public services or private back-offices rather than knowledge-intensive types of activity. The office decentralisation policy in the UK in the 1960s and 1970s arguably played a role in relocating economic activities across British sub-regions (Daniels, 1982). With higher GVA and highly knowledge-intensive employment, the outstanding exception among these non-HST one-hour towns is Cambridge, which was served by two branches and two London terminal stations. Although the Liverpool Street line showed no time-space shrinkage, electrification resulted in semi-HST effects on the line from King's Cross station, linking Cambridge with commercial speed at 160 kph (100 mph) and an average 52-minute travel time, 30 minutes faster than travel from Liverpool Street station.

Within the 2-hour ring, different HST effects are evident. Before IC125/225 services, many 2-hour towns were well-established regional capitals e.g. Bristol, Leeds, Cardiff and Norwich, or formerly heavy industrialised cities e.g. Doncaster, and Newport, all suffering fierce competition in developing their knowledge economy after the 1960s. With the arrival of HSTs, some 2-hour towns reversed their previous decline. Unemployment rates were arrested in Leeds and Cardiff, and GVAs reflecting urban competitiveness were enhanced in Bristol, Leeds, Cardiff and York. Population decline reflected the varied HST effects between one-hour and two-hour HST towns. The evidence demonstrates that Bristol and Leeds expanded their core city-regions' hinterlands by sharing a similar pattern to the London mega city-region, which explosively grew with high GVAs and aggregated highly knowledge-intensive industries, in particular knowledge-intensive services, despite low GDHIs and population decline in the town centres. This suggests that these cities' status as critical transport hubs due to HST services from London conferred economic advantages, to some degree alleviating London's excessive agglomeration economies. It reinforces the argument of Bonnafous (1987), as with easy accessibility from Lyon to Paris by TGV for specialised service industries, there was no need for Lyon firms to relocate to Paris. However, these promising results are not shown in two HST towns, Newport and Doncaster. Taking their heavy-industrial tradition into account, path dependency may have hindered them from developing a knowledge economy and experiencing resulting economic growth. Recent research on the relationship between path dependency and innovation in British city-regions suggests that an industrial legacy may hinder economic adaptation, while successful cities are free of industrial legacies (Simmie, et al., 2008). In contrast, 2-hour non-HST towns were characterised by a weakness in low GVAs and GDHIs, high unemployment, low employment, low office rents and highly public-oriented services. It is important to note that the same GVA figures were shared by some places since they are allocated in the same NUTS3 unit.

Therefore, it is necessary to analyse more than one indicator to reach a balanced judgement. Although Norwich shows strength in knowledge-intensive employment, its high unemployment and low levels of employment were still problematic. This suggests that, with longer train times and frequent stopping patterns, the attraction for developing knowledge-intensive activities and commuter residency seems to be relatively weak. This also raises another question: now that HST has brought East Kent towns like Ashford, Canterbury and Folkstone within one hour of London in December 2009, will this have a positive effect on their GDHI? An early short-term impact study conducted by Canterbury City Council in 2011 shows the growth of commuter housing market with commuters earning an average of 7% more than local workers and a 11% increase in average price range in two years (Canterbury City Council, 2011). A positive answer appears quite certain to be the case. However, Southampton and Bournemouth are two exceptions, with stronger economies than the others in terms of GVAs, high office rents, and more knowledge-intensive industries. The explanation must be that these places had a long-lasting close economic

relationship with London prior to the arrival of IC125/225. They are all within 2 hours from London and enjoy a high-frequency train service, even though they did not enjoy the same reduction of time as the HST towns.

Beyond the 2-hour ring, HST effects appear weaker and also contrasting. Darlington and Swansea both show indicators under the average level, while Edinburgh grew faster despite a time distance of more than 3 hours by HST. The explanation may be that domestic air passenger traffic grew six-fold from 1975 to 2005 (and by 400% between London and Newcastle). More recently, from 1995 to 2005, both London-Edinburgh and London-Newcastle have shown a near-doubling of air travel, contrasting with a drop for 2-hour HST towns like Leeds and Darlington (Civil Aviation Authority, 1975, 1995, 2005). It appears that air travel, rather than HST, has played a dominant role in travel to and from Edinburgh and Newcastle. Nevertheless, Newcastle provides a more mixed picture with GVA that is under the national average but office rental values that are very competitive with outer London. The results suggest a critical question: whether economic benefits could result from a 300km/h HST service, bringing these cities within 2 hours of London.

Influence of other factors and Causality

Despite the fact that analysis so far suggests the wider impact of HST in the case of IC125/225, as reviewed in Chapter 2, the difficulty of claiming causality is one of the major challenges. The challenge is harder in this study, since over the thirty years, the intervening factors in the process could be various and very complex. Here, other factors need to be taken into account, such as other transport modes, decision-making of business location, office decentralisation, etc.

Other Transport Modes

As discussed in section 4.4.2, most HST towns have been served by motorways prior to the arrival of the IC125/225. It is clear that the journey time to London by road is not competitive in comparison with rail, but it is inherently difficult to claim that only rail is the cause of economic performance. In particular, the majority of long-distance trips have continued to be made by car. Cars are used for nearly 80% of all long-distance travel mileage whereas rail accounts for only 12% of all long-distance travel (ITC, 2010). However, observing the inter-relationship between these modes over time provides insights into the change. Growth in long-distance travel by car has almost ceased in the last few years, and coach travel has been rather flat, while rail and air have both demonstrated strong growth (ITC, 2010). The National Travel Survey (see Appendices 13 and 14) has demonstrated that business travel by rail has shown a significant rise in percentage among all modes. For commuting and business purposes, travel by rail has risen to around 15% in 2012.

Business Location and Office Decentralisation

A survey of the location of high-tech industry in *Western Sunrise* (P. Hall, Breheny, McQuaid, & Hart, 1987) suggested that businesses would relocate to or remain in places enjoying excellent transport accessibility is ensured. Hall et al. (1987) argued that the role of IC125 enhances the competitive character of a place, which allow businesses to remain in the existing location. *"All that the 125s did was to enhance this quality of service, investing Reading with an accessibility to London that was almost unique, in terms of times and frequency, among the towns of the Outer Metropolitan Area. This quality made the town's centre highly attractive for decentralised office development, and it was clearly a significant factor for administrative high tech headquarters offices"* (Hall et al., 1987, p.170). Similarly, Pope (1994) found businessmen in Leeds would expand their business if a new public transport system is developed.

Business location in the UK has shown a long-term impact from office decentralisation policy from the 1960s onwards. Daniel (1983) argued that British government decentralised office development on a large scale during the mid-1960s, but the failure to secure a significant effect led to the abandonment of office development control after 1979. By the early 1970s, R.K. Hall (1972) argued that "undoubtedly, office decentralisation has brought about the spread of office activity throughout the South East, and has modified previous relationships between homes, workplaces and commuting… However, few of the benefits of office decentralisation accrue outside the South East" (R. K. Hall, 1972, p.390). In the 1980s, private sector relocation took place and long-distance commuting became a phenomenon (A. E. Green, Hogarth, & Shackleton, 1999) . The findings from the IC125/225 study suggest that the arrival of the IC125 effectively assisted the further expansion of the office decentralisation process occurring, outside the South East. For instance, the Ministry of Defence and University of the West of England (UWE) Frenchay Campus are located in close proximity to Bristol Parkway station. These reflect a long-term (culmulative) effect. As Hall et al. (1987) maintained that

> *"The growth of the Crescent and eastern M4 Corridor has been powerfully aided by important public sector policies in addition to defence expenditure. Perversely, this aid has occurred by accident. National transport planning priorities after World War II caused Heathrow Airport to be established west of the capital to serve as the nation's main international traffic centre; in the 1960s, the M4 London-South Wales motorway was routed south of Reading; in the 1970s, British Rail introduced the first high-speed Inter-City Trains on this route. None of these policies was supposed to add to the development of industry in the corridor; all did" (Hall et al., 1987, p.178).*

4.6 Chapter Conclusions

It is important to stress the historic circumstance that the British IC125/225 arrived at a time of pervasive deindustrialisation in many British cities, followed by a sometimes-difficult transition to a new knowledge-based service economy. Building upon evidence from upgraded British HST lines, findings suggest that HST has had demonstrable and varied effects on cities within 1 hour and 2 hours from the capital city, thus helped to generate renewed economies. Towns within 1 hour of London tend to form a part of London's commuter catchment area, and the effect of HST helps to extend this catchment further. 1-hour HST accessibility from London benefitted from exploiting both commuting and knowledge-intensive economic functions, while 2-hour HST accessibility from London benefitted mainly the exploitation of knowledge-economic functions, in particular for major regional cities such as Leeds, Bristol, Cardiff. Beyond a 2-hour distance, the effect appears weak. However, these effects have not been automatic or universal.

This leads to the reiterated point made by earlier researchers (Bonnafous, 1979; Fogel, 1964): that transport is a necessary but not a sufficient condition for the wider impact on urban and regional development. As Blonk (1979) opines, transport can be an agent for decline as well as growth, if it exposes a place to outside competition. Ampe (1995) points out that a TGV network node will not automatically favour the city; an auxiliary strategy must be developed to capture the developmental opportunities. Central or local strategic policies can play a crucial role here.

Zooming into the intra-regional scale, examination of the present pattern of accessibility by rail demonstrates sharp and increasing discontinuities within the UK's major regions, between relatively few core cities and favoured interchange points, and their surrounding city regions. This appears to be reflected in their relative economic performance. A town like Burnley, although the same distance from Manchester as Reading from London, has no direct rail connection and this is mirrored in its weak economic performance (Lucci & Hildreth, 2008). Again, in a case such as this, an improved train service, whether in the form of extensions of the HST network, at lower speeds, over conventional tracks (as SNCF have achieved in peripheral regions of France) or by good linkages to intra-regional services, would appear to be a necessary (though not automatically a sufficient) condition. Needless to say, improved access is only one factor among many in improving the economic prospects of languishing urban centres that have lost their traditional industrial roles and have failed so far to make a full transition to the new knowledge economy. That said, at the very least there appears to be a strong case for a finer-grained and deeper-probing analysis of the potential for rail improvement as an agent of change in city-region development at an intra-regional level. This intra-regional study is reported in the next chapter.

Chapter 5 The Regional Impact: A Comparative Case Study

5.1 Introduction

This chapter is a direct follow-up from the previous empirical study of the UK's Inter City 125/225 presented in Chapter 4. There, the findings suggest that an upgraded HST system has brought about demonstrable effects in shaping spatial-economic patterns through improved accessibility within 1-hour, 1-2-hour, or over-2-hour travel limit of London. Major regional cities within 2-hour from London by HST have shown renewed economic growth, but the impact was not automatic or universal. A question naturally arises: can such effects spread from the core city to other locations in the surrounding sub-region, or do they in fact increase the peripheralisation of places not directly served by the new HST? This chapter seeks to answer that question through a comparative case study of two core regional cities and their sub-regions in the course of transformation from an industrial to a post-industrial knowledge-based economy with the arrival of HST. This case study examines the modernisation of the West Coast Main Line (WCML) for Manchester and its sub-regions in North West England (henceforth NWE) (UK) and the TGV-Nord for Lille and its sub-regions in Nord-Pas-de-Calais (henceforth NPDC) (France). With the same SRQ2, two follow-up hypotheses arise for testing at the intra-regional level (as proposed in Chapter 3 [24]).

> ***SRQ2:*** *Whether and to what extent has HST accessibility boosted a knowledge economy and led to a reduction in regional inequality?*
>
> ***Hypothesis 3*** is that the arrival of HST in sub-regions will potentially strengthen local economies and employment within a knowledge economy over time.
>
> ***Hypothesis 4*** is that there will be different effects among these sub-regions. Within 2-hour accessibility from the National Capital, HST sub-regions could boost economies as polycentric sub-centres with the regional core. Within 1-hour accessibility from the national capital, HST sub-regions could potentially develop decentralised interdependent and commuting functions. Non-HST sub-regions could be very challenged in their prospects for economic transformation, but they will not necessarily lose out as long as their intra-regional accessibility can be strategically improved.

This chapter first gives an overview of these two post-industrial regions and two HST lines in section 5.2 and 5.3, followed by detailed research methods within section 5.4 including units of analysis, variables, datasets and observed time-periods in relation to key watersheds of HST services (distinguishing before and after HST). In sections 5.5 and 5.6, result 1 and result 2

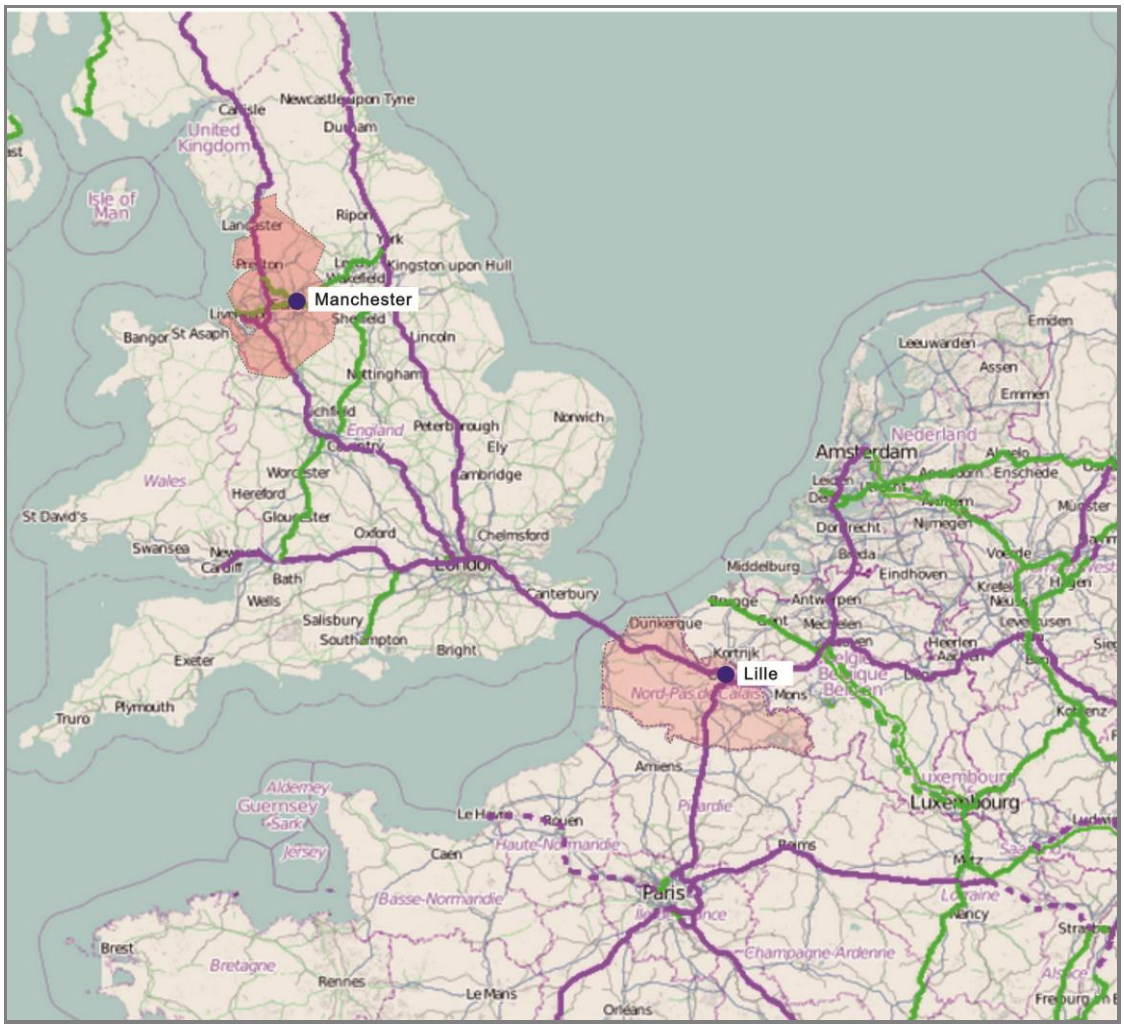
[24] Here, Hypothesis 4 was updated after the findings from the inter-regional study with the distinction of 1-hour and 2-hour time-space between cities.

respectively present effects of time-space shrinkages and wider spatial-economic patterns of NWE and NPDC. Next, there is a comparative discussion in section 5.7, and finally the conclusion in section 5.8.

5.2 An Overview of Two Post-Industrial Regions

Manchester and its sub-regions in NWE, and Lille and its sub-regions in NPDC have a similar industrial legacy. Both were the first in their respective countries to experience large-scale industrialisation; NWE from the late 18th century (Crafts, 1983, 1985; Deane, 1965, as referred to in P. Hall, 1998, p. 314), NPDC during the 19th and early 20th centuries. Between 1850 and 1900, the textile industry in NWE was the largest in the world, followed by NPDC (Fraser and Baert, 2003, as referred to in Colomb, 2007, p. 8). However, both were affected by massive deindustrialisation, beginning in NWE in the 1920s and in the NPDC region in the 1950s (Clout, 1971). Meanwhile, during industrialisation, a synergetic economic network had developed between the two core cities and their surrounding towns, which has altered as a consequence of deindustrialisation (P. Hall, 1998, p. 344; 2002b). Core sub-regions began to adapt successfully; the specialised and peripheral sub-regions less so (ADULM, 1997; EKOS, 2008; The Northern Way, 2009b). The regional background prior to the 1980s in both contexts was examined below to set the scene. Figure 5-1 shows the location of the two study regions in Western Europe.

Figure 5-1 The Location of the Two Studied Regions in Western Europe



Source: European Commission GIS Dynamic Maps (TEN-T Railways Core Passengers)
http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/main.jsp

5.2.1 Regional Context: The Spatial-Economic Trajectory of NWE

Consisting of 7 million inhabitants on an area of 14165 km^2, North West England (NWE) is a heterogeneous industrialised region which embraces the original territory of the world's first industrial revolution. By the end of 19th century, Manchester and Liverpool had grown to be two major commercial, trading, and transport centres. The two prime metropolitan cities have been historical and contemporary rivals. The construction of Manchester Ship Canal in 1894 led to the expansion of Manchester's economic territory southwards into Greater Manchester South. Since then, Manchester had evolved into a much larger and more dominant metropolitan centre than

Liverpool[25]. Prior to the massive deindustrialisation, British old industrial cities were hit by the Great Depression in the early 1930s and did not recover. Up to the 1980s, new types of industries[26] had largely decentralised whereas metropolitan cities suffered from shrinking population and economic restructuring. Three major spatial-economic policies had significantly resulted in this pattern, namely the overspill from the metropolitan areas, new town development, and motorway development.

1930s-1960s: A Process of Overspill from Metropolitan Areas

Between the 1930s and the 1960s, there was an overspill phenomenon from two metropolitan areas. The decentralisation process was evolving through the municipal housing building programmes in the peripheries served by tramcars and buses, but physical barriers determined over-spill patterns. Due to the absence of physical barriers, population decentralisation in Merseyside was more flexible than in Greater Manchester. With the existence of a continuous built-up area in the west, east, and north, Greater Manchester suburbs outflowed southwards into rural Cheshire. By the end of the 1930s, the suburbanisation of Manchester into Cheshire had been steadily progressing into the area around Wilmslow (P. Hall, Gracey, Drewett, & Thomas, 1973, p. 575). At this stage, the solution for overspill problems mainly catered for place of residence instead of workplace. In the study of "*The Containment of Urban England*", Hall et al. (1973) found there was a real paucity of studies of overspill industry in these areas and the plan assumed people commuting into traditional centres for work. They noticed two exceptions: Macclesfield and Congleton.[27] The solution for overspill problems involved a long-distance travel-to-work pattern was not realised until the second wave of New Town designation in the early 1960s (Hall et al., 1973:586).

1960s-1980s: The Development of New Towns and the Motorway Network

Due to a policy shifting towards growth in the early 1960s, New Towns (NTs) were regarded as a regional solution for NWE. The underlying principle for new towns was the combination of work place and residence as self-contained and balanced communities. Each NT Development Corporation, now a long- superseded authority, was established by central government and vested

[25] According to the census data of 1981 (ONS), the population of Greater Manchester accounted for 2,618,300 in comparison with 1,522,000 in Merseyside.

[26] New industries of the 20th century are electrical engineering, motor vehicles, aircraft, precision engineering, pharmaceuticals, processed foodstuffs, rubber, cement etc. (Hall, 2002).

[27] Macclesfield, eighteen miles south of Manchester and Congleton, twenty-four miles south of Manchester and eight miles south-west of the Macclesfield expansion.

with development power, such as drafting a master plan and providing fundamental infrastructure, housing, and industrial estates. In about a decade from 1961 to 1970, four new towns were designated in NWE to absorb the overspill flow from two metropolitan cities, namely Skelmersdale NT (1961) and Runcorn NT (1964) for Liverpool, Warrington[28] NT (1968) and Central Lancashire NT (1970) for Manchester.

Over this period, there was a cross-political recognition and comprehensive campaign that the construction of motorways could arrest industrial decline in Lancashire[29] and an intention by the Government to rebalance the employment and settlement patterns with and between regions (Starkie, 1982). Thus, despite delayed by limited resources, the first motorway section in the UK began with the arrival of the Preston Bypass in 1958 in this industrialised region which was struggling to adapt to new economy since the 1930s. Following rapid and successive construction, this polycentric region is intersected by extensive motorway systems with a clear hierarchy: national routes (the M6 and M62), intra-regional sections (the M55, M65, M56 and M58), and urban orbitals (M57 and M60) around the two metropolitan cities. The density of motorways is likened to an English version of Los Angeles (P. Hall, 2008a), but this motorway network served the southern part much better than the northern part.

Consequently, the extensive construction of motorways resulted in business relocation. As early as the mid-1970s, all the employment focus had shifted to those places with better motorway accessibility from not only other regions but also two conurbations and special development areas (S.D.A.[30]) which suffered from industrial decline (Cornfoot, 1982). From the late 1960s to 1980s, Halton and Warrington and Central Lancashire benefited from both motorways for attracting new industries and NT programme for housing provision. The most favourable condition was vested in "crossover" Warrington NT. In addition to the new town and motorways, it is critically located on the north-south WCML and a central position on the east-west rail line between Manchester and Liverpool.

Hence, up to the 1980s, with the combination of a long-term uncontrolled overspill from two conurbation areas and later public intervention with new town and motorway construction, the spatial-economic landscape in NWE had been largely changed. Economic growth was taking place in places with less-industrial legacy and good road transport accessibility around the southern and middle parts of the region (Cheshire West and Chester, Cheshire East, Halton and Warrington, and

[28] Later in 1981, the Warrington and Runcorn Development Corporation were merged to replace two initially separate new towns. In "the late 1980s" from 1985 to 1989, these new towns were wound up.

[29] Harry Yeadon Interview [Interviewed by Marshall, Chris] (Available from 12 April 2006, at http://www.cbrd.co.uk/people/harry-yeadon/)

[30] SDA was introduced in 1967 to assist the development of manufacturing industry in the industrial regions.

Central Lancashire). This applied to a lesser degree to Central Lancashire which is relatively far away from the metropolitan areas.

5.2.2 Regional Context: The Spatial-Economic Trajectory of NPDC

The Nord-Pas de Calais region (NPDC) with a population of 4 million inhabitants on an area of 12,414 km² is located in the northern border of France. In the second half of the 19th century, the textile industry was the second largest in the world after Manchester and south Lancashire (Fraser and Baert, 2003, as referred in Colomb, 2007, p. 8). Two main inter-related industrial zones were dominant. The textile complex agglomerated in Lille-Roubaix-Tourcoing conurbation as well as Armentières, while the coalfield "*Pays Noir*" was seated in the south of Lille conurbation, forming an extensive industrial belt (Béthune- Lens- Douai- Valenciennes) (Thompson, 1965). Outside these two major industrial agglomerations, the regional industrial distribution was less significant and widely dispersed. Since the 1950s, these previous growth industries have encountered economic contraction. The mining industry earliest faced the economic shrinkage and a similar situation of employment shrinkage occurred in textile industries (Clout, 1971). Resulting from rapid urbanisation and industrialisation in the past, these industrial areas are short of developmental land, coupled with the dense and disorganised settlement, proved unfit and unattractive for new types of economic activities (Clout, 1971; Thompson, 1965, p. 32). In contrast, places like Arras, without the industrial legacy and with good motorway links, demonstrate attractiveness to new economic activities. In the 1960s and 1970s, a couple of national initiatives and investments were implemented to assist regional economic restructuring. Before the arrival of the TGV-Nord, NPDC's regional transport infrastructure was improved for better linkages with major cities for industrial development, including a new canal network[31], the electrification and modernisation of several railway lines and new motorway lines[32] (Clout, 1971). However, as a border region with its remoteness, the transport infrastructure was still not well-developed, in particular for the coastal area.

From the mid-1960s, the French state had made a series of planning reforms to rectify the hyper-agglomeration economies in Paris by establishing, empowering, and strengthening major regional metropolises. These reforms are discussed in more detail in section 6.6.2.2. *Lille Métropole* (hereafter Lille Metropolis) was designated for NPDC, coupled with various measures

[31] In 1966, the opening of Canal du Nord to Paris and the creation of a deep-water canal link from Dunkerque to Valenciennes.

[32] In 1963: A25 linking Lille and Dunkerque, in 1967: A1 linking Paris- Artois-Ternois-Lille, in 1972: A2 serving Paris-Cambresis and Valenciennois- Brussels.

for addressing regional inequality in the 1960s, namely (1) the metropolitan plan organisation (OREAM-Nord)[33] for promoting and coordinating city-regional plans, (2) an inter-communal organisation (LMCU[34]), (3) the capacity of drafting the development framework (SDAU or SD)[35] in a long term perspective for territory development, (4) "*Lille Est*" New Town (*villes nouvelle*)[36] established as a (literally eccentric) part of the Parisian region's master plan package *Schéma directeur d'aménagement et d'urbanisme de la région de Paris* (SDAURP), and (5) the expansion and decentralisation of higher education establishment in Lille metropolis outside Paris. Due to the growing congestion of Lille 1 University in city centre, the university complex was developed in 1962 in "*Lille Est*" new town. Three universities were recreated in 1970, each with a specialised field[37]. In total, with over 90,000 students, three university campuses in Lille are now the major knowledge assets for the *Université Lille Nord de France* (Watiez, 2010). In addition, with the available funding largely endorsed from VT[38], in the early 1970s, the world's first automatic light vehicle system (*Véhicule Automatique Léger* (VAL)) was developed in Lille. The construction of the first Metro line began in 1978 and completed in 1983 linking between 4 Cantons and *Lille République*, on which line the Villeneuve d'Ascq New Town and the university complex was connected with Lille.

Except for state intervention in developing the knowledge economy in Lille metropolis, other areas within the region were imposed with industrial sectors. In the coal mining area, after 200 years of coal exploitation, the last pit closed in 1990. There had been a process of creating a new industrial cluster of car and rail industry from the 1960s. An industrial expansion association in NPDC (*Association pour l'Expansion Industrielle de la Région Nord/Pas-de-Calais*) was formed in 1966 and a wide range of light industries were subsidised and attracted to diversify the regional economic structure. In Lens, Renault, the then national-owned car company, was first imposed in this area to trigger the process. Peugeot and Toyota came afterwards. Sub-contractors which make plastics elements for cars were developed in parallel. In Valenciennes, two rail manufacturers, Alstom and Bombardier, had developed out of traditional steel industry. So Northern France becomes one of the most important regions in the car and rail industry. More recently, with its

[33] OREAMs were created in six major urban regions, namely Lille-Dunkerque, Rouen-Le Havre, Nantes-Saint-Nazaire, Lyon-Saint- Étienne, Marseille-Aix, and Nancy-Metz.

[34] LMCU (*Lille Métropole Communauté Urbaine)* was renamed in 1996 and originally called CUDL (*la communauté urbaine de Lille*) when it was created in 1967.

[35] SDAU was replaced by *Schémas Directeurs* (SD) in 1983.

[36] Nine new towns were designated: five located around Paris (Cergy-Pontoise, Marne-la-Vallée, Sénart (former Melun-Sénart), Évry, Saint-Quentin-en-Yvelines) and the other four situated near regional cities: Lille (Villeneuve d'Ascq (Former Lille-Est)), Grenoble: L'Isle-d'Abeau, Marseille: Rives de l'Etang de Berre, Rouen: Val-de-Reuil.

[37] The former Faculty of Science became University of Science and Technology of Lille - USTL" (Lille I), and meanwhile two universities are created Lille II (Law and Health) and Lille III (Humanities).

[38] VT is a hypothecated tax introduced in the 1970s. More discussion is in section 6.4.1.

geographical advantage in the European territory, the logistics industry has been growing. Despite this area experiencing economic restructuring through the introduction of the car industry by the national state in the 1960s, massive employment loss has not abated[39].

As for the coastal area, with the state intervention, the port of Dunkerque was expanded to become the third biggest industrial port in France, following Marseille and Le Havre/ Rouen (Clout, 1971). By the end of the 19th century, apart from shipbuilding and oil factory, the port activities in Dunkerque were specialised in the imports of raw materials for industries, in particular for serving the textile conurbation and some part of coalfield. In addition, grain imports also made Dunkerque an important marketplace (Port of Dunkerque). After Dunkerque was heavily destroyed in WW2, state intervention intensified the development of manufacturing economies in Dunkerque. The steel industry USINOR was imposed in 1957, beginning to operate in 1963. In 1968, with an institutional tool, the state-controlled autonomous Port Authority in Dunkerque was established to enhance the development of port facilities. The *Charles de Gaulle* lock was completed for the passage of large ships in 1970. In addition, Dunkerque kept on attracting energy, manufacturing, and other investment. A large nuclear power station Gravelines was established between 1974 and 1984. A tax-exempt enterprise zone was created to attract foreign investment in 1987 and an aluminium factory Pechiney was completed in 1992 (Bruyelle & Thomas, 1994; Paris, 1991). For all these investment, Dunkerque had grown fast as the major sub-region with the largest population 262692 in 1990 which amounted to one third of the coastal area.

In spite of strong public intervention on restructuring regional economy, by the mid-1980s, the turning point of the transformation process had not taken place. NPDC had been very much characterised by its distinct features of three industrial agglomerations, namely declining textile industries (Lille-Roubaix-Tourcoing), withering coal mining industries (*Béthune-Lens-Douai-Valenciennes*), and expanding industrial activities in the coastal area (in particular in Dunkerque). As Mr Christopher Bartholeyns who is in charge of the territorial redevelopment in Chamber of Commerce and Industry (CCI) for NPDC expressed it:

> *This metropolitan area was a border region, so there was no investment since the Second World War. There were located only production industries, not strategic one and not decision centre, so it was very specialized… When Pierre Mauroy obtained this connection of HST, the territory was not transformed. Here the centre of Lille was a bit the same after the war. There was nothing here.*

[39] Between 1968 and 1990, the decline in employment and population was 21.1% and 6.2% in Valenciennois and 21.3% and 6.4% in Lens-Hénin.

5.3 An Overview of Two HST Lines

These two post-industrial regions located in two countries respectively experienced two different HST approaches during their restructuring process towards the knowledge economy. From the 1970s onwards, Europe began developing HST systems in two ways: upgrading existing main lines or constructing new dedicated lines. The UK typically adopted the upgrade approach until the early 1990s, when a new dedicated HST line (CTRL) was officially developed, in contrast with France which was the first European country to ambitiously and systematically develop a new HST network.

5.3.1 The WCML Modernisation

The West Coast Main Line (WCML) is the longest and busiest mixed-traffic railway in the UK between London and Glasgow serving large conurbations Birmingham, Manchester, and Liverpool. It was electrified and modernised in the mid-1960s (south of Manchester and Liverpool) and in the early 1970s (between Weaver Junction (north of Crewe) to Glasgow), but due to financial constraints, these previous partial improvements had been limited and not undertaken in compliance with the original investment plan (Strategic Rail Authority, 2003b). It was supposed to be the first upgraded long-distance intercity line, but the failure of the Advanced Passenger Train (APT) project on this circuitous line led to a delay in the upgrade scheme until the early 1990s. This was far later than the arrival of the InterCity 125 on the upgraded GWML in 1976 and the ECML in 1981. BR privatisation in 1994 complicated and lengthened the whole process. Virgin trains began its WCML Franchise in 1997 and modernisation work began in 1998. Nevertheless, the modernisation project soon encountered difficulties due to the ambitious, but untested signalling technology. Along with Italian tilting train technology, the first stage of the WCML was completed in 2004. Since December 2008, the upgraded WCML has operated at a maximum speed of 200 km/hour, with up to three trains per hour, typically taking just over two hours to travel between London Euston and Manchester Piccadilly station.

5.3.2 The TGV-Nord

The French counterpart in this study is the TGV-*Nord*, the third newly dedicated line, which was inaugurated in 1993/1994. With an initiative begun in the 1960s, the arrival of the TGV *Sud-Est* in 1981 brought about subsequent decision making on TGV investment, which seemed promising due to the success of TGV *Sud-Est* which linked Paris with Lyon in two hours over 419 km at speeds of 300 kph. The TGV network has expanded not only on a national scale, but also on a

European scale to UK, Belgium, the Netherlands, Germany, Switzerland, Italy and Germany. Over thirty years, from 1981 to 2011, considerable progress involving new TGV lines has been made to connect major cities with Paris, namely the TGV-*Atlantique* (to Tours and Le Mans in 1989/1990), the TGV-*Rhône-Alpes* (to Valence in 1992/1994), the TGV-*Nord* (to Lille in 1993, to London in 1994, to Brussels in 1996), the Paris interconnections (1994/ 1996), the TGV-*Méditerranée* (2001), the TGV-*Est* (to Strasbourg in 2007), and the Perpignan-Figueres line (to Spain in 2010). The HST lines in operation accounted for 1,896 km of tracks in 2010 (UIC High Speed Department, 2012).

The TGV-*Nord* is not only the third new dedicated TGV-line in France following the TGV-*Sud-Est* and the TGV-*Atlantique* but also an critical section (TEN-T priority 2) connecting three major European capitals - London, Paris, and Brussels - in the expanding European HST network. However, the TGV-Nord project was not agreed and constructed straightforwardly. It originated in the early 1970s but later was abandoned after the UK withdrew from the Channel Tunnel project in 1975 on which the TGV-Nord line critically depended for profitability. In 1984, the German, French, Belgian, and Dutch governments launched a high-speed rail link (PBKA) study between Paris and Brussels with extensions to Cologne and Amsterdam. The PBKA study showed that in the absence of the Channel Tunnel, the economic rate of return only accounted for 7% for the French side, and beyond Brussels, the economic return would be much lower (RFF, 2005, p. 3). After British private companies revived the interest of constructing and operating the Channel Tunnel project, the Treaty of Canterbury was signed jointly by the French and British Governments in January 1986. Since then, the TGV-Nord line began to take shape with public intervention made in different government levels. These interventions are investigated and analysed in the following sections.

Lille has become a dominant rail hub thanks to two TGV stations playing specific roles in train services. Domestic TGV services have operated to and from Lille-Flandres terminal station since 1993, halving the Paris-Lille journey time from two hours to one hour, while International TGV services have called at Lille Europe since 1994, Eurostar, which successfully overcame technological obstacles to operate safely and efficiently across three territories (JRTR, 2005) began service in 1994 between London and Paris. The arrival of HST services on the London-Brussels route was delayed until the completion of high-speed line 1 (HSL1) from Brussels Midi Station, connecting to the TGV-Nord within the Belgian territory in 1996. In addition, a highly novel regional TGV service (TERGV), launched in May 2000 by the NPDC regional government, cleverly exploited available seats on underutilised domestic TGVs, for which a regional subsidy was paid to SNCF (Torchin, Grilly, Combes, Hasiak, & Menerault, 2008), bringing most sub-regions within one hour of Lille, specifically the remote coastal areas of Dunkerque, Calais and Boulonnais. After the devolution of regional passenger services, TERGV services were further extended to Artois-Ternois in 2003 and to Berck-Montreuil in 2010.

Hence, with similar economic trajectories and opportunities allied to two different HST approaches, a comparative empirical study of the two regions can offer crucial insights into the potential spatial-economic impact of HST systems.

5.4 Research Methods

5.4.1 Units of Analysis

The definition of the unit of analysis needs to take data availability and the location of rail stations into account. Due to the different administrative and statistical systems in the two countries, regarding data availability and compatibility, there are inherent problems of comparative research in defining a universal sub-region as an unit of analysis. In addition, this research aims to measure the wider impacts of rail improvement at the sub-regional levels, so the definition of a unit of analysis needs to embrace key railway stations for observation.

In order to measure varying effects between sub-regions, units of analysis need to consist of an appropriate number of sub-regions served by key railway stations, subdivided into those with and those without HST service. Key railway stations were identified according to railway timetables. In NWE, the upgraded WCML did not create new railway stations, while in NPDC, two new TGV stations (Lille Europe and Calais-Fréthun) were built for the arrival of the TGV-Nord.

With regard to NWE[40], sub-regions within this study exclude the county of Cumbria because it was not located within the main historical territory of industrialisation. The European-standard spatial unit (NUTS 3) was adopted as a basic unit of analysis for defining sub-regions in NWE. However, NUTS 3 units are unequal; some are too coarse to properly distinguish the effects, in particular Lancashire County Council, comprising no less than twelve local district authorities. Others represent a single unitary authority such as Blackpool and Blackburn with Darwen, which need to be grouped with other local districts to form a suitable sub-region unit for observation. Greater Manchester South, Greater Manchester North, Merseyside[41], and Halton and Warrington are four NUTS 2/3 units, which are directly used as sub-regions for analysis. The NUTS 3 unit

[40] According to the Office for National Statistics (ONS), NWE is one of the government offices for the regions (GORs) in England which were set up in 1994 (and abolished in 2010). The spatial boundaries of these English regions generally derived from standard statistical regions (SSRs) which were used for statistical rather than administrative functions prior to 1994. There were several adjustments to the North-West regional boundary before the current version adopted in 1998. For instance, Cumbria originally belonged to the North SSR, but was incorporated into the North-West when the GORs were introduced. Moreover, Merseyside, included in the North-West SSR, was first separated from the North-West GOR and later was re-joined with the rest of the North-West in 1998 (source: http://www.statistics.gov.uk/geography/gor.asp).

[41] Merseyside, which is statistically a NUTS 2 unit, is used here as a sub-region because its overall area is equivalent to a NUTS 3 unit.

Cheshire county council is coarse, so two newly formed unitary authorities, Cheshire East and Cheshire West and Chester, are adopted as two sub-regions. Central Lancashire (main town: Preston), West Coast Lancashire (main town: Blackpool), and Pennine Lancashire (main town: Blackburn with Darwen) are three main sub-regions regrouped from twelve local authorities so as to properly reflect their geographical location and their close economic relationship. Finally, Lancaster is a large local authority in area and is quite self-contained within Lancashire, so stands alone as a sub-regional unit.

For NPDC, the French statistical unit "employment area", selected from three such statistical areas devised by INSEE[42]: "employment areas"[43], "urban areas"[44], and "urban units"[45], is used as a spatial unit for sub-regional analysis in this study. Unlike the other two, "employment areas" extend more broadly to reflect the influence of major employment centres and spread contiguously to the boundaries of neighbouring employment areas, thus making it possible to interpret changes over time. Additionally, consistent census data from 1968 to 2006 are available at the "commune"[46] level, the smallest and oldest administrative geographical unit in France, therefore census data can be regrouped into "employment areas" to observe changes over time. In total, 10 sub-regions in NWE and 15 sub-regions in NPDC were adopted as the basis for analysis. Details of both units and involved local authorities and rail stations are illustrated in Table 5-1 and Appendix 15.

[42] INSEE [*Institut National de la Statistique et des Études Économiques*] is the acronym of France's National Institute of Statistics and Economic Studies.

[43] An employment area [*zone d'emploi*] is a geographical area in which people live and work, which is useful to recognise the influence of a major employment centre.

[44] An urban area [*aire urbaine*] is characterised by an urban growth core [*pôle urbain*] and commuter belt formed by rural communes, urban units [*unités urbaines*], or periurban areas [*Couronne periurbaine*]. More than 40% of residents work within an urban area.

[45] An urban unit [*unité urbaine*] is determined by two criteria: a maximum distance between two buildings of 200 meters and containing more than 2,000 residents.

[46] There are five major and well-established administrative units, which (proceeding from the largest to the smallest) are "*région*", "*département*", "*arrondissement*", "*canton*", and "*commune*". Originally, there were 670 communes in the Nord Département and 909 communes in the Pas-de-Calais Département.

Table 5-1 List of Units of Analysis (Sub-regions with Corresponding Local Authorities and Main Railway Stations) for the Two Regions

	North West England (NWE)			Nord-Pas-de-Calais (NPDC)		
	10 Sub-regions	**33 Local Authorities**	**31 Rail stations**	**15 Sub-regions**	**EPCIs**	**20 Rail stations**
1	**Greater Manchester South**	Manchester, Salford, Stockport,Tameside, Trafford	Manchester Piccadilly, Manchester Victoria, Stockport	**Lille**	CU de Lille	Lille Flandres, Lille Europe*
2	**Greater Manchester North**	Bolton, Bury, Oldham, Rochdale, Wigan	Wigan North Western, Wigan Wallgate, Bolton,	**Roubaix-Tourcoing**	CU de Lille	Roubaix,Tourcoing
3	**Merseyside**	Liverpool, Knowsley, Sefton, St Helens, Wirral	Liverpool Lime Steet, Southport, Kirkby, St.Helens Junction, Newton-le-willows	**Dunkerque**	CU de Dunkerque	Dunkerque
4	**Halton & Warrington**	Warrington,Halton	Warrington Bank Quay,Warrington central, Runcorn	**Flandres-Lys**		Hazebrouck
5	**Cheshire East**	(former districts of Congleton, Crewe & Nantwich, Macclesfield)	Crewe, Macclesfield, Wilmslow	**Douaisis**	CA du Douaisis	Douai
6	**Cheshire West and Chester**	(former districts of Chester, Ellesmere Port & Nestor, Vale Royal)	Chester	**Valenciennois**	CA de Valenciennes Métropole and C.A. de la porte de Hainaut	Valenciennes
7	**Lancaster**	Lancaster	Lancaster	**Artois-Ternois**	CU d'Arras	Arras, St.Pol
8	**Central Lancashire**	Preston, Chorley, South Ribble	Preston, Chorley, Leyland	**Lens-Henin**	CA de Lens - Liévin and CA d'Hénin-Carvin	Lens
9	**West Coast Lancashire**	Blackpool, Wyre, Fylde, West Lancashire	Blackpool, St Annes-on-Sea, Poulton-le-Fylde	**Béthune-Bruay**	CA de l'Artois	Béthune
10	**Pennine Lancashire**	Blackburn with Darwen, Burnley, Hyndburn, Pendle, Rossendale, Ribble Valley	Blackburn, Burnley Central/ Manchester Rd,Accrington,Nelson, Clitheroe	**Saint-Omer**	CA de Saint-Omer	St.Omer
11				**Calais**	CA du Calais	Calais-Ville, Calais-Fréthun*
12				**Boulonnais**	CA du Boulonnais	Boulogne-sur-Mer
13				**Cambresis**	CA de Cambrai	Cambrai
14				**Sambre-Avesnois**	CA de Maubeuge-Val de Sambre	Aulnoye-aymeries, Maubeuge
15				**Berck-Montreuil**		Étaples

Note1: *: new TGV stations

Source:author

5.4.2 Variables, Data Collection and Observed Time Periods

Table 5-2 lists the dependent variables, indicators and data sources collected for two regions. The independent variables are the changes to rail services with regard to train times and frequencies. In general, passenger statistics are treated as commercially confidential and so are not usually available. Hence, train times are employed to present the effects of time-space shrinkage while train frequencies are used to reflect demand on different routes. The attended dependent indicators are again these proxies for these variables of economic strength and structural change. Gross Value Added (GVA), employment and available property values are proxies for economic strength. Employment structures based on work places are used to comprehend economic restructuring. Four identical economic groups (A, B, C,D) are defined here for the intra-regional study as in

section 4.3.2. In addition, supplementary indicators based on places of residence such as population, migration and Gross Disposal Household Income (GDHI) are used to assist the analysis of spatial-economic patterns. Regarding data sources, in the UK, the main data sources draw from the Office of National Statistics (ONS), Valuation Office Agency (VOA), and Official Labour Market Statistics (NOMIS). In France, *L'Institut national de la statistique et des études économiques* (INSEE) is the main source.

Again, since the variables are subject to the inevitable variance of data comparability and availability in the two countries, due caution was taken to ensure reliability. The major difficulty lies in the equivalent measurement of economic strength at the sub-regional level for the two countries. GVA/head is the best indicator for this purpose. However, GVA figures are available at three levels (NUTS 1, 2, 3); and the smallest level is NUTS3. In the UK, NUTS 3 level is similar to the sub-region unit, although not all sub-regions have sufficient GVA values. Whereas in France, NUTS 3 is equivalent to the "*département* " level, which means the whole region could only be divided into two parts for measuring its economic change. It is not very useful to observe the economic change into smaller sub-regions. Therefore, the alternative indicator for measuring economic strength in France at the sub-regional level is the change in employment figures. For the rest of the indicators, problems are normal and inevitable. For instance, the two countries adopted different SIC code systems, UK by SIC 92 & SIC 2003 vs. France by NES 14. The key point is to ensure the consistency of the statistical data used for comparison among sub-regions within each context.

All the indicators and data collection comply with a decisive time-series reflecting "before" and "after" situations for the observed regions and sub-regions. In NWE, the WCML modernisation was completed in two stages: 2004 and 2008. Given that the post-2008 time-series is not widely available, the observations emphasise the distinction between pre-stage one of the WCML (1998-2004) and post-stage one (2004-2007/2008). Due to the short observation period and the effects of the economic recession by the time of completion, it is not possible to fully reach a decisive judgement; however, the study period from 1998 to 2007 allows the effects of the first stage to be measured. In NPDC, recent French Census data covering three periods, namely 1990 (pre-TGV-Nord), 1999 (post-TGV and pre-TERGV), 2006 (post-TGV-Nord and post-TERGV), were analysed. Great efforts were made to ensure equivalent and comparable variables for the time-series in question.

Table 5-2 Dependent Variables, Indicators and Data Sources for the Two Regions

Variables	Key indicators	Data sources (time-series)				Supplement indicators
		North West England		Nord-Pas-de-Calais		
		Before	After	Before	After	
1 Economic strength	GVA/head	ONS (1998-2004)	ONS (2004-2007)	INSEE (1990)	INSEE (1999&2006)	For North West England (source: ONS and NOMIS): *Population change (1981-2004 & 2004-2009) *GDHI (1998-2004 & 2004-2007) For Nord-Pas-de-Calais region (source:INSEE): *Population change (1968-1990& 1990-2006) *Migration rate (1990-1999 & 2001-2006)
	Employment	ONS-ABI (1998-2004)	ONS-ABI (2004-2007)	INSEE (1968-1990)	INSEE (1990-1999 &1999-2006)	
	Property values	VOA-PMR (1982-2004)	VOA-PMR (2004-2008)			
2 Ecoonomic structure	Group A: Secondary industries /construction /energy	ONS-ABI (1998-2004)	ONS-ABI (2004-2007)	INSEE-NES14 (1990)	INSEE-NES14 (1999 &2006)	
	Group B: Commerce/ transport/ other services					
	Group C: Public services					
	Group D: Knowledge intensive services					

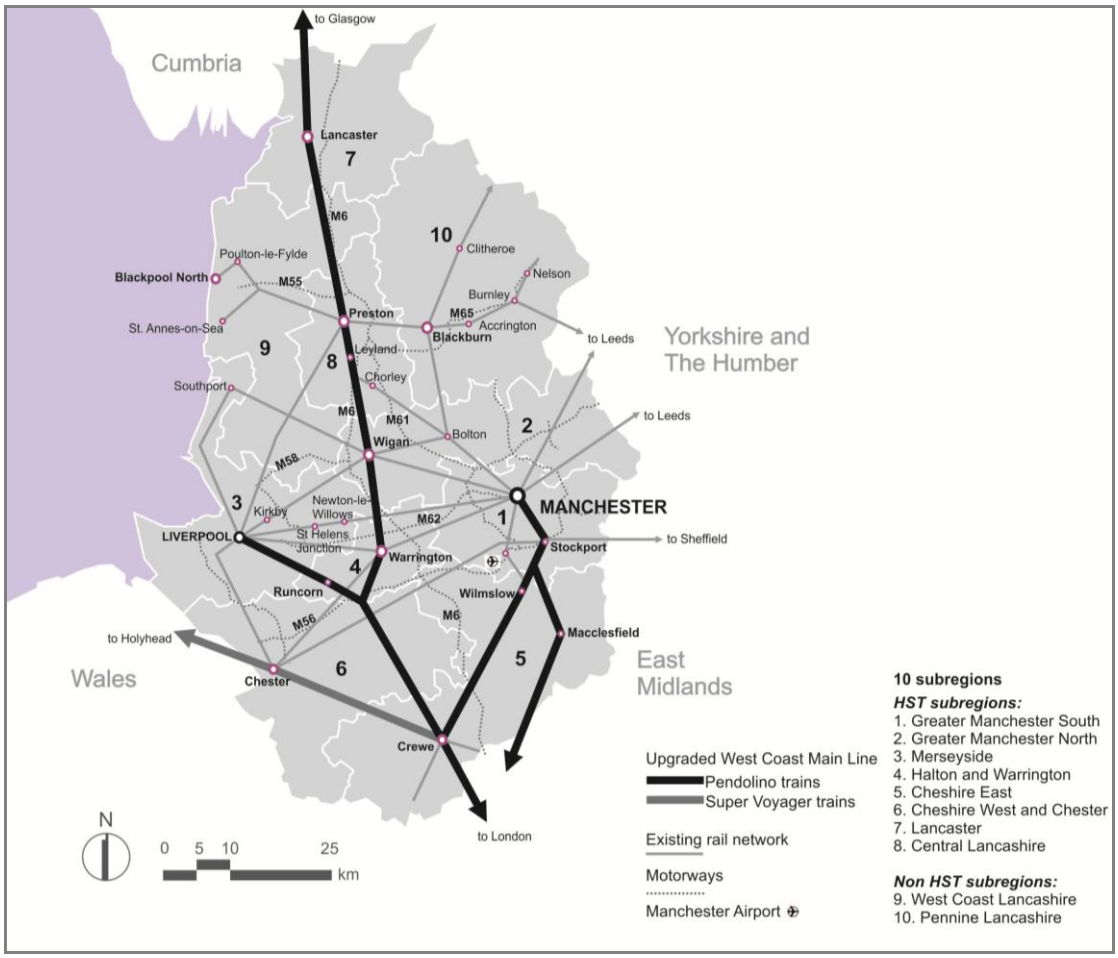
Note1: ABI (Annual Business Inquiry)
Note2: GVA (Gross Value Added)
Note3: GDHI (Gross Disposal Household Income)
Note4: INSEE(L'Institut national de la statistique et des études économiques)
Note5: NES14 (system code of economic activities in France)
Note6: NOMIS (Official Labour Market statistics)
Note7: ONS (Office for national statistics)
Note8: PMR (Property Market Report)
Note9: VOA (Valuation Office Agency)

Source: author

5.5 Results 1- The Upgraded WCML and Manchester vs. Sub-regions in NWE

Before the modernisation of the WCML, the layout of the WCML network had already significantly influenced the spatial economy of cities. Core cites such as Manchester and Liverpool are located on branches from the WCML, which enabled faster services for intermediate stations on the main north-south rail link between London and Glasgow. After the completion of the upgrade in December 2008, with the introduction of a non-stop service between London and Warrington, the different effects experienced by HST and non-HST sub-regions were further polarised - in particular between the northern and southern parts of the region. Figure 5-2 illustrates railway lines, key railway stations and boundaries of 10 sub-regions in NWE. The routes for the upgraded WCML are highlighted in black (electrified) and dark grey (non-electrified) lines. Apart from core cities, a few intermediate stations on the main line (and their sub-regions), namely Crewe (Cheshire East), Warrington Bank Quay (Halton and Warrington), Wigan North Western (Greater Manchester North), Preston (Central Lancashire) and Lancaster (Lancaster), occupy especially advantageous positions in time-space terms. Nevertheless, it is evident that the southern part of the region is much better served than the northern. Nine out of 12 stations served by Virgin Pendolinos and Voyagers in this region are located in the south, while only three are served in the north. In addition, an extensive motorway network (completed between the late 1950s and the early 1990s) has significantly altered the spatial-economic landscape of the region.

Figure 5-2 The Railway Network, Main Stations, and Sub-regions in North West England



Source: author (Note: The motorway network is supplementary in this diagram)

5.5.1 Effects on Train Times, Patterns and Frequencies

Table 5-3 displays the evolution of train times and frequencies from 1998 to 2010 between London and NWE sub-regions and between Manchester and its sub-regions. Two time periods are listed: the period between 1998 and 2007 presenting the effect after stage one of the upgraded WCML in 2004 and the period from 2007 to 2010 for the outcome following final completion in 2008. Train times shown here are the average of all main stations and the frequencies are the sum of all main stations in each sub-region. It is worth noting that these rail times and frequencies do not all result from direct rail services. In measuring inter-regional services between London and NWE sub-regions, for non-HST sub-regions, rail times of indirect train services with London are calculated through at least two components of a trip. When measuring intra-regional services between Manchester and these sub-regions, most post-industrial towns within Pennine Lancashire

do not have direct rail services with Manchester. Most trains from these towns need to change at Blackburn or Preston rail stations for further journey to and from Manchester Victoria or Piccadilly station. In order to understand overall train time between these places (within Pennine Lancashire) and Manchester, train times and frequencies of these indirect rail services are carefully checked, summed up, and averaged. The effects of sub-regional accessibility after the arrival of the upgraded WCML are demonstrated by a comparison between the inter-regional and intra-regional services in sections 5.5.1.1 and 5.5.1.2.

Table 5-3 The Evolution of Train Times and Frequencies in North West England

Sub-regions	Main railway stations	Average train times			Time zone	Train Frequencies			Stage 1 Change 1998-2007		Stage 1+2 Change 1998-2010	
				(min)	(h)			(count)	(min)	(count)	(min)	(count)
		1998	2007	2010	2010	1998	2007	2010	Time	Freq.	Time	Freq.
Between London and North West sub-regions												
HST sub-regions												
Greater Manchester South	Manchester Piccadilly /Stockport	147	133	123	2H	34	64	91	-14	30	-24	57
Greater Manchester North	Wigan North Western	148	134	120	2H	15	17	18	-14	2	-28	3
Merseyside	Liverpool Lime Steet	166	150	133	>2H	14	16	18	-16	2	-33	4
Halton and Warrington	Warrington Bank Quay/Runcorn	138	126	111	1-2H	29	31	36	-12	2	-27	7
Cheshire East	Crewe/Macclesfield/Wilmslow	124	111	99	1-2H	49	62	65	-13	13	-25	16
Cheshire West and Chester	Chester	146	134	122	=2H	5	5	14	-12	0	-24	9
Lancaster	Lancaster	180	168	149	>2H	8	14	14	-12	6	-31	6
Central Lancashire	Preston	166	148	133	>2H	16	18	19	-18	2	-33	3
Non-HST sub-regions												
West Coast Lancashire	Blackpool/Poulton-le-Fylde/St Annes-on-Sea	205	197	184	>3H	47	47	47	-8	0	-21	0
Pennine Lancashire	Blackburn/Burnley Central/ Burnley Manchester Road /Accrington/Nelson/Clitheroe	231	209	196	>3H	66	71	71	-22	5	-35	5
Between Greater Manchester South and its sub-regions												
Greater Manchester North	Wigan North Western/ Wigan Wallgate/Bolton	26	27	27	<0.5H	159	188	200	1	29	1	41
Merseyside	Liverpool Lime Steet/Southport/Kirkby/St.Helens Junction/Newton-le-Willows	45	44	46	<1H	178	189	210	-1	11	1	32
Halton & Warrington	Warrington Bank Quay/ Warrington Central/Runcorn	44	39	40	<1H	100	107	105	-5	7	-4	5
Cheshire East	Crewe/Macclesfield/Wilmslow	30	30	30	=0.5H	167	171	171	0	4	0	4
Cheshire West and Chester	Chester	74	74	75	1-2H	38	37	35	0	-1	1	-3
Lancaster	Lancaster	74	63	60	=1H	20	23	17	-11	3	-14	-3
Central Lancashire	Preston/Chorley/Leyland	46	44	43	<1H	103	126	155	-2	23	-3	52
West Coast Lancashire	Blackpool/Poulton-le-Fylde/St Annes-on-Sea	82	81	80	1-2H	87	79	90	-1	-8	-2	3
Pennine Lancashire	Blackburn/Burnley Central/ Burnley Manchester Road/ Accrington/Nelson/Clitheroe	74	73	80	1-2H	72	85	126	-1	13	6	54

Note: the train services analysed in this table are based on regular weekday services.

Source: GB National railway timetables (1998, 2007, 2010)

5.5.1.1 Inter-regional Services: Between London and NWE Sub-regions

The upgraded HST system resulted in an identifiable, but modest reduction in train times. Train times were reduced by about 15 minutes between 1998 and 2007. A further reduction of around 15 minutes came between 2007 and 2010. Consequently, the total reduction in train times amounts to approximately 30 minutes for most sub-regions, which are now connected within 2 hours (or slightly over 2 hours) from London except for Merseyside, Central Lancashire and Lancaster. In contrast, two non-HST sub-regions, West Coast Lancashire and Pennine Lancashire, with indirect

rail services, take more than 3 hours to reach London. Train frequency has increased overall, but the degree varies among HST sub-regions. Greater Manchester South and Cheshire East show the most significant increase after the arrival of the WCML. A total of 57 additional trains per weekday between 1998 and 2010 were added to serve Greater Manchester South, which was followed by Cheshire East with an increase of 16 trains; two thirds less than Greater Manchester South. For non-HST sub-regions, the marginal increase in train frequency could be explained by the fact that the reduction in train times through better interchange arrangements made this possible.

5.5.1.2 Intra-regional Services: Between Manchester and Its Sub-regions

In contrast with the time-space shrinkage of inter-regional services observed above, train times between Manchester and its sub-regions remained largely unaltered or were even slightly lengthened. Pennine Lancashire, albeit remaining within the over-one-hour catchment from Manchester, experienced an addition of six minutes to journey time on average. The only exception was Lancaster, which moved from the category of over-one-hour in 1998 to one-hour in 2010. Most sub-regions could be reached within one hour from Manchester, except for Cheshire West and Chester, West Coast Lancashire and Pennine Lancashire. Regarding frequency changes between 1998 and 2010 which reflect the intra-regional relationship between sub-regions and Greater Manchester South, three patterns were found. Firstly, some sub-regions show a dramatic increase in frequency to Greater Manchester. Significant increases in frequency occurred in Central Lancashire (+52), Merseyside (+32), Greater Manchester North (+41) and Pennine Lancashire (+54). Here, the largely increased frequency of indirect rail services to and from Pennine Lancashire is different from direct rail services in the other three sub-regions. Secondly, three sub-regions showed marginal increases signifying relatively high, but stable travel-to-work patterns, namely Halton and Warrington (+5), Cheshire East (+4) and West Coast Lancashire (+3). Thirdly, two sub-regions show a weak connection, reflected in their low and reduced train frequencies, namely Cheshire West and Chester (-3) and Lancaster (-3).

Overall, the upgraded WCML drew most sub-regions in NWE within a two-hour radius from London. In addition, a massive increase of frequency between Greater Manchester South and London enhanced the economic link between London and the regional centre, but with the limited existing capacity on the WCML, some intra-regional train times were not improved and were even slightly lengthened. These affected intra-regional services are particularly serious in the southern part of the region where the majority of rail capacity is prioritised for long-haul Pendolino services. As the Greater Manchester Passenger Transport Executive (GMPTE) has claimed, additional Manchester-London services reduced track capacity available for other operators, and to some degree limited other operators' services (GMPTE, 2010). On the other hand, despite the

unimproved train times, a significant increase in frequency in certain northern sub-regions (Central Lancashire, Merseyside, Greater Manchester North) is closely related to the launch of Trans-Pennine Express services in 1998 to expand the catchment of Manchester Airport through Manchester Piccadilly into a wider northern catchment beyond the boundary of North West England. This intervention is discussed in more detail in section 7.3.2.1 and a rail connection to Manchester Airport is shown in Figure 7-2. It is quite apparent that within NWE, the three sub-regions which have shown the largest increase in train frequencies with Manchester are literally major service routes of Trans-Pennine Express. Due to the geographical layout and service patterns, these services enhance the connectivity from these sub-regions not only with Manchester Airport but also with Manchester Piccadilly (city centre) - the major agglomeration economies in Greater Manchester South. In section 5.5.2, with evidence of economic performance, the change in sub-regional economic geography will be teased out further.

5.5.2 The Wider Impact on Spatial-Economic Development

5.5.2.1 Changes in Regional Strength and Economic Structure

Before investigating the wider intra-regional spatial-economic impact, it is essential to understand the overall picture of regional economic performance. Table 5-4 shows changes in GVA per head and GVA by four groups of economic activities over time for English regions. Three time series were analysed: 1998 (pre-upgrade), 2004 (the initiation of the first stage of upgrade), and 2007 (post- the first stage of upgrade[47]). Regardless of a better performance than other disadvantaged northern regions, NWE showed a consecutive decrease in economic strength (88.3-86.4-85.0). The four main economic groups underlying the aggregated GVA figures are also further examined. The highest percentages contributing to the GVAs are emphasised in bold and italics. NWE experienced economic restructuring towards the knowledge economy from 1998 to 2007, and by 1998 the highest economic value was generated by group A (manufacturing). The situation altered when group A was overtaken by group D (knowledge economy) from 2004 onwards, in contrast with other old manufacturing-led regions (Yorkshire and the Humber, North East and East Midlands) over these three time series. Overall, the result suggests that uneven regional development widened, but regional economic strength already relied on knowledge-intensive services by the arrival of the first stage of the upgraded WCML and was further reinforced in 2007.

[47] The upgrade was fully completed in 2008.

Table 5-4 Changes in Gross Value Added (GVA) and GVA by Group of Economic activities in North West England

	GVA / head			A Manufacturing, construction, and electricity				B Commerce, transport, and other services				C Public services				D Knowledge intensive services			
	1998	2004	2007	1998	2004	2007	04-'07	1998	2004	2007	04-'07	1998	2004	2007	04-'07	1998	2004	2007	04-'07
			index				%				%				%				%
UK	100.0	100.0	100.0	27.0	21.7	21.0	-0.7	23.5	23.2	22.2	-1.0	21.1	22.9	23.0	0.0	26.7	30.8	32.8	2.0
Regions	(NUTS1)																		
London	158.7	163.6	168.9	14.1	10.7	10.1	-0.6	24.9	21.7	20.3	-1.4	20.2	21.5	21.1	-0.4	***40.5***	***45.9***	***48.3***	2.4
South East	105.6	107.9	106.5	23.9	19.8	19.1	-0.7	25.2	24.8	24.2	-0.6	18.9	19.9	20.9	1.1	***30.9***	***34.7***	***35.0***	0.3
East of England	94.5	95.0	95.6	***28.0***	23.4	23.3	-0.1	25.1	24.7	23.9	-0.8	18.2	20.0	20.7	0.7	26.5	***29.9***	***30.8***	0.9
South West	92.0	92.4	91.4	***27.7***	23.0	22.8	-0.2	22.4	23.1	22.1	-1.0	23.3	24.0	24.2	0.2	24.1	***27.7***	***29.2***	1.5
West Midlands	91.5	87.3	85.4	***34.8***	***26.8***	25.3	-1.5	22.8	23.8	23.4	-0.4	19.1	22.6	23.3	0.8	22.0	25.5	***26.9***	1.4
East Midlands	91.6	89.7	88.3	***35.3***	***29.2***	***28.0***	-1.2	22.9	23.9	23.6	-0.3	19.2	21.6	21.8	0.2	20.0	23.3	25.0	1.7
Yorkshire & The Humber	88.3	86.0	83.6	***32.1***	***26.7***	***26.1***	-0.6	23.8	23.7	22.7	-1.0	21.5	24.2	23.9	-0.3	20.6	23.8	***26.1***	2.3
North East	79.1	78.0	77.5	***33.6***	***28.2***	***27.4***	-0.8	21.1	20.8	20.2	-0.6	24.8	27.9	27.1	-0.7	19.0	21.7	24.2	2.5
North West	88.3	86.4	85.0	***31.4***	25.6	25.2	-0.4	23.8	24.3	22.9	-1.4	21.5	23.3	23.3	0.0	22.3	***25.9***	***27.9***	2.0

Note1: In this table, the headline gross value added (GVA) per head is based on a workplace basis at current basic prices.
Note2: The table denates four groups of economic activities were aggregated from 31 industries based on UK standard industrial classification SIC (92). The group A accounts for the income from these (sub-)sections DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, E, and F. The group B is consisted of sections of G, H, I, and P. The group C includes the aggregation of section L, M, N, and O. The group D represents the section J and K.

Source: ONS

5.5.2.2 *Changes in Intra-regional Economic Strength and Restructuring in NWE*

GVA / GDHI and Employment / Population

Table 5-5 illustrates changes in GVA per head, GDHI per head, employment and population for sub-regions in NWE. GVAs and GDHIs are utilised to understand economic strength and residence wealth, but are only available for ill-defined NUTS3 units. Thus, figures for employment change and population change from individual local authorities were aggregated to discern variations between sub-regions. The figures that are higher than the regional average are highlighted.

Before the arrival of phase one of the upgraded WCML in 1998, sub-regions within NWE had to some extent already undergone considerable economic restructuring. Higher than regional average economic strength and job creation were evident and concentrated in the south, namely Greater Manchester South and three adjacent sub-regions (Halton and Warrington, Cheshire East and Cheshire West and Chester). From 1998 to 2004, Halton and Warrington maintained a leading position with an identical GVA figure from 130.0 to 132.9. Cheshire CC (covering Cheshire East and Cheshire West and Chester) performed second best, but declined notably from 125.1 to 120.6. Greater Manchester South, ranked third, conversely improved its productivity from 124.2 to 129.1, coupled with an employment rise 14% higher than the regional average (8.9%). In contrast, the remaining sub-regions demonstrated severe disadvantages, with declines in GVA and the lowest employment increases, except for Merseyside and Central Lancashire. Both showed signs of

improvement with one well-established major city, respectively the port city of Liverpool and the home of Lancashire County Council, Preston. Merseyside showed a slight improvement in GVAs (80.4-83.0) parallel to a large employment rise of 8.7%. Likewise, Liverpool strongly improved its economic strength according to GVA (99.0-104.7) with employment growth of 9.7%. Central Lancashire demonstrated its strength with the highest employment rise of 22.4%.

Table 5-5 Changes in Headline Gross Value Added (GVA) Per Head, Gross Disposable Household Income (GDHI) Per Head, Employment and Population for Sub-regions in North West England

		GVA/head			GDHI/head			Employment	Employment change		Population	Population change	
		1998	2004	2007	1998	2004	2007	1998	98-'04	04-'07	1981	81-'04	04-'07
				Index			Index	Count		%	Count		%
	North West	100	100	100	100	100	100	2,788,544	8.9	0.1	6,940,300	-1.8	0.7
HST subregions	**NUTS3**												
Greater Manchester South	★	***124.2***	***129.1***	***130.6***	***100.2***	99.2	98.8	664,556	***14.0***	-1.5	1,442,500	-5.4	***2.2***
Greater Manchester North	★	82.8	80.4	77.5	97.5	96.5	96.3	407,517	5.6	-0.5	1,175,800	***-0.5***	0.0
Merseyside	★	80.4	83.0	83.4	97.1	96.2	95.6	496,264	8.7	-0.1	1,522,000	-10.7	-0.5
	(Liverpool)	99.0	***104.7***	***109.1***	88.2	90.5	90.2	202,172	***9.7***	***2.1***	517,000	-14.6	0.2
Halton and Warrington	★	***130.0***	***132.9***	***131.6***	***102.9***	***104.8***	***106.8***	156,099	3.9	***2.5***	293,800	***5.7***	***1.0***
Cheshire East	*Cheshire CC	***125.1***	***120.6***	***122.4***	***115.5***	***120.3***	***121.4***	149,021	7.6	***4.6***	328,500	***8.5***	***1.3***
Cheshire West and Chester	*Cheshire CC	***125.1***	***120.6***	***122.4***	***115.5***	***120.3***	***121.4***	139,319	7.4	0.1	311,000	***4.4***	0.6
Lancaster	*Lancashire CC (part)	95.5	95.5	94.0	97.6	98.2	98.4	52,369	5.1	-1.0	125,200	***10.1***	***1.5***
Central Lancashire	*Lancashire CC (part)	95.5	95.5	94.0	97.6	98.2	98.4	145,525	***22.4***	***1.8***	315,400	***8.6***	***1.5***
Non-HST subregions													
West Coast Lancashire	*Blackpool	82.2	75.2	73.1	96.8	88.2	85.5	171,582	-1.3	0.0	425,000	***0.0***	0.4
Pennine Lancashire	*Blackburn with Darwen	95.0	89.4	87.3	85.5	80.6	80.9	209,873	3.3	***1.5***	520,000	***2.8***	0.3

Note1: The headline gross value added (GVA) and gross disposable household income (GDHI) are both at current basic prices.
Note2: The figures for headline gross value added and employment are based on a workplace basis, while the figures for gross disposable household income and population are on a residence basis.
Note3: The population figures were sourced from mid-year population estimates in NOMIS.
Note4: The national level for populatiment and employment is using England as a common denominator.
Note5: ★indicates the name of NUTS3 unit is identical to the classification of subregions in this paper.
Note6: * indicates the lack of equivalent figures for spatial units at the NUTS3 level for GVA and GDHI, so the figures used here are only used as a reference rather than the definite performance.

Source: ONS/ NOMIS

Furthermore, GDHIs and population change are used to comprehend the spatial distribution of residence and wealth. From 1998 to 2004, the four economically stronger southern sub-regions were also relatively wealthier than the northern, but the residence pattern is different from the economic standpoint. People in Cheshire CC were wealthier than in Greater Manchester South and Halton and Warrington. Most sub-regions showed declining GDHIs, except for Cheshire West and Halton and Warrington. Additionally, by the first inauguration stage of WCML services, a longer-term analysis between 1981 and 2004, shows an distinguishable pattern of population changes and transport provision within the region. Well-established metropolitan sub-regions (Greater Manchester South, Greater Manchester North and Merseyside) experienced population losses, while substantial population increases occurred in sub-regions such as Halton and Warrington, Cheshire East, Cheshire West and Chester, Lancaster and Central Lancashire, which are characterised by a weaker industrial legacy, designated new town development, critical railway

stations on the direct London-Glasgow WCML and motorway connections (M6, M56, and M61 all completed before the end of the 1970s). In contrast, two sub-regions, Pennine Lancashire and West Coast Lancashire, had the lowest population increase and also the poorest GDHI index. Both are old post-industrial sub-regions served by poor transport provision. They are not served by the WCML but slow/obsolete rolling stocks, and have relatively delayed and insufficient motorway accessibility due to the late arrival of the M65 (Burnley-Colne section) in 1997 and the termination of the M55 at the edge of Blackpool, the main centre of West Coast Lancashire[48].

After the arrival of the upgraded WCML, between 2004 and 2007, Greater Manchester South continued the rise of economic competitiveness measured by GVA (129.1-130.6) and Cheshire CC also improved GVA value (120.6-122.4). Although Halton and Warrington still performed best, a decline in GVA and employment change reduced the gap with Greater Manchester South. In addition, Liverpool showed steady improvement in strength with 2.1% employment growth and a rise in GVA from 104.7 to 109.1. Furthermore, those sub-regions with more stations served by faster train services appeared to be more capable of creating new employment. Halton and Warrington (2.5%) and Cheshire East (4.6%) displayed employment figures above the GB average; Halton and Warrington has two WCML stations, Cheshire East has three. In contrast, Cheshire West and Chester has only Chester station served by Virgin Pendolino services, and this coincided with a lower employment increase of 0.1%. On the other hand, metropolitan sub-regions were becoming slightly poorer in contrast with wealthier non-metropolitan sub-regions except for West Coast Lancashire and Pennine Lancashire. In addition, among metropolitan sub-regions, only Greater Manchester South showed a population increase higher than the regional level, while a general minor population increase above the regional level occurred for all non-metropolitan sub-regions, except for Cheshire West and Chester, West Coast Lancashire and Pennine Lancashire.

Overall, the figures show that, by 1998, the southern part of the region was already performing well and proving attractive for both business and residence, in particular for wealthy people. Central Lancashire shows a lesser degree of attraction of both business and residence. Well-established metropolitan sub-regions show more employment revival than residential attraction. Other northern sub-regions on the WCML were more attractive for immigration than business, while two non-WCML sub-regions and Greater Manchester North were very disadvantaged for both immigration and business. Over the short observation period, there was a marginal change in the figures for economic strength and residential wealth, but the arrival of the upgraded WCML seems to be best reflected by well-established metropolitan sub-regions and by creating jobs in HST sub-regions with more stations served by faster trains.

[48] However, the motorway was later connected to the centre by a two-lane road on the track bed of an old railway.

Change in Property Values

Additionally, property value changes were analysed to study possible HST effects. Table 5-6 shows office rent and residential land value changes in NWE; figures higher than the regional average are highlighted in bold and italics. There are two noteworthy features; firstly, data sourced from VOA were analysed for specific towns within sub-regions, allowing distinctions to be drawn between sub-regions within identical NUTS3 units. Secondly, since the routes and stations served by the upgraded WCML were already confirmed by the late 1990s, it would be reasonable to expect that potential rises in property values would already be evident by first-stage completion in 2004.

Regarding office rental values, figures confirm that southern sub-regions remained economically stronger than northern sub-regions throughout the three time series 1982, 2004, and 2009. Manchester and Trafford (Greater Manchester South), Liverpool (Merseyside), Warrington (Halton and Warrington), Winslow (Cheshire East), and Chester (Cheshire West and Chester) show higher office rents than the regional average, despite a fall in Wilmslow and Chester centres in 2008. Additionally, the weaker office rental values in Chester demonstrates a useful distinction between Cheshire West and Chester and Cheshire East, which it was not possible to discern through analysis of GVAs under the NUTS3 unit of Cheshire County Council. This suggests that several towns within Cheshire East, adjacent to Greater Manchester South, became more attractive destinations for decentralised economic functions than Cheshire West and Chester, which were relatively farther away. Over time, Manchester, Trafford, Liverpool, and Wilmslow enjoyed office development both in town centres and out-of-town, while Warrington demonstrated competitive office rents stronger in its town centre.

Well-established metropolitan core cities appeared to experience the most significant boost in office rents. From 2004 onwards, office rents in Manchester rose further, to levels double the regional level. Moreover, Liverpool showed a noticeable improvement just second to Manchester. Greater Manchester North is an exception. Wigan where the WCML services serve did not present any strength either in office rent or residential value. Only a rough area named Bolton (Bury) in the Property Market Report showed out-of-town office rental value above the regional level from 2004 onwards. Although not served by the WCML, Bolton has been a major sub-regional rail centre between Preston and Manchester, and Bury has been well connected to Manchester city centre through the Metrolink since 1992. More insight could be attained by further splitting Bolton and Bury, but with the data limitation, one could reasonably interpret in this way: when the arrival of the WCML services at Manchester Piccadilly well connected to the existing efficient internal rail services (either regional rail or MRT), the wider spatial-economic impacts of HST could be realised because Bolton or Bury prove attractive for office development; both are well-connected and have frequent rail services with Manchester agglomeration economies.

Table 5-6 Change in Property Values in North West England

		Office rent						Sites for flats or mansionettes			
		town centre			off town						
		£/m²/ ann			£/m²/ ann			£ per ha (thousands)			%
		1982	2004	2008	1982	2004	2008	2004	2008	2009	2008-2009
North West		37	126	149	30	91	108	2,090	2,560	1,930	-25
HST subregions											
Greater M/C South	Manchester	***72***	***245***	***310***	***60***	***-***	***180***	***3,300***	***4,000***	***3,200***	***-20***
	Stockport	35	105	130	-	-	-	***2,900***	***3,800***	***2,950***	***-22***
	Altrincham,Trafford	***47***	***155***	***160***	***30***	***150***	***130***	1,500	***2,600***	***2,100***	***-19***
Greater M/C North	Bolton(Bury)	33	110	120	28	***100***	***110***	750	1,900	1,485	***-22***
	Oldham (Rochdale)	28	90	113	20	55	80	800	1,800	1,300	-28
	Wigan	28	95	115	25	65	80	-	1,900	1,400	-26
Merseyside	Liverpool	***43***	***128***	***180***	***35***	90	***150***	2,000	1,875	1,100	-41
Halton and Warrington	Warrington	***48***	***150***	***170***	***32***	80	95	1,500	2,500	1,700	-32
Cheshire East	Wilmslow (Crewe,Macclesfield,Nantwich)	***48***	***168***	143	***35***	***135***	***120***	1,045	2,000	1,600	***-20***
Cheshire West and Chester	Chester	***38***	***135***	138	29	***100***	105	***6,900***	***4,000***	***2,800***	-30
Lancaster	Lancaster	28	-	-	28	80	95	-	-	-	-
Central Lancashire	Preston	17	-	-	27	***95***	100	1,700	2,000	1,560	***-22***
Non-HST subregions											
West Coast Lancashire	Blackpool	-	-	-	-	-	-	-	-	-	-
Pennine Lancashire	Blackburn	18	95	120	30	90	100	480	1,700	1,100	-35

Note1:The figures for offices rental value in town centre is the average of type 1 and 2.
Note2:The property market report(PMR) in general is released twice a year. The figures in this table were sourced from the versions of March 1982, January 2004, July 2008, and July 2009.
Note3:The decimal fractions here had been rounded up and down.
Note4: The residential land value shown here is presumed to locate in a typical location for the area with planning permission and ready for development.

Source: Valuation Office Agency

Concerning residential development land, the economic recession seems to have hit the housing market harder than the office rental market. To a large extent, HST sub-regions show relatively greater resistance to falling residential land values. Manchester, Stockport and Chester were the only three places with values higher than the regional average throughout 2004, 2008 and 2009. Greater Manchester South reinforced its strength not only in office development but also in its attractiveness for urban living, while other HST sub-regions presented partial strength. The internal redistribution of residence occurred in both the sub-regions north and south of Greater Manchester South, but with higher rents in the south. Chester became the most popular place outside Greater Manchester South for residence. Cheshire East resisted the national trend of declining land values. Some northern towns like Bolton (Bury) in Greater Manchester North and Preston in Central Lancashire demonstrated a stronger resilience as residential locations than the regional average.

Structural Change in Employment

Table 5-7 presents employment changes by economic groups over time. Since group B (commerce, transport, and other services) was one of the two highest employment bases for all sub-regions between 1998 and 2007, observation of the next fastest-growing employment group proves useful to understand the change in economic structure. The two highest percentages of employment in each sub-region are highlighted in bold and italics (the highest by a single underline and the second by double underlines). The result displays a sharply distinct trajectory of restructuring between the south and the north. Four southern sub-regions with stronger economic strength, led by Greater Manchester South, increased their employment in knowledge-intensive services (group D), whereas the remaining sub-regions showed high representation in public services (group C) except for Pennine Lancashire which was still dominated by a heavy industry-led structure (group A), even though most of them experienced higher than national average increases in their knowledge-intensive services.

Table 5-7 Changes in Employment by Economic Structure in North West England

	A Manufacturing, construction, and electricity				B Commerce, transport, and other services				C Public services				D Knowledge intensive services			
	1998	2004	2007	04-'07	1998	2004	2007	04-'07	1998	2004	2007	04-'07	1998	2004	2007	04-'07
				%				%				%				%
North West England	24.0	18.9	17.8	-6.2	***32.6***	***32.9***	***31.1***	-1.5	***25.0***	***27.8***	***28.6***	3.6	17.6	19.8	21.9	4.3
HST subregions																
Greater Manchester South	19.7	14.7	13.3	-6.4	***32.3***	***31.7***	***30.4***	-1.9	***24.0***	25.6	26.8	2.8	23.9	***27.9***	***29.4***	5.5
Greter Manchester North	***30.6***	23.9	22.4	-8.3	***32.6***	***33.4***	***32.5***	0.0	24.3	***26.5***	***27.4***	3.2	12.3	16.0	17.5	5.2
Merseyside	18.3	14.0	13.4	-4.9	***32.6***	***31.2***	***28.7***	-3.9	***32.0***	***36.4***	***37.2***	5.2	16.9	18.3	20.6	3.7
(Liverpool)	13.0	9.0	8.0	-5.0	***31.0***	***30.0***	***27.0***	-4.0	***36.0***	***38.0***	***40.0***	4.0	21.0	23.0	25.0	4.0
Halton and Warrington	22.6	16.9	17.6	-5.0	***35.2***	***38.0***	***34.9***	-0.2	17.4	21.1	20.9	3.5	***24.4***	***23.6***	***26.3***	1.9
Cheshire East	***27.1***	***22.9***	21.1	-6.1	***31.9***	***34.6***	***30.9***	-1.0	16.7	21.0	22.3	5.7	22.0	19.8	***23.9***	1.9
Cheshire West and Chester	***23.9***	17.5	16.0	-7.9	***31.5***	***36.4***	***32.9***	1.4	19.0	***22.7***	24.5	5.5	23.9	22.2	***25.4***	1.5
Lancaster	17.6	14.3	13.2	-4.4	***30.1***	***33.0***	***32.5***	2.4	***40.5***	***39.0***	***37.9***	-2.6	10.1	12.6	14.8	4.7
Central Lancashire	21.8	20.4	17.3	-4.5	***34.6***	***30.6***	***29.2***	-5.4	***27.2***	***29.6***	***31.4***	4.2	15.3	18.7	21.4	6.0
Non-HST subregions																
West Coast Lancashire	24.7	21.2	20.2	-4.5	***31.8***	***33.2***	***31.8***	0.1	***28.5***	***30.3***	***29.7***	1.2	12.7	13.6	16.4	3.8
Pennine Lancashire	***37.6***	***30.7***	***28.8***	-8.8	***29.1***	***30.2***	***28.7***	-0.5	23.1	27.2	27.4	4.3	9.6	11.6	14.8	5.2

Note1: In this table, the headline gross value added (GVA) per head is based on a workplace basis at current basic prices.

Note2: The largest structure of employment is highlighted by one underline and the second largest structure is emphasised by double under lines.

Note3: The table presents four main groups of economic activities assembled from database of annual business inquiry (ABI) employee analysis for 1998-2007 time series, which are based on standard industrial classification (SIC 2003). The group A is the sum of economic activities coding 15-37, 40-41, and 45. The group B is the aggregation of economic activities coding 50-52,55,60-64,91, and 93. The group C is consisted of economic activities for coding 75,80,85,and 90. The group D represents those economic activities coding 65-67, 70-74, and 92.

Source: ONS

Among the southern sub-regions, there was a shift of knowledge creation hubs from neighbouring sub-regions back to metropolitan sub-regions. In 1998, Halton and Warrington had the highest percentage of knowledge services employment (24.4%) within the region, greater than Greater Manchester South which had a higher percentage of group C (24.0%) than group D (23.9%). After the arrival of the upgraded WCML from 2004 to 2007, group D remained the second biggest type of employment in Halton and Warrington (in 2004: 23.6% and in 2007: 26.3%), but Greater Manchester South was restructured to rely on group D (in 2004: 27.9% and in 2007: 29.4%) as the second biggest type of employment and overtook Halton and Warrington as the knowledge centre in the region. Likewise, Cheshire East and Cheshire West and Chester gained knowledge-intensive employment. Cheshire East and Cheshire West and Chester converted their second largest kinds of employment respectively from group A to D and from group C to D.

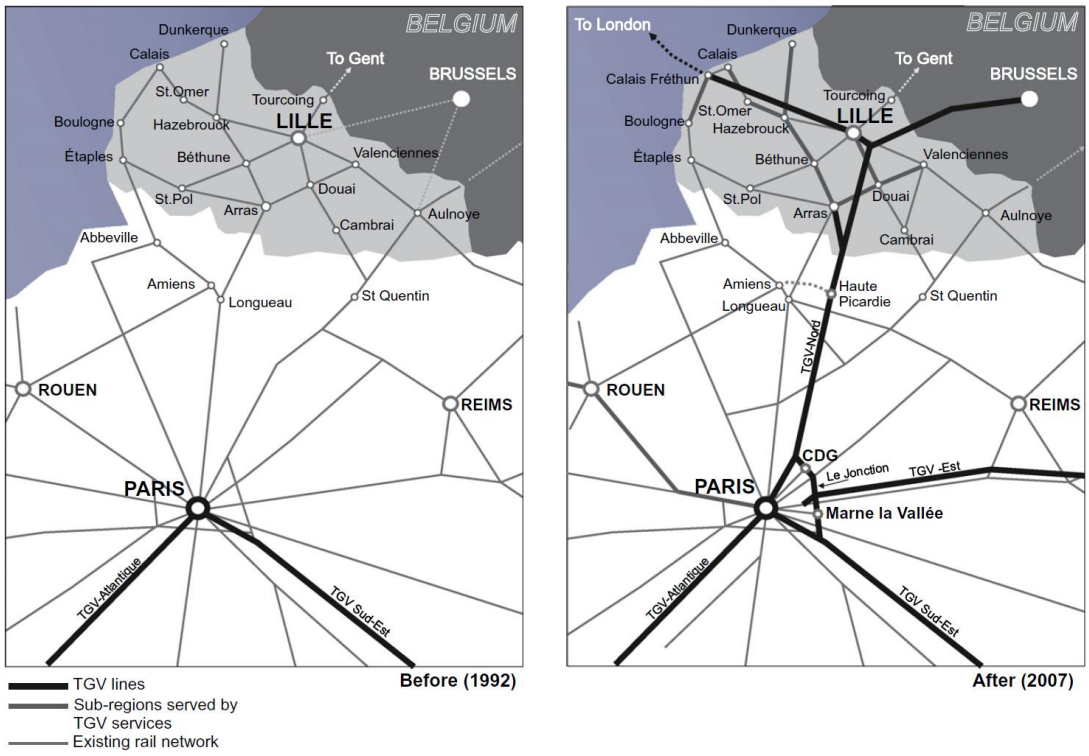
On the other hand, in 1998, northern sub-regions had shown the two major economic group B and group C, including Lancaster (group C/ B[49]), Liverpool (group C/B), Merseyside (group B/C), West Coast Lancashire (group B/C), and Central Lancashire (group B/C). The exception is Pennine Lancashire and Greater Manchester North which still largely depended on group B and A. From 1998 to 2004, for the majority of sub-regions in the north, the structure of their two largest employment groups remained unchanged. Two sub-regions were restructured. Greater Manchester North was restructured from group B/A to B/C and Merseyside from group B/C to C/B. From 2004 to 2007, Central Lancashire (group B/C to C/B) showed further dependence on group C. Between 1998 and 2007, Central Lancashire also displayed the largest increase 6% in knowledge intensive services. The rapid growth of University of Central Lancashire seems to be one obvious explanation for the dependence on public services in Central Lancashire. University of Central Lancashire which was the former Lancashire Polytechnic was granted university status in 1992 and is located in proximity to Preston rail station. Since then, the University has rapidly expanded. According to Higher Education Statistics Agency, in 1995/1996 academic year, University of Central Lancashire with 17406 students was ranked 25 in England. Then it became ranked 12 in 2008/2009 with 28130 students. In 2011/2012, with 31530 students, it has become the 6th largest university in England.

[49] Group C/B denotes the largest group of employment is group C and the second is group B.

5.6 Results 2- The TGV-Nord and Lille vs. Sub-regions within NPDC

Unlike the UK's upgrade approach, the arrival of the TGV-Nord, the third dedicated TGV line in France, crucially established not only a national HST network, but also international connections to the UK and Belgium. Figure 5-3 juxtaposes the rail network before and after the arrival of the TGV-Nord. Prior to its arrival, the shortest journey between Paris and Lille had to pass over existing railway tracks with at least three intermediate stations. Domestically, the arrival of the TGV-Nord in 1993 made Lille a dominant regional railway hub, which was further fortified in 1994 by the East Interconnection high-speed line [LGV *Interconnexion Est*, later *Le Jonction*], bypassing central Paris to reach major regional cities in central and southern France. However, Lille's location roughly midway between three large European cities, London, Brussels, and Paris, does not bring it much benefit, with only an intermediate stop on the international London-Lille-Brussels service. Paris (Nord)-Brussels trains bypass the city to the south and many London-Paris trains do not stop in order to reduce overall journey times (Ureña, et al., 2009). Furthermore, this disadvantage intensified after the advent of extended European HST services in 2009 between Paris-Amsterdam and Paris-Cologne, which use the bypass line.

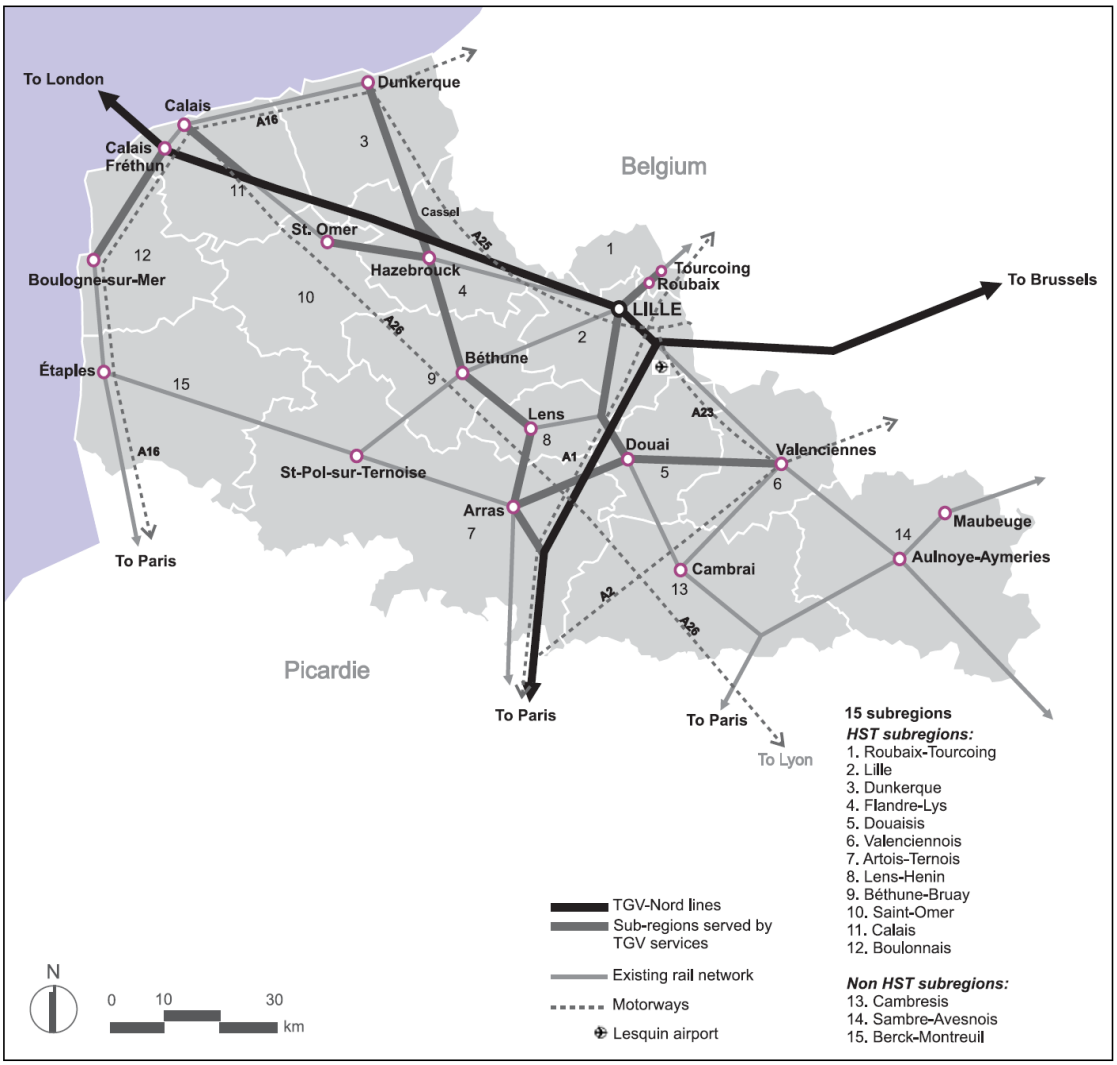
Figure 5-3 The Change in the Rail Network (Before and After the Arrival of the TGV-Nord) in Nord-Pas-de-Calais, France



Source: author

Figure 5-4 further demonstrates the railway network, main stations and 15 sub-regions in NPDC. The interoperability of TGV trains on conventional tracks allowed 12 sub-regions to be served by TGV services between Paris and sub-regions. The TGV-Nord tracks are emphasised in black/ bold and those sub-regions served by the TGV on conventional tracks in grey/ bold. Furthermore, unlike the well-established and extensive motorway systems in NWE before the arrival of the upgraded WCML, the opening of the Channel Tunnel triggered the construction of two motorways, namely the A26 and A16, which were respectively completed in 1992 and 1993. The A26 bypasses Paris, from Calais towards Lyon, via St. Omer, Béthune-Bruay, Lens- Hénin, Artois-Ternois and Cambresis. The A16 is a coastal motorway connecting Dunkerque, Calais, Boulonnais and Berck-Montreuil to Paris via Amiens (Bruyelle & Thomas, 1994). Hence, in addition to the existing A1 (serving Artois-Ternois and Lille), A2 (Cambresis and Valenciennois) and A25 (Lille and Dunkerque), the whole region is well-served by motorways, as well as TGV services. The only exception is Sambre-Avesnois, which has neither a TGV station nor a motorway.

Figure 5-4 The Railway Network, Main Stations, and Sub-regions in Nord-Pas-de-Calais, France



Source: author (Note: The motorway network is supplementary in this diagram)

5.6.1 Effects on Train Times, Patterns and Frequencies

The synergy of the TGV-Nord line and the bypass line (*Le Jonction)* enabled Lille to become an important transport hub. In addition to a faster connection with Paris, Lille was given direct train connections to London, Brussels and major French regional cities like Lyon, Marseille and Bordeaux, and later to Strasbourg and south-west Germany. In the following sections, three types of rail services are analysed, namely inter-regional, intra-regional and international. Table 5-8 shows the evolution of train times and frequencies in NPDC from 1990 to 2006 respectively between Paris and NPDC sub-regions and between Lille and its sub-regions. Three key timings are

analysed in this table: 1990 (pre-TGV-Nord), 1999 (post-TGV-Nord and pre-TERGV) and 2006 (post-TGV-Nord and post-TERGV).

Table 5-8 The Evolution of Train Times and Frequencies in Nord-Pas-de-Calais

Sub-regions	Main Stations	Distance	Average train times			Time zone	Direct train frequencies			Change 1990-2006	
		(km)			(min)	(h)			(count)	(min)	(count)
			1990	1999	2006	2006	1990	1999	2006	Time	Freq.
Between Paris and NPDC sub-regions											
HST sub-regions											
Lille	Lille Flandres	258/227	132	68	64	>=1H	14	22	19	-68	3
	Lille Europe*	258/225	-	62	59	=1H	-	23	24	-	24
Roubaix-Tourcoing	Roubaix-Tourcoing	270/239	157	85	89	1-2H	22	8	8	-68	-14
Dunkerque	Dunkerque	312	181	114	123	=2H	3	7	8	-58	5
Calais	Calais-Ville	296/336	197	179	100	1-2H	6	7	1	-97	-5
	Calais Fréthun*	288/328	-	111	89	1-2H	-	5	5	-	5
Boulonnais	Boulogne	254/370	160	117	121	=2H	6	6	6	-39	0
Artois-Ternois	Arras	199	95	51	49	<1H	14	17	22	-46	8
Flandres-Lys	Hazebrouck	272	159	99	104	1-2H	3	6	7	-55	4
Saint-Omer	St.Omer	293	-	112	116	1-2H	-	1	1	-	-
Valenciennois	Valenciennes	260	-	100	105	1-2H	-	7	10	-	-
Lens-Henin	Lens	219	119	67	70	1-2H	3	6	7	-49	4
Douaisis	Douai	224	112	68	66	>=1H	14	15	19	-46	5
Béthune-Bruay	Béthune	238	135	79	84	1-2H	3	6	7	-51	4
Non- HST sub-regions											
Cambresis	Cambrai	207	-	122	117	=2H	-	1	1	-	-
Sambre-Avesnois	Aulnoye-aymeries, Maubeuge	217/229	134	128	119	=2H	20	17	15	-15	-5
Berck-Montreuil	Étaples	227	142	144	143	>2H	6	6	5	1	-1
Between Lille and its sub-regions											
TERGV sub-regions											
Dunkerque	Dunkerque	86	68	31	32	=0.5H	6	10	23	-36	17
Calais	Calais-Ville /Calais Fréthun	108/110	82	31	30	=0.5H	11	22	32	-52	21
Boulonnais	Boulogne	150	156	54	56	<1H	2	10	10	-100	8
Artois-Ternois	Arras / St.Pol	59/74	35	37	36	<1H	23	26	28	1	5
Non- TERGV sub-regions											
Roubaix-Tourcoing	Roubaix,Tourcoing	10/13	16	20	19	<0.5H	52	8	8	3	-44
Flandres-Lys	Hazebrouck	46	36	36	33	=0.5H	16	24	32	-3	16
Saint-Omer	St.Omer	67	54	54	48	<1H	9	13	16	-6	7
Valenciennois	Valenciennes	48	38	40	40	<1H	18	21	28	2	10
Lens-Henin	Lens	38	42	44	44	<1H	18	23	30	2	12
Douaisis	Douai	34	19	20	20	<0.5H	19	20	30	1	11
Béthune-Bruay	Béthune	42	40	48	46	<1H	6	11	7	6	1
Cambresis	Cambrai	66	47	60	63	=1H	1	5	7	16	6
Sambre-Avesnois	Aulnoye-aymeries/Maubeuge	82/94	73	81	72	>1H	18	29	40	-1	22
Berck-Montreuil	Étaples	135	130	124	138	>2H	2	1	2	8	0

Note1: The figures shown here are the trains departing from Paris or Lille to sub-regions.
Note2: Because some sub-regions have more than one railway station, average train times are the average of all stations and train frequencies are the sum of all
Note3: The train times and frequencies here are based on regular weekday.
Note4: The train times and frequencies from Paris were analysed based on two stations, namely Paris Gare du Nord and Paris Charles de Gaulle TGV station.
Note5: * denotes the new TGV stations.

Source: Thomas Cook Railway Timetables and SNCF-SARDO

5.6.1.1 Inter-regional Services

Between Paris and NPDC Sub-regions

The reduction of train times between Paris and sub-regions is evident; travel times were roughly halved for most sub-regions. Lille and Artois-Ternois could be reached in one hour and all HST sub-regions could be reached within two hours from Paris. Saint-Omer and Valenciennois are now served by the TGV compared with former non-direct train services from Paris. For the three non-TGV sub-regions, there was no reduction in train times from Paris, but they were accessible within two hours except for Berck-Montreuil (2 h 23 m). The time-space effects were the most

significant for Dunkerque and Calais in contrast with the previous average times of more than three hours from Paris. Train frequency has increased rather moderately as compared with the massive reduction in train times. The exception is Lille. Between 1990 and 2006, the train frequency for Paris-Lille route (+27) massively increased by more than threefold the increase for the Artois-Ternois-Paris route (+8). This one hour accessibility from Paris led to a significant demand in daily commuting. Of the top nine TGV cities[50] which are reachable in around one hour from Paris, the Lille-Paris route had the largest base of customers, which exceeded the second TGV city (Le Mans) by 35%. Arras and Douai respectively take fifth and ninth place (SNCF, 2011). In contrast, two non-TGV sub-regions, Sambre-Avesnois and Beck-Montreuil, demonstrate not only no increase, but an actual reduction in train frequency (in the latter case, probably due to a traffic diversion on to the new high-speed line (Vickerman, 2007)). Roubaix-Tourcoing, however, shows a major reduction (-14), which suggests that although the Lille-Roubaix-Tourcoing conurbation was reinforced by the revival of urban tramway services in 1994, the concomitant reduction in direct rail service reinforced Lille's gateway role as the regional intermodal interchange point.

Between NPDC Sub-regions and Other French Regions

Lille possesses a crucial rail interchange function for international and domestic rail services as a gateway to other French regions outside Paris. Eurostar exploited the TGV to directly reach Disneyland Paris in 1996, the French Alps in 1997 and Avignon in 2002 (JRTR, 2005). Additionally, it is evident that for passengers from either UK or Belgium, Lille Europe TGV station provides a seamless and effortless interchange for services to North West France (Le Mans, Nantes, Rennes), South West France (Bordeaux, Toulouse), South East France (Lyon, Marseille, Montpellier and Perpignan), East France (Nancy-Metz, Strasbourg) and South West Germany/Switzerland (Karlsruhe, Stuttgart, Munich, Basel, Zürich). This is in sharp contrast with the inconvenient interchange services in central Paris, which are distributed in different terminal stations such as *Gare Montparnasse*, *Gare du Lyon* and *Gare du Nord*.

5.6.1.2 Intra-regional Services: Between Lille and Its Sub-regions

Unlike the dramatic time-space shrinkage between Paris and Lille's sub-regions, generally speaking the time-space distances between Lille and its sub-regions showed little reduction between 1990 and 2006, except for three remote coastal sub-regions: Dunkerque (-36 min), Calais (-52 min) and Boulonnais (-100 min). All sub-regions are now reachable within one hour with the exception of Sambre-Avesnois (72 min) and Berck-Montreuil (138 min). Train frequencies

[50] In the order of numbers of customers from the largest to the smallest, these nine TGV cities are: Lille, Le Mans, Tours, Saint-Pierre-des-Corps, Arras, Vendôme-Villiers-sur-Loir, Reims, Angers-Saint-Laud and Douai.

increased between Lille and most sub-regions except for Berck-Montreuil, which had a higher frequency to Paris than its regional capital, Lille. Huge increases occurred for those sub-regions around 30 minutes from Lille including Calais (+21), Dunkerque (+17) and Flandres-Lys (+16). There are two exceptions. One, Sambre-Avesnois (+22) shows the highest increase, with a travel time of over one hour from Lille. Here, a similar situation to Pennine Lancashire in the British case, the frequency presented here for Sambre-Avesnois is the average sum of several indirect rail services while measuring the overall rail time spent, so the increased frequency could not be interpreted directly as a sign for improved intra-regional connectivity. Therefore, due caution is needed. The other exception was Roubaix and Tourcoing, with a dramatic decline (-44), again occasioned by the arrival of alternative tramway and metro systems within the Lille-Roubaix-Tourcoing conurbation. It appears that intra-regional TERGV services enlarged the travel-to-work catchment areas between Lille and peripheral coastal sub-regions. According to the regional transport authority, from 2004 to 2009, on the basis of a regular week, the number of TERGV passengers increased almost threefold from 8,211 to 22,305 (Conseil Régional Nord-Pas de Calais, 2010). A growing number of residents in remote Dunkerque commuted to work in Lille (Deroo & Smuerzinski, 2008).

5.6.1.3 International Services

Located as an intermediate station between three large European centres, Lille experienced a transformation from an ignored border city to a potential European hub. However, the international reality has not yet been realised as successfully as its national counterpart. Table 5-9 showed the evolution of HST services from 1998 to 2006. Regardless of TGV services between Lille and Paris Charles de Gaulle Airport, the TGV services between Lille and Paris Nord in 2006 (4.7 million) already accounted for roughly ten times as much traffic as the volume between Lille and London (450,000), as well as between Lille and Brussels (466,000). In addition, Lille's relationship with London and Brussels differs. On the Lille-Brussels route, the initial HST services were relatively low, but demonstrated a steady increase over time, whereas on the Lille-London route, a fluctuating and unstable trend was revealed; only in 2006 did the volume exceed that of the Lille-Brussels route.

Table 5-9 The Evolution of Train Passengers between Lille and Other Cities

Routes									unit: thousands
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Lille - Paris (Gare du Nord)	3,561	3,889	4,260	4,337	4,628	4,450	4,619	4,647	4,737
Lille - Lyon	…	…	…	…	554	576	576	542	607
Lille - Marseille/Montpellier	…	…	…	…	201	218	225	232	225
Lille - Bordeaux	…	…	…	…	135	136	145	143	156
Lille - London	461	528	530	470	491	510	561	…	450
Lille - Brussels	269	309	334	413	382	388	417	438	466

Note1: … figures are not available
Note2: the figures shown here comprised the Thalys trains and Eurostars in both directions.

Source: SNCF

Three reasons may explain why the Lille-Brussels route is more popular than that of Lille-London, namely ticket price, journey time and geographical proximity with cultural similarity. Firstly, the ticket price to London must include the toll of £25 per passenger for using the Channel Tunnel (O'Connell, 2008). Secondly, the journey time on the train between London and Lille takes around one hour 30 minutes, which more than doubles the journey time between Lille and Brussels of 40 minutes. Moreover, the compulsory passport and custom inspection procedure between Schengen and non-Schengen countries requires a minimum of 30 additional minutes before departure (10 minutes for the premium Business service). In this sense, Eurostar services from Brussels to Lille are restricted by this regulation, with the exception of SNCF TGV services. Thirdly, the geographical proximity of Lille and Brussels creates a similarity in culture and economic reality in comparison with that between Lille and London. In particular, the southern part of Belgium is a French-speaking region closer to Lille than to the National Capital, Brussels. In fact, a call for cross-border Lille Metropolitan co-operation involving 15 local authorities and embracing 3.4 million inhabitants was established based on "a common identity forged by history" and now "shared international access" (SPIRE, 2005).

5.6.2 The Wider Impact on Economic Strength and Restructuring

5.6.2.1 Changes in Regional Strength and Economic Structure

Table 5-10 shows changes in GVA, overall and per head, by four groups of economic activities for four main regions in France over three periods of time. The highest percentages contributing to the GVAs are emphasised in bold and italics. The unbalanced development between the Parisian region (Île-de-France) and the rest regions remains, but NPDC did make marginal and slow progress. Regional GVAs were unchanged (at 78) from 1990 to 1999, but rose to 80 in 2006 after the introduction of TERGV.

Table 5-10 Changes in Gross Value Added (GVA) and GVA by Type of Economic Activities in French Major Regions

	GVA /head			A Manufacturing, energy, and construction				B Commerce, transport, and personal services				C Public services				D Knowledge intensive services			
	index						%				%				%				%
	1990	1999	2006	1990	1999	2006	90-'06	1990	1999	2006	90-'06	1990	1999	2006	90-'06	1990	1999	2006	90-'06
France Métropolitaine=100	100	100	100	27.3	23.1	20.6	-6.7	20.1	19.9	20.1	0.0	19.2	21.6	21.3	2.1	29.6	32.3	35.9	6.3
Regions																			
Île-de-France	154	154	152	23.5	16.7	14.2	-9.3	22.3	21.9	22.4	0.1	15.2	16.8	16.1	0.9	***38.7***	***44.3***	***47.1***	8.4
Rhône-Alpes	101	101	101	***32.5***	28.7	25.4	-7.1	18.6	19.3	19.6	1.0	17.4	20.4	19.5	2.1	29.4	***30.0***	***34.2***	4.8
Provence - Alpes - Côte d'Azur	92	90	94	20.9	17.3	16.9	-4.0	23.1	22.1	22.1	-1.0	22.8	25.7	24.9	2.1	***30.5***	***32.3***	***34.5***	4.0
Nord - Pas-de-Calais	78	78	80	***32.8***	***28.3***	23.7	-9.1	19.3	18.5	18.6	-0.7	21.7	25.1	25.3	3.6	23.5	25.9	***30.7***	***7.2***

Note1: The employment is on a workplace basis.
Note2: The table sourced from a database based on economic activities NES14 shows the GVA and GVA by economic activities. The sector of group A is the aggregation of the following economic activities: B(industries agricoles et alimentaires), C(Industries des biens de consommation), D(Industrie automobile), E(Industries des biens d'équipement), F(Industries des biens intermédiaires), G(Energie), and H(Construction). Goup B is the sum of J(Commerce), K(Transports), and P(Services aux particuliers). Group C represents the figures of QR(Education, santé, action sociale, administration). Group D denotes the figures of knowledge intensive services are aggregated from the two categories, namely LM(Activités financières, activités immobilières) and N(Services aux entreprises).

Source: INSEE

Next, the four economic groups underlying the aggregated GVA figures were examined. Similar to NWE, NPDC was experiencing economic restructuring towards the building of a knowledge economy, but at different stages. Prior to the TGV-Nord in 1990, the main economic input came from group A, and this remained unchanged after the advent of TGV-Nord in 1999, until 2006 when group D overtook it. Over the period from 1990 to 2006, group D increased in economic value by no less than 7.2%, higher than the national average of 6.3%. Overall, these figures suggest that it is necessary to properly measure impact at different points in time, in line with key development stages. Here, regional performance figures in 1990, 1999, and 2006 are available to understand the changes after the arrival of TGV in 1993 and TERGV in 2000.

5.6.2.2 Changes in Intra-regional Economic Strength and Restructuring

Employment/ Population/ Migration

In NPDC, GVA/GDHI figures are not available for sub-regions, so employment changes, supplemented with demographic changes, were examined as alternative indictors. Table 5-11 shows employment, population and migration changes for three time periods: before (1968-1990) and after (1990-1999, and 1999-2006). Prior to the arrival of the TGV-Nord, the whole region was hit hard by economic restructuring. The region as a whole experienced massive employment losses which mainly occurred in those sub-regions formerly specialising in coal, iron and textiles, in sharp contrast to employment growth in Lille, Dunkerque, Calais, Saint-Omer, Béthune-Bruay, Berck-Montreuil and less severe reduction than the regional level in Boulonnais and Artois-Ternois. On the other hand, regional population was growing during 1968-1990. However, coal mining/ steel sub-regions had lost employment as well as population. Here, although Lille

was part of the textile conurbation (Lille-Roubaix-Tourcoing), it has been the commercial/trade centre, which could explain why its employment growth during this period 1968-1990 is in sharp contrast to the dramatic decline in Roubaix-Tourcoing.

Table 5-11 Changes in Employment, Population, Migration in Nord-Pas-de-Calais

	Employment	Employment change			Population	Population change		Migration rate/ year	
	1990	68-'90	90-'99	99-'06	1990	68-'90	90-'06	90-'99	01-'06
	count			%	count		%		%
Nord-Pas-de-Calais	1,288,441	-3.6	4.3	9.1	3,965,058	3.9	1.4	-	-
HST subregions									
Lille	312,159	***13.4***	***4.6***	***11.6***	739,794	***11.5***	***5.4***	-2.9	-5.3
Roubaix-Tourcoing	142,423	-12.7	0.2	4.7	413,089	***4.8***	***1.9***	-4.4	-5.6
Dunkerque	88,176	***15.6***	***5.5***	6.2	262,692	***21.7***	-2.3	-5.8	-8.5
Calais	47,027	***3.0***	***7.5***	7.0	153,279	***14.4***	***5.3***	-1.7	-4.3
Boulonnais	49,828	***-0.9***	3.0	***9.9***	158,703	***4.0***	***2.5***	-1.5	-3.8
Artois-Ternois	79,912	***-0.3***	***4.7***	***9.7***	229,057	***8.5***	***3.4***	-2.1	0.3
Flandre-Lys	31,861	-4.4	***5.5***	4.8	112,381	***10.3***	***6.0***	0.8	0.5
Saint-Omer	41,946	***16.4***	2.8	5.3	109,612	***18.3***	***3.9***	-2.2	-3.9
Valenciennois	96,124	-21.1	***8.0***	***17.2***	349,262	-6.2	-0.4	-2.8	-4.3
Lens-Henin	90,264	-21.3	***6.6***	***12.4***	376,738	-6.4	-2.8	-5.2	-5.5
Douaisis	70,278	-7.8	1.1	***9.4***	247,015	-1.2	0.2	-3.0	-3.7
Béthune-Bruay	81,489	***3.6***	3.2	7.2	290,400	-2.5	0.0	-2.1	-0.5
Non-HST subregions									
Cambresis	56,194	-17.7	-5.1	4.7	179,312	-6.9	-1.7	-2.8	-2.8
Sambre-Avesnois	68,824	-18.2	-2.0	2.1	245,460	-0.5	-4.4	-6.6	-6.8
Berck-Montreuil	31,936	***1.2***	***4.4***	***11.2***	98,264	***11.9***	***6.2***	0.3	4.4

Note1: The employment change is on a workplace basis.
Note2: The population change and migration rate are on a residence basis.
Note3: The figures were derived from two datasets, so the change of jobs between 1990 and2006 is demonstrated in two sections i.e. 1990-1999 and 1999-2006.

Source: INSEE

After the arrival of the TGV-Nord, employment losses in sub-regions gradually decreased, while population migration tends to move out of post-industrial sub-regions. Between 1990 and 1999, employment decline was arrested except in two non-HST sub-regions: Cambresis and Sambre-Avesnois. Meanwhile, out-migration prevailed across the region, except for Flandre-Lys and Berck-Montreuil. From 1999 to 2006, employment increases occurred in all sub-regions, but only Lille, Boulonnais, Artois-Ternois, Douaisis, Valenciennois, Lens- Hénin and Berck-Montreuil experienced a growth rate higher than the regional average. Roubaix-Tourcoing showed the lowest employment rate among all HST sub-regions although its job loss had been stemmed. Two non-HST sub-regions are still relatively disadvantaged with the lowest employment growth. In addition, out-migration rates were generally higher than previous for most sub-regions except Berck-Montreuil. Some ex-coalfield sub-regions managed to stem serious population

decline, but due to the increase in out-migration. People continued to migrate to other places, either to Flandre-Lys, Artois-Ternois or Berck-Montreuil within NPDC or to southern regions in France like Rhône-Alpes and Provence-Alpes-Côte d'Azur (Chaillot, 2010).

In brief, over the period from 1990 to 2006, Lille, Valenciennois and Lens- Hénin were the only three HST sub-regions with strong employment increases. Valenciennois benefited the most with the highest employment increases and was the second sub-region (besides Lille) to show positive net travel-to-work flow. Moreover, Valenciennois gradually became a sub core-centre, providing job opportunities for two adjacent non-HST sub-regions, Cambresis and Sambre-Avesnois (Deroo & Smuerzinski, 2008). Non-HST sub-regions showed the weakest performance, except for Berck-Montreuil, which demonstrated continuous employment growth above the national average and was an increasingly popular destination for migration. The exception of Berck-Montreuil may be explained by its accessibility from Paris by conventional train in two hours, equal to the road journey, in particular with the new arrival of the A16 connecting coastal sub-regions with Paris.

Structural Change in Employment

Table 5-12 shows the change of employment structure over the three periods, with the two highest percentages of employment again highlighted (the largest employment growth by a single underline and the second by double underlines). Unlike NWE, whereby group B had been the major economic base at the outset of the upgraded WCML, in NPDC, when the TGV-Nord arrived, the whole region was still industrially-oriented (group A). Between 1990 and 2006, these two largest economic structures (groups A and B) have continued to dominate both HST and non-HST sub-regions, albeit in parallel with a gradual transition in dominance from group A to B. In addition to the TGV-Nord, two new motorways seem to show significant influence on some sub-regions. The growth of employment in group B appeared significant in HST sub-regions served by the A26 and A16 motorways, in particular for Calais where the Eurotunnel portal is situated, with a 9% rise in group B reflecting the effect on developing trade and industry in NPDC (OBM, 2011). However, the former industrial trajectory still plays a key role in the process of economic restructuring. Notably, five HST sub-regions, Béthune-Bruay, Douaisis, Dunkerque, Sambre-Avesnois, and Valenciennois, retain a Group A-led employment base.

Table 5-12 Changes in Employment Structure in Nord-Pas-de-Calais

	A Manufacturing, energy, and construction				B Commerce, transport, and personal services				C Public services				D Knowledge intensive services			
				%				%				%				%
	1990	1999	2006	90-'06	1990	1999	2006	90-'06	1990	1999	2006	90-'06	1990	1999	2006	90-'06
Nord-Pas-de-Calais	***33.9***	***29.7***	***26.9***	-7.0	***27.6***	***29.3***	***30.3***	2.8	19.6	22.9	23.5	3.8	15.3	15.8	17.4	2.1
HST subregions																
Lille	***27.1***	21.6	19.2	-7.9	***28.1***	***30.1***	***29.4***	1.3	23.2	***26.1***	***26.1***	2.9	20.4	21.4	24.7	4.3
Roubaix-Tourcoing	***34.4***	***28.8***	***24.6***	-9.8	***29.0***	***31.0***	***32.9***	3.9	16.2	19.3	20.4	4.1	19.4	20.1	21.5	2.1
Dunkerque	***35.4***	***33.9***	***32.9***	-2.5	***27.9***	***27.1***	***27.6***	-0.3	18.9	21.9	22.3	3.4	14.6	14.8	15.4	0.9
Calais	***39.1***	***29.8***	***24.9***	-14.2	***27.3***	***33.7***	***36.3***	9.0	16.2	19.9	22.5	6.4	13.1	13.7	13.9	0.8
Boulonnais	***31.6***	***29.0***	***26.8***	-4.8	***31.7***	***31.6***	***33.2***	1.5	18.1	22.5	22.8	4.7	13.2	12.7	14.0	0.8
Artois-Ternois	***30.1***	***27.7***	***25.8***	-4.3	***25.4***	***27.6***	***28.7***	3.3	20.1	23.6	24.4	4.3	14.7	15.0	16.3	1.7
Flandre-Lys	***34.6***	***33.5***	***29.9***	-4.6	***28.2***	***29.3***	***31.0***	2.8	16.6	19.6	20.8	4.2	9.6	11.2	12.9	3.4
Saint-Omer	***40.3***	***37.0***	***32.3***	-7.9	***27.2***	***30.0***	***32.3***	5.1	15.3	17.7	18.4	3.1	10.4	11.3	13.3	2.9
Valenciennois	***36.3***	***33.7***	***32.6***	-3.6	***26.8***	***27.8***	***28.6***	1.8	21.0	23.9	23.5	2.5	14.4	13.6	14.3	-0.1
Lens-Henin	***36.9***	***31.5***	***27.4***	-9.5	***29.8***	***30.7***	***33.4***	3.6	20.1	24.1	24.3	4.2	12.3	13.1	14.4	2.1
Douaisis	***39.0***	***33.8***	***31.8***	-7.2	***26.3***	***28.2***	***29.0***	2.7	20.0	23.4	24.2	4.2	12.1	13.0	13.6	1.5
Béthune-Bruay	***41.8***	***38.4***	***34.8***	-6.9	***24.9***	***26.5***	***28.3***	3.4	18.2	20.7	21.8	3.7	11.2	12.1	13.1	1.9
Non-HST subregions																
Cambresis	***37.2***	***32.4***	***30.4***	-6.7	***26.1***	***29.2***	***30.9***	4.8	16.5	20.9	21.6	5.1	11.8	11.7	12.3	0.5
Sambre-Avesnois	***38.3***	***36.2***	***31.7***	-6.5	***24.7***	***26.1***	***28.5***	3.7	18.6	22.6	23.5	4.9	12.6	11.2	12.8	0.2
Berck-Montreuil	***29.9***	***29.1***	***27.4***	-2.5	***27.8***	***29.6***	***31.1***	3.3	22.5	23.8	24.2	1.7	9.0	10.5	11.4	2.4

Note1: The employment is on a workplace basis.
Note2: The largest structure of employment is highlighted by one underline and the second largest structure is emphasised by double under lines.
Note3: The table is the rearrangement of employment groups based on the dataset of 15 economic functions from National Institute for Statistics and Economic Studies, France (INSEE). The group A is the sum of three economic functions, namely fabrication, entretien-réparation, and bâtiment et travaux publics. The group B is consisted of four economic functions, including commerce inter-entreprises, distribution, services de proximité, and transports/ logistique.The classification of group C comprise three economic functions, namely education, formation, santé et action sociale, and aministration publique. The definition of group D includes the four economic functions: gestion, conception-recherche, prestations-intellectuells, and culture-loisirs.

Source: INSEE

The only exception is the regional core sub-region, Lille. Here, Group B was the major base of employment before the advent of the TGV-Nord. After the arrival of the HST, the second employment base changed from group A to C in 1999 and 2006. The apparent tendency of growth in public services (group C) in Lille was further confirmed in a recent report, which demonstrated that authorities and associations accounted for 21% of the total floor space in 2010 and over the past five years, from 2005 to 2010, the figure continually rose from 14.5% (OBM, 2011). In addition, most HST sub-regions had lower rates of knowledge-intensive employment than the regional average, except Lille and Roubaix-Tourcoing. Lille showed a big increase in group D (24.7-20.4=4.3%), higher than the regional average (17.4-15.3=2.1%). On the other hand, non-TGV sub-regions demonstrated a continued weakness in growing their knowledge-intensive employment base. In 2006, they became the bottom three in terms of group D employment.

5.7 Discussion

Bringing these findings together, the evidence of the wider impact of HST is now discussed with specific reference to the research question and hypotheses posed at the outset. Based on two different HST approaches and two spatial-economic effects, two-hour (London-Manchester) and one-hour (Paris-Lille) respectively, the spatial-economic patterns of HST systems are presented.

In NWE, the upgrade approach to HST development reduced the London-Manchester inter-city rail journey to two hours every 20 minutes, leading to a sharper north-south divide than had existed before the upgraded WCML. Four southern sub-regions had already been experiencing strong economic strength, led by Halton and Warrington. Then the advent of the upgraded WCML brought these four within two hours of London, triggering an internal shift of significance to Greater Manchester South, which shortened the gap between Greater Manchester South and Halton and Warrington, and gave the four southern sub-regions momentum to grow in knowledge-intensive services. In contrast, four other HST sub-regions (Merseyside, Greater Manchester North, Central Lancashire and Lancaster) presented weaker economic performance with high a proportion of public services, which seems to show their reduced attractiveness to knowledge-intensive services with train times of over two hours from London despite, being directly served by HSTs. Additionally, two non-HST sub-regions, West Coast Lancashire and Pennine Lancashire, not only in relation to the national capital (over three hours from London), but also to the regional capital (over one hour from Manchester), seem to be condemned to lingering economic disadvantage. The updated 2010 Index of Multiple Deprivation for English Cities (2011) confirmed that intra-regional inequality had widened between metropolitan and peripheral non-metropolitan sub-regions within the North West. During 2007 and 2010, Metropolitan core cities served by HST improved, but towns in post-industrial Pennine Lancashire and West Coast Lancashire deteriorated. The number of most deprived neighbourhoods had fallen by 13% in Manchester and 9% in Liverpool, whilst figures for the same indicator had increased by 43% in Burnley and by 17% in Blackpool.

The varying rail frequency between the core metropolitan sub-region and its sub-regions also reflects the constraints and opportunities for intra-regional development. The revived Greater Manchester South area consolidated its importance as the main agglomeration economy. For southern HST sub-regions, adjacent Cheshire East and Halton and Warrington, which have been, for a long time, decentralised economic centres from Manchester, show a stable relationship, whereas relatively remote Cheshire West and Chester and Lancaster maintained their weak relationship. In addition, intra-regional services from these sub-regions which are approaching Manchester Piccadilly station from the southern rail link actually are largely squeezed by

inter-regional Pendolino services. With regard to the remaining northerly HST sub-regions, namely Central Lancashire, Merseyside and Greater Manchester North, apart from the arrival of HSTs, the frequency of intra-regional services is enhanced through the Trans-Pennine Express services with Manchester Piccadilly and Airport. This coexists with the high percentage of public services in these places. One could expect that this could be explained by their preferable location for certain types of public services which could be accessed frequently from the metropolitan centre but not necessarily need to be located within the metropolitan core. On the other hand, for the non-HST sub-regions, their intra-regional and inter-regional services are both disadvantaged. Although directly served by intra-regional trains, West Coast Lancashire has not enhanced its intra-regional connectivity either through increased frequency or reduced train times. As for Pennine Lancashire, indirect and lengthy inter- and intra-regional train services discourage easy commuting into the economic agglomeration in Manchester as well as resulting in their weakness in accessibility which is a handicap in attracting inward local economic development.

In NPDC, within one hour (previously two hours) from Paris, with high train frequency and high percentages of daily customers, Lille demonstrated the largest increase in knowledge-intensive employment above the national average and continued to grow in public services. This shows that the arrival of the TGV-Nord and the interconnection with Paris CDG Airport not only assisted Lille to develop its knowledge economy, but also drew Lille into a wider Parisian region within a one-hour commuting distance, which was reflected in the growth in public services. This situation echoes the third scenario presumed in the *Livre Blanc du Bassin Parisien* (DATAR, 1992) which hypothesised that, since it became within one hour from Paris, Lille has effectively joined the Parisian region with the localisation of high-valued economic activities, whereas within two hours from Paris, Lyon remains a centre independent from the Parisian Basin. Furthermore, the TGV-Nord brought a new perspective to the previously negative position of a frontier region; the international connection assisted by growth of a cross-border region centred around Lille. On the other hand, the interoperability of TGV trains onto the conventional tracks allowed most sub-regions served by TGVs to fall with two hours (previously three hours) travel time from Paris and reversed job losses for most HST sub-regions. However, employment change towards building a knowledge economy did not improve equally. Non-HST sub-regions, indeed, show the lowest percentages of knowledge-intensive employment. However, less-industrialised sub-regions, either with or without TGVs, seem to demonstrate fewer problems in their transformation process than others. In addition, the TGV-Nord and new motorways led to much-improved accessibility to this region, which seems to have generated a higher level of migration to other places.

Similar to NWE, the revived Lille centre became a magnet for jobs for its surrounding sub-regions. The analysis of rail frequency suggests that the arrival of TERGV increased travel-to-work mobility from the coastal area to the regional centre Lille, while Sambre-Avesnois, despite

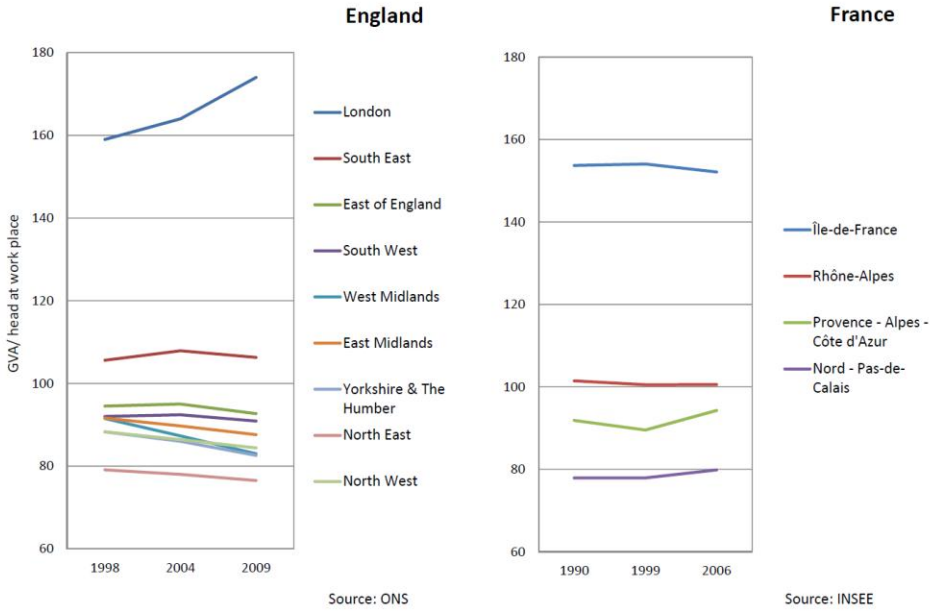
showing the highest increase in train frequency with Lille, has indirect transport connectivity over about one-hour rail journey and disadvantaged economic conditions.

Comparison between the two regions shows that the transformation of two post-industrial regions and sub-regions towards a knowledge economy brought by HST has proved to be a complex and difficult process, but the similarity and difference between these two case study regions are manifest (Figure 5-5). The similarity lies in the fact that both regions have strengthened their representation of knowledge intensive industries, and the connection with the national capital by faster train services did economically strengthen Manchester and Lille, but did not necessarily have the same effect for nearby sub-regions, especially former industrial sub-regions. The difference is that the overall regional disparity between NPDC and *Île-de-France* has been progressively reduced, although a big gap remains, whereas uneven regional development between NWE and Greater London has widened. It suggests the transformation process of post-industrial regions is a long-term evolution and involves more than a HST connection. Further qualitative in-depth interviews and policy analysis is necessary to offer insights into the variations in the wider spatial-economic outcomes.

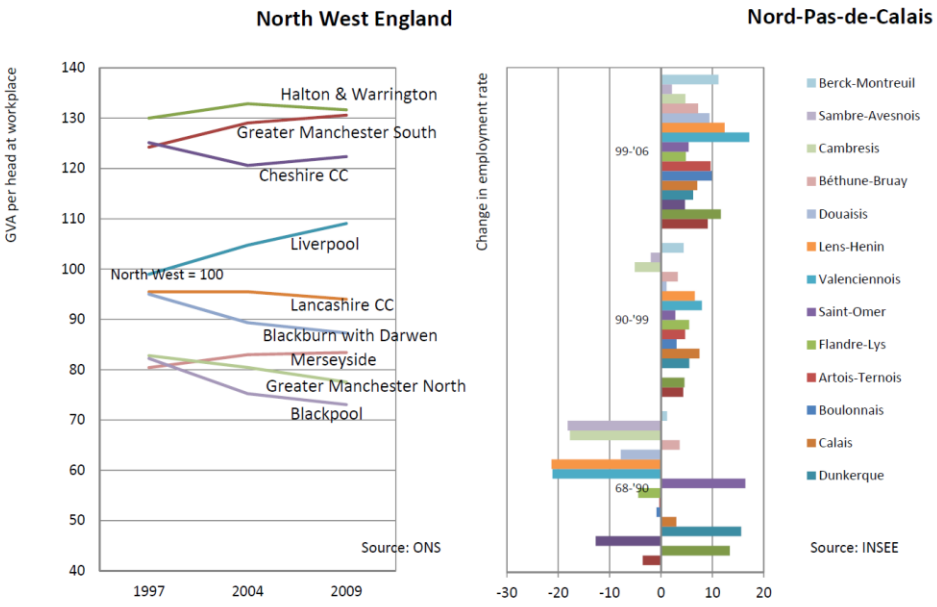
From the findings of the two regions, a critical distinction needs to be made between directly served HST-sub-regions and non-HST sub-regions. The findings from this intra-reigonal study have revealed that regional capitals have benefitted the most from agglomeration economies, but the benefits have not necessarily spread into neighbouring sub-regions. It suggests that HST could facilitate the decentralisation at the national level with the revival of regional cities through efficient and much improved inter-city connectivity by HST within 1-hour and 2-hour from the national capitals. At the same time, HST tends to trigger the centralisation at the regional level around the regional capitals. Although there could be several other HST sub-regions within a region, their HST services usually do not have the same level as the regional capital has unless there are additional interventions at work to widely spread the benefits. Most importantly, it is not necessarily a zero-sum game because both inter- and intra- regional connectivity are essential. Therefore, for non-metropolitan sub-regions, intra-regional accessibility with the regional capital could prove to be more critical and practical than inter-regional connectivity. But then it suggests that strategic regional intervention would be needed to exploit the HST opportunity at the regional level. To understand further, all these depend very much on specific contexts with qualitative investigation.

Figure 5-5 A Summarised Comparison of Inter- & Intra- regional inequality between the Two Cases

Inter-regional Comparison



Intra-regional Comparison



Source: reorganised from Table 5-4, Table 5-5, Table 5-10, & Table 5-11.

5.8 Chapter Conclusions

These findings lead to the conclusion that the wider intra-regional impact of HST are challenging. Through the quantitative examination of a "before" and "after" situation for both post-industrial regions, it is found that the connection with the national capital by faster train services did economically strengthen the regional capital, but not necessarily for sub-regions around it, especially formerly industrial sub-regions. The transformation process of post-industrial regions involves more than connection with a high-speed train, significant as this may be, over a long-term evolution. Both post-industrial regions are still in the course of transition; in NPDC, wider economic transformation is just beginning to happen through improving the intra-regional connection, while in NWE, the laboriously-upgraded approach seems to demonstrate wider uneven patterns and limits to its transformative power. From the next chapter onwards, the second half of this research is devoted to teasing out the complexity and difficulties involved in exploiting HST opportunities via public intervention in these two regions over time. An analytical framework which presents the national context for local intervention is proposed and reviewed in Chapter 6 as a guideline for conducting the qualitative part of the study and consequent analysis.

Chapter 6 Towards An Explanation: Establishing An Analytical Spatial-Economic Planning Framework for Government Intervention

6.1 Introduction

Based on the potential of HST, Chapter 3 developed a theoretical framework for two empirical studies (Chapters 4 and 5) in order to understand the spatial-economic impact of the competitiveness of HST on economic strength and economic restructuring towards a knowledge economy in dynamic regional and urban development. Chapter 5 showed the arrival of HST services strengthens regional capital, but not necessarily in neighbouring sub-regions; this is particularly the case for post-industrial towns. Regional performance has been slowly improving in NPDC, but deteriorating in NWE.

This chapter aims to develop an analytical framework in order to understand the role of government intervention in seizing the opportunities presented by HST to possibly reduce intra-regional inequality. It tentatively guides the following two empirical chapters with qualitative research methods based on in-depth interviews and policy analysis. By so doing, it could assist the comprehension of the varying impacts between the two regions and within them. The major question posed is sub-research question three (SRQ 3) proposed in Chapter 1.

> ***SRQ 3:*** *How could the impact of HST be spread as widely as possible throughout a region by government intervention, which could ultimately reduce regional inequality?*

Since HST investment is generally a national decision, the wider impact of HST will involve interaction between the national and local governments during the transformation process. Both national contexts defined here refer to national spatial-economy planning approaches from the 1980s to 2000s, which were adopted and modified according to national perspectives of the political economy on transport/urban/regional planning policies and government institutional systems/restructuring. Planning policies are closely interdependent with government systems and restructuring because they determine the most appropriate scales and levels of power at which policies will be implemented. They will be discussed in more detail later in both national contexts.

This chapter is structured in six sections. Section 6.2 begins with an analytical framework which is further developed through a literature review and policy reviews for each element, before hypotheses are raised in the last section. Section 6.3 embarks on the national political economy perspective and modern capitalism and state intervention are discussed, namely the fundamental characteristics of the political economy embedded in society and the evolution of the political economy throughout the arrival of economic crises in the late 1970s. In section 6.4, styles of

transport investment are reviewed in relation to national political economies. In section 6.5, government systems and restructuring are examined via the way in which the institutional form was restructured by the national state, which possibly affected intervention at the local government level. In section 6.6, urban and regional planning policies are discussed. In section 6.7, with reference to each element suggested in this framework, a close examination of British and French planning approaches is hypothesised as the basis leading to two follow-up empirical chapters.

6.2 Establishing An Analytical Spatial-Economy Planning Framework for Government Intervention

The art of capitalising on transport investment varies in different contexts and involves public intervention in a strategic way that stretches beyond the original investment. In parallel with the arrival of HST, the decline in post-industrial regions and cities has resulted in the evolution of urban and regional planning policies and government restructuring in tackling these urban and regional problems. It is fundamental to envisage how local intervention would be shaped by or respond to the national context, which entails different national political economies and their consequent decisions regarding urban and regional planning policies, as well as institutional arrangements. This framework involves a series of literature and policy reviews in the following sections, which assist in understanding the wider impact of HST and the generation of hypotheses for this comparative case study.

6.3 The Perspective of the National Political Economy

6.3.1 Modern Capitalism and State Intervention

The modern capitalist economy continues to be marked and propelled by rapid industrialisation. Classical economists proposed a new vision with a request of "*laissez faire, laissez aller*", i.e. the removal of all restraints in order to reach a world of perfect competition because free market conditions were regarded as beneficial to society. This revolutionary claim exerted far-reaching influence in the era of the late 18th century, when restrictions such as monopolies, tariffs, duties and other state enforced constraints were pervasive due to "the destruction of what was and the rebuilding of the world according to a new ideal" (Strachey, 1994, p.42).

However, the nature of the free market condition has been controversial. Polanyi argues "the idea of a self-adjusting market implied a stark Utopia" (K. Polanyi, 2001 [1944], p.3) because land, as

one of three basic elements (in addition to labour and money), is particularly rooted in a specific milieu, and has unavoidably had to operate under certain regulations or customs. Instead, the state has played an indispensible role in relation to all the circumstances of market forces in a capitalist economy. On the one hand, he stresses that, far from exclusion from intervention, free market conditions are deliberately controlled by the state. "The road to the free market was opened and kept open by an enormous increase in continuous, centrally organized and controlled interventionism" (K. Polanyi, 2001 [1944], p. 146). On the other hand, the state has to deal with the negative consequences of free market conditions. Polanyi identifies "a double movement", namely market expansion on a global scale as well as "a network of measures and policies […] integrated into powerful institutions designed to check the action of the market relative to labour, land, and money" (K. Polanyi, 2001[1944], p. 79). Similarly, Scott echoes this view by emphasising the interdependent relationship between the national economy and the state because it is "[…]the essential guarantor of those institutional underpinnings without which markets cannot work, and which help to stabilize the numerous inner disequilibria and imbalances of capitalist society" (Scott, 1998, p.13).

Consequently, state intervention in order to readdress the imbalance between private and public power results in the prevention of dynamic capitalist systems from collapse. Like the concept of a "dual movement" coined by Polanyi, Scott states that "capitalist society thus made its historical appearance as a system offering enormous flexibility and wide margins of manoeuvre for economic and political action" (Scott, 1998, p.13).

6.3.2 Post-war Capitalism in Western Europe and Its Evolution

This research context is set in post-industrial Western Europe in the 1980s when economic models adopted in the immediate post-war period were facing serious challenges after a thirty- year implementation. The Keynesian paradigm had profoundly shaped the ideological consensus on the active role of the state among many European countries, but a variety of national styles existed when it came to stabilising economies and addressing high unemployment.

Social scientist scholars have attempted to identify different styles of national regimes with different specific concerns. Sociologists are particularly interested in state commitments to social welfare systems e.g. Richard Titmuss (1958), Esping-Andersen (1990). Three works are examined to identify three classic models of post-war capitalism in Western Europe, namely Shonfield (1965), Albert (1993) and Schmidt (2002, 2003). Firstly, British economist Andrew Shonfield pioneered the teasing out of different styles of capitalism in his invaluable work "*Modern Capitalism- The Changing Balance of Public and Private Power*". He offered invaluable insights into the role of the state, the relationship between the private and the public sector and approaches

to economic planning through the lens of histories and cultural attributes. Secondly, French economist Michael Albert, in his work "Capitalism against Capitalism"[51], classified three types of capitalist states, namely the Anglo-Saxon model, the Rhineland model and the French model. The focus of Albert rested on the role of the state in managing economic order. Lastly, with a special focus on European states, Schmidt (2002) and (2003) developed the same classifications as Albert with different labels for three ideal-typical models of capitalism, namely Market Capitalism, Managed Capitalism and State Capitalism. She attempted to systematically create a comparative framework to identify different styles of national states.

Although each country is different, studying all the capitalist states in Europe is beyond the remit of this research. Based on the aforementioned scholars' work, three models (see Table 6-1) are distinguished and illustrated briefly in order to better understand the national differences between the two studied countries, the UK and France.

Table 6-1 Three Models of Capitalism in Western Europe (Prior to the 1980s)

	Model 1	**Model 2**	**Model 3**
	Market Capitalism (Anglo-Saxon)	Managed Capitalism (Rhineland model) (Social market economy)	State-led Capitalism
The State			
State characteristics	Liberal arbiter	Enabling facilitator	Interventionist leader
Government relations	Arms' length	Negotiated	State-directed
Investment			
Investment horizon	Short-term view	Long-term view	Medium-term view
Investment sources	Capital markets	Banks	State
Investment goals	Profits	Firm value	National political-economic priorities
Representative countries	UK	Germany, Sweden, The Netherlands	France, Italy

Source: Adapted from Shonfield (1965), Albert (1993), and Schmidt (2002, 2003)

[51] The original French version was published in 1991 and the English version was released in 1993.

Model 1: Market capitalism (the Anglo-Saxon model)

Market capitalism, termed elsewhere as the Anglo-Saxon model, is characterised by the role of the state in setting rules (regulations). Like a liberal arbiter (or an umpire), the state makes judgements based on rules (regulations). In addition, even if the state offers aid to industries on an ad hoc basis and intermittently intervenes, it remains at arms' length from the private sector. Regarding investment, market capitalism has a short-term view which prioritises profits (as well as cost) from investment through the financial resources of capital markets. The UK is widely recognised as an example of this model.

Model 2: Managed capitalism (the Rhineland model)

Managed capitalism, also known as the Rhineland model or the social market economy according to Albert's classification, is remarkable due to the active role played by public authorities in guiding investment planning. Private enterprises are encouraged by public funding through banking systems; this is particularly the case for regional policies. The "enabling" state facilitates "business activities through more targeted aid to industry by way of regionally provided subsidies and loans, support for research and development, as well as education, apprenticeship and training programmes, often leaving the rules to be jointly administered by economic actors" (Schmidt, 2003, p. 529). The most exemplary country is Germany and some smaller European countries such as the Netherlands, Austria, Denmark and Sweden. Although a further distinction could be made between West Germany and Scandinavian countries, the shared features here are twofold. Firstly, a strong state manages capitalist economies through active social welfare policies. Secondly, the state does not particularly intend to nationalise all industries, but to lead national economic development under their guidance (German and Swedish models are illustrated further in Appendix 16).

Model 3: State-led capitalism

State-led capitalism represents the strong role of the state in capitalist economies. The dirigiste or interventionist state leads economic activities "through planning, industrial policy and state-owned enterprises" and the rules are administered by the state (Schmidt, 2003, p. 529). The best example of this model is France, which distinguishes itself from most European countries. Spain and Italy take similar approaches and Perez argues post-Franco Spain, to some degree, resembles state capitalism (Schmidt, 2003). In addition, Lange and Regini opine that Italy, particularly northern Italy, is also counted since large firms and nationalised enterprises reside and operate in a "state-led by indirection" manner (cited in Schmidt, 2003, p.527).

The Evolution of Capitalist Systems

Since the mid-1970s, after thirty glorious years (*Les Trente Glorieuses*) over the post-war boom era, national states in Western Europe have encountered more and more external and internal challenges due to this Fordist type of economic expansion with significant public expenditure. Externally, the rapid expansion of globalisation and Europeanisation has increasingly exerted common pressure on national states, which responded with a series of structural reforms towards greater market-oriented approaches e.g. deregulation and privatisation. Internally, massive deindustrialisation in the post-industrial era has resulted in economic restructuring towards a knowledge economy. Nevertheless, these national states have adapted themselves to the challenges based on their traditional political economy. Schmidt (2002) notes that British market capitalism has been further enhanced. As for managed capitalism in Germany, elements of market capitalism have been incorporated into the existing model with the on-going enabling role of the state. In France, state-led capitalism has been transformed with a less direct, but still active role of the state. Table 6-2 shows changes to models of capitalism prior to 2000.

Table 6-2 Changes in Characteristics of Models of Capitalism (Prior to 2000)

	Model 1	**Model 2**	**Model 3**
	Market Capitalism (Anglo-Saxon)	Managed Capitalism (Rhineland model) (Social market economy)	State-enhanced Capitalism
State			
State characteristics	(More) Liberal arbiter	(Still) Enabling facilitator	(Much less) Interventionist leader (much more liberal)
Government relations	(More) Arms' length	(Still) Negotiated	(Less) State-directed, (more arms' length)
Investment			
Investment horizon	(Even) Shorter-term view	(Somewhat less) Long-term view	(Less) Medium-term view
Investment sources	Capital markets	Bank, Firm, Capital markets	Firm, Capital markets
Investment goals	Shareholder values	Stakeholder values	Firm autonomy
Representative countries	UK	Germany	France

Source: adapted from Schmidt (2002, 2003)

6.3.3 The National Political Economy in the UK and France (1980s-2000s)

The national political economy in the UK and France needs to be examined further to gain a comparative perspective. Firstly, a distinguished political culture, which could not easily be erased and converted, has developed and become embedded in society. The UK is the epitome of market capitalism due to its historical roots. The British style of capitalism can be traced back to its origins in the industrial revolution in the 18th century. Andrew Shonfield notes that the British system "was believed to be the impossibility of imposing any direction on it whatsoever-whether from inside the market, by the firms themselves, or from outside it by the authority of the government" (Shonfield, 1965, p.71). In addition, this deeply ingrained ideology in industrial Britain appears to profoundly determine the British planning approach, hence concern regarding cost and price and negligence of long-term investment. By the mid-19th century, German economist Friedrich List had remarked that "the British doctrines concentrating on cost and price factors, combined with an apparent indifference to the problem of long-term investment, were part of an intellectual trick perpetrated by a satisfied industrial nation" (quoted from Shonfield, 1965, p. 81).

In contrast, France has been a prototype of a strong state interventionist approach. There are at least four key elements underlying this methodology. Firstly, an elite ruling class responsible for national development has deep roots in history. The French essentially believed that "…a nation's economic life must depend on the concentration of power in the hands of a small number of exceptionally able people, exercising foresight and judgement of a kind not possessed by the average successful man of business" (Shonfield, 1965, p.71). Secondly, "highly skilled, technically trained civil servants" became the powerhouse leading a strong administrative bureaucracy with a strong state identity e.g. *colbertisme, dirigisme,* which can be traced back to the Napoleonic era, if not further (Schmidt, 1996, p.25). Since WW2, this elite corps has been deliberately produced and reinforced by their attendance at identical educational institutes (*Ecole nationale d'administration* (ENA) [52] or *Polytechnique*) and their associates in the *grands corps* of civil servants (Schmidt, 1996). Thirdly, a close government-business relationship was forged out of civil service recruitment patterns and career histories. "*Pantouflage*" denotes the mobile relationship between high-level positions among administration, politics and business (Schmidt, 1996, p.26). Finally, the national state has strongly leaned towards economic activities. It was observed that the French economic policy traditionally attempted to extend the range of national production (Shonfield, 1965). Friedrich List, the inventor of "national economics", describes the French industrial system as "a system which has solely in view the founding of a national industry… without regarding the temporary gains or losses of value in exchange" (quoted from Shonfield, 1965, p.78).

[52] ENA was created by *Charles de Gaulle* in October 1945.

The role of state intervention has been the major difference between the two countries. In reaction to external forces in the 1980s, the newly-elected political leaders in both countries implemented a series of reforms which signified their traditional distinctiveness. In the UK, under the regime of Conservative Prime Minister Margaret Thatcher, massive public spending cuts, deregulation, privatisation and the withdrawal of public investment reflected the basic market-led approach which adhered to the belief that minimum public intervention could ensure efficiency and delivery by the private sector. The British Labour party's ideology towards the spatial distribution of power, wealth and status did not seem to prevail. Sharpe (1982) states it was puzzling that the British Labour party presented an idea of centralism. In contrast, in France, the left-wing Socialist President François Mitterrand, elected in 1981, brought about the remodelling of a strong state, highlighting his concern for social welfare and inequality. One of his most significant reforms was the decentralisation law of 1982 which was pledged in the socialist party's manifesto in the 1970s; the objective was to allow greater local democracy and political participation against the bureaucratic system traditionally controlled by the centralised state (Bizet, 2002; Mazey, 1987). Mitterrand[53] disagreed with the dichotomy of the two cultures of the French left: a centralised Jacobin culture and a decentralising culture, which is doubtful about state intervention. He firmly believed "the necessity of conquering the state as a *sine qua non* of any transformation" (Cole, 1994, p.62). As Cole comments, "Mitterrand's actions, before and after becoming President, could be located firmly within the centralising tradition of French republican political culture" (Cole, 1994, p.62). Despite the fact his successor, French President Jacques Chirac (1995-2007), was usually classified as a right-wing leader in France, he still embraced the dirigiste political-economic model rather than adopting a *lassez faire* "Anglo-Saxon ultraliberalism" (Alesina & Giavazzi, 2006, p.125).

6.4 National Perspective: Styles of Transport Investment

Encountering the growth of and competition from road transport, in the 1960s and 1970s rail services experienced a huge deficit. Since the 1980s, although characteristics vary among advanced countries in Western Europe, general trends have tended to promote the efficiency and competitiveness of transport sectors in response to external competition and fiscal deficit. Two general public policies have profoundly challenged conventional styles of transport investment.

[53] "I have been labelled as a centraliser. That makes me smile. I am mayor of a small commune, president of a provincial departmental council, and I have always argued in favour of a thoroughgoing decentralisation, for the suppression of the institution of Prefect, and for increased powers and finance for local authorities. It is true, however, that I do not consider that a break with capitalism can come about by a collection of social experimentations. I firmly believe in the power of the [sic] state as well" (quoted from Cole, 1994, p.62).

Firstly, austerity measurements in public spending have had a major impact on transport investment. Since then, key questions have shifted from public provision to private participation regarding how infrastructure should be financed and how it should be priced (Banister and Berechman, 2000). Secondly, the efficiency of public provision and ownership has been questioned. Neoliberal critiques regard these circumstances as "inefficiencies" of centralised public control and ownership, which led to infrastructural liberalisation and privatisation (S. Graham & Marvin, 2001).

National styles of transport investment entailed national political ideology in the UK and France. In the 1980s, the British Government embraced deep-rooted neo-classical ideology to slash public spending; transport has been largely privatised since the mid-1980s. The French Government, however, implemented a Keynesianism approach by injecting public money[54] into TGV construction which was intended to reduce unemployment and stimulate growth (Meunier, 2002). In the following sections, the two approaches to transport investment are further discussed.

6.4.1 Transport Investment in the UK and France

UK

From the early 1970s onwards, although the role of transport was not abandoned publicly, a deep-rooted British ideology which valued cost, competition and efficiency has gradually been reflected in the transfer of transport investment from public to private hands. This is significantly different from post-war Britain, when the British Government injected massive investment in roads into disadvantaged regions[55] (Hart, 1993). The evaluation of transport investment shifted its focus: from systematic analysis in the 1960s and 1970s of large-scale state-oriented investment projects to emphasising financial-driven policies (Banister, 1994).

Firstly, there has been a shift in public expenditure in transport in two aspects, namely a move from investment to revenue subsidies and a change in resources from public to private road construction under the ideology of "Roads for Prosperity" (Starkie, 1981). In 1976, less than one seventh of the transport resources of £20 billion was paid by governments (Department of Transport, Scottish Development Department, & Welsh Office, 1977). Although this shift did not demonstrate the relationship between a reduction in expenditure and an increase in efficiency

[54] Meunier (2002) stresses that the first TGV line between Paris and Lyon did not rely on public money but a financial loan. However, under the Mitterrand presidency, public money was injected into TGV development.

[55] The first motorway section in the UK was the Preston bypass, completed in 1958; subsequently, North West England had the densest motorway network in the UK by the early 1980s.

(Starkie, 1981), the government appeared not to invest as much as they had in the past due to the unjustifiable cost of unpopular transport modes[56]. The 1977 Transport White Paper stated:

> *"The Government cannot expect its own view to command uncritical support. But those who wish to see a significant increase in transport expenditure have a duty to say where the additional money should come from. Those who want to spend more in one area or another of transport must show where, within the budget for transport, compensating savings should be found" (Department of Transport, et al., 1977, p.3-4).*

The story of the construction of the Channel Tunnel is a classic example to illustrate the government's views on public transport. The oil crisis of 1973 led to the abandonment of this transport project from the British side. Although it was revived in the 1980s, the British Prime Minister at the time agreed to this project on the condition that no public funding would be involved[57].

Secondly, the privatisation of transport sectors was implemented from the 1980s with a series of Acts[58]. The Transport Secretary of State at the time, John MacGregor, aptly articulated the exemplary political ideology for this policy.

> *"Privatisation is one of the great success stories of this Government. It has taken different forms in different different industries. But common to all privatisations has been the harnessing of management skills, flair and and the entrepreneurial spirit of the private sector to provide better services for the public. The time has come to to extend these benefits to the railways. This calls for a new approach. British Rail makes large losses. It cannot cannot therefore be sold as a complete concern in the same way as other industries which we have privatised and and there will not be substantial proceeds to the Exchequer. Our objective is to improve the quality of railway railway services by creating many new opportunities for private sector involvement. This will mean more competition, greater efficiency, and a wider choice of services more closely tailored to what customers want" (Department for Transport, 1992).*

[56] The implementation of rail privatisation in the UK has not only created a complicated contractual relationship between the public and the private sectors, but also among private companies. The split of British Rail into a large number of private companies is reminiscent of a model of "the competitive structure of Victorian times" (BBC, 2000). The role of the government was that of an umpire, to set up a regulatory framework with two regulatory bodies, namely the Office of Passenger Rail Franchising (OPRAF) and the Office of the Rail Regulator (ORR). However, the impact of rail privatisation has been controversial. The government believed that the introduction of competition involving private companies would increase efficiency and ease financial constraints by handing public assets to private hands. In order to make franchises attractive to the private, subsidies were guaranteed to cover their losses. It was argued to be "a sure way to ensure a speedy sale" (BBC, 2000). However, public expenditure in rail sectors increased instead. Roger Ford, editor of Rail Privatisation News, points out "There is now around £ 1.8bn in subsidy going into the rail industry, compared with £ 1.1bn before the restructuring ... We don't know whether we are going to get value for that extra money" (Wolmar, 1996). Similarly, regarding the Rail Value for Money study, a recent independent report completed by Sir Roy McNulty found similar evidence of "an efficiency gap" in the British rail industry "…the UK taxpayer is also paying at least 30% more than taxpayers elsewhere" (McNulty, 2011) and identified ten major barriers to efficiency, including fragmentation, the ways in which the main players are operated, roles of government and industry, incentives, franchising, fare structures, legal and contractual frameworks, supply chain management and relationship and culture. He suggests that these barriers can be overcome, with strong leadership and concerted effort.

[57] In 1984, the British and French Governments reached an agreement on a private investment approach, namely using private promoters for the construction and operation of a cross-Channel fixed link and related rail links.

[58] The Airport Act 1986, the Transport Act 1985 (for buses) and the Railway Act 1993.

In addition, rail services under privatisation in the UK are controlled and implemented at the national level. Rail services are provided, in line with rail routes rather than territorial boundaries such as regional or sub-regional areas. Therefore, there is no responsibility or resources at the local level to develop an intra-regional network for each region. The power is controlled by the state and private train operators.

France

In France, urban public transport returned to prominence in the 1970s after a massive programme of road investment[59] resulting in an urban transport crisis e.g. financial limitations, congestion and quality of life (Lassave & Offner, 1989). A critical hypothecated tax (*Versement Transport*, VT[60]) was introduced in this period, which has proven to be significant in granting local authorities the power and resources to invest in and transform local transport systems. "Urban transport policies in the 1970s can be analysed as local takeovers of national procedures" (Lassave & Offner, 1989, p.121).

Efforts made in the 1970s towards urban public transport planning were further institutionalised in the 1980s (Lassave & Offner, 1989). In association with the decentralisation law introduced in 1982, Charles Fiterman, the then Communist transport minister under a coalition government, introduced a series of transport reforms despite the fact that they "all occurred against a background of economic crisis and deregulation" (Lassave & Offner, 1989, p.120). Firstly, a key transport law called The Future of Internal Transport (LOTI) was introduced in 1982 to highlight the wider perspective on transport in society e.g. social, economic and equality aspects. It initially targeted a revision of the statutory position of the SNCF which monopolised the national rail industry, but the outcome provided a comprehensive legal framework for transport planning. Shared roles were defined for the relationship between the central and local states and also that of the public authorities and the operators for all modes and at all spatial levels (Harman, I'Hostis, & Ménerault, 2007). In addition, LOTI explicitly illustrates a broader perspective on transport which is interwoven with other physical and social-economic environments. This system involves "an overall policy associating direct and indirect partners around economically and socially effective objectives" (Lassave and Offner, 1989, p.126).

[59] The fifth plan (1966-1970) demonstrated "a Buchanan like concern with the need to improve highways and to adapt the town to the car" (Banister 1994, p.108).

[60] VT was first introduced in the Parisian region. In 1973 VT was applied to towns with a threshold of 300,000 inhabitants. In 1974, the threshold of VT was dropped to 100,000 inhabitants. The threshold of VT continues to drop significantly: 30,000 inhabitants in 1982, 20,000 inhabitants in 1992, 10,000 inhabitants in 1999.

Two objectives of LOTI are stated. One, public transport needs to ensure 'complementarity' and 'fair competition' among different methods of transport. The other, the users have the right to be informed of Urban Travel Plans (PDUs). A PDU is the remit of a local transport planning authority (AOTU) given to local authorities to organise their urban public transport (Lassave and Offner, 1989). Most importantly, LOTI reflects a concern for equality within a capitalist society, promoting the mottoes of a "right to transport for everyone", "public services", and "freedom of choice for the user" (Harman, et al., 2007).

Secondly, public investment in transport was not withdrawn regardless of external and internal pressures. Global and national economic transformations after the late 1970s inevitably exerted severe pressure on the existing French approach to transport investment. Le Galès finds there has been an increased tendency towards a competition approach and fiscal cuts in the state funding available to local and regional authorities (cited in T. Marshall, 2009a). Nevertheless, the state has not remained hands off and left progress to the market (T. Marshall, 2009a). Transport investment still presented a critical mass in public spending. In 2005, transport investment in France accounted for 17 billion Euros, which was high by international comparison and represented an equivalent figure to Germany, despite the fact that France is smaller than Germany in terms of both population and economy; it is also a much greater amount than invested in the UK (T. Marshall, 2009a).

Thirdly, similar to the UK, rail reform came about in the mid-1990s, but the method of restructuring differs. Two reforms comprised the separation of responsibility between rail operators and rail infrastructure, and the devolution of regional rail passenger services to regional governments. In the former, unlike the split of national rail into a number of private companies in the UK, SNCF was transformed into two separate state-owned companies in 1997: SNCF and RFF (*Réseau Ferré de France*), which are respectively responsible for train operation and rail infrastructure. Under the regulation of LOTI, SNCF must listen to and take local needs into account. According to the latter, in line with decentralisation measurement, regional governments have become the regional tier of transport authority since 1982 and regional rail passenger authority since 2002[61]. Regions have responsibility for defining regional passenger rail services by settling multi-annual agreements (2002-2007, 2008-2014) with SNCF (The North European High-speed Network, 2010).

However, since 1997, disagreements between SNCF and regional governments have loomed large and, indeed, expanded from 2002. In its role as a state-owned private railway operator, SNCF focuses on commercial concerns about national and international long-haul rail journeys and so

[61] After a period of experiments (1998-2002) and an appropriate cash flow to region was set up in 2002. Between 1998 and 2002, a period of experiment was carried out in seven major regions.

tends to operate as fast as possible without many stops in order to compete with air transport and the expansion of its European market. This approach clashes with regional expectations, as governments hoped that HST services could be used to serve wider regions. SNCF and regional governments compete with each other to use rail tracks in order to organise their own services. In actuality, due to the scale of investment in rail rolling stock and running regional services, regional governments largely depend on SNCF which is still the dominant provider of rail facilities.

Regarding the privatisation process, the two countries again reflect their different ideologies of the political economy. "In France, privatisation was a centrally controlled, highly regulated affair" (Schmidt, 1996, p.52). The state in France "remains embedded in French culture and embodied in its institutions, with change able to come only through the state, not against it… Governments have not stopped seeking to guide business, albeit in more indirect ways …and they as always play a primary role in deciding the direction of economic growth…" (Schmidt, 1996, p.442). In the case of *Aéroports de Paris*, the French Government Authority hold the majority shareholding (52.1%) (Aéroports de Paris, 2011b).

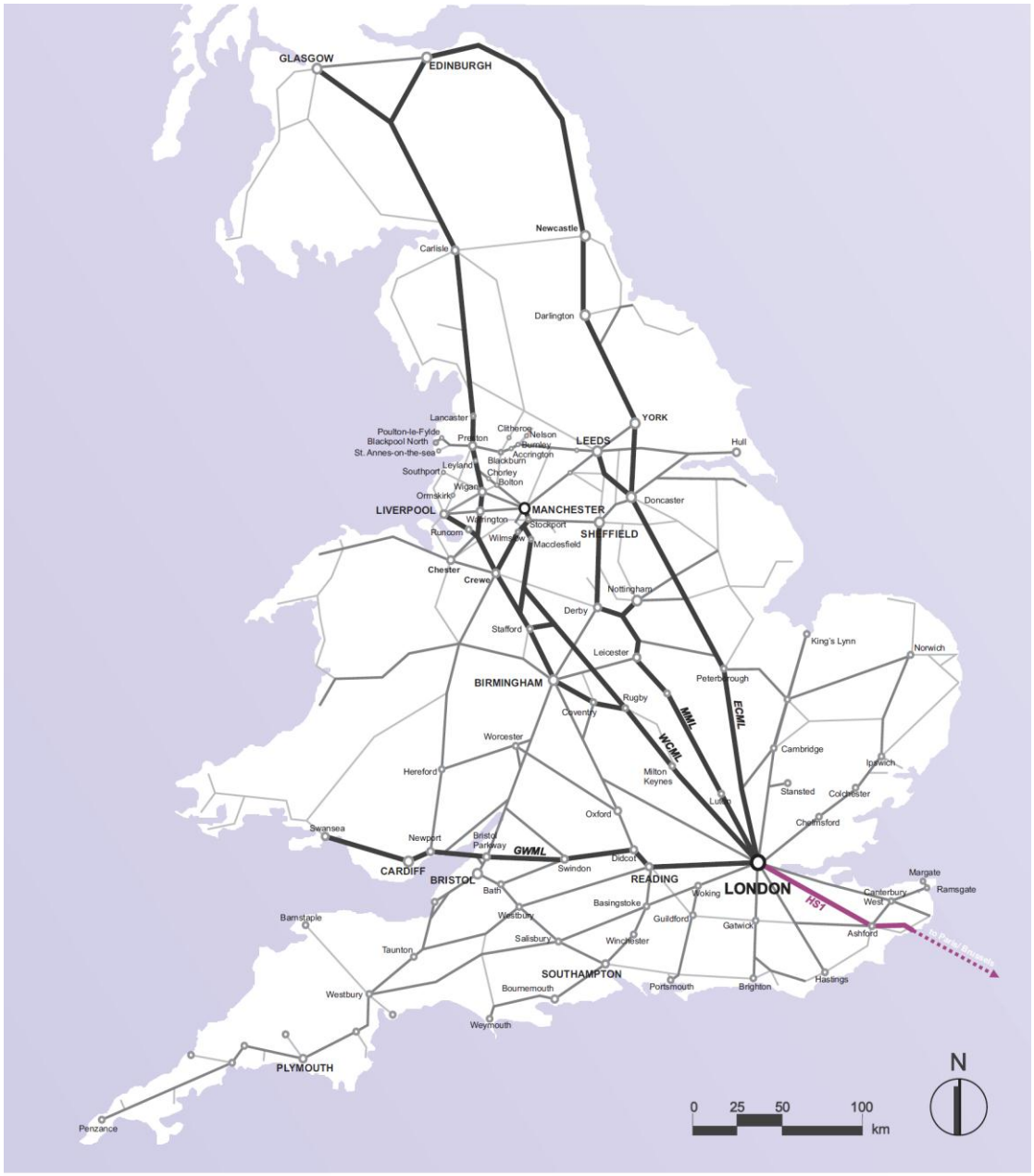
6.4.2 HST Approaches in the UK and France

Since the 1960s, rail sectors have encountered significant competition from road and air in terms of freight and passenger services in both countries. As mentioned already in section 5.2, the two countries adopted distinct HST approaches: the UK followed an upgrade approach vs. France's policy of building new HST lines. In addition to different national political economies, three major aspects shape these two models, namely technical, geographical and evaluation considerations.

UK

Despite recognition of the need for inter-city rail services, building new lines was not an option in that context for three reasons. Firstly, from a technical viewpoint, due to the high quality of the inherited Victorian rail infrastructure, it was possible to efficiently upgrade the lines to meet the needs of faster services. "It stands as a permanent memorial to an extraordinary genius of engineering, whose vision leapt far into the future" (Hall, 2009b, p.59). Figure 6-1 shows a map of the British Railway Network.

Figure 6-1 The British Railway Network



Source: author

Secondly, geographically speaking, the construction of new lines in the relatively densely populated UK would be more costly than other countries. An increase in finance was particularly unjustifiable when the rail industry was declining (Barnett, 1993). The Beeching Report of BR modernisation plan in 1963 found inter-city rail passenger services were potentially profitable, but

the stopping services were poorly used. Therefore, the transport policy aimed to close uneconomic services by the "discontinuance of many stopping passenger services" and the "selective improvement of inter-city passenger services and rationalisation of routes" (British Rail Board, 1963).

Thirdly, evaluation of rail investment by the 1980s largely relied on financial appraisal supplemented with cost benefit analysis (ACTRA, 1977, p.125). Cost-benefit analysis (CBA) has been a common method for road appraisal since the 1960s for an overriding need for road construction. With distorted bias towards time saving and the attempt to apply monetary terms to non-monetary situations, CBA has been problematic. The Roskill Commission (1968-1971) on the third London Airport is "one of the most exhaustive cost benefit analyses ever undertaken" (ACTRA, 1977, p.123). Several scholars had cast doubts on CBA. Self (1970) stressed the lack of a planning framework which would involve conflicts and public debates on different sets of requirements. The extent of these conflicts could not be known and evaluated unless they are classified and analysed in the investigations. Adams (1970, 1974) maintained that the decision is not quantifiable and the value of human life is subjective far from a rational one. Lichfield (1971) argued that distributional benefits should be included. These problems aroused the concern that decisions should not be made based on CBA; instead, they should be modified by judgement (Banister, 1994; P. Hall, 1980).

The assessment of transport investment was under rigorous review by the Leitch report (ACTRA, 1977) signified a milestone on the evolution of CBA in the UK. A contemporary judgement described it as "a bench mark in a field of general disorder…[T]he committee has attempted to deal systematically with a range of complex criticisms about the use of computerised cost-benefit economic assessments…" (Financial Times 11 January 1978, cited in Dudley & Richardson, 2000, p.133) and it "clarified many issues previously obscure or unexplained" (Commercial Motor 3 February 1978, citied in Dudley & Richardson, 2000, p.133). Consequently, it led to the permanent status of the Standing Advisory Committees on Trunk Road Assessment (SACTRAs) which could advise and initiate any significant changes in transport appraisal and forecasting methods. Greater comparability with other modes of transport was proposed, such as the application of the SACTRA framework to rail investment (Colin Buchanan and Partners, 1984). Later on, cost benefit analysis became a basic method of economic appraisal as just one important common factor in the decision-making process for transport investment (Steer Davies Gleave, 2004, p.19).

Although the Leitch report suggested that investment in rail "should be conducted on the basis of [CBA], within the framework, rather than financial appraisal" (ACTRA, 1977, p.137), the dominance of financial appraisal in rail investment continued to exist in the 1980s and the early

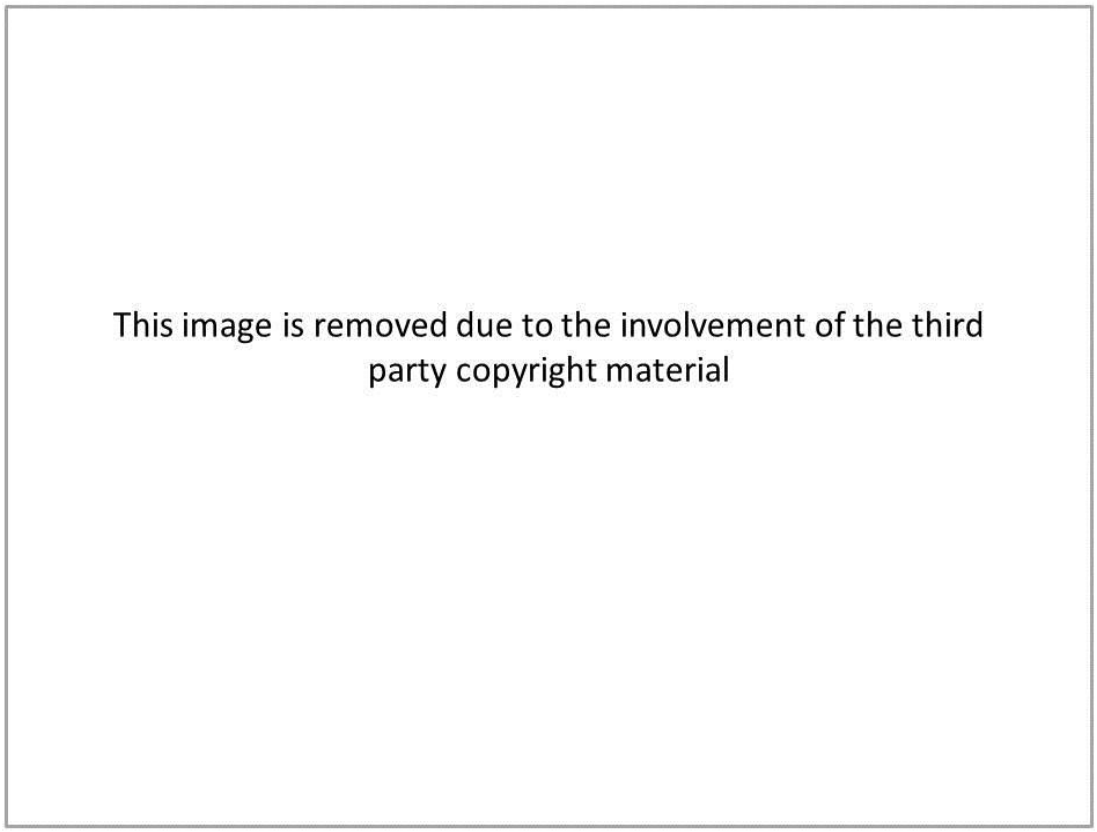
1990s: "all rail investment had to be justifiable on the basis of returns from commercial revenues at the Government's then-standard 8% discount rate" (Steer Davies Gleave, 2004, p.19). But by the late 1990s, evaluation began to take into account the integration with other transport modes and land use. The White Paper "A New Deal for Transport: Better for Everyone" (Department of the Environment Transport and the Regions, 1998a) led to a New Approach to Transport Appraisal (NATA) (Department of the Environment Transport and the Regions, 1998b) for multi-modal appraisal. In addition, SACTRA (1999) noted that CBA is not capable of taking full account of wider impact (agglomeration) and regeneration impacts. In addition to NATA, Transport Appraisal Guidance Unit 2.8 has been developed to serve this purpose. This may improve the evaluation of the wider agglomeration and regeneration effects around a HST hub, but the distribution effects into a wider region have been not well addressed. As Rierveld (1989) has emphasised, "This distribution issue receives little systematic attention in the models surveyed, which is regrettable since the regional incidence of infrastructure improvements depends strongly on it" (Rietveld, 1989, p.273).

France

The French approach to HST is characterised by its progressive construction of new TGV lines, but the origin of this HST solution is far from inevitable and straightforward. Figure 6-2 shows the plan for the TGV network over the long-term. Firstly, from the technical aspect, in the aftermath of WW2 the existing conventional rail network was "in a shambles" (Meunier, 2002, p.1); half of the network was unusable with fragmented sections. Over the immediate post-war period, the state rebuilt the rail system (T. Marshall, 2009a), but was reluctant to permit SNCF to take rail modernisation further by the end of the 1960s because SNCF was indebted (Meunier, 2002). Through tracing the origins of the TGV, Meunier (2002) argues that, quite contrary to the common impression of TGV as an example of far-sighted transport policy planning, until the inauguration of the first TGV-line the TGV favoured by SNCF was "an unwanted child", encountering extensive opposition and alternative competition from train technology e.g. the oil-burning gas turbine propulsion system and Jean Bertin's Aérotrain. Meunier (2002) attributes the threat of technical competition from the Japanese Shinkansen to be the decisive factor in the SNCF's development of the TGV[62].

[62] SNCF created a new research department two years after the arrival of the Shinkansen and there was a change in attitude by the end of 1960s that believed TGVs have certain economic and commercial advantages over slower conventional trains (Meunier, 2002).

Figure 6-2 The Long-term Plan for the TGV Network



Source: Amended from Arduin & Ni (2005, p.28)

But all the doubts and fears appeared groundless when the TGV *Sud-Est* line was successfully inaugurated in 1981, which unified the whole of the country and psychologically motivated the newly-arrived Socialist President to change his attitude towards TGV. The development of TGV was undertaken before socialist President Mitterrand came into power, and the attitude of Mitterrand towards the TGV was negative at that time. The French press *Le Monde* revealed that Mitterrand said to a colleague, when he was the deputy of the National Assembly, that "Between us, this TGV is only going to cause headaches and will do nothing for our *départements*" (cited in

Meunier, 2002). However, later Mitterrand became especially proud of the French technology inherent in the TGV which was regarded as a victory for French industry. An increase in R&D funding for TGV was endorsed to maintain its leading position in this field. The TGV has become one of the ten favourite brands of France (Pepy and Leboeuf, 2005) and "a symbol of modern society" (Arduin and Ni, 2005).

Despite the uncertainty of the controversial and troublesome process before the arrival of the first TGV-line, under the Mitterrand Presidency, the long-term development of TGV gained more justifiable support. The further expansion of the TGV network (TGV-Atlantique and TGV-Nord) forged ahead soon after the first appearance of the TGV. It starts with individual lines between Paris and major provincial cities and later evolves to allow direct rail services between provincial cities with an integrated HST network around Paris. In order to provide TGV services to Paris CDG Airport for the TGV-Nord project, an interconnection line (*Le Jonction)* was ingeniously proposed by a civil engineer, R. Rudeau, to transform the initial TGV model (Pepy & Leboeuf, 2005). Synergy of rail journeys was achieved: interchange at the junction stations enables direct services between provincial cities without the need to change terminal stations in central Paris, with TGV seats used by two successive travellers (Pepy & Leboeuf, 2005).

In addition, the SNCF introduced a remarkable publicity slogan "progress means nothing unless it is shared by all" (Meunier, 2002, p.7). Also, with a Keynesian approach, the endorsement of the TGV was believed by Mitterrand to assist in the creation of jobs (Meunier, 2002).

Secondly, the famous book "Paris and the French Desert" written by Jean- François Gravier (Gravel, 1947) vividly reflected the geographical features of the uneven and thinly populated French territory outside the Parisian region. Paris and its Île-de-France location in the northern part of France has an over-dominant population, industries and productivities in a relatively small area, whereas other major French regional cities are relatively distant from the capital. Most are more than 400 km away (the exception is Lille which is 200 km from Paris), so such features are particularly suitable for the commercial operation of HST in competition with air. The competitiveness of TGV services diverted half a million passengers from air to rail per annum (Thompson, 1994). The arrival of the TGV *Sud-Est* line resulted in the transformation of Lyon into an HST hub city because of the logic of the TGV service; passengers from several intermediate towns which previously had direct trains to and from Paris first had to travel to Lyon to catch the TGV to Paris (Meunier, 2002). Therefore, the logic of the French HST system suits the geographical features of the country in terms of connecting major provincial cities with Paris as fast as possible without the need for frequent stops. At the same time, the interoperability between new TGV lines and conventional lines enables faster rail services to serve a wider network into various towns beyond the new lines (Arduin and Ni, 2005). In addition, since the mid-1990s, the arrival of the TGV-Nord has brought about an innovative solution to progress French HST

operation into an effective system with the creation of interconnected lines and stations around Paris to avoid inconvenience in the Paris central termini and to increase accessibility between provincial cities.

Thirdly, a broader assessment approach was adopted to consider wider issues e.g. regional development and environmental impacts in addition to financial and economic CBA. The progressive investment in TGV could be attributed to the possibility of political judgement on projects based on public utility (*Déclaration d'utilité publique)*. "[C]ost-benefit analysis is intended to inform, but not to substitute, the political decision" (Steer Davies Gleave, 2004). This investment concern could also be attributed to its academic trajectory of transport planning. Benwell believes many French researchers have extended their interests into transport fields from other disciplines and tend to focus on the behaviour of individuals, the role of cultural factors and the organisation of society. Therefore, there is an inclination towards the conceptual links between transport and land-use dynamics (quoted in Banister, 1994). This approach is sharply different from the modelling approach to problem-solving found in the UK.

6.5 National Styles of Local Governmental Systems and Restructuring

Local government systems are associated with the spatial scale and power divided within a country to delegate the responsibility of the national state into lower tiers of local government. In addition to the service function, local economic development is another responsibility delegated to local authorities. However, with the increasing expansion of spatial economic territory and widening spatial inequality, local authorities cannot deal with economic development and deliver services alone. The support of a political coalition or governmental reorganisation is necessary to deal with many of the common issues involved in a wider territory.

The constitutional division and hence the capacity of local government are occasionally restructured by the national state. Reforms have a significant impact on local intervention because the ideology of the national state is reflected in the resulting changes. For instance, the national state may decide to restructure and empower regional government and municipalities through devolution, which allows local governments to combat regional and urban inequalities e.g. encourages positive agglomeration and growth in poorer cities and regions. On the contrary, the national state may squeeze local discretionary power and resources and create difficult conditions for local intervention.

The following two sections examine the sharing of power amongst different tiers of government. Section 6.5.1 focuses on the formation of sub-national governments: metropolitan and regional

governments and their interaction and section 6.5.2 outlines local government systems and restructuring in the UK and France.

6.5.1 The Formation of Sub-national Governments

6.5.1.1 The Formation of A Metropolitan Government

A mismatch between municipal administrative territories and interdependent city-region economic territories has progressively widened. As national capitals and provincial cities gather diverse urbanisation economies, they tend to grow and become co-dependent on neighbouring cities and towns beyond their existing boundaries. Widespread travel-to-work patterns and the de-concentration process of economic activities have given rise to the need for larger scale city-regional planning to sustain agglomeration economies and also to allow for continuing growth. However, the nature of individual municipalities is fragmented, so it is not a simple matter to achieve wider territorial development at the metropolitan scale. Political consideration shapes the formation of metropolitan governments, which involves the reallocation of existing power held by municipalities. As Cheshire and Gordon (1996) stress the achievement of a collective action will encounter political obstacles. The eventual results of organising wider territorial co-operations are relatively weak (Brenner, 2003) e.g. the coverage of fewer individual municipalities than initially planned (Hampton, 1991).

6.5.1.2 The Formation of A Regional Government

Regions are definite sub-divisions of a nation, while metropolitan areas are less definite and may be likened to agglomerated hilly areas within a regional plain. A regional boundary normally incorporates one or two metropolitan areas. There is an inherent difference in responsibility between regional governments and metropolitan governments. Inevitably, the legitimate metropolitan boundaries do not reflect the real spatial-economic landscape. Rather, the real catchment area (hinterland) of the core metropolitan city is much wider than its administrative zone. According to constitutional responsibility, unlike the role of metropolitan governments in managing urban growth and its legitimate hinterland, the mission of a regional government critically consists of taking care of everyone and every place within the region, no matter how poor or how rich. In this vein, regional government carries out a critical role in the rebalancing of uneven intra-regional development. In order to achieve that, it has been suggested that there is a need for a countervailing power. Keating notes "As the regional planning and development policies became more ambitious and more politicised, there was an argument that they could only

effectively be carried through by multi-functional authorities with the political weight provided by direction election" (Keating, 1998, p.58).

6.5.1.3 The Interaction between Different Levels of Government

The interaction between nation states, regional governments, metropolitan governments and municipalities is dynamic and relies on specific forms of government moulded in different countries and localities. There are inherent differences in the concerns of different government tiers. Although national government may not be willing to devolve its power to regions, devolution also pushes down to the regional level "the difficult questions of distribution and priorities" (Keating, 1998, p.59). For a regional/ metropolitan nexus, it could be argued that tension between regional and metropolitan governments is unavoidable if both are present within a region. If regional government plays a more active role towards the more vulnerable places, it could have a more a positive impact than the opposite situation. The interaction between different government tiers may play a key role in determining the outcome of opportunities offered by HST.

6.5.2 Local Government Systems and Restructuring in the UK and France

6.5.2.1 British Systems and Restructuring

Traditional Local Government in the UK

There is a traditional separation between central and local government in the UK. Redlich and Hirst remark that self-government by UK local authorities has been admired by Britain's European neighbours (cited in Goldsmith & Page, 1987). This feature is conceptualised by Bulpitt as the "dual polity"[63], which has also been termed as "divided administrative systems" (Ashford, 1982, p.4). This characterisation has a close association with the traditional ideology of the national state. As Ashford (1982) denotes, this self-government by British local states results from the 19th-century liberal democratic state with its prevailing laissez-faire values in society. Therefore, the local government system in the UK was quite heterogeneous by the late 19th century. Every

[63] The dual polity thesis maintains that "British national political elites had traditionally shown little interest in the more mundane activity of municipal government. In order to relieve themselves of this task they delegated, or rather failed to appropriate for themselves, large areas of state services to the local authorities. In particular, the authorities were given responsibility for fulfilling a wide range of state functions and were allowed a high degree of discretion in delivering local services. In turn, central elites became relatively unencumbered by demands for central intervention in local services- a position congruent with their desire to relieve the pressure to become embroiled in unglamorous "low politics" so that they might devote their attention to issues of "high politics", such as foreign affairs, defence and taxation" (Goldsmith and Page, 1987: pp. 68-69).

municipal corporation had a separate and different character (Hampton, 1991). This traditional dual polity leads to a general separation of national from local politics and the subordination of local aims to national party strategy and priority. "Local authorities have no powers except such as defined by statue" (cited in Goldsmith and Page, 1987, p. 71) and "local politicians tended to lose community ties once elected to Parliament" (cited in Goldsmith and Page, 1987, p.82).

Local Government Reforms in the 1980s and 1990s

The post-war welfare state resulted in a massive increase in expenditure on local service provision, so local government in the UK took responsibility for a wide range of government functions. Two major impacts of reforms were the political weakness of local states and the further dismantling of strategic spatial structures for governance. Firstly, a new style of centralised state broke down the traditional dual polity model. The Conservative Government reduced government expenditure and local spending with a series of radical reforms which allowed the central state to intervene in the affairs of the local state and reduce the capacity of local discretion[64]. Despite the national state becoming more directly involved in local policy making, it did not bridge the political gulf between the two arms of government. Goldsmith and Page (1987) stress that the traditional characteristics of local governments in the UK could explain the political weakness of this tier, which made it relatively easy for the national state to intervene. Secondly, due to the Local Government Act of 1985, the abolition of metropolitan counties (including London and provincial metropolitan counties) resulted in two negative outcomes for strategic structures. Firstly, the official role of strategic planning at the metropolitan level disappeared. Secondly, power passed from metropolitan counties to metropolitan districts (Hall, 2002). Metropolitan districts became single-tier Unitary Authorities (UAs) which were granted the combined functions of a county council and a district council. With the advent of the Local Government Act 1992 and consequent Local Government Commission for England (1992), some non-metropolitan districts in England were further given power to act as single-tier unitary authorities[65]. The consequences of these institutional changes led to the weakening of the concept of a strategic planning authority at both the metropolitan and non-metropolitan county level.

The division of "region" largely catered for statistical purposes and planning guidance without integrating planning power and resources. In the early 1990s, a regional concern was pushed forward after the Treaty of Maastricht, 1992. The selection of members for the Committee of the

[64] Such as the introduction of the centralised Audit Commission to replace the office of district auditor in 1980, a new grant system replacing a block grant with reduced grants, targets, claw backs and penalties and "rate-capping" (Goldsmith and Page, 1987).

[65] From 1992 to 2002, 46 unitary authorities were created out of non-metropolitan counties. In 2009, another wave of UAs was created.

Regions fostered the creation of regional divisions in England. In 1994, the Government Offices for the Regions (GORs) in England were set up (then abolished in 2010) for the purpose of effective coordination between various regional offices of central government departments.

Local Government Reforms from the Late 1990s

After the Labour Government took power in 1997, a new institutional system for regional development was proposed. The new regional system envisaged that a directly elected mayor was given a leading and responsible role with regional strategic authority to integrate crucial functional bodies, corresponding to a grand strategic plan[66]. This regional strategic authority would be scrutinised and monitored by an elected London Assembly. This attempt succeeded in London, Scotland and Wales, but other regional strategic authorities in England failed after a rejected referendum in the north-east in 2004. However, three regional bodies co-existed in provincial regions (GORs, Regional Development Agencies (RDAs), and Regional Assemblies (RAs)). RDAs and RAs were respectively in charge of Regional Economic Strategy (RES) and Regional Planning Guidance (RPG), which was later replaced by Regional Spatial Strategy (RSS). On the one hand, RDAs were assigned the power of land assembly and compulsory purchase in order to function as a developer in delivering investment for regional economic growth and regeneration in compliance with the Regional Economic Strategy on a long term basis. On the other hand, RAs which comprised local authorities and other social and business partners, were granted regional planning power. Nevertheless, all these regional tiers and planning mechanisms were abolished in 2010 when the conservatives returned to be the ruling party.

In brief, following dramatic government reforms, local government in England[67] has become largely controlled by the central government with very limited local financial discretion. In addition, a mixture of two government systems (a single-tier unitary authority and a two-tier system (non-metropolitan counties and districts)) and fragmented regional organisations and responsibility could likely generate inconsistency and fragmentation of urban and regional development. These circumstances, with the traditional separated relationship between the central and local state, may lead to difficulties in local intervention caused by the dominance of the powerful centralised state.

[66] In the case of Greater London, there are four functional bodies associated with transport, police, fire and emergency, and economic development.

[67] Devolution in Scotland, Wales, Northern Ireland and Greater London was achieved by 2000. Only England was the exception.

6.5.2.2 French Systems and Restructuring

Traditional Local Government in France

France was a synonym of a centralised state. Two traditional administrative divisions were created after the French revolution, namely the large unit (*département*) and the small unit[68] (*commune*). However, both structures are inadequate to manage and develop the territory. The large unit *département* was recognised as being insufficient to cope with the growth of local initiatives, which led to the birth of the concept of a region (Hackett & Hackett, 1963). Similarly, individual small unit communes were too fragmented to effectively deal with common issues with the growing inter-relationship between municipalities. Therefore, there has been a continual process of decentralisation in France from the late 1950s through various inter-communal and regional reforms.

There are two distinctive features of French government systems. Firstly, despite the presence of a hierarchical framework, none of the sub-national levels is superior to others. There is thus a greater requirement for cooperation and negotiation than would be necessary in a largely centralised state before consensus is forged. Secondly, another feature which is deeply associated with the centralised state is the traditional centre-periphery relations, the "*cumul des mandates*" (multiple political office holding) (Colomb, 2007; Mény, 1987). This tradition which has persisted since the third republic means that the mayor of a municipality could be a minister in central government, and the president of a region, and the president of an inter-communal cooperation at the same time.

The Formation of Inter-communal Structures (EPCIs)

In order to address the problem of the over-concentration of Paris, the designation of *métropoles d'equilibre* in 1963 brought about the creation of CUs in eight major French regional cities. CUs were given power and resources by the national state to take over key responsibilities and fiscal resources from individual municipalities (Farthing & Carrière, 2007) and form a upper-tier framework for a wider urban community with the responsibility for a range of strategies such as spatial economic planning, urban transport and cohesive territory master planning. Since the 1960s, three major EPCIs[69] have come into being, namely "*communautés urbaines*" (CU),

[68] The small administrative unit *commune* in France represents a unit of a municipality with its own directly elected mayor. A French municipality is relatively much smaller than the British equivalent. The population of the smallest English municipality has at least 30,000 inhabitants (2001 census), while the median population of a French municipality is 380 inhabitants (1999 census).

[69] A single function cooperation (SIVU) between municipalities had come into being by the end of 19th century, followed by multiple function cooperation (SIVOM) since 1959. However, little was achieved between 1959 and 1961 because of a variety of issues of a political and financial nature. According to Hackett and Hackett (1963), the following

"*communautés de communes*" (CC), and "*communautés d'agglomération*" (CA), in line with the degree of integration. In 1992, the second EPCI known as CCs was created without a minimum threshold of population except geographical continuity. Later on, CCs were modified in compliance with the *Chevènement* Law of 1999 which gave rise to the third EPCI (CA) with a minimum threshold of population. In January 2011, the total number of EPCIs reached 2,599, covering 95% of the communes and 91% of the population. To suit the nature of small communes, the boundary of EPCIs is not fixed because it depends on successful cooperation and fusion with neighbouring communes. As Breuillard et al. (2007) note, French government style is "territorial democracy" based on local interests while the British approach shows a "functional democracy"- the local government provides local services under the direction of parliament and the control of central administration's rationalisation.

The Formation of the Regional Tier in France

A new geographical layer known as "programme regions" was created by a decree in 1956. Since the mid-1950s, regions have become a key spatial unit for investment under the *Contrat de Plan*. The major change which took place in the 1980s was the decentralisation law in 1982, which marked an adjustment in this decentralisation process. Four local governments (region, *département*, EPCIs, commune) were given respective competences within their responsible territories. In contrast with the traditionally British self-governing local authorities, the habitually small and weak French local authority *commune* went through a process of creating new governance structures, as well as delegated responsibility and financial resources to local levels. Governance restructuring could not be separated from its delegated responsibility and resources in the French system. French planning approaches will be discussed further in section 6.6.2.

In addition, despite the limits that were placed on *cumul des mandates*[70], the centre-periphery relation in France is characterised by "osmosis" rather than "separation" (Mény, 1987), or "a very strong mutual influence" instead of "division" (Colomb, 2007). "The interpenetration between centre and periphery is linked with constant exchanges and overlap between the administrative and political sphere" (Mény, 1987, p.99). With the two traditional features mentioned earlier, the series of government restructuring involved an intensive process of negotiation, compromises and cooperation in order to seek consensus among different tiers for mutual interest. Otherwise, the

solutions were proposed by the commission: (1) Reinforcing the power of urban districts with the provision of financial resources. The district could be given any of the functions of the communes. (2) Harmonising activities, drawing up an overall plan for urban development. (3) A newer and more appropriate local government system which is needed to deal with the inadequacy of the traditional form of local government.

[70] Since 1986, politicians are only allowed to hold two offices. But the rule excludes mandates in cities with a population smaller than 20,000 (Mény, 1987).

relationship between the tiers would be combative in essence and it would be an arduous task to reach agreement. Positively, it also allows holders of local political office direct access to national government (Booth, Nelson, & Paris, 2007), the chance to nationalise local affairs and special consideration accorded to peripheral interests (Mény, 1987).

6.5.3 Local Transport Authorities

In the UK, each local level has a different degree of transport responsibility, including districts, unitary authorities, counties and regions. However, local authorities in the UK have little control over public transport; rail is controlled at the national level. It does not mean there are no new urban transit systems in the UK, but they rarely exist because of the limited funding available to local authorities, unless local authorities participate in a vigorous funding campaign process for the central government. In actuality, the majority of limited funding available at the local level is used to fund unpopular bus routes or make accessibility improvements to bus and railway stations (Harman, et al., 2007). In France, as mentioned earlier in Section 6.4.1, local transport authorities are termed AOTUs. Within a region, there may be four types of AOTUs, namely regions, departments, AOTUs which are the same as EPCIs, and AOTUs that differ from EPCIs. At the inter-communal level, AOTUs are not necessarily identical to inter-communal organisations (EPCIs), although most AOTUs are associated with EPCIs. Each AOTU has its own financial resources, which enables them to develop their own transport systems. In order to enhance cooperation between AOTUs, the arrival of the SRU law encouraged the creation of SMTs to better deal with the wider travel-to-work patterns and agglomeration economies by fiscal incentives. However, with all these different tiers of AOTUs, coordination has become difficult because no AOTUs have control over any others (Harman, et al., 2007).

6.6 National Styles of Regional and Urban Planning Approaches

6.6.1 The Co-ordination between Spatial-Economic and Transport Planning

In addition to government systems and their restructuring, local interventions to make the most of opportunities presented by HST are closely associated with urban and regional planning approaches shaped by the national political economy. There may or may not be an enabling and co-ordinated environment in which local authorities can take action. Urban and regional planning approaches in this study have focused on the co-ordination of spatial-economic planning and transport planning. The current debate discussed in section 2.4 and two empirical findings in Chapter 4 and Chapter 5 strongly suggest that transport itself is not a sufficient condition for urban

and regional development. The issue is that the nature of public intervention needs to be co-ordinated rather than being isolated. "…[t]his sort of intervention, in any of its institutional guises, has little resemblance to traditional urban policy, with its emphasis on infrastructure, housing, transportation and urban public finance; it is instead oriented toward the problem of coordination of urban production systems" (Scott & Storper, 2003, p.587). In the following section, regional and urban planning approaches in the UK and France are reviewed to understand the essentially different approaches.

6.6.2 Urban and Regional Planning Approaches in the UK and France

6.6.2.1 British Planning Approaches

With the background of being the earliest and most rapidly industrialised country in the world, British approaches to spatial-economic planning have developed to tackle regional/urban problems rather than national/regional problems. The landscape of industrial urbanisation is evident in several well-established industrial core cities across the counties, particularly in northern and midland England. These industrial cities eclipsed London in their heydays. Overspill problems in all industrial core cities resulted in a series of planning initiatives such as Green Belt, New Town development, and the construction of motorways; in other words, key public interventions.

Spatial-economic planning policy at the national/regional scale was formulated in the early 1960s, but this attempt at emulating the French economic planning approach soon failed in 1969 when inter-departmental conflicts caused difficulties[71]. The nature of economic planning itself involved the need to integrate different departments on complex issues. It could be argued that the absence of a cross-department board with a higher position above departmental level brought about the rival mentality among departments. As Hall (2002) illustrates, the boundary between short-term economic planning (the Treasury) and long-term economic planning (the DEA) proved difficult to delineate. In addition, the uneven prosperity between regions resulted in different spatial and economic planning requirements for each region, which also led to uneven responsibility between departments[72]. The failure of the economic planning initiative suggested a reasonable link to the deep-rooted national style of political economy discussed already in section 6.3.3. Shonfield (1965)

[71] At the national level, the Department of Economic Affairs (DEA) was established to prepare a national plan. Additionally, at the regional level, regional economic planning councils and regional economic planning boards were created for regional coordination. O'Hara argues in his book titled "From Dreams to Disillusionment: Economic and Social Planning in 1960s Britain", due to the uneasy and shifting compromise, co-ordinated planning was relinquished to "individual, piecemeal, and reactive initiatives" (O'Hara, 2007, p.128).

[72] For instance, the more prosperous south-east region would request stronger physical elements of planning because development would still take place anyway, whereas other declining regions would demand economic, educational and social measures, in addition to physically-led planning.

expresses his suspicion of this experiment, based on the observation of a period of 20 years in the evolution of British planning approach after WW2:

> *"The approach to planning involved a long and unwilling apprenticeship. It was the frustration caused by the series of ad hoc interventions, forced upon the government by its desire to control the business cycle, maintain full employment and at the same time keep a weak balance of payments from running into deficit, which led to a new and sympathetic interest in economic planning. The development is all the more striking because it was the erstwhile ideological antagonists of a planned, as opposed to a market, economy who in the end created the machinery of planning" (Shonfield, 1965, p.123).*

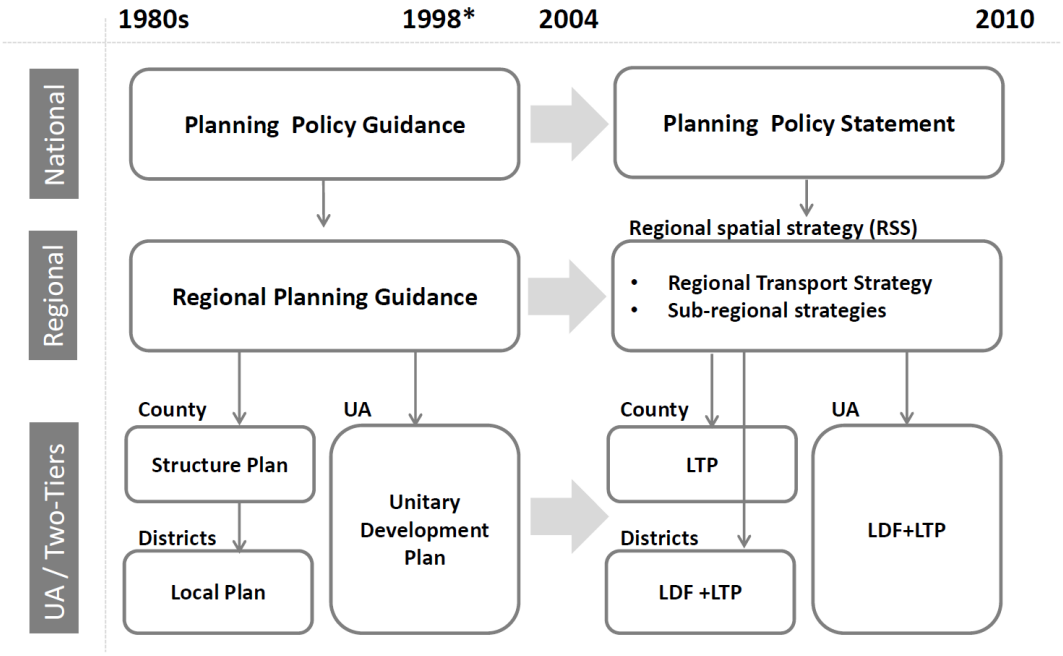
In the 1980s, the active market-led approach significantly determined modern planning practice. The spatial-economic planning policy was targeted at the urban level in order to tackle the inner-city problem which persisted in the late 1970s and urban riots in the early 1980s. As for regional planning, the role of regional planning at this stage was implemented as guidance for local planning permission rather than controlling planning resources allocated at the regional level. After the Labour Government was re-elected in 1997, urban regeneration strategies were further implemented. A commission report "Towards An Urban Renaissance" (Urban Task Force, 1999) recommended the concentration of resources in urban areas and the solution to urban sprawl by supporting higher-density residential development in run-down urban areas. In line with this vision, a series of key urban regeneration initiatives were implemented e.g. Urban Regeneration Companies (URCs), New Deal for Communities (NDCs), Market Renewal Pathfinders (MRPs). Most importantly, regional planning operations were introduced to assist tackling regional inequality. Regional Development Agencies (RDAs) brought massive funding for northern regional development.

Four broad aspects of British planning approaches could be identified. Firstly, the role of private sectors in these regeneration programmes and the physical reclamation and reuse of derelict land in the inner-city area were highlighted (Fraser & Lerique, 2007). A series of physical and economic regeneration programmes and subsidies were intensively employed by the Conservative Government to regenerate urban derelict areas e.g. Urban Development Corporations (UDC), Enterprise Zones (EZ). UDCs which bypassed local authorities were given planning power directly from the central state. Under the Labour Government, a novel aspect was introduced. URCs which were granted funding and commercial elements operated in partnership with private sectors and local governments, albeit without planning power.

Secondly, a competition approach to government funding and grants was implemented for local regeneration projects. City Challenges and Single Regeneration Budgets are typical schemes. These competition bids allocated resources to capable local authorities which could present a demonstrable outcome, whereas the places which were vulnerable and in need of help were not always capable of proving their potential for change.

Thirdly, the British planning system is guidance-led between the central and local states. Since 1947, the Town and Country Planning Act has long established in-house planning expertise and planning mechanisms at the local level. Figure 6-3 demonstrates a change in planning policy framework in England between 1980 and 2004. Before 2004, the regional tier had no actual planning power, but provided guidance in line with the "material consideration" of PPG with which lower tiers of governments must comply regarding their structural and local plans including UAs, counties and districts. The impact of the separate central-peripheral relationship discussed in section 6.5.2.1 on this guidance-led relationship is apparent. After the 2004 reform, the strategic role of planning was transferred from counties to Regional Assemblies which could prepare their own RSSs (including RTS) as strategic upper plans for guiding UAs and districts' LDFs.

Figure 6-3 The Planning Policy Framework in England between 1980 and 2010



Notes: In 1998 Transport White Paper, the attempt was made to integrate transport planning with land use planning.

Source: adapted from Cullingworth and Nadin (2006) by author

Fourthly, the co-ordinated relationship between public transport planning and spatial-economic planning was weak. As mentioned in section 6.4.1, under Margret Thatcher's regime, investment in public transport was massively slashed and it was largely privatised. Except for road construction, public transport was not a tool for change. Transport policies were targeted to be improved after 1997 under the Labour Government. A series of transport policies were introduced,

namely a transport White Paper "A new deal for transport: better for everyone" in 1998, the Transport Act 2000 introduced the local transport plan (LTP) and Transport 2010, and another two white papers in 2004 reviewed the rail administration and the future of transport- Network 2030. There was an attempt to integrate transport and land use planning through planning policy guidance PPG12 in the 1998 White Paper. Nevertheless, there have been practical problems. Harman et al. (2007) point out that under the two-tier system, counties still have transport responsibility, but the accountability for LDF was transferred to the district authorities. In addition, the different durations of LDF (10 years) and LTP (five years) were difficult to integrate.

Additionally, regarding central government's responsibility, planning was closely associated with local governments, but had a weak relationship with transport planning except for a short period of experiments. Over the period 1951-1970, planning was under the remit of the Ministry of Housing and Local Government. In 1970, it shifted to the Department for the Environment, linked to local government, but expanded to include transport. In 1976, a lack of integration between planning and transport emerged again when the Department for Transport was separated from Department for the Environment. From 1997-2002, however, under the labour regime, a short attempt to re-integrate transport, local government and planning was made under DTER until ODPM was created in 2002 (Breuillard, Stephenson, & Sadoux, 2007).

6.6.2.2 French Planning Approaches

In contrast with early industrialisation in the UK, France is remarkable for its late industrialisation, much slower urbanisation, thinly populated territories and over-dominant capital, which resulted in a state-led decentralisation process via spatial-economic planning approaches from the 1960s, with a critical watershed in the early 1980s. National spatial development was regarded as an interdependent system consisting of cities and regions and an attempt was made to integrate and channel resources into national/regional and national/urban networks. The French spatial-economic planning approach has a direct link with institutional reorganisation with designated competences, as discussed in section 6.5.2. The review below emphasises the evolution of planning policies.

After WW2, up to 1982, strong state-led intervention initiated national plans invented by Jean Monnet in 1947, with a planned period of four years. Although initially the geographical distribution of investment was not the core concern for economic planning, regional and urban elements[73] were gradually taken into account in the evolution of the national plans (Loughlin,

[73] Hackett and Hackett (1963) explain three reasons behind the emergence and the role of regional and urban planning. Firstly, the national state which is responsible for all citizens is a relatively recent concept. Secondly, there is a natural tendency for political representatives to campaign for the interests of their electors. Thirdly, the concept of welfare and

2008). A regional dimension was formally incorporated from the Fourth National Plan onwards. In the national/ regional nexus, employment differences between regions were targeted. In order to close the gap between national and regional plans, propulsive policies were used for declining regions with high unemployment, while complementary policies were designed for growing regions where labour was in demand. Operational tranches were used as a key interactive tool, the procedure for which was laid down by the General Planning Commissariat (for the operation of this tool see Hackett and Hackett (1963)). Throughout this operation, the national and regional government formulated a coherent investment plan for the next four years, which had the potential to result in a concerted effect i.e. it provided the private sector with a broader picture of the direction of development so it could adjust itself to governments' priorities (Shonfield, 1965, p.129).

In addition to the national/regional nexus, urban planning was simultaneously regarded as indispensably complementary to regional development. The ever-increasing dominance and concentration of the Paris region reflected a knotty problem. On the one hand, considering fierce external competition, weakening the status of the Paris region which was the greatest industrial zone in France was not an option. This view was expressed explicitly in a speech given by the *Commissaire General* in the National Assembly (Hackett and Hackett, 1963). On the other hand, it indeed revealed the need for an urban development policy to implement de-concentration and introduce new industries to solve the problem of inequality, which was regarded as the fundamental problem of regional development. In 1963, with the national intervention of *métropoles d'equilibre*, seven major regional cities were designated as regional growth engines. At the same time, DATAR[74] was created to further reinforce co-ordination between different sectors and departments for territorial development. As Keating notes, the concept of "*Aménagement du Territoire*" denotes "an integrated view of spatial development, incorporating economic development, land use planning and infrastructure provision".

Over this period, despite resources[75] allocated by the state for urban and regional development, the competences of cities and regions were still limited to decision-making for local interests. It was argued that regions could not really enter into a contractual relationship with the state because of their limited resources and the fact that their chief executive was the regional prefect, who was designated by the state (Balme & Bonnet, 1995).

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the distinction between the private and the social gave regional and urban planning an intellectual respectability which intensive liberalism denied for a long time.

[74] Three main functions were engendered, namely providing the secretariat of the Inter-ministerial Committee, co-ordinating the activities of the various public departments, and helping the General Planning Commissariat to draft the operational tranches of the national plan (Hackett and Hackett, 1963).

[75] contracts for medium-sized cities (*contrats villes moyennes*) in the 1970s and regional programmes (*Programmes d'Action Prioritaire d'Innitiative Régionale*).

The 1982 decentralisation reform, in addition to LOTI 1982 and a series of reforms, marked a huge change in planning approaches. In comparison with the British planning approaches reviewed above, French planning approaches include four special aspects.

Firstly, in contrast with the private sector led and competition-oriented planning policy in the UK, the most important feature of the French system is the wide application of a public-led and contractually-oriented planning[76] agreement between the national state and local states (including EPCIs). Contracts are made through a bargaining process to organise central-periphery relationships in the realm of public policy, with the aim of defining common objectives and securing public financial cooperation on a multi-annual basis. At the regional level, coupled with a new tier of local government, a new national/regional planning mechanism with generous public funding created *Contrat de projets État-région* (CPER)[77]. It is argued that over 25 years of this kind of contractual practice, there has been a transformation in the role of regions from a top-down relationship inferior to the state to an active and strengthened partnership role (Loughlin, 2008; OECD, 2007a). This is also the case for cities. In 1989, cities were given resources for major urban projects through "*Contrat de Ville*" or "*Contrat d'Agglomeration*" between the state, local governments and private partners. Urban riots in 2005 resulted in the replacement of *Contrat de Ville* with *Contrat de Cohésion Sociale* in 2006 under the management of *Public Agence Nationale de Cohesion Sociale et pour l'Égalité des Chances* (Fraser & Lerique, 2007).

Secondly, there has been a process of capacity building at the local level (Cole, 2006) and major reform to government machinery (Breuillard, et al., 2007). A series of urban planning reforms were introduced. In 1983, based on the decentralisation of planning law (*the décentralisation du droit de l'urbanisme)*, municipalities (communes) were given responsibility for taking initiatives in preparing POS (*Plan d'Occupation des Sols*- local plans) and participating in inter-communal syndicates for SDAU (*Schéma Directeur d'Aménagement et d'Urbanisme)*[78]. Those new competences which were previously controlled by the state cultivated the vision and capacity of local authorities to develop their own territories (Booth, et al., 2007). In the late 1990s, three significant pieces of legislation were introduced to enhance local planning. *Loi Chevènement and Loi Voynet* (called LOADT) in 1999 respectively improved inter-communal cooperation and strategic development. *Loi SRU 2000* was further introduced to improve the coherence of strategic and operational policy and foster local responsibility in the development of planning policy (Booth,

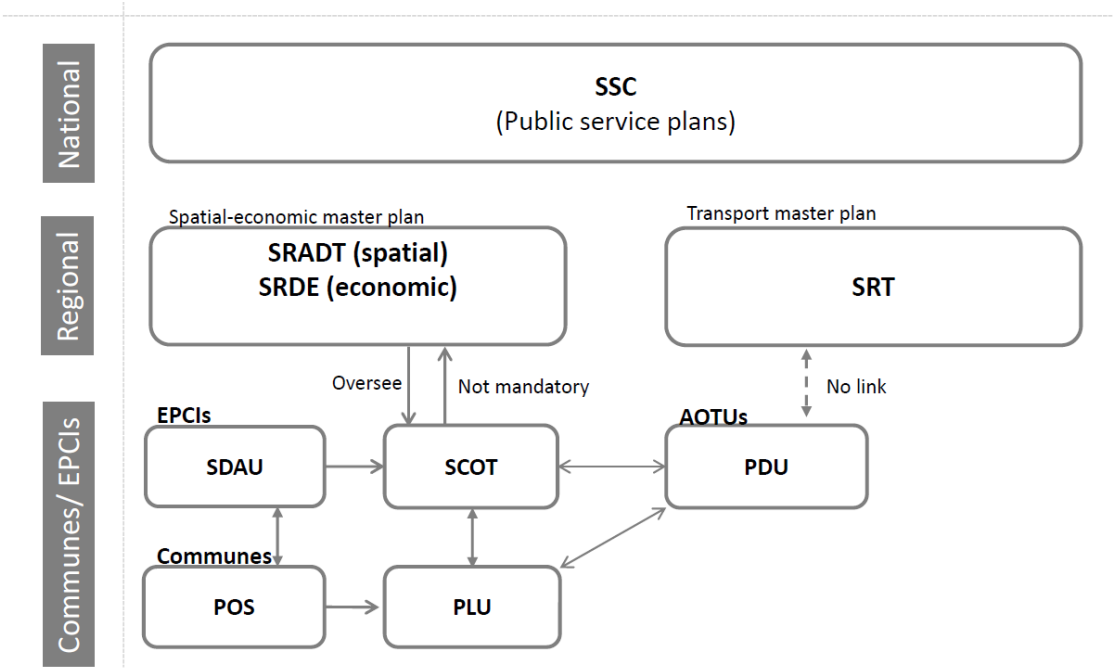
[76] Balme and Bonnet (1995) argue that there are three forces underlying the creation of contractual planning, namely the French national plan (1946), regional policy by DATAR (1963), and the decentralisation reform of 1982. Loughlin (2008) adds that the CPER corresponded with the EU's mode of governance, based on partnership and subsidiarity.

[77] CPER has evolved over time. The first two CPERs were for four years (1984-1988; 1989-1993), then for five years (1994-1999), followed by six years (2000-2006; 2007-2013).

[78] Both POS and SDAU were introduced in 1967 with the arrival of LOF (*Loi d'Orientation Foncière*).

et al., 2007). Each CA/CU has to prepare a SCOT (a strategic planning document) and each commune is then responsible for a PLU (a detailed planning document)[79]. Figure 6-4 illustrates the planning policy framework in France.

Figure 6-4 The Planning Policy Framework in France



Source: author, illustrated based on Brevillard et al. (2007) and Harman et al. (2007)

Thirdly, transport planning plays a much broader role in potential spatial-economic development. As discussed in sections 6.4.1 and 6.4.2, the expansion of the HST network was endorsed by the central government after the debut of the TGV-*Sud-Est* and the introduction of VT in the 1970s. Thirty years on, more and more connections are made at major TGV stations with growing urban and regional light/ heavy rail networks; this proves that transport investment in France can transform cities and become a model for other French cities to follow. By 2010, more than twenty French cities (including major and small-to-medium-sized metropolises) had implemented new tramway systems into city centres with this financial innovation (P. Hall, 2013a, forthcoming). However, this approach does need collective negotiation among joined communes with local capacity and among different transport authorities. There is the risk of disintegration of transport

[79] A prerequisite for both SCOT and PLU is the PADD which sets the objectives for planning policies.

and land usage planning if AOTUs and EPCIs are formed to cover different territories. Also, coordination between different tiers of transport plans is problematic (Harman et al., 2007).

In addition, transport has played an indispensably leading role in territorial development and planning in the sphere of central government. Despite the frequent shift in ministers, urbanism, planning and housing have been the remit of the Secretary of State for Transport. The close relationship between transport and territorial development and planning has been enhanced continually over time. In 1974, the *Ministre d'État, Ministre de l'Aménagement du Territoire, de l'Équipement et des Transports* was created to show the connection forged among territorial development, construction and transport. After the 1982 reform, in 1984, the *Ministre de l'Urbanisme, du Logement et des Transports* was specifically created to further link urban development and housing with transport. More recently, the *Ministre d'État, ministre de l'Écologie, du Développement et de l'Aménagement durables* has been designated to embrace ecology and sustainable development. Finally, the grand urban projects (GPUs) which was initially proposed by *Comité Interministériel des Villes* (CIVs) became the responsibility of the transport department in 1994 (Breuillard, et al., 2007).

6.7 A UK-France Comparison of the Spatial-Economy Planning Framework for Government Intervention

Following the review of each element in the framework, a major national difference can be identified. The synthesised comparison of each element between the UK and France will lay significant foundations for two different spatial-economic planning frameworks prior to two empirical chapters in order to further understand the varying effects of HST on the two countries and within the two regions. Table 6-3 summaries the results of the literature review.

Firstly, the political ideology of national states underlies the nature of government intervention. It is evident that, in many ways, the role of rail transport investment was grasped more enthusiastically and received stronger commitment in France than in the UK. Traditionally, the political economy of the UK has been characterised by a market-led approach in contrast to a state-led approach in France. Despite the fact that both countries have encountered increasing external pressures in the forms of deregulation and marketisation since the 1980s, a state-enhanced approach with a concern for equality (for instance: *LOTI* 1982) has been implemented in France. Two distinctive views of government towards investment in transport infrastructure persist. The British market-led ideology presents a reactive perspective that "infrastructure is following private investment". The conditions for infrastructure investment are set only when serious bottlenecks for

growth occur. This is in contrast with another view, that "infrastructure is leading private investment", which the French public-led perspective maintains. Thus, **National Condition One** is that, in line with this national difference, the opportunities provided by HST would be more appreciated and better exploited in France than in the UK.

Secondly, dynamic reformation and decentralisation of government systems generates specific possibilities and difficulties in planning and taking action. In addition, different concerns among government tiers (national/ regional/ sub-regional government) mean inherently different agendas. Therefore, the redistribution of benefits within a region will heavily depend on a more balanced inter-relationship between different government actors in these dynamics. Although the UK and France are unitary countries, there has been a consolidated decentralisation process for regional, metropolitan, and inter-communal governance over time in France (including transport authorities, particularly for devolution of regional rail services) whereas an increasing centralisation process has taken place in the UK, with a reduction in local financial discretion and fragmented local government structures. Hence, **National Condition Two** is that the decentralised local government system in France appears more inclusive and appropriate than that in the UK, with legitimate authority given to tackle intra-regional inequality.

Thirdly, given that HST investment is a large-scale national transport planning project, a positive wider impact on cities and regions relies on co-ordination between transport and spatial-economic policies.

British planning approaches to spatial economy planning and resources allocation have demonstrated an approach led by the private sector, competition and guidance. In the 1980s, the prevailing political economy insisted on a reduction in public spending and the shrinkage of local financial capacity. The private sector was encouraged to participate in urban regeneration schemes. Local governments participated in competition bids were encouraged by central government. The spatial focus was on urban initiatives, but the redistribution of regional prosperity attracted less attention. The experiment of French-style indicative regional planning failed in the 1960s, so regional planning played the role of giving planning guidance in the 1980s and most of the1990s until the late 1990s. At this point, the Labour government attempted to address regional inequality by granting more resources for intervention and by seeking to develop a regional economic and transport strategy. A series of planning reforms was introduced in the late 1990s including an attempt to integrate transport and land use through PPG/PPS, but the coordination between transport and spatial-economic development seemed weak and difficult under these conditions.

Over the same period of time, in France, planning approaches have been influenced by the public sector, contractual agreements and capacity-building, resulting in significant public funding

through contractual agreements between the state and a range of local government structures (regions, departments, EPCIs, communes) and planning reforms.

In the 1980s, public transport investment was a strong tool for spatial economic development. Each of these local government structures had its own transport competence for its territory along with transport funding resources, which allowed local authorities to develop their own transport networks. Within each territory, the integration of spatial economy and transport with strategic planning and resources was highly encouraged to achieve a holistic planning *Aménagement du territoire*. Likewise, under the responsibility of DATAR and Ministry of Transport, the French method presented a transport-led planning approach, that brought about transformation through investment in public transport. Furthermore, concern for equality has been more evident in France than in the UK. Consequently, **National Condition Three** is that, in seizing HST opportunities for transformation, the French planning approach seems more conducive than the British for local interventions and achieving a wider impact.

Table 6-3 The UK-France Comparison of Spatial-Economic Planning Framework, 1980s-2000s

Elements	UK	France	Comparison
National political economy	• Market-led approach	• From state-led to state-enhanced interventionist approach	**National Condition 1** With this national difference, the opportunity of HST would be appreciated and realised better in France than in the UK.
	Conservative Gov.(1979-1997) Labour Gov. (1997-2010)	Francois Mitterrand (1981-1995) Jacques Chirac (1995-2007)	
Transport investment	• Private mode: motorway building • Slash public investment • Privatisation/Deregulation	• The revival of public transport 1974_VT (*versement transport)* • The concern for inequality (LOTI 1982): • Partial privatisation (Government-led shareholding)	
HST approach	• An incremental /upgraded approach	• A new dedicated approach	
Government Systems & Restructuring	***Local governments***		**National Condition 2** The decentralised local government system in France appears more inclusive and appropriate than that in the UK with legitimate authority in tackling intra-regional inequality.
	• A separate central-peripheral relation	• An osmosis central-peripheral relation	
	• An process of centralisation and fragmenting local tiers	• A process of decentralisation and creating inter-communal levels to enhance cooperation	
	1986 _Metropolitan counties abolished 1992 _LA reform (UAs) 1994_ GOs Region 1999_ RDAs/RAs 2004 _Northeast referendum	1982_ Decentralisation law 1992 _EPCIs: CCs 1999 _EPCIs: CAs 2004 _DATAR call for metropolitan areas	
	Transport authorities		
	Rail: • Pre-1996: British Rail • Post-1996:NetworkRail*+TOCs	Rail: • Pre-1997: SNCF • Post-1997:SNCF+RFF+Region	
	Local governments/ PTEs	AOTUs	
Planning approaches **(spatial-economic & transport planning)**	***Planning approach***		**National Condition 3** The French planning approach seems more conducive than British ones for local interventions and achieving wider impacts of HSTs.
	• Private-led • Competition approach Urban & regional policy: 1979-1997: - EZs, UDCs, CCs, SRBs Late1990s-2000s: - SRBs, URCs, HMRPs, NDCs	• Public -led with huge public funding • Contractual approach Regional policy: 1984 DATAR + Contrat de Projets État-région (CPER) Urban policy: 1989_*Contrat de Ville* 2006_ CUCS	
	• Guidance-led 1980_LG,P & L Act 1990_T&C P Act 2004_P&C P Act 1980-2004: PPG+ RPG+ Structure/Local Plans 2004-2010: PPS + RSS + LDF	• A process for capacity building on strategic planning power 1983_ POS + SDAU 1999_Loi Chevènement 1999_Loi Voynet (or called LOADT) 2000_Loi SRU (SCOT+PLU)	
	• Local government –led DETR>ODPM>DCLG	• Transport-led Ministry of Transport	
	Transport policy		
	1998_WP- a new deal for transport 2000_TransportAct /Transport2010	1974_ VT 1982:_LOTI (AOTU+PDU)	
	Co-ordination planning		
	1998 White Paper/ PPG (S) Transport + Land Use: LDF+LTP	2000 SRU law (Transport + Land Use): (PDU+SCOT)	

Source: author

6.8 Chapter Conclusions

In summary, this chapter has developed a national spatial economy planning framework which is constructed by examining public policies over a period of time from the 1980s to 2000s within which the opportunity of HST roughly arose in the two countries. The framework reviewed and discussed above identify three national conditions will inherently shape local intervention. Firstly, the political ideology of national states differs in their attitudes towards transport investment. With a series of reforms in deregulations and privatisation, British market-led ideology contrasts with the French state-led perspective, which was reinforced by a concern for equality. Secondly, government systems and their restructuring play a critical role in generating enabling or constraining conditions for planning and taking action at the local level. Although the UK and France are both unitary countries, over the same period of time, the UK has gone through an centralisation process with limited local financial discretion and a lack of strategic government structure, whereas in France there has been a decentralisation process, devolving power and competence to the local level. In addition, the central-peripheral relationship is characterised by a "separate" approach in the UK vs. an "osmotic" technique in France. Thirdly, national planning policy including transport and spatial economic development is directly relevant in areas reflecting national concerns with resources allocation. British planning policy has shown a private-, competition- and guidance-led approach, which is in contrast with a public-, contractual-, and capacity-building-led approach. In addition, transport resources has played a critical role in leading spatial economic development in France. Because of the existence of VT, several local government tiers have the capacity to develop local transport plans and the financial capacity to implement them. In contrast, transport resources in the UK has been largely controlled by the state. Considering these different contexts and approaches between the UK and France, local intervention in the UK could be much more frustrated than in France without available financial resources and power and inclusive institutional governance unless local conditions could possibly conquer the constraints for any possible transformation. How local interventions operated (re-acted, pro-acted, or did nothing) with respective national contexts to seize the opportunity of HST is the focus of following two empirical chapters to understand better the transformation process and the differential wider impacts of HST. The next two chapters will unveil the empirical evidence from both regions with the British case first.

Chapter 7 The Modernisation of the WCML in North-West England: Manchester vs. Its Sub-regions

7.1 Introduction

As quantitative findings showed in Chapter 5, the wider impact of the WCML modernisation has been limited to areas around regional metropolitan cities in concurrence with the widened intra-regional and ultimate inter-regional polarisation. In order to understand and explain the quantitative results, following the establishment of a comparative national planning framework in Chapter 6, this chapter is dedicated to exploring national and local interactions and interventions employed to seize the opportunities presented by HST, which contributed to the transformation process in North-West England for around 30 years between the 1980s and the 2000s.

This chapter is organised in five main parts. Under the national spatial-economic framework constituted in Chapter 6, section 7.2 examines how the WCML modernisation was implemented and perceived at the national level. Regional intervention is first explored in section 7.3, followed by different interventions at the sub-regional level. The opportunity of the WCML modernisation seized under multi-level interaction and interventions are summarised in section 7.4 prior to the concluding remark in section 7.5.

7.2 National Intervention in the WCML Modernisation

National intervention in the WCML modernisation proves to be market-led, private-led, profit-led, and intercity-prioritised. With an obsolete infrastructure and increasingly unreliable services, the implementation of the WCML modernisation did not begin until rail privatisation and finally arrived in 2004 and 2008. There are four key features underlying this belated investment at the national level.

Firstly, the WCML modernisation was essentially a national decision, but as discussed in Chapter 6, under the Thatcher administration in the 1980s, the ideology was waiting for private money to invest in public transport. British Rail made several failed attempts to kick-start the project, causing serious problems at later stages. The former Managing Director of InterCity Rail services and the former CX of Virgin Trains, Mr Chris Green, explains why.

> *Over the last 10 years of British Rail, between 1984 and 1994, a strong effort was made to invest in modernising the WCML because we knew the assets were getting old and, above all, because we knew we would need more capacity as time went by. We completely failed. The Treasury would not give us money…It (Pendolino) started running with passengers in 2004, but it should have been running in 1986/1987. All our problems come from that long time gap.*

Secondly, although the state expected private money to be invested in the WCML, the whole process reflected a lack of national intervention until RailTrack went broke. The state played an arbiter's role, with regulation governed by OPRAF scrutinising rail time between London and Manchester, but a big decision maker was not nominated to negotiate between infrastructure and various train operating companies until the bankruptcy of Railtrack. In order to win the franchise, Virgin trains proposed an ambitious objective for speed at 125 mph which beat other bidders[80]. In order to achieve the 140mph promised by Virgin Group, Railtrack adopted an untested signalling technology (Butcher, 2010). However, coordination between Virgin and Railtrack was absent. Mr Green recalls,

> *Virgin tried to say what they wanted, but Railtrack said this is not possible… it is not possible to make compromises. Luckily, at that point, everything stopped and the government took over and we got what we wanted.*

After Railtrack went broke, the government intervened to take direct control and wrote the timetables. The key concern for the government was to ensure inter-city connectivity rather than concentrate on commuting and freight. Mr Green states,

> *They broke the promise and said "no 140 mph an hour… not 14 trains an hour on the fast line…we wanted to share with what is now London Midland…We the government would write the timetable". They did it well. So you now have a timetable where the government has moved all the trains out of the way… the freight train is moved, the local train is moved, we have got very fast to Scotland. It would not have been possible for Virgin. Virgin could not move other people's trains.*

Therefore, the problematic WCML modernisation demonstrates something went wrong in the privatisation process. As Professor Peter Hall argues, "*the UK seems not to have the same tradition as in other places of putting together public and private sector planning and investment*". Likewise, the former chief planner in NWDA, Mr Ian Wray, opines "*the British civil service really regards itself as a body which regulates the British economy, which doesn't plan developmental planning properly*". Mr Wray argues the whole process was "*a planning disaster with an over-extended time period, overrun budgets, and extremely unreliable services*". Consequently, the modernisation of the WCML was literally perceived and treated as a problem rather than an opportunity.

[80] Interview with Mr Chris Green (the quotation is in Appendix19-CG-1)

Thirdly, the upgraded WCML did not involve the construction of new stations, so decision making regarding HST stopping patterns and timetables is based on market-led and profit-oriented factors, which Virgin Trains took into account. According to Mr Green[81], there are four main concerns for the service pattern. The first one is existing spatial-economic strength. Nine out of twelve HST stations are located within the prosperous southern part of the region, which has been demonstrated in section 5.5. This spatial-economic pattern was explicitly suggested by the business model used for decision making. Secondly, British Rail's experience assisted the arrangement of three trains per hour between Manchester and London without blocking track capacity for local train services. Thirdly, the technical aspect of electrification is critical, but the business model is superior to other factors. This can be illustrated by the contrast between Chester and Blackpool. Despite the fact that both are located on non-electrified conventional lines, through services to and from Blackpool were cancelled in 2003 in contrast to Chester, which continued to be served by Virgin Voyager diesel trains because Chester is a more buoyant business and tourist destination than Blackpool. Finally, market share is another factor which is revenue-centred.

Fourthly, the WCML exploits the existing rail capacity for a mixed traffic railway, including long-haul HST, intra-regional commuting trains, and freight. The priority of inter-city travel squeezed the capacity for commuting and freight services, but no investment was made on improving the intra-regional network to reduce the deterioration of local services. The deficient capacity has become more problematic when the full completion of the WCML modernisation arrived in December 2008 with three trains per hour between London Euston and Manchester Piccadilly stations. The lack of network capacity has impeded the development of additional services even though there is huge demand. The only exception was places which are already located on the WCML and served by Pendolino services[82].

7.3 Local Intervention in the WCML Modernisation

Due to the separate central-peripheral relationship in the British institutional system, the local level has not been influential in the national decision making process. However, as soon as the WCML modernisation was completed in 2008, the more frequent and reliable services between major city cores would certainly have an impact on those HST cities. The level of wider impact would depend on what local intervention was either consciously or subconsciously made before the

[81] For detailed quotations from interviewee, please see Appendix 19- CG-2, CG-3, CG-4, and CG-5.

[82] Interview with Mr Dave Whyte (the quotation is in Appendix 19-DW-1)

arrival of the WCML modernisation. Local intervention at the regional and sub-regional levels is reviewed as follows.

7.3.1 At the Regional Level

7.3.1.1 From the 1980s to the Mid-1990s: Regional Campaign Groups Urged Transport Investment in the WCML

Regardless of a private-led approach at the national level, there was a strong regional campaign to upgrade the WCML, although there was no regional government. The key cause for this campaign was a great fear that the peripheralisation of NWE might occur if the UK did not upgrade its national rail network to connect with mainland Europe. This view was highlighted in the manifesto booklet "Capitalising on the Channel Tunnel: Action for North West England"[83]. Two major campaign groups[84] were formed collectively in 1990 when agreement to establish a Trans-European network was reached. According to the transport advisor to the North-West Business Leadership Team, Mr David Thrower, who was closely involved with both campaign groups, two stages of the campaign could be distinguished. In the first stage, the purpose was to highlight the need for transport investment in the WCML and to keep the campaign going. The campaign argument was based on a comparison with two existing upgraded mainlines: the East Coast Main Line (ECML) and the Great Western Main Line (GWML). When the Channel Tunnel opened in 1993/4, the second stage of the campaign began and concerned beyond technical improvements to aim for a link through to Europe in addition to significant improvement to the WCML[85].

Nevertheless, these campaigns could not influence central government's decision, the whole project was held back until rail privatisation took place. In addition, in order to realise the network link through Europe, the campaign groups supported the Channel Tunnel Rail Link project (CTRL) and campaigned for the location of the CTRL stations on the northern side of London for a better interchange to Northern England. Afterwards, when the new CTRL project was completed in 2007, the upgraded WCML modernisation was not finished until December 2008, let alone Eurostar services to the NWE which have not been realised.

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[83] Source: House of Commons, Deb 24 May 1990, Vol. 173 cc406-18.

[84] According to Mr Thrower, there was one more campaign group called North-West Regional Consortium which does not exist any longer. The first group was "Channel Tunnel North-West Group" with full support from a range of business groups and some local authorities across the North-West (House of Commons, Deb 24 May 1990, vol. 173 cc406-18). The other group was "West Coast Rail 250" organised completely by major local authorities, led by Cumbria Council.

[85] For quotations from interviewee, please see Appendix 19- (DT-1).

7.3.1.2 After the Mid-1990s

Problematic Regional Planning and Institutions

The construction work to modernise the WCML began in 1998 when regional planning was introduced to better address regional inequality by a re-elected Labour Government as discussed in section 6.5.2.1. However, the failure to directly create an elected regional government resulted in three indirect regional institutions being in charge of different parts of regional planning. The whole experience of regional operations has proved to be ineffective and indirect regional institutions are not particularly capable of delivering effective strategies[86]. Firstly, the difficulty of balancing local and regional interests for members of the North West Regional Assembly (NWRA) hampered the strategic regional vision. When the North West Development Agency (NWDA) produced a draft of a Regional Economic Strategy (RES) in 2000, there was disagreement regarding the designation of strategic sites between NWDA and NWRA (Wray, 2011). Secondly, although the need for improving intra-regional transport rail services was identified in regional planning documents[87], the Department for Transport had final decision making power from a national perspective and regional bodies had no decisive influence. According to the Transport Act 2000, an integrated local transport plan (LTP) was reflected to cooperate with the regional transport strategy (RTS) as a basis for funding preparation for an Annual Progress Report (APR), but the whole funding review procedure was strictly controlled and allowed little freedom to coordinate or negotiate (Harman, et al., 2007). Thirdly, there is a fundamental lack of regional consensus in NWE, which is problematic. The combination of a lack of effective regional mechanism and collective regional consensus means it is difficult to tackle regional inequality and improve intra-regional connectivity within a wider regional concern beyond a city-regional territory. As Mr Wray recalls that the NWDA made several attempts to seek support for the electrification of the Liverpool-Manchester line and Preston-Chorley-Bolton-Manchester line, but could not attract Greater Manchester's interest[88]. In particular, a historical rivalry between

[86] Interview with Professor Alan Harding (the quotation is in Appendix 19- AH-1).

[87] In regional planning Guidance for the North West (RPG13), it was mentioned as "The West Coast Main Line should be developed so as to make certain that the proposed improvements for long-distance passenger movements are realised whilst ensuring that sufficient capacity remains to meet the future aspirations for regional and local passenger services and the movement of freight" (GONW, 2003, p.126). In retrospect, these links are critical to the regional development and were proposed already in the Regional Planning Guidance in the 1970s (North West Joint Planning Team, 1974). The impact of the WCML on local rail services was pointed out as a serious concern in the 2008 Regional Spatial Strategy (RSS). "The quality of many local services and infrastructure leaves much to be desired, and congestion on some rail routes, both in terms of the number of trains and passengers, is now a serious concern" (Government Office for North West, 2008, p.11). But more than 30 years later, this electrification scheme has only just been approved by the British central government and will not be realised until 2013 at the earliest between Manchester and Newton-le-Willows. Three lines are included, namely Newton-le-Willows – Liverpool and Huyton - Wigan (in 2014), Preston- Blackpool (in 2015), and Manchester-Bolton-Chorley (in 2016).

[88] Interview quotation is in Appendix 19-IW-1.

Manchester and Liverpool explains this lack of regional consensus. Professor Sir Peter Hall illustrates this point with an anecdote.

> *Quite early on in the New Labour era, it must be around 1998, there was a big conference in Bridgewater Hall in Manchester and I was asked to speak. And it was really big. John Prescott was going to open it. It was to launch a new concept called "Mersey Belt" that the local authority would come together to promote this Mersey Belt between Manchester and Liverpool including also Warrington as a unified planning concept… It was chaired by Felicity Goodey. She said, and was only half joking, that "no one in this room goes up there mentioning the Ship Canal" … A hundred and four years later, you couldn't mention the Ship Canal because with two city leaders the memories were too painful.*

The Regional Strategy- The Northern Way

Regional inequality has been simplified and widely emphasised as a north/south divide at the inter-regional level. "Making It Happen: The Northern Way" (ODPM, 2004) was published in February 2004 as a growth strategy for three post-industrial northern English regions, which were identified as suffering a £35 billion gap in productivity compared to the national average. In September 2004, Moving Forward: the Northern Way Growth Strategy was published (Northern Way Steering Group, 2004) and clearly stressed that any boost in the productivity of the northern economy would lie in the development of eight city-regions across the north. The improvement in transport linkages between eight city regions was regarded as fundamentally important to achieve the vision of "The Northern Way" in Strategic Direction for Transport[89] (The Northern Way, 2007).

This east-west artery connected by canal from Hull, Leeds, Rochdale, Manchester to Liverpool was central for the world's first industrial urbanisation. Since the 1970s, a campaign for Pennine identity has been attempted on the basis of "political regionalism that looks for a northern unity" (Hebbert, 2000). In the 1990s, addressing the barrier of the Pennine Chain complied with the policy objectives of the European Spatial Development Perspective. The Trans-Pennine corridor had "a role to play in developing the northern arc trading axis from Ireland across North Germany to the Baltic and Eastern Europe, [which] will both generate growth and deflect trade from the congested south" (cited in Hebbert, 2000, p.386).

However, in the railway age, the Pennine Chain between Lancashire and Yorkshire has historically determined a Y-shape of economic geography in England (Hebbert, 2000). Economic interdependence between the two sides of the Pennine Chain has proved to be weak. A study conducted by Robson et al. (1995) found static migration flows since the 1960s, limited travel-to-work patterns and a marked separation in economic activities. Similarly, an environmental assessment of the M62 Corridor demonstrated the corridor is "a pair of

[89] Three transport investment priorities were pinpointed, namely an improvement to access to the North's airport and ports, and between and within the North's city regions.

back-to-back activity systems" (cited in Hebbert, 2000, p.386). Again, the findings were similar in a more recent study titled "Connecting the North" (2008): three northern regions have separate markets with very little evidence of trade in services across the Pennines. "The pattern was compounded by a tendency for firms in the different regions of the North to prefer relationships with business service providers in their regional centre and to secure additional services from London, rather than elsewhere in the North, if the required expertise was not readily available regionally" (Coates, Institute for Political and Economic Governance, et al., 2008, p. 29). As a result, the geographical barrier (the Pennines) and cultural identity has historically limited east-west interdependence. The ancient rivalry between the White Rose of Yorkshire and the Red Rose of Lancashire still holds.

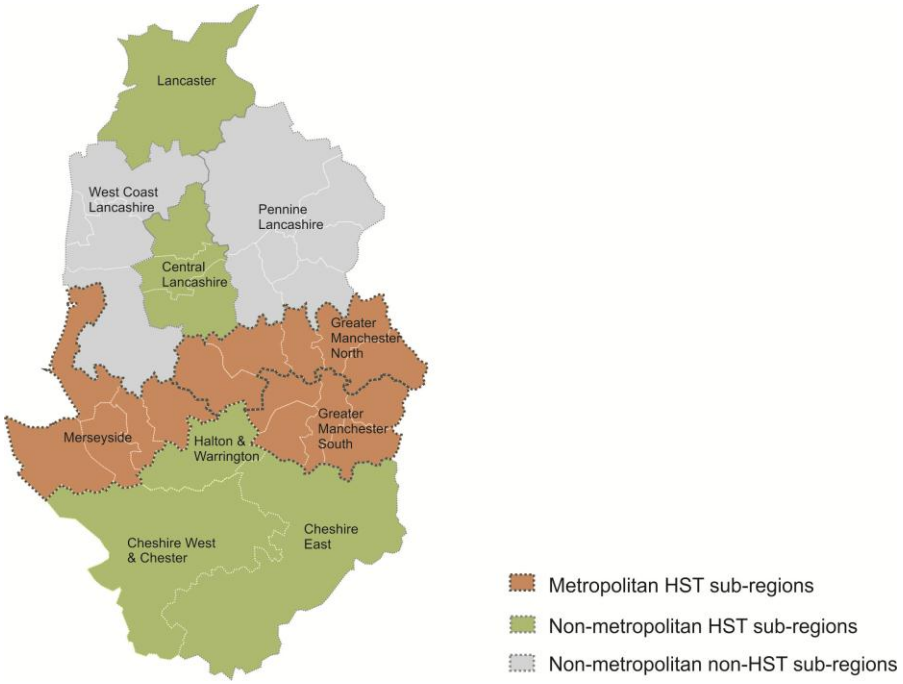
Even so, the demands for the connection of northern cities to Manchester Airport have gradually demonstrated the need to overcome this east-west rail barrier. SURF et al. (2006) stress its importance for business between key economic clusters and Manchester Airport. In order to pave the route for further development, the issue of congestion has been emphasised. An associated constraint on the Trans-Pennine corridor from Hull, Leeds and Manchester to Liverpool was identified in Network Rail's Business plan (2007) and the Rail White Paper (2007).

Gradually, the regional concept was superseded by a city-regional concept (J. Harrison, 2010). Furthermore, when the North-East Referendum failed in November 2004, the regional concept became elusive. The inter-regional inequality of the north/south divide has, to some extent, drawn more attention at the expense of persistent intra-regional inequality.

7.3.2 Varying Local Interventions at the Sub-regional Level

Given ineffective intervention at the regional level, attention naturally shifted to the lower levels. Since the market-led approach of HST services, three types of sub-regions are distinguished to understand differential local intervention, namely metropolitan HST sub-regions, non-metropolitan HST sub-regions and non-metropolitan non-HST sub-regions (Figure 7-1). Four sets of transformation processes are identified and each is examined as follows.

Figure 7-1 Typologies of Sub-regions in NWE



Source: author

7.3.2.1 The Re-centralisation of Regional Hegemony around Manchester

Up to the mid-1980s, Manchester suffered from a process of decentralisation, losing population and new economic activities to adjacent prosperous sub-regions in the southern part of NWE. The depressing situation was observed by Tom Bloxham, the chairman of Urban Splash Ltd as follows.

> *"I first came to Greater Manchester 20 years ago as a student. My first impression was of an unhappy place, truly truly full of "dark, satanic mills." The city had a huge stock of under-valued buildings, a centre that seemed to shut shut down at 5:30pm and a shaky local economy struggling to figure out where to go next" (Northwest Regional Development Agency & Centre for Cities at ippr, 2006, p. 25).*

No proactive action directly linked to the WCML was noticed in Manchester. Apart from the reason that local governments hardly have a dominant role to play in the national transport project, the perception is much less conscious towards this upgraded approach than a new dedicated approach, regardless of its notorious fiasco. Mr Stephen Clark and Darren Kirkman from GMPTE Rail Programme recall,

> *I am not aware of any plan drafted by the city council or regeneration team who said this was because of this arrival, so we did this…Effectively, what was already there on the west coast was upgraded …Whereas if you take any place where HST has been built and it has a new station, you have to redevelop a bit of the city centre in order to make that place fit, and that wasn't the case with the west coast. It just fitted in with what was already there.*

Although Greater Manchester did not involve the decision making of the WCML modernisation, it proactively and strategically responded to urban and regional planning policies and institutional changes initiated by the national state. From the mid-1980s onwards, local intervention was made to address the decline in the metropolitan area through strong and stable leaderships in fulfilling political and economic strategy and handling crises, active development of external and internal transport links, and progressive redevelopment of urban centres on a polycentric city-regional scale.

I. Strong and stable leaderships

A long-term collaboration between political and bureaucratic leaders of Manchester city council critically orchestrated Manchester's transformation. Key leaders are Manchester city leader Graham Stringer (1984-1996), Richard Leese (1996- to now), and Chief Executive Howard Bernstein (1998- now). Their internal unification acting as an active team for 25 years is an important factor underlying the transformation[90] and ensuring strong and stable political leaderships. This character is argued to be associated with cultural coherence in Manchester. Humphrey Chetham (1580-1653), a Mancunian textile merchant and entrepreneur, founded Chetham's School of Music and Chetham's Library, the first public-lending library in the English speaking world in 1653. Mr Wray observed that this illustrates "*the sense of cultural cohesion*" embodied in "*intellect and capability of people who run and work in Manchester that actually drove the industrial revolution and the revival since the mid-1980s*".

In the 1980s, a central-local political conflict intensified (Hampton, 1991) because several radical instruments were seen as attempts to constrain the power of local authorities. Manchester was one of the original cities against the national government. But after Thatcher won a third successive

[90] Interview with Mr Dave Whyte (the quotation is in Appendix 19- DW-2).

election, Manchester implemented "a Manchester Model" (Robson, 2002). Firstly, its political/economic strategy was revisited to welcome national initiatives and operated in partnerships with the public and private sectors to attract inward investment for turning Manchester's economy around[91]. Secondly, in response to the abolition of Manchester Metropolitan County in 1986, an informal framework for ten metropolitan districts, the Association of Greater Manchester Authorities (AGMA), was alternatively established to maintain strategic function for economic development, transport, housing and planning at the city-regional level (Harding, Harloe, & Rees, 2010). Twenty-five years later, AGMA further evolved to become the Greater Manchester Combined Authority (GMCA), established on 1st April 2011.

Apart from tackling economic crises, strong leaderships reflect in dealing with unpredictable crises. The IRA bomb was a negative event, but Manchester's reaction to it with calmness and confidence seized the opportunity to rebuild that part of the city centre. This reminds one of Harold Macmillan's famous political dictum "events, dear boy, events". As Professor Sir Peter Hall notes,

> *You could have a political plan, but it was entirely blown off the course by an event like an IRA bomb…It will force you to change your course. The interesting thing in Manchester is that they made a negative event work for the most positive effect. So IRA bomb is as negative as you can get, but immediately the next day they said this is positive. We can rebuild the city centre.*

In turn, the bomb speeded up the transformation process[92] and remarkably transformed the perception of Manchester. Professor Brian Robson argued, "*The real spur was that bomb, which just changed the readiness for people to act, to deliver and also changed the Central Government's perception of what Manchester can do*". Likewise, two failed bids for Olympic Games turned out to be the successful Commonwealth Games in 2002. Harding et al. (2004) argued the two Olympic Games bids demonstrated Manchester's approach was proactive to redevelop the most problematic part of a city with a long-term vision rather than passively arresting decline.

Moreover, their tenacity in securing public funding is remarkable. This can be demonstrated by the funding for the Metrolink extension Phrase 3b. It essentially relied on a congestion charge project as part of a bid for Government's Transport Innovation Fund of a £3-billion package. Although the congestion charge referendum failed in December 2008, this financial crisis was eventually overcome. Sir Howard Bernstein argued that "*There's no magic bullet that's going to give us £3 billion pounds to spend on transport. That being the case we're having to re-evaluate where our*

[91] Interview with Professor Alan Harding (the quotation is in Appendix 19, AH-2)

[92] Interview with Mr Dave Whyte (the quotation is in Appendix 19- DW-3).

priorities lie" (Shanahan, 2009). Five months later, Transport Secretary Geoff Hoon endorsed £195 million for the extension project (BBC News, 2009). Mr Wray provided this anecdote,

> *They are persistent…. The government did not want to pay for this special link of extension. Howard Bernstein was taken to a meeting with Robert Devereux… I think he was the deputy at the time, Devereux told him he would not give him this money. Bernstein gathered his papers in a bundle, stood up, said "so this means war, does it not?" and walked out... And of course, after 12 months' time, he got the money for the Metro link extension. He got it.*

The Development of External Transport Links: Manchester Airport and its Regional Connections

Without a reliable inter-city rail service, Manchester Airport[93] naturally appears to be a controllable asset to attract investment, not only from the domestic field, but also from abroad. In response to an airport privatisation policy, Manchester City Council, along with nine other district councils, unusually and strategically kept ownership as a municipal enterprise. The development of Manchester Airport demonstrated the ambition of Manchester to become an international competitor through international connectivity to attract international inward investment. As the Planning Director of Manchester Airport, Mr John Twigg, notes, "*…so many businesses are located in Manchester and North West. One of the reasons that brought them here is the ability to get international connectivity out of here, whether that is for goods or people".*

Since the 1980s, Manchester Airport has progressively expanded and established its ground transport access. In order to reach a wider catchment, rail linkages became a priority due to increasing motorway congestion[94]. In addition, cooperation with Trans-Pennine Express TOC further assisted the expansion of the network to key northern cities beyond NWE, including Leeds, Hull, Newcastle, Glasgow and Edinburgh. Thanks to Manchester's role in hosting the Commonwealth Games in 2002, two transport gateways were created to significantly enhanced Manchester's connectivity and external image. These were an integrated transport interchange for buses, coaches and rail at Manchester Airport and the remodelling of Manchester Piccadilly. The integration of the rail and urban transit systems in a remodelled Piccadilly station generated a good psychological effect for Manchester in its quest to become an important European city. As Professor Sir Peter Hall confirms,

> *It is a very good psychological message, since decision makers arrive by trains. It embeds itself in the brain. Putting that metro link into the underground was pretty good because you can argue that the tram system creates the image of an important large European City.*

[93] A consortium of local authorities with 55 per cent ownership resting with Manchester City Council and the remaining 45 per cent split evenly among nine councils of other nearby towns.
[94] Interview with Planning Director of Manchester Airport, Mr John Twigg.

Figure 7-2 Rail Connections from Manchester Airport to its catchment

Source: Manchester Airport

The Development of the Metropolitan Internal Transport Link- the Metrolink Network

Apart from the development of external transport linkages through an airport hub, the Metrolink light rail system has crucially assisted the expansion of labour market areas in a city-regional territory beyond the City of Manchester. Evolving from an idea to connect two mainline stations that was mooted in the late 1960s, the plan for a light rail system in Manchester was first proposed in the mid-1980s. The initial phase began with construction in 1988 and the project was fully completed in 1992 in order to connect Manchester with Bury and Trafford (Altrincham). Phase 2 further extended the network to serve Salford (Broadway in 1999 and Eccles in 2000). Phase 3 (divided into 3a and 3b, still under construction and partly completed) massively stretches out to Oldham, Rochdale, Manchester airport, Tameside and eventually Stockport.

Figure 7-3 Metrolink Future Network

Source: Transport for Greater Manchester

Redeveloping Metropolitan Urban Centres

In addition to boosting Manchester's external and internal transport connections, a wide spectrum of urban redevelopment projects were implemented to create new spaces for diverse economies with a polycentric structure. Firstly, the Central Manchester Development Corporation (CMDC) in 1988 operated as a tipping point between the collapse of manufacturing and the growth of a

service-based economy[95]. Likewise, Trafford and Salford embarked on inner city redevelopment schemes. Secondly, the aftermath of the IRA bomb in 1996 led to the redevelopment of the Arndale shopping centre and a newly built museum and exhibition centre, Urbis, for cultural and creative inspiration. Thirdly, Spinningfields commercial office development was marketed as "the region's premium financial and business services destination" (Hebbert, 2010) to diversify the post-industrial economy and compete with London's office rental market. "*The whole picture of it is that the office area could compete with London Broadgate or that sort of equivalent urban development*"[96]. The Piccadilly Partnership (2003) is a similar development. Fourthly, a new wave of massive government funding was implemented from the late 1990s to a few large-scale urban redevelopment projects, namely East Manchester URC (1999), Media City in Salford in relation to the BBC relocation (2006), the relocation of GONW to Piccadilly Gate (2009), and the Government Quarter plan- "The Whitehall of the North" (2009)[97]. The case of MediaCity in Salford has resulted in rectifying not only a London-centric, but also a Manchester-centric ideology. As Professor Michael Hebbert remarks, the BBC project represents "a combination of two advantages: the relocation from London of various services and relocation within Greater Manchester from Manchester to Salford". Nationally, MediaCity confirmed the reality of the north/south divide and was expected to make efforts to shrink the gap. Sub-regionally, the BBC relocation to Salford significantly presented a chance to rectify the existing patterns which displayed a concentration of high value-added economic activities in Manchester city centre. Even so, it is still confined to the boundary of Greater Manchester South rather than a wider region. In addition, higher education development assisted to diversify spatial-economic progress through a knowledge capital partnership (2003), namely the merger of Manchester University (the former university of Manchester Institute of Science and Technology (UMIST) and the University of Manchester (2004), which enhanced links between the university and local/regional activities[98].

II. Challenges

Regardless of the extraordinary transformation Manchester has demonstrated, the city's success has not spread equally within the boundary of the City of Manchester. As Professor Peter Hall points out,

[95] Interview with Professor Brian Robson and Mr Ian Wray.

[96] Interview with Professor Michael Hebbert.

[97] A decentralisation policy of moving government offices from London was proposed by the Labour Government. "The plans are part of a wider push to relocate 24,000 civil servant posts outside London" (BBC, 2009).

[98] Interview with Professor Brian Robson.

> *I think Manchester did brilliantly, but was not entirely successful because we know it is still a divided city. It is a half-successful and half-disaster city. … But if you go down to Wythenshawe, to an area called Baguley, which is still recorded as one of the most deprived areas in the whole of Britain, you would not see that Manchester is as successful as everyone makes it out to be. It is a really divided city - between people who made it and people who haven't made it.*

Likewise, inequality is perpetuated within the Greater Manchester metropolitan area. The quantitative findings in Chapter 5 and Manchester Independent Review show a striking divide between Greater Manchester South (GMS) and Greater Manchester North (GMN). Five post-industrial towns in GMN are economically dependent on Manchester, but have been suffered during a difficult transformation towards the knowledge economy, as they still depend on manufacturing activities (MIER, 2009b).

However, the development of the Metrolink with GMS have demonstrated positive effects on housing prices in some towns in GMN which become pleasant commuting towns. Bury was found to be one of three local districts with the highest proportion of highly-skilled workers who commute to Manchester, Salford, and Trafford (MIER, 2009b). Bury's experience has boosted the continual expansion of the Metrolink because a similar effect has been anticipated by other local authorities with a similar economic trajectory to Bury's[99].This result implies that by being connected by the internal city-regional transport system, these post-industrial towns could alternatively explore a commuting function to serve the metropolitan city in parallel to their own economic restructuring, in particular when local labour skills are not yet competitive enough to attract inward investment. In addition, this also reflects a coordinate city relationships that exists within Greater Manchester. Bury's development strategy as Manchester's commuting town is a good example. Mr Paul Hildreth conveyed the idea of Bury city council in the study of City Link Relationship,

> *We went to talk to Bury before we came out of our conclusions. They said: "well, the way we positioned ourselves not trying to be a great important centre. We see ourselves actually as a nice place to live with people can commute easily to Manchester. This is where we are positioning ourselves".*

7.3.2.2 A Catch-up Process in Liverpool/Merseyside

Similar to Manchester, Liverpool city council did not hold specific discourses or develop targeted strategies towards the modernisation of the WCML. It was regarded as a technical issue that was part of national responsibility rather than an apparent opportunity for local action[100]. However,

[99] Interview with Professor Alan Harding (the quotation is in Appendix 19-AH-3).

[100] Interview with Professor Michael Parkinson (see Appendix 19- (MP-1)).

when Manchester made the conscious intervention in exploiting national regeneration funding to redevelop its declining city centre and keeping its own airport, invest in it, expand it, link it with other transport networks and develop a light rail network, Liverpool did not demonstrate a strategy for redevelopment. Liverpool Airport and Mersey Docks and Harbour Company (MDHC) were privatised and it appeared difficult to develop a constructive relationship between privatised infrastructure providers and the local council. Although the Loop & Link transport project was completed in the 1970s in Liverpool city centre, rail on its own could not save Liverpool (P. Hall & Hass-Klau, 1985). Instead, the whole city centre was left deteriorated in the 1980s until the mid-1990s.

I. The Rediscovery of Political Leadership

Urban Blight in the 1980s

Regarding the decline in metropolitan cities, Liverpool which possessed specified and less diverse economies encountered a greater challenge than Manchester (Chape, 2009). Moreover, its political conflict with the central government paralysed the local economy. Liverpool City Council did not seize the great opportunity to redevelop its city centre in parallel with the significant physical transformation made in the docklands by Merseyside Development Corporation (MDC). As Mr Wray notes in his interview "*The place was run by extreme left-wing politicians who just brought it into dispute*". Also, there was a lack of vision for long-term development by short-sighted local politicians (Harding et al, 2004). "*Too often it was seen by local politicians as less important than other parts of Liverpool, because the votes were not there in the city centre…[I]t was backward looking and introspective*" (Parkinson, 2008, p. 15). What is more, the higher-level central-peripheral dispute could not justify Liverpool as the leader of Merseyside. Neighbouring councils in Merseyside were embarrassed by Liverpool. "*Other places won't have anything to do with Liverpool. And they don't mind calling it Merseyside, as long as it's not Liverpool.*"[101] "No stable majority could be constructed" (Harding, Deas, Evans, & Wilks-Heeg, 2004). As a result, the unstable political situation between central and local government alienated potential investors (Couch, 2003), so it depended heavily on public investment (Parkinson, 2008). The development of Manchester and Liverpool diverged in the 1980s. By then, Liverpool was known as "a destination for those seeking out urban blight" (Wilks-Heeg & Jones, 2004), and the decline of Liverpool led to the assured dominance of Manchester in the region[102].

[101] Interview with Professor Michael Parkinson.

[102] Interview with Mr Ian Wray (the quotation is in Appendix 19-IW-2).

A Sign of Revival from the Mid-1990s

The blight in Liverpool began to change in the mid-1990s. A sharp rise in private sector investment in the city occurred from the late 1990s (Wilks-Heeg & Jones, 2004). Four key changes contributed to a "catch-up" performance in Liverpool. Firstly, Merseyside Objective One (MOb1) European funding evoke an active and strategic thinking mode within Liverpool The requirement for the funding scheme raised the agenda to the future in terms of economic development and governance at the city-regional scale. It provided "a very positive experience for collaboration in Merseyside" (The Northern Way, 2009d, p. 12). Secondly, with the assistance of the MOb1 funding (Harding, et al., 2004), public and private partnerships were gradually forged in Liverpool from the early 1990s. The Mersey Partnership (TMP) was established in 1993. This effectively helped to make Liverpool attractive for businesses. But without government support and resources, this voluntary and informal structure has not become a very powerful city-regional agency. Professor Michael Parkinson from Liverpool John Moores University stresses that "*For Liverpool, I think it's a vacuum. We are making progress. It is getting better. It is possible. But I would not hold your breath: we're not politically mature enough".* Thirdly, Liverpool participated in the Core Cities Group which was founded in 1995 to promote the role of core cities in driving economic growth. Professor Parkinson states that "*Liverpool recognised they needed to play with the big cities…with European cities - hence the sense of Liverpool as part of an urban lobby group".* After 1997, the relationship between central and local government improved. The change of local politics and mood was conducive to repositioning Liverpool as a European city[103]. Finally, critically required local leadership was exerted in 1998. It was widely regarded as a key factor contributing to these politics of "catch-up" (Wilks-Heeg & Jones, 2004). A new council leader, Mike Storey, and a new chief executive, David Henshaw, were both "*entrepreneurial, innovative, modern, and outward-looking*"[104]. Thus, the improvement in Liverpool has been multi-faceted, e.g. politically, economically and strategically. A recent debate on a second crossing for the Mersey demonstrates collaboration among local authorities within Liverpool city-region for wider strategic economic benefit[105].

Regenerating Liverpool City Centre before the Arrival of the WCML Modernisation

A series of strategies and tranches of funding was orchestrated and utilised by the new governance team to revitalise neglected city centre and its waterfront. Firstly, Liverpool Vision Urban Regeneration Company (URC) was established in 1999 and did function as "a useful interface" to interact with private investors effectively and strategically (Biddulph, 2010, pp. 103-104).

[103] Interview with Professor Michael Parkinson (see Appendix 19- (MP-2)).

[104] Interview with Professor Michael Parkinson.

[105] Interview with Professor Michael Parkinson.

Secondly, the regeneration strategy capitalised on Liverpool's rich cultural assets. The vision was stated explicitly in the strategic regeneration framework (2000). In line with this culture-centred vision, two cultural initiatives were actively implemented. The first initiative was the bid to hold European Capital of Culture (ECOC) in 2008. The successful bid reconfirmed a strategy involving partnerships and fresh governance and bringing new life into Liverpool. Chief Executive of City Council, Mr David Henshaw, said " [I]n the past we've been prisoners of our history" and "It's a momentous day for Liverpool because it's about looking forward" (BBC News, 2003). The second cultural initiative was a designated status as a World Heritage Site, which was actively pursued by the City Council. In January 2003, Liverpool's waterfront and commercial district were confirmed as Britain's only new nomination for World Heritage Status (Liverpool Vision, 2003),which might have boosted Liverpool's ECOC bid before the decision made in June 2003. To no great surprise, Liverpool Maritime Mercantile City was inscribed by UNESCO in July 2004 as "The supreme example of a commercial port at the time of Britain's greatest global influence."[106] Thirdly, these cultural strategies also brought about the transformation of the city centre and waterfront. The core city centre, including the waterfront area, was classified into eleven targeted zones covering a wide range of large and small projects involving physical, social, economic and environmental programmes. Among these interrelated and indispensable projects, the most remarkable elements of the physical transformation were the gateway to Liverpool Lime Street station, the waterfront transformation and a large retail scheme named Liverpool One. Through these recreated urban spaces, the connectivity and permeability between the waterfront areas and the city centre were largely enhanced before the arrival of the WCML modernisation.

II. Challenges

However, major transformation in Liverpool focused on the city centre and the gap between the city centre and outside areas widened, including the poor north and posh south. In terms of transport connectivity, Professor Parkinson indicates that Liverpool has four important challenges which are still a long way behind Manchester, namely: Liverpool Airport (a tourist-oriented rather than business travel and low-cost European destinations rather than long-haul international destinations), rail services to London (less frequent than Manchester-London route and it is still not certain whether HS2 will link with Liverpool), the regional rail network (which occupies a peripheral location among eight major northern cities while Manchester is the core of the northern hub), and the tramway system at the city-regional level (Liverpool could not achieve a tramway project in the city centre).

[106] The website of the world heritage site http://www.liverpoolworldheritage.com/

7.3.2.3 A Stable, Less Strategic, and Path-dependent Process in the Non-Metropolitan HST Sub-regions

The investigation was further conducted into three types of non-metropolitan sub-regions, namely new towns, well-established medieval towns, and overspill suburbia. Similar to the two metropolitan cities, these sub-regions did not intervene into the decision-making process of the WCML modernisation. However, it is worth noting that metropolitan cities have implemented major physical transformations supported by tranches of national funding in the city centre where HST services will be delivered; whereas these towns which benefited from decentralised economic activities from metropolitan cities were not targeted by national policy and did not make serious attempts to improve their city centres. In his interview, Mr Aidan Manley, the Head Operating Officer for the support team in Cheshire & Warrington LEP Board confirms that,

> *We have got three centres (Warrington, Chester, or Crewe) which have direct rail links to London, but none of them have actually secured major town centre office occupiers to capitalise on their faster rail links to London. That hasn't happened.*

Similarly, in Preston, the HST opportunity was not explored either. As City Centre Planning Manager of Preston City Council, Mr John Crellin states,

> *Preston hasn't had any new office development for many years. We don't have any Grade A office development in the centre…I don't think there was public intervention before the arrival of the upgraded WCML…. I think in many ways the investment in the rail network hasn't been harnessed in a way perhaps it could have done or should have been done in the past.*

I. Sub-regions with New Towns

The first type is one with new town development. Warrington, within one hour 46 minutes from London with a non-stop HST service, has the shortest journey time to London in the North-West. However, this faster link with London did not reinforce Warrington's strength. Instead, as quantitative findings in Chapter 5 have showed, there was an apparent decrease in economic strength measured by GVA per head, closely followed by Greater Manchester South. Interview findings suggest that two major factors could explain this change.

Firstly, a coherent new town with the existing city centre has not been accomplished due to political conflict and policy shift. Warrington and Halton and Central Lancashire are two new towns designated alongside existing towns rather than placed in isolated green-field sites. To some extent, both benefit from new town investment and possess good transport accessibility in the form of the WCML and motorway, but development patterns were incoherent and segregated. In Warrington city centre, conflict between new town development cooperation and the local council

led to a development concentrated on the edge of town which left the city centre a mess[107]. Likewise, Central Lancashire New Town suffered from a fragmented landscape, only achieving bits of development around motorway junctions in Leyland and north of Preston because of the shift of national funding resources towards inner city regeneration[108]. Secondly, there was a lack of strong local intervention to insist on redeveloping the fragmented city centre. Concerns over cost led to the abandonment of the interchange project in Warrington. Mr Manley recalls,

> *At one time, it was actually planned to combine both Warrington Bank Quay and Warrington Central into one major interchange. That would cost many millions of pounds. That is now being dropped….Warrington Bank Quay hardly sensed its arrival and its surrounding area. It is awful…I think it is local authority's responsibility to invest in the environment around those stations. Clearly they haven't, have they?*

In retrospect, if an active role had been implemented by the local authority, the whole economic trajectory could possibly have been redrawn. As Professor Hall argues "*If Warrington had the leadership that Manchester had, it would have gone to it and said we need another Urban Regeneration Corporation. We have got to build the city around the Bank Quay station."* As a result, in comparison with the previous motorway-led development, Warrington did not explore the opportunity of HST and the train station and the city centre remained neglected. Both Warrington and Preston are on the list of ten worst railway stations in the UK (C. Green & Hall, 2009). It demonstrated a case which stuck to its dependency on the motorway and did not exploit the opportunities presented by HST. Professor Hall remarks that,

> *It benefited hugely from the construction of the motorway system in the 1960s and 1970s. It advertised itself, I remembered everywhere in London, as the crossover town...That really made it. They got huge inward investment especially firms needing good access for logistics. But then it just settled down and it never exploited the railway… The train station was a total disaster area. Warrington really failed to benefit.*

II. Sub-regions with Well-established Medieval Towns

The second type is one with well-established medieval towns. Chester has developed its historical town centre to become a pleasant and attractive tourist destination. The development of the industrial revolution did not have much of an impact on Chester; instead, the locality developed its prosperity through retailers, relying on income from the elite classes in the surrounding countryside and the professional and service sectors influenced by the powerful Grosvenor family (Ward, 2009). Chester, as a trade and clerical city in medieval times, achieved a reputation as a

[107] Interview with Professor Peter Hall (the quotation is in Appendix 19-PH-1)

[108] Interview with Professor Peter Hall (the quotation is in Appendix 19-PH-2)

pleasant place to visit and to shop during the 18th century and further capitalised on its streetscape, a rich urban exhibition of architectural styles (Ward, 2009). When metropolitan cities in NWE were suffering from overcrowding and economic restructuring, the *Insall* report published in 1968 crucially decided to capitalise on Chester's historical heritage for economic development and maintain this unique quality (Ward, 2009, p. 117). The modernisation of the WCML assisted Chester to reinforce a tourism-based function within a two-hour journey from London and out-of-town business parks for financial service sectors. As Mr Wray confirms,

> *Over the last 10 or 15 years, Chester has been remarkably buoyant. It's developed financial service sectors, the kind of offices which are normally expected to be an hour away from central London. One, this has to do with tourism because this is a very nice place. It has all the characteristics of towns in the South-East. People want to live there; two, because you've got two hour rail service to London. So I think Chester has, I think, benefited very substantially and unknowingly. Tourism also benefits from the WCML improvements, even though the line from Crewe to Chester (the final line) is still not electrified.*

III. A Sub-region Characterised by Overspill Suburbia

The third type is one which has major overspill towns. Cheshire East is a sub-region without a single dominant town, but instead has a constellation of scattered towns acting as industry premises for R&D activities and favourable residential areas for those commuting into Manchester. In addition, some towns (i.e. Wilmslow and Macclesfield) located on the WCML routes have directly benefited from the favourable direct faster services to and from Manchester. The arrival of the WCML simply reinforced this area's existing favourable conditions and further attracted knowledge intensive economic activities to locate in these towns. This reflects the economic structural change presented in Chapter 5, namely that Cheshire East has devoted a high percentage of its economic structure to the knowledge economy. As Professor Cecilia Wong highlights in her interview,

> *North Cheshire is very prosperous and very successful largely because of people commuting into jobs in Manchester. Also you've got some local industrial and R&D activities in north Cheshire itself, places like Wilmslow.*

7.3.2.4 An Arduous but Frustrated Process in Peripheral Non-HST Sub-regions

In contrast to HST sub-regions which are chosen for revenue purposes, two non-HST sub-regions which experienced a difficult and frustrated process were neglected due to their poor economic adaptation after massive deindustrialisation. Regardless of their intervention in improving their attractiveness, intra-regional inequality has widened in parallel to their poor transport connectivity in a peripheral location.

I. West Coast Lancashire

West Coast Lancashire (WCL) is a sub-region defined in this study by an aggregation of four local authorities. Blackpool, which is the major town in WCL, was a thriving seaside resort. " People saved up 50 weeks of the year in order to be able to afford to come to Blackpool for two weeks" (BBC, 2011a). Blackpool used to have good rail connectivity with London to cater for a massive number of visitors, once being the busiest railway station in Europe with 26 platforms. However, with changes in economies and transport conditions, Blackpool and its surrounding towns became disadvantaged and further peripheralised. Economically, massive deindustrialisation and the growth of overseas tourism since the 1970s and low-cost flights since the 1990s have had a serious impact on its specialised leisure economy. In line with declining leisure activities, the shopping market has shrunk dramatically. Blackpool had the lowest amount of domestic internal shopping activities in the mid-2000s. Hotels, restaurants and theatres suffered too. Major annual political conferences are not held in Blackpool any more due to a lack of modern conference facilities and are now held in Manchester and Liverpool. Moreover, Blackpool city council failed to capitalise on a historical association with the aviation industry to diversify its economic base[109].

Transport Disadvantage

Furthermore, transport change significantly led to the decline of Blackpool and the rise of Preston. In contrast with Preston which becomes a major transport hub on the north-south backbone of the WCML and the M6 motorway, Blackpool has been progressively peripheralised. In the early 1960s, the replacement of steam traction by electrification bypassed Blackpool, which resulted in rail services to Blackpool being a technological and operational inconvenience. In 1975, the M55 finally reached Blackpool outskirts and the last extension of the M55 to reach the city centre was not completed until 1983 on an old excursion line. There is a weak internal road system which results in the difficulty in travelling north-south in Blackpool[110], Mr David Bayliss points out, regarding tourist catchment in the North-West, road access is rather more important because nowadays tourist activities in Blackpool reply on coaches and cars[111]. Moreover, due to declining local economies, the modernisation of the WCML removed previous direct rail services to London. Direct rail services continued until 2003 when Virgin trains transferred to cross-country services, before the completion of Phase 1 of the WCML modernisation (Blackpool Gazette, 2003). An interchange had to be made in Preston to continue a journey. The contrast between fast inter-city

[109] Interview with Mr David Bayliss.

[110] Interview with Mr David Bayliss (the quotation is in Appendix 19-DB-1).

[111] Interview with Mr David Bayliss (the quotation is in Appendix 19-DB-2).

services and intra-regional services further resulted in Blackpool acquiring a negative image in the mind of anyone who changed trains at Preston to Blackpool. As Mr Bayliss honestly describes,

> *Although the Pendolinos aren't the nicest rail trains in the world, they're not bad….You then get off at Preston, and there's a contrast between the nice, shiny London train to Preston and the rather dreary train, particularly on the South Fylde Line, to the Pleasure Beach in Blackpool South; the contrast there is quite stunning. And you feel like you're stepping from a first-class world into a third-class world…it is a psychological thing.*

Failed Regeneration Attempts: A Combination of the Ideology of National Political Economy and A Lack of Political Leadership

Regardless of the transport disadvantage, a major attempt to diversify Blackpool's economy was not made until the creation of ReBlackpool URC. During the conservative regime (1979-1997), no major urban regeneration funding was allocated to the area, except the Lancashire Manufacturing Partnership[112] to enhance the manufacturing economy. Under the re-elected Labour Government, a major attempt was made to improve Blackpool as a tourist destination. "ReBlackpool" URC was created in 2003, built on cooperation between Blackpool Council, NWDA, and then English Partnerships, with large investment commitment to major physical transformation and conference facilities in the town centre and promenades, with an ultimate idea of creating a Las-Vegas style Super-Casino. In line with this idea, various transport schemes were planned and proposed. Blackpool airport would have needed to be significantly redeveloped as a key external transport hub to accommodate people from the UK and abroad, mainly Europe. For urban transit, Blackpool applied for funding to upgrade its tramway system between Starr Gate and Fleetwood, but there is no linkage between tramway and railway. Meanwhile, during the process of the WCML modernisation and the discussion of railway timetables, there was an attempt to campaign for a resumption of the national rail services between London and Blackpool. Mr David Bayliss, an independent professional advisor who was involved in this attempt on behalf of ReBlackpool URC, states

> *There was an attempt to re-establish a through service with one or two main trains a day each way between Blackpool and London… We spoke to the people in the department of transport to see whether or not trains would run as far as Lancaster, because I think one train a day going up to just Lancaster and turning back could go to Blackpool rather than up to Lancaster.*

[112] This included the coastal area of West Lancashire containing the towns of Morecambe, Lancaster, Blackpool and Preston, and the former traditional textile area of East Lancashire comprising towns such as Blackburn, Burnley, Accrington, Nelson and Colne and Rossendale. The scheme received £8.1million of SRB funding, with a further £8.3million from other public expenditure and £15million levered in from the private sector.

These attempts failed as soon as Blackpool lost to Manchester in its bid for the Super-Casino, which was a major argument in support of the need for faster rail services[113]. Only the tramway project was later approved by the Department for Transport[114]. This national decision demonstrates the value judgement at the national level that there is little confidence in Blackpool which is able to deliver. "In our view the regeneration benefits of the proposal before us are unproven" (Casino Advisory Panel, 2007, p.108).

However, the national decision proves a serious crisis for Blackpool and a critical test on its lack of political leadership to deal with this crisis. The "no plan B" attitude responding to the national decision expressed by Mr David Weaver from Blackpool Borough Council was questioned by the panel. "*It seems to us that the reliance for several years on the resort casino concept has inhibited the production of other ideas for addressing decline*" (Casino Advisory Panel, 2007, p.41). Similarly, the former ReBlackpool Chairman Professor Hall confirmed the local council's attitude and argued that it is normal and also occurred in other parts of the country.

> *"We have no plan B"... When the day came and Blackpool City Council found out Plan A had gone and said he had no plan at all. That was a major crisis for Blackpool. I think ReBlackpool never recovered. We devoted almost all our activities to that super-casino and some associated schemes which also unfortunately didn't get any money…. But I think it was normal: it more or less happened in other parts of the country.*

Fragmented Governance

In addition to the lack of political leadership, sub-regional governance has been weak and appears to be problematic after the institutional reform brought about by Local Government Act 1992. Blackpool was granted the status as a Unitary Authority in 1998, which resulted in a barrier for Blackpool to cooperate with other authorities within WCL. Blackpool's indulgence in this new power impedes the cooperation "because it feels it might be dominated by Lancashire which it was part of for a long time so it fends off Lancashire and dislikes Preston"[115]. And the mentality of Blackpool is described as "*We are Blackpool; we are a unitary authority; No, we can look after our own affairs; No, keep away- you're our rivals"*[116].Given that Blackpool is such a small UA "with relatively little clout" alongside major metropolitan cities, it is worth pondering whether Blackpool could benefit more under regional operation which recognises its problems. Although bringing these rival authorities together had not been easy, regional funding resources provided the

[113] Interview with the former Chairman of ReBlackpool, Professor Peter Hall (the quotation is in Appendix 19-PH-3)

[114] This was approved with the assistance of professional consultant Mr David Bayliss, who sat round the table with the Blackpool representative in the meeting with DfT and brought in his experience in building the Croydon tram line and the Docklands Light Railways to make the case in Blackpool more compelling in order to secure funding.

[115] Interview with Mr David Bayliss.

[116] Interview with Mr David Bayliss.

incentive for local authorities to work together. The relationship between NWDA and local authorities could be acutely presented like this. "*Look, we've got to work together. If you work together with us, we'll make sure we provide funding for you; there'll be some differences as to who gets what, but we'll make sure we can support your priorities*"[117]. As soon as the regional operation is abolished in 2010 and there is little money available for current LEPs, old rivalries will resurface.

II. Pennine Lancashire

Pennine Lancashire (PL), which has a constellation of six small towns[118], is remotely located in the north-east part of the region. A large number of rail lines were closed or converted to single tracks in the 1960s (British Rail Board, 1963) and two major rail links remain, from PL to Preston and Manchester respectively. Over the years, rail transport connectivity with these two major rail hubs has remained unimproved. The east-west rail link with Preston, which is a single track with two old train coaches, provides unreliable and lengthy services[119]. The other rail link with Manchester runs from Clitheroe to Greater Manchester through Blackburn. The Blackburn-Bolton section was converted to a single track in the 1960s. Given the polycentric nature of the PL settlement, this rail link to Manchester is extremely unsatisfactory and provides uneven cover for the wider territory within PL[120]. Blackburn has the best accessibility to both Preston and Greater Manchester. The final section of the M65, Burnley-Colne, was completed in 1988 and brought a sign of hope for PL, functioning as a life line.

Historically, each town has its own strong identity instead of a whole. Inequality exists within PL. The northern part of the M65 such as the Ribble Valley is a pleasant and sleepy place without serious issues of deprivation but a lot of structural problems need to be addressed just over the hill in Nelson, Burnley or Accrington. For these southern post-industrial towns, difficulty in adapting to and attracting new types of economic activities has resulted in continual decline, with associated

[117] Interview with Mr David Bayliss.

[118] The six towns comprising PL are Blackburn with Darwen, Burnley, Hyndburn, Pendle, Rossendale and the Ribble Valley.

[119] This rail link competes with bus services by serving every stop. It takes about one hour to reach Preston from Nelson, which is about half the time from London to Preston. In an interview with Mr Brian Cookson, the executive director for regeneration from Pendle local authority, he stated: *"It can take half the time it would take you to travel from Preston to London and not a very pleasant experience I guess- rottenly old train, two coaches. You were lucky if you didn't break down or stop at Burnley and not come through to Nelson and so on".*

[120] Apart from the journey time from Blackburn to Manchester, the time travelling from any village in PL to Blackburn for interchange services either by car or rail would take at least another 30-40 minutes. In this circumstance, it is easier for people living near Blackburn to commute into Greater Manchester rather than to the wider territory of PL.

serious problems such as high levels of unemployment, low incomes and poor educational attainment (EKOS, 2008), a spin-off young generation with low aspirations[121], the deterioration of housing stock and an oversupply of two-bedroom terraced housing, a peripheral location and poor transport connectivity with the whole region. Thus, the external perception of PL was very negative without positive investment cases. As Mr Lingard[122] states, "*That affected the way the potential investors saw it. They didn't see it as somewhere they could do – they saw it as a rural backwater, rather than somewhere where they could bring impact*".

In order to stimulate inward investment, in the 1980s, the intervention was made by the national level for manufacturing activities, such as the designation of North-East Lancashire Enterprise Zone (1983-1998) (Downey, 1986; Potter & Moore, 2000) and the Lancashire Manufacturing Partnership. Since the non-metropolitan area was not the main target area by national urban programme, very limited funding for urban regeneration was available to PL. The Blackburn City Challenge fund in 1993 was an exception made a successful bid (Mann, 1998).

From the late 1990s, several funding schemes were employed to assist the most deprived communities, dealing with not only economic transition but also housing, physical transformation, skills and education. Firstly, the bid for Elevate East Lancashire Pathfinder ('Elevate') was approved in 2004 to address housing problems and deprivation (Committee of Public Accounts, 2008). Not only the physical refurbishment of housing, but also the remodelling of housing types and sizes were carried out to diversify housing choices. The performance of Elevate had been regarded as a success (The Audit Commission, 2005, p. 40). However, the whole process of housing market renewal was stalled just less than half of the way through because funding was cut due to the recession in 2008, which seems to put those efforts down the drain. As Mr Lingard describes,

> *There are many hectares of undeveloped land that are left empty right in the middle of the communities affected. So if you were living in one yourself, you might not think that anything had got any better.*

Secondly, two reports, the Urban Strategy Initiatives study (The Audit Commission, 2005) and "Dreaming of Pennine Lancashire" report (Livesey Wilson Ideas Management, 2005), proposed a wide range of innovative ideas covering culture, social, economy and transport infrastructure initiatives to diversify the economy. In order to implement this long wish list, the East Lancashire Chief Executives Group (ELCHEX) was formed to develop a coherent strategy for PL in

[121] Interview with Mr. Brian Cookson (the quotation is in Appendix 19-BC-1).

[122] Interview with Mr Lingard (Interview quotation in Appendix 19-SL-1)

partnership with local communities, key regional and sub-regional stakeholders and potential private investors (The Audit Commission, 2005).

Thirdly, higher education and skills were substantially improved. The significant expansion of Blackburn University College delivering accredited university courses in a number of subjects and a new campus of the University of Central Lancashire in the centre of Burnley accomplished a huge physical transformation right in the city centre and directly provided access to higher education on the doorstep. As Mr Lingard describes

> *That's more likely to make people think: this is something I can do, or this is something I can aspire to. It's not something on the TV or something I read about in the newspaper, this is something for me.*

Fourthly, a request for an improved rail connection with Manchester was made by local authorities. Two separate campaign camps for two rail lines were formed; one campaign group was organised by Blackburn with Darwen UA, which asked for the track comprising the Blackburn-Bolton section to be doubled. The other was marshalled by Burnley borough council with regard to the reinstating of the Todmodern Curve which would enable direct rail services from Burnley to Manchester. For PL, the prime issue is not a direct rail service by HST, but the need for intra-regional transport improvement with the large regional city in order for them to access their regional centre. As Mr Brian Cookson from Pendle council expresses, *"The point I am making is those hubs are no good for us unless the linkage is there as well."*

It is argued that with the advance of information and communication technology, the possibility of running business from home presents a great opportunity for these small towns adjacent to outdoor activities to arrest the decline[123]. In line with this view, there is an essential need for transport connectivity to open up any possibility because, with improved connectivity, a multiplier effect could be generated that high-income workers could be attracted to live in these small towns and spend money locally. Over time, the character of and labour skills in a place could improve and become attractive to inwards investment. However, this proves to be a chicken-and-egg problem because this potential contradicts with a conventional view that transport investment in linking these poor towns could not be the cure for the local economy and are likely to have negative effects. This conventional view assumes the weakness of places as a fixed condition rather than allows transport improvement to be an opportunity for change. As Mr Brian Cookson in Pendle local council argued,

[123] Interview with Mr. Lingard (the quotation is in Appendix 19- SL-2)

> *If you have a better link there whether it is road or rail, it is a two-way link, isn't it? Not only you give right education and you allow your people to live here to go there to get jobs, but also the area of the city centre whatever people are saying: it is a quite nice area to live and nice villages around there, I am going to go that way as well. You do both. So you get high wealthy individuals thinking I am coming to live here rather than there. Those people who get high-paid jobs in Manchester then chose to live in Pendle, spend more on the local economy, employ people with low skills, doing certain jobs in retail or anything from painting to decorating to garages and so on: so all these spin-off benefits… We could develop as a commuter town to Manchester and so on. Over a generation or two, the population would adjust and we would get people with more disposal income here and that would help the shops and town centres and so on.*

However, local intervention in campaigning for intra-regional links to Manchester was fragmented and ineffective. As Mr Lingard states,

> *East Lancashire as a whole did not punch above its weight. Its lobbying is inefficient and it adds up to less than the sum of its parts in the way it manages to influence governments. It frequently gives many different messages instead of one clear message… there're others to make the best of what one has to do is speak with one voice and to say to the government: "These are our three priorities" and to keep saying "These are our three priorities – this is what we want."*

Fragmented and ineffective campaign could be attributed to two reasons. Firstly, a mismatch of leadership and power resulted in an uncomfortable tension growing between local authorities and Elevate, which was the only organisation which was responsible for the whole PL regarding housing market, but not for other things like government services, education, social services, and transport. Although Chief Executive of Elevate Max Steinberg realised housing alone is not enough and began to organise and lobby for other improvement, he did not have overarching administrative power. As Mr Lingard reveals,

> *In fact, the people that did have the power weren't necessarily really happy in having Max implying that they weren't doing the best job. Of course, he is very effective and perfectly charming and not at all a confrontational character, but that was the way it was received.*

Secondly, there is a fragmented institutional structure. Similar to Blackpool, with a mixture of one- and two-tier systems in Lancashire County, Blackburn with Darwen was administratively separated from Lancashire County whose power in transport connectivity is limited to county-own transport, such as buses and highways, not for rail investment. In this circumstance, it is up to each local authority's lobbying and influence with evidence to approach Network Rail and the Central Government in order to get their rail investment on the list of prioritised rail investment. Even though Burnley managed to get approved for the Todmodern Curve[124] in 2011, it was achieved by

[124] In October 2011, the reinstatement of the Todmodern Curve and the redevelopment of industrial heritage of Weaver's Triangle which costs £8.8m were announced by the coalition government as part of the Regional Growth Fund.

the interest of partial local authorities- "*doing what's best for Burnley, not by giving up a bit of them for the bigger area"*[125]. Mr Lingard the argued this fragmentation is the major cause for ineffective use of public and private resources.

> *PL's ability to deal with that – to make the best of the public resources and the private resources that it might attract, I think, is fundamentally constrained by the local government system that operates within the area of one unitary authority – Blackburn – and the county council based 35 miles away in Preston…and then a series of small district authorities – each of which is tiny.*

This lack of leadership in local authorities was evident in the way of arranging budgets when public spending cut arrived in 2010, which resulted in the termination of the Elevate based on an understandable thinking of prioritising budget for social services rather than a strategic perspective in maintaining the Elevate for the whole PL in a long term process. Mr Lingard stated,

> *It takes an awful lot of vision, far-sightedness and leadership to say "no, we're not cutting our economic development, we're not cutting our branding and our marketing, because these are the things that are going to help us out of this mess". But that's not what happened. We (Elevate) were gone within months of the conservative government taking over.*

Overall, despite many attempts and improvements made in non-transport initiatives within PL, poor rail connectivity with Manchester could not produce synergetic effects of intervention and has resulted in PL's relatively self-contained travel-to-work patterns and its economic weakness, as demonstrated in Lucci and Hildreth (2008). Without unified will (under the lack of leadership and fragmented governance), individual local authorities in deprived places have been unable to improve their transport connections with stronger places as they have weak power under the centralised funding control by the state. In the case of Mr Lingard's office, his colleagues did not want to live in PL because they could not go to Manchester or Liverpool easily by public transport[126]. Similarly, for local economic development, the risk is not only that an area may be unable to adapt to a knowledge economy, but also that it may fail to maintain existing manufacturing companies. Mr Brian Cookson is aware of their predicament and the concerns of investors.

> *If you are from Japan or Korea or wherever and want to invest in factories in England, why would you build it here? You wouldn't. So in terms of our economic development, I think we are more likely to become successful by helping those companies we already have to grow and expand and help people who are already living here to become more entrepreneurial and develop the skills to grow their businesses and so on. Let's make it easier for those businesses to grow rather than wasting lots of money chasing around the world.*

[125] Interview with Mr Lingard.

[126] Interview with Mr Ste Lingard (the quotation is in Appendix 19–SL-3)

7.4 Discussion: Multi-Level Interventions

The British case demonstrated that the national state did not intervene to seize the opportunity presented by the WCML modernisation. Instead, the project was held back by the Treasury and implemented under rail privatisation. The fiasco of the WCML modernisation with over-run budget and serious delay had been perceived as a technical problem rather than a strategic opportunity. Moreover, HST service patterns on this upgrade project honestly reflect a revenue- and profit-led perspective with major metropolitan cities, thriving tourist places, better-off places, and places conveniently located on the WCML are preferred whereas poor and peripheral places have been left out. The inequality within the region has been reinforced. In addition, the decision-making process of the WCML modernisation presents a separate central-local relationship and was treated as a pure national transport project. As discussed in Chapter 6, the local does not traditionally have a legitimate role to play in the national decision-making process. The interview findings confirm this point because no apparent intervention was made to do with the WCML. The only exception is Blackpool's failed attempt to resume previous direct train services with London.

On the other hand, national spatial-economic planning contexts have generated an exclusive and constrained environment for local governments to make local interventions on transport and non-transport initiatives for seizing the opportunities of HST. Under the Conservative Government's reform, there was a process of weakening local financial discretion and dismantling strategic planning counties with competition-led funding schemes and prioritised metropolitan issues. Although the Labour Government concerned more about regional inequality by pouring much more funding resources into poor regions and attempting to reintroduce strategic regional planning, institutional and planning reforms were fragmented and ineffective as investigated in section 7.3.2. The focus naturally shifts to the lower levels: the municipal and sub-regional.

Local intervention is closely affected by market-led and private-led national contexts but varies from one place to another. As soon as the WCML modernisation was completed at the national level, albeit the reduction of time was not as great as specially-built new lines, faster services between major cities and London are secured and prioritised. Therefore, whether or not the opportunity of HSR could be seized lies in to what extent and what local intervention has been made before the WCML modernisation was completed and is likely to be a reactive rather than proactive effect. Two key local capacities accounted for the wider impact, namely: economic trajectory and political leadership.

Firstly, the economic trajectory which is closely associated with the wider effect of HST reflects varying need for the opportunity of HST. Among three types of sub-regions, two metropolitan

sub-regions have significantly redeveloped their city centres before the completion of the WCML modernisation. In Manchester, local attractiveness with a great city offering (cultural, high-end retail, top-ranking university, well-connected transport network, the quality of life etc.) has been improved and provided a conducive environment to attract knowledge intensive activities. In Liverpool, the European Capital of Culture 2008 was a showcase to convey to the world what had been significantly transformed in the city centre. There is still a lot to do outside city centre and the transport connectivity within and outside the city-region. For non-metropolitan HST sub-regions, with less difficult situation in economic restructuring, major urban funding programmes in the 1980s and 1990s had little to do with them. HST accessibility in the city centre were not capitalised, just existing patterns are reproduced: city centres of two new towns Warrington and Preston are left unimproved in a poor condition; a well-established town, Chester, benefits from its faster rail link with London for tourist activities; spill-over towns in Cheshire East have been located in the southern region between London and Manchester, so the WCML modernisation enhances their existing development. These all well explained their economic performance shown in Chapter 5. As for two non-HST sub-regions (WCL and PL), there is no chance to exploit HST in the same way as those HST sub-regions can do, but it is not just about a key hub but how the hinterland could be better connected to the hub. Both suffered from poor transport connectivity in different ways. For WCL, the earlier direct train between London and Blackpool was taken away with the introduction of Virgin Pendolinos while PL has been remote and isolated in transport with its regional centre. Thus, regional inequality had been widened without proper improvement of intra-regional rail connectivity between sub-regions and their regional centre which in particular benefited from faster rail services with national capital.

Secondly, the political leadership and governance demonstrated the differential effect. In response to all the national conditions, Manchester demonstrated its strong political leadership and governance to achieve significant revival as a solid regional capital. In response to institutional and financial crises in the 1980s, a cooperative relationship with the national state, a city-regional political coalition, and a public-private partnership was created to ensure a political and economic strategy. Moreover, encountering the pervasive privatisation of airports and unreliable inter-city rail services, Manchester Airport was kept under the ownership of ten municipalities to ensure its external transport connectivity for attracting inward investment. In line with positioning itself as a competitive European City, under a stable and strong leadership and governance which ensured a virtuous cycle, it successfully made the most of national resources to achieve physical transformation, diversify local economies with the recreation of new economic space in a polycentric city-regional territory, and extend external and internal public transport network. Therefore, it was argued that good rail connection to London as well as the international airport has become a very important marketing factor to attract some prestigious companies locating in

Manchester[127]. In Merseyside, this factor explain the catching-up performance in Liverpool. In the early 1980s, Liverpool had all these adverse conditions to Manchester's. The performance gap between Manchester and Liverpool was thus widened. This negative situation had not be altered until a cumulative effect deriving from a series of good efforts made from the mid-1990s in a way emulating Manchester's successful model. Similarly, the differential performance between Warrington and Manchester has the most demonstrative effect in the high-valued economic activities that path dependence on a model of motorway-based R&D business parks in Warrington which did not exert leadership and vision to reconnect its fragmented city centre and resulted in high-value economic activities concentrating in the well-transformed metropolitan centres. Likewise, in the two remote post-industrial sub-regions, local intervention was made to improve their attractiveness and arrest decline, but both lacked sub-regional leadership with fragmented governance. ReBlackpool's request for resuming direct trains to and from London closely linked with a bid for super casino. The bid failed because national ideology showed little confidence in a declining resort town which lacks strong political leadership in response to the crisis. The lack of political leadership is also unveiled with the shorted-sighted interest of enjoying the power of Unitary Authority rather than concerning strategic sub-regional intervention. In PL, the un-unified campaign for improving intra-regional transport link to Manchester reflected the depressing situation for the peripheral place to have possible transformation. Without an inclusive and capacity-building assistance from the regional and national level, the efforts made so far could not have a synergetic effect and these two sub-regions reflected their constraint within this market-led national context.

[127] Interview with Mr Dave Whyte (interview quotation in Appendix 19, DW-4)

7.5 Chapter Conclusions

To sum up, through the examination of multi-level government interventions, this chapter shows that, in line with a traditional central-local separate relationship, the modernisation of the WCML was purely implemented at the national level with a market-led approach. Waiting for private money and the fiasco of the project under rail privatisation caused serious problems in securing effective transport connectivity. During the absence of reliable inter-city rail services for nearly 30 years from the 1980s to late 2000s, there was a shift from rail to air, which led to the development of Manchester Airport and progressive development of its rail connectivity within the region and beyond. The arrival of the WCML has seen traffic shifted back from air to rail. A combination of the international airport and HST services between London and Manchester does consolidate the central role of Manchester for North-West England and even the whole Northern England. Meanwhile, the British national spatial-economic planning framework during the 1980s-2000s led to a constrained and city-led transformation process in NWE. At the sub-regional level, four varying local interventions were found closely associated with national and different local conditions, and central-local and local-local interactions.

It suggested that the separate process of the WCML modernisation has resulted in a reactive impact of the WCML for the transformation of sub-regions. The polarisation of HST services in better-off sub-regions in the southern part of NWE, but the upgraded WCML appears to best fit renewed metropolitan centres. It explains the re-centralisation of regional hegemony around Manchester and a catch-up process in Liverpool and Merseyside. A lack of active intervention in the non-metropolitan HST sub-regions shows a stable, less strategic, and path-dependent process. For non-HST sub-regions, an arduous but frustrated process was persistent. There is little wonder that the intra-regional and inter-regional inequality had widened. The next chapter will turn to the HST experience and findings in NPDC.

Chapter 8 The Arrival of the TGV-Nord in Nord-Pas-de-Calais: Lille vs. its Sub-regions

8.1 Introduction

Following the British case presented in Chapter 7, this chapter is devoted to the French case associated with the opportunities presented by the TGV-Nord for Nord-Pas-de-Calais (NPDC) over the same period of time from the 1980s to the 2000s. This chapter is structured in five sections. Section 8.2 examines the TGV-Nord from a national perspective. In section 8.3, the focus sequentially shifts to lower level-regional and sub-regional intervention: three major economic zones, namely the Lille metropolis, the coastal area and the coal mining area, are chosen for further investigation. A discussion on multi-level interaction is featured in section 8.4. Section 8.5 summarises the conclusion.

8.2 National Intervention in the TGV-Nord

The TGV-Nord was explicitly endorsed by the French state (Figure 8.1 shows the position of the Lille Metropolis in the heart of the TGV network in Northern Europe). As mentioned earlier in section 6.4.2, the successful debut of the TGV-Sud-Est in 1981 resulted in the determination of the newly-incumbent Mitterrand administration to develop successive TGV lines. Naturally, it immediately led to the re-opening of dialogue regarding developing a feasible case for the Channel Tunnel project between the UK and France. As Fraser and Baert (2003) argue, the process began in 1982 when the French and British Prime Ministers at the time, Pierre Mauroy and Margaret Thatcher, agreed to reconsider construction of the Channel Tunnel. Both sides finally signed the Canterbury Treaty in 1986. Soon after the construction of the Channel Tunnel was officially declared, the French transport ministers, along with their counterparts from Belgium, Germany and Holland, agreed to construct the northern European TGV network in October 1986 (RFF, 2005). Meanwhile, the French government announced their decision to construct the TGV-Nord and commissioned a study of possible HST routes.

National intervention in the TGV-Nord has to balance three major concerns, namely rail market, national spatial-economic strategy, and local needs. According to the head of major infrastructure projects in SNCF, Michel Leboeuf, these concerns shaped this third TGV line[128]. Firstly, the potential to exploit an international rail transport market was a key driver. The TGV-Nord would create an attractive potential rail market between Paris and London because, prior to the TGV-Nord, air was a dominant travel mode. But air travel between Paris and Lille was not popular

[128] Interview with Mr Michel Leboeuf (the quotation is in Appendix 20- ML-1, ML-2, ML-3,& ML-4).

and the Lesquin airport had been operating with a much lower level of usage than its original intended capacity since the journey time between Paris and Lille by rail was already only two hours, which was not too onerous. Similarly, regarding rail revenue, business travellers are targeted rather than commuters. The SNCF reasoned that when the distance is short, more and more people travel by rail. Consequently, more season tickets would be purchased and less revenue would be generated from rail services. For instance, the domestic route between Paris and Lille is less profitable than that between Paris and Lyon because the TGV line between Paris and Lyon did successfully beat the air market when rail travel time was slashed from four hours to around two hours.

Secondly, in addition to the rail market, there is a spatial concern regarding rebalancing the concentration around Paris and improving the connectivity between provincial regions. Gradually a national high-speed transport system has taken shape. The French TGV system adapts to a historical Paris-centred spatial structure with the creation of a super transport hub system around Paris. Except for the rail services which terminate in Paris central station, the current French HST system is progressively developing a high-speed rail loop link around the outskirts to connect provincial TGV links through Charles de Gaulle international airport (later also be connected to Paris-Orly Airport) from where the provincial cities could easily connect each other. As a result of the efficient synergy of traffic around Paris, the transport structure comprises a national transport system through the integration of air and HST systems. This involves using TGV lines to link provincial cities with Paris so the HST system and international airports can work together to exploit their own niche markets. As a result, the function of provincial airports within two hours by TGV from Paris has largely diminished and been replaced by HST and international flights are concentrated around Paris.

Thirdly, the law LOTI ensures the negotiation mechanism between the national and the local levels. Rail services provided by SNCF need to take the needs of local authorities into account. The initial TGV-Nord route proposed by SNCF was intended to route through the western outskirts of Lille metropolis, avoiding Lille city centre, and directly link Paris with Calais through Amiens. However, this initial idea encountered local opposition during the decision-making process and it was eventually decided to locate a new TGV station, Lille-Europe, in the city centre where the locals preferred. Mr Michel Leboeuf explains why SNCF agreed to change the original plan for the TGV-Nord.

In French law, "Law for orienting internal transport", the SNCF has a monopoly over rail services. This means the SNCF cannot design rail services only on the basis of its own interests and has to pay attention to the local government. On the one hand, it has the benefit of local competitors. On the other, it is necessary to make concessions. That is the deal.

Figure 8-1 Lille Metropolis in the Heart of the TGV Network in Northern Europe

Note: The first phase of the TGV-Est Line (Paris and Strasbourg) was opened between Paris and Nancy/Merz in 2007.

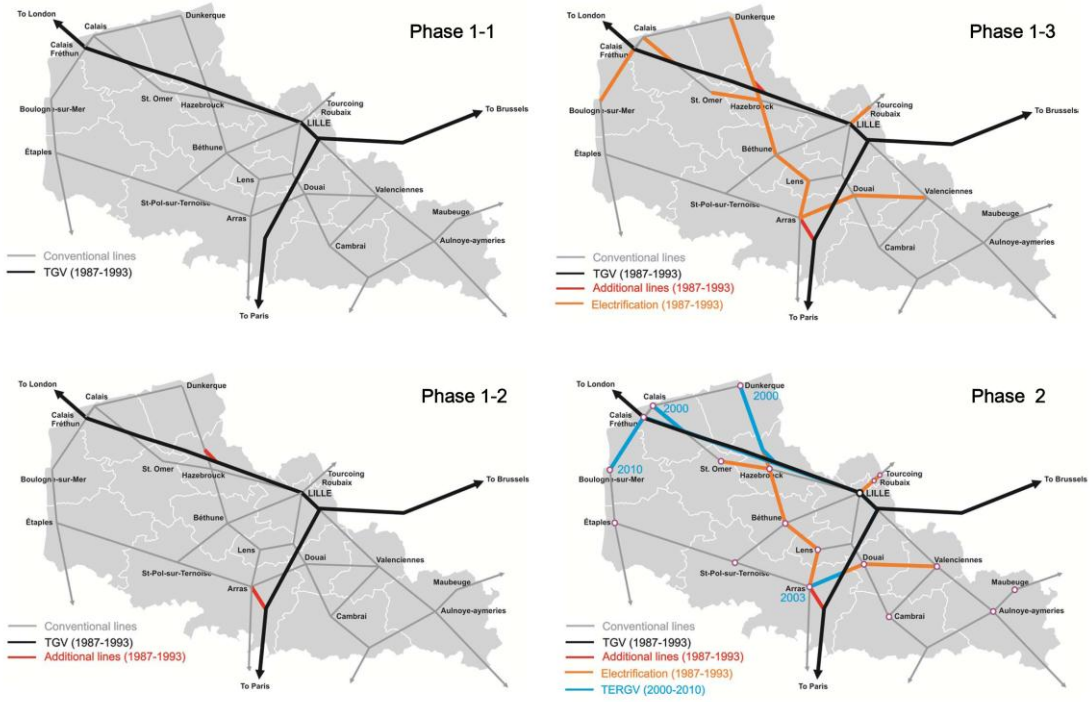
Source: http://www.lille-metropole-2015.org/schemdir/pages/cartes.htm

8.3 Local Intervention in the TGV-Nord

8.3.1 At the Regional Level

The NPDC regional government was created before the re-dialogue of the Channel Tunnel project and the TGV-Nord. A proactive role has been played by the regional government over the past 30 years with three major interventions on the opportunity which the TGV-Nord presented. With the arrival of rail reform in 1997, these interventions could be classified in two phrases illustrated in Figure 8-2.

Figure 8-2 Regional Intervention Processes in Exploiting the TGV-Nord



Source: author

8.3.1.1 Phase One- A Paris-oriented TGV Services

A Collective Campaign for Wider Regional Benefit

A collective regional campaign critically influenced the route of the TGV-Nord line and the location of the TGV stations. When SNCF plotted the possible TGV-Nord route, a choice needs to be made between two regions (Picardie or NPDC). On the one hand, the route Paris-Amiens-Sangatte in Picardie would prove a shorter route, but this route would

simultaneously lengthen the route from Brussels to London and from Paris to Amsterdam and Cologne. The proposed route through Lille was favoured by SNCF and the political compensation for Amiens was a TGV Haute-Picardie station (Siino, Laumière, & Leriche, 2004) and an unclear long-term commitment to build the Amiens "cut-off" route (Assemblee Nationale, 1988. quoted from Mawson, Holliday, & Vickerman, 1990). On the other, a strong coalition within NPDC in seizing the HST opportunity was demonstrated. First, it was formed to oppose the claim of Amiens, since this route would sabotage the economic restructuring strategy for the City of Lille and the whole region. Secondly, it was further provoked by SNCF's proposed route avoiding Lille city centre. In 1987, a coalition group RAFHAEL (*Réseau des Agglomérations de Flandre, du Hainaut, de l'Artois Et du Littoral*) which was formed within "TGV-*Gare de Lille*" association. Regional consensus was made based on both benefits to Lille and the wider region. As Professor Philippe Menerault stressed,

> *The notion was that Lille would have a driving role in the redevelopment of the whole region. This was apparently understood from the beginning…The bargain was that we would support Lille if we had a guarantee that we would be reached directly by TGV.*

This collective intervention in NPDC was in sharp contrast with the decision of a TGV Haute-Picardie station; the political operation proved a constraint for wider regional benefit. The rivalry between the two regional cities (Amiens or Saint-Quentin) ended with a compromise of a "beetroot station", which could not bring about the full potential of wider regional development[129].

The Electrification of Conventional Rail Tracks and the Addition of Two New Branches

In order to fulfil the promise of TGV services for the wider region, the first intervention was to electrify lines and add two branches to enable the interoperability between TGV and conventional lines. Concerning the regional economic geography, the two additional branches were best employed to serve medium-sized cities. Professor Didier Paris, from Lille 1 University and the current President of the Development Council of Lille Metropolis, explains how two additional branches could serve many medium-sized cities with around 300,000 inhabitants.

> *The aim of this coalition was to persuade French national company SNCF to build each station (in Boulogne, Calais, Dunkerque, Béthune, Lens, Douai, Arras, Valenciennes)…These two small branches have a main role. So it was very good to build and provide transportation for all the medium-sized cities.*

[129] Interview with Professor Philippe Menerault (the quotation is in Appendix 20- PM-1)

Ms Anne-Sophie Legendre from the Regional Transport Department stated that this regional concern did not fit SNCF's priorities, so the regional government paid for these rail improvements[130]. At this stage, the wider benefit was assumed to lie in the faster rail services with Paris. As Professor Philippe Menerault points out that "*The arrival of the TGV encouraged the improvement of the existing network within the region. The aim of the region was to ensure that its main cities could have a direct TGV link to Paris*".

8.3.1.2 Phase Two- A Lille-oriented TGV Services

The Launch and Expansion of Regional TGV Services (TERGV)

Rail reform resulted in the devolution of regional passenger rail services to the hands of the regional transport authority. A second intervention was made with the sheer novelty of regional TGV services (TERGV), which were launched in May 2000. It involves the exploitation of available seats on underutilised domestic TGVs, for which a regional subsidy was paid to SNCF (Torchin, et al., 2008), bringing most sub-regions within one hour of Lille, specifically remote coastal areas such as Dunkerque, Calais and Boulogne. The TERGV services were further extended to serve Arras in 2003 and Berck-Montreuil in 2010.

In contrast with the previous intervention, the launch of TERGV significantly shifted the developmental relationship from being Paris-oriented to Lille-oriented. SNCF specifically devotes itself to long-haul national and international rail services and the regional government are given authority to develop regional rail services. The regional government had to pay for the intra-regional link to and from Lille. Ms Legendre explains how the TGV lines were exploited to provide the TERGV service.

> *What we have developed with SNCF is HST running at high speed using a high-speed network, but for regional purposes. That is what we call TERGV…There were two possibilities: either we had special HST running for us or we had HST which were going, for example, from Lille to Paris. Instead of leaving from Lille, they would leave from Dunkerque running high-speed to Lille and then high-speed to Paris, but we would only pay for the Dunkerque-Lille connection.*

[130] According to Ms Legendre, between 1989 and 1994, the investment by the regional council for the arrival of the TGV-Nord amounted to € 239M. (1.Financing of part of the additional costs to establish the HST in Lille (€150 M), 2.Programme to electrify classic lines to expand HST trains (€71 M : Cambrai-Douai €9 M, Boulogne-Calais €52 M, Lille-Baisieux €10 M), 3.Connecting High Speed lines (€18 M) to provide HST access to Arras and Dunkirk (junction line at the north of Arras €8 M, junction line at Cassel €10 M)).

8.3.1.3 Two Models of Exploiting the TGV

These two phases of TGV services to serve the wider regional territory critically manifest two kinds of models exploiting HST for wider regional development: the first phase (the extended TGV service) is known as "the irrigation approach" and the second phase (the TERGV model). The first model which provides TGV services between small regional towns and Paris has the issue of little commercial popularity and are unlikely to be robust in the long term. As Mr Alain L'Hostis from Le Laboratoire Ville Mobilité Transport (LVMT) argues that the irrigation of TGV services within a region is a fragile approach.

> *This has proved to be a fragile approach because it is a big vehicle with a hundred people in two trains. When there are 55 hundred people in the train of 400 seats… you have to serve big cities to make it worth serving the smaller cities. This system is not suitable for regional services.*

The second model, coupled with a TGV model, appears to utilise rail services better than the irrigation approach. However, its current development has encountered problems for long-term development. Firstly, the extensive expansion of TERGV services has brought about a conflict between the national TGV and TERGV services. For SNCF[131], the concern is competition for "capacity" with regard to intra-regional and inter-regional purposes. What is more, it was regarded as unfair competition because the regional transport authority receives funding from regional government to pay for the services whereas SNCF runs services without state funding. Secondly, the excessive cost of paying SNCF for TERGV has been a serious problem for the regional council. This unsustainable public funding issue is stressed by Mr Christopher Bartholeyns from Chamber de Commerce and Industry (CCI) for NPDC.

> *The problem with this service is that perhaps the region didn't consolidate the cost of this service. The service is paid for by public money and not enough is paid by private investment. So it is developing very fast, but there is a restriction because you cannot pay more than you have in your pocket.*

It was suggested that the current TERGV system is potential but not yet very well-articulated and should be improved. Mr Alain L'Hostis said,

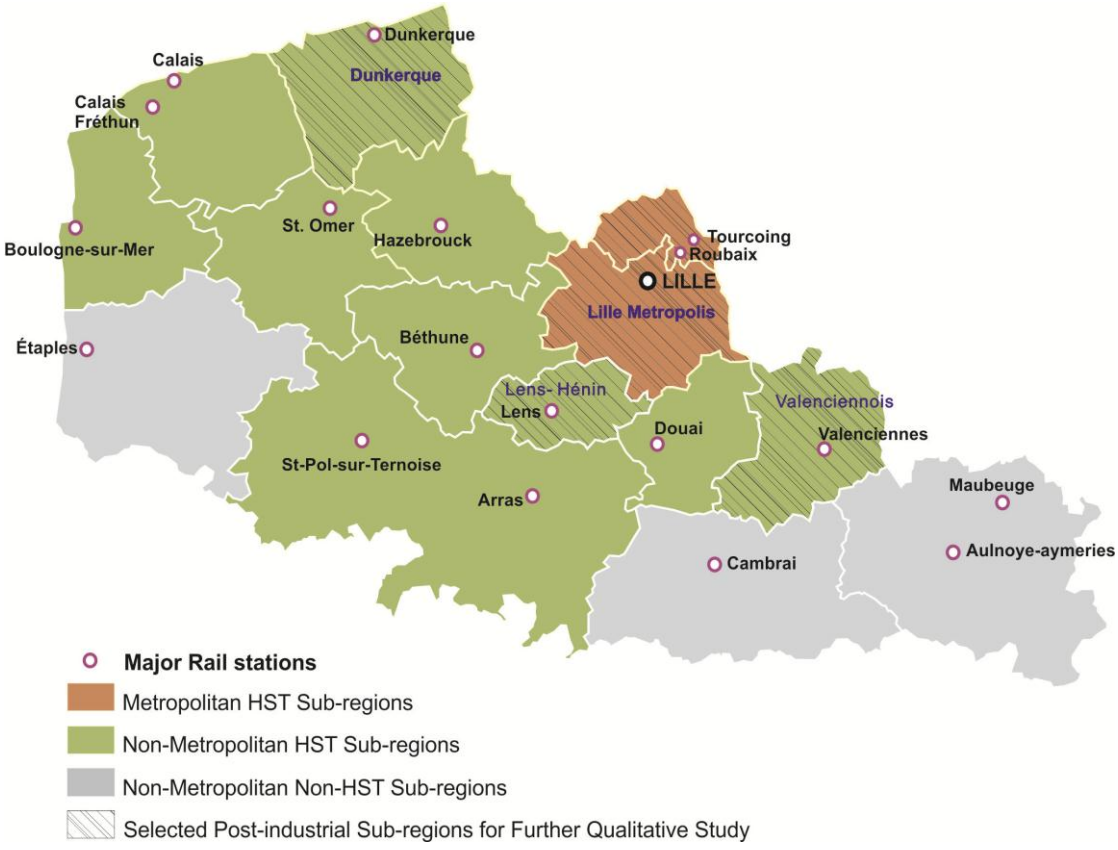
> *I think the most important thing is how we articulate the HST dedicated systems which serve the long-distance bigger agglomerations with existing regional trains …I think the Lille case shows that there is the potential for TERGV, but it is rather limited in space and there has to be very strong articulation with the regional system. I think this articulation can still be improved.*

[131] Interview with Mr Michel Leboeuf (the quotation is in Appendix 20- ML-5, and ML-6).

8.3.2 Varying Local Intervention at the Sub-regional Level

Three major industrial agglomerations (see Figure 8-3) in NPDC are chosen from for further investigation, namely Lille Metropolis (Lille-Roubaix-Tourcoing), the coastal area (Dunkerque) and the former mining area (Lens- Hénin and Valenciennois).

Figure 8-3 Typologies of Sub-regions in NPDC



Source: author

8.3.2.1 Lille Metropolis- A Process of Developing A Polycentric Metropolis from A HST Hub

Lille Metropolis[132] is a border metropolitan city in France. Although it is not far from Paris, it was situated at a neglected position. The north-ish location of Paris in the country resulted in Lille being hidden behind Paris, which faces the majority of regional cities in the south. Fraser and Baert (2003) argue the major problem with Lille Metropolis is its peripherality and remoteness from its cultural heart, "the mountains of the Pyrenees". Perhaps because of this inherited geographical disadvantage, it has long envisaged that being closely connected to the Channel Tunnel and European HST network, Lille could possibly to reverse the situation with a European hub strategy. From the 1920s onwards, a few attempts were already made to develop a through station, namely Dubuisson's plan (1921), Théo Leveau's plan (1951), and the OREAM-Nord (1971) (Menerault, 2009). However, the plan in the 1970s could not immediately be carried out because the Channel Tunnel project was abandoned in 1975. Before the decision to introduce the TGV-Nord project in the 1980s, Lille Metropolis had experienced an evolutionary process of consolidation since the 1960s, as mentioned in section 5.2.2, to curb over-agglomeration in the Paris region. But the turning point was still yet to come. Professor Didier Paris remembers Lille's previous image when it was hit hard by economic restructuring.

> *It is very important for all these industrial cities to be proud of ourselves and to be more confident. You know when I was young, it was the beginning of my career and it was just the worst moment of this region from an economic point of view at the beginning of the 1980s… no vision…and it was hard for young people to show interest in the territory.*

I. Strong Political Leadership and Governance

Although strategic planning was imposed in the late 1960s and VT became available for local AOTUs to organise urban transport systems in the 1970s, it would not be possible to exploit the wider impact of HST without the strong leadership and governance of Pierre Mauroy as the president of LMCU from 1989 to 2008. He is widely regarded as a key figure in seizing the opportunity of the TGV-Nord. As Dr Alain L'Hostis stresses that, "*I could not start without mentioning what Pierre Mauroy has done in Lille, basically put HST inside the city as opposed to outside the city, which was the most important decision taken locally*".

[132] Lille Metropolis has a polycentric city-regional structure that embraces four major cities: three municipalities that were previously textile conurbations, namely Lille, Roubaix and Tourcoing, and Villeneuve-d'Ascq. Along with 81 smaller municipalities, a new tier of strategic local government (LMCU) comprising 85 towns was officially created in 1966, with a population of 1,091,438 inhabitants as calculated in 1999 (Colomb, 2007, p. 18).

The "osmotic" centre-local relationship is best exemplified in Lille. Pierre Mauroy has been Mayor of Lille (1973-2001), Prime Minister (1981-1984), and the President of LMCU (1989-2008). When he negotiated with the British government for the construction of the Channel Tunnel, he was also the Mayor of Lille. This approach of *cumul des mandates* enabled him to combine national interests with local interests from a broad perspective by "[drawing] together the various strands of the coalition and ensure consistency in its direction" (Newman and Thornley, 1995, cited in Newman and Thornley, 1996, p.193). In line with those historical attempts mentioned above, Mauroy envisaged the rediscovery of Lille's historical niche from an industrialised metropolis to a powerhouse of services, a "turbine tertiaire" with a critical location in the European crossroads. A lobby office was established in Brussels and Lille actively promoted itself as "a European city" (cited in Newman and Thornley, 1996). Significant interventions were carried out under his leadership and are discussed further as follows.

The Redevelopment of a TGV Hub with Large-scale Urban Projects

Firstly, a large urban redevelopment project was instigated to create a new European HST hub on former military land to accommodate the arrival of new international traffic flows, the interchange function between different transport modes (road, metro, tram and conventional rail), and to provide new space catering for new service activities. A research firm, Euralille-Métropole, was set up in 1988 to oversee the development of the whole area. As a result of the decision to locate the new TGV station in the city centre, a financial issue arose because local and regional authorities needed to compensate for any associated costs.

After Pierre Mauroy acceded to be President of LMCU, the Euralille project was accepted with the political support of LMCU (Newman and Thornley, 1996). He officially launched the EuraLille project in 1990 with the creation of the SEM (*Sociétés d'Economie Mixte)* Euralille company, a French tool for implementing major urban development schemes with a majority or shareholding held by the public sector. As Newman and Thornley state "Euralille is a mixture of smaller projects funded by private investors within a master plan defined by the public sector and co-ordinated by a nominally mixed, though public sector controlled, management agency" (Newman and Thornley, 1996, p.193).

Two phases of development (see Figure 8-4 for the boundary of Euralille 1 and 2) critically generate a psychological effect with a revamped image that caught the attention of the outside world. The first step of transformation was made by Euralille. Multiple spatial functions i.e. spaces required for economic activities, culture and leisure, were built within this critical transport hub, including two landmark office blocks, a large shopping centre (Euralille centre), a student hall of residence, a business school, an urban park and Le Corbusier viaduct. To the south of the Euralille

project, Lille-Grand Palace was created as a large cultural complex for the various functions of conferences, exhibitions and entertainment. After the Euralille1 construction period of 1990-1995, the physical transformation of this large scale and high-density urban complex was manifest. To sustain the momentum ten years later, Euralille2 launched in 2000, a second phase with a new orientation is extended from Euralille1 The idea of "*renforcer le pôle directionnel*" was clearly defined as the general objective of this phase (Vermandel & Prévot, 2009). A mixed-use scheme was dominated by a housing project including 700 housing units of various typologies and densities, amid other functions, namely the HQ of the NPDC regional council, the extension of Lille *Grand Palais*, offices, hotel, sport facilities and social-educational facilities. The total floor space of Euralille2 amounted to 170,000 $m^{2,}$ about half of the spread of Euralille1. The key feature of "*Bois Habité*" was highlighted as the key concept of the scheme, which directly evoked an ideal urban setting created by green architecture which echoed the present environmental concern (Vermandel & Prévot, 2009). Later, a further redevelopment site was extended from Euralille 2 and in 2006, ZAC Porte de Valenciennes was created (Paris & Mons, 2009).

Nevertheless, a single seamless super-transport hub was not achieved. The new TGV through Lille was constructed in close proximity (500 meters) to the existing regional terminal station Lille-Flandres. Largely due to financial reasons, the idea of a people mover was not pursued and transit movement between the two stations became a nagging problem for passengers with baggage (Menerault, 2009). In addition, the new Lille Europe station, located in the north of the city, did not manage to secure a stop on the Metro line 1 (P. Hall, 2013a, forthcoming). A better interchange between the new HST and urban transit system was made possible by the Metro line 2 and the renovation of two tram lines in the early 1990s.

Figure 8-4 Urban Projects (Euralille 1 & Euralille 2)

Source: Paris and Mons (2009, p.254)

The Creation of A Strategic Planning Agency

Secondly, a strategic planning agency ADULM (*L'Agence de Développement et Urbanisme de Lille-Métropole*) was created outside LMCU in 1989. This crucial agency effectively exerted its strategic overview in the transformation process of Lille Metropolis over a period of 20 years. The LOF in 1967 brought about the creation of a planning agency at the local level. However, due to political objections, planning power was vested within LMCU prior to 1989. ADULM functioned under a management structure involving various government agencies including the central state, Direction Regional, *Departement du Nord*, NPDC regional council and LMCU. Most importantly, this management structure was closely associated with the French contractual planning approach mentioned in section 6.6.2.2. A forum was set up comprising these government agencies and the state bank, the *Caisse des Dépôts et Consignations*, to agree the financial plans of the metropolis (*Contrat d'Agglomeration*) which could then be integrated with the physical plans set up in the *Schéma Directeur* (Fraser and Baert, 2003). In addition, there was a special need for this specific agency to maintain a neutral position in order to draw strategic master plans and to bring various actors together in an acceptable venue. Mr Thierry Baert from ADULM explains this tacit situation.

> *It is much more difficult within the Communauté Urbaine. If we invite Communauté Urbaine, chamber of commerce, chamber of crafts, trade unions, and so on, there is no problem because the place is neutral. Chamber of commerce goes to Communauté Urbaine, always in a way that says I am entering the enemy's fortress. Also, there is more freedom for everybody including civil servants from Communauté Urbaine.*

The Linkage between HST Stations and Expanded Urban Transit Systems

Thirdly, with the political consensus within LMCU, the expansion and renovation of the urban public transport network was pushed forward to allow the wider city region to connect with the TGV hub. Prior to 1989, due to a lack of political consensus, expansion and improvement of urban transit systems are difficult to proceed. For instance, although the decision to construct a second line between Lille and Roubaix and Tourcoing was planned as early as the end of the 1970s, it was fruitless. Likewise, when the "Mongy" tramway system suffered from huge financial deficits in the 1960s and 1970s, it was seen to be too difficult to take action on tramway issues (Pradeilles & Chapoutot, 1981). As "an operational compromise", Roubaix and Tourcoing accepted the backing of Euralille and marketing under the Lille Metropolis banner, so in return LMCU poured huge investment into a renovated tram line in 1991-1994 and extending Metro line 2 to Roubaix and Tourcoing in 1999 as well as funding urban renewal in these two cities (Colomb, 2007). Thanks to the introduction of two metro lines and two tramlines, four major cities and some intermediate stations within Lille Metropolis are evolving from industrial conurbations to a modern polycentric city-region in the 21st century.

The Distribution of Economic Growth in Polycentric Economic Centres

Fourth, in parallel with the continual expansion of the urban public transport network, the benefit of a TGV hub was exploited to distribute economic opportunities across a wider metropolitan territory beyond Lille's urban core. In 1989, a new map of future "Excellence Poles" attained consensus in Lille Metropolis and was incorporated into the strategic master plan *Schéma Directeur* in 2002. The polycentric projects were devoted to a wide range of knowledge economy activities, with functional specialisation at different poles: executive and international business functions in Lille, communication technologies and textiles in Roubaix and logistics and transport in Tourcoing (Colomb, 2007). It is worth noting that both government structure and leadership are indispensable. This awareness of the necessity to rebalance the city-regional economy would not have been possible without the city-region competence granted by the national decision in the first place. Without strong leadership at both metropolitan and municipal levels, historical rivalry would have dominated and strong city-regional consensus would not have been possible. In the case of LMCU, after Pierre Mauroy became President of LMCU in 1989 and René Vandierendonck ascended to Mayor of Roubaix in 1994, the relationship between Lille and Roubaix improved and a "metropolitan compromise" was reached. LMCU had a strong will to tackle the unbalanced development within the city region by helping deprived areas; meanwhile, the deprived area, in the case of Roubaix, accepted Lille as the capital of the city-region (Colomb, 2007).

Widening Territorial Cooperation

Fifthly, cross-border cooperation was pursued in order to proactively consolidate Lille's position as a hub at the centre of the European crossroads. In 1991, an informal cooperative structure, the COPIT (*Conférence permanente intercommunale tranfrontalière),* was first formed between France, Wallonia and Flanders (Colomb, 2007). The territory for cooperation covered Lille Metropolis Urban Community (1.1 million inhabitants) and four Belgian inter-municipal entities (700,000 inhabitants). In line with the policy of European cohesion (Regulation 1082/2006/EC), a new structure for cooperation, Eurométropole Lille-Kortrijk-Tournai, the first European Grouping of Territorial Cooperation (EGTC), was officially created to cover 145 municipalities consisting of two million inhabitants in a territory of 3,550 km², which formed the largest cross-border conurbation in Europe. Even though cross-border cooperation inevitably involved different institutional regulations, European cross-border development took shape and was reinforced (URBACT, 2010) .

At the national level, in 2004, DATAR set up a programme calling for proposals to create a metropolitan area (*Aire de coopération métropolitain)* and Mauroy talked to local actors and created an informal steering group to work on different common fields i.e. transportation, employment etc. Lille Metropolitan Areas (LMA) involved 23 partners, nearly 500 municipalities and three point four million inhabitants in a territory of 75000 km^2 (SPIRE, 2005). This wider area

had a much larger cooperative territory than the COPIT and EGTC, embracing the whole area of EGTC, the former coal mining area, and non-industrial sub-region, Arras. However, in 2006, DATAR suspended the initiative without further state funding to support this LMA structure. In response, Mauroy created a new association (LMAA) in 2007 to continue the process, despite the lack of government funding[133]. A new president, Mayor of Roubaix and Vice-president of LMCU, René Vandierendonck, carried on the development of this territory. Figure 8-5 shows the boundary and location of LMA.

Figure 8-5 The Boundary of the Lille Metropolitan Area and its Location at the Heart of Northern Europe

Source: LMAA (2012, p.31)

[133] Interview with CEO of MBM.

The aforementioned large-scale urban development projects with the extension of the transport network and polycentric growth poles, the collective image created by these projects shapes the general perception of places. Although it is not the only cause of transformation, such perceptions are important in influencing the decision-making of private investors. Dr Alain L'Hostis (LVMT) used research findings in his institute to reveal that,

> *Company representatives said TGV was important to them even though they don't use it themselves on a daily basis. It gives a positive image, so you want to be associated with this. This is especially important in the knowledge economy framework, and should not be neglected.*

A commercial property recession took place in the mid–1990s (1995-1998). Although this recession did not appear to be a big problem in Lille Metropolis in contrast with other French cities (Newman & Thornley, 1996), Euralille was affected to a certain degree in the short term because there was a direct association between the vulnerability of the commercial property market and the type of economic space which Euralille would like to develop. During the recession, it attracted "more tourists than business men", as pointed out by Professor Philippe Menerault in his interview. He argues that the cultural policies implemented in Lille Metropolis significantly attracted tourists to the city centre via TGV services, which was not the original intention. As soon as the economic recession was over, new dynamics occurred and projects were reinitiated around Euralille. For instance, the Euralille project produced around 45,000 square metres of office floor space, 70% of which was sold out by 1998 and 95% by 2001 (Colomb, 2007). Over the long term, the evaluation is positive. In the words of Dr Alain L'Hostis during his interview,

> *If you want to assess the public sector intervention, we should look at how the area around Euralille is now in 2010 and the choice that was made about the location of the station. So it is a positive ex-post evaluation.*

II. Cultural Initiatives

In addition to physical transformation made to seize the HST opportunity, cultural initiatives continue to exploit the opportunity of the TGV-Nord and the key turning point was hosting European Capital of Culture (ECOC) in 2004, which is a follow-up attempt to an unsuccessful bid for the 2004 Olympic Games attempted in 1996. Despite its failure, the whole bidding process covered by national and international media proved to be a success for Lille as its impressive transformation story helped it rise to fame, in particular for its outpacing of Lyon as the legitimate representative of France. Paris and Stevens (2000) argue that this experience of bidding for the 2004 Olympic Games did successfully transform Lille to become an emerging, internationally recognised European metropolis. Later on, it led to a successful bid to be the ECOC in 2004 with wider cross-border partners. Yaari (2008) opines the presentation of the mayor of the Belgian city

of Kortrijk[134] in the opening celebration of "Lille 2004" alongside the Lille Mayor Martine Aubry indicated the indispensable financial aid, active participation and support from the entire *Métropole Transfrontalière* in making this mega-event happen (Yaari, 2008, p. 181).

The year long tenure of Lille as ECOC brought signs of changes in society as the city capitalised on its rich traditional assets and continued to invest in its culture. The award's contribution to the boosting of civic pride and confidence was widely praised and stressed by interviewees. Mr Thierry Baert (ADULM) stresses that the huge success of this event reflected the fact that "the whole local society is still full of resources and potential for creative industries" and cultural development and fondness in Lille continued to grow after 2004. Building on the legacy of Lille 2004, a cultural event "Lille 3000"[135] takes place every two years. Mr Baert (ADULM) also talked about the tremendous popularity of cultural events is soaring much faster than expectation.

> *There is a Saatchi exhibition at the moment and the museum of modern art opens with the biggest collection…In five weeks, we reached the number of visitors we were expecting in the first three months. So there was something like three times the number of visitors we were expecting. It is really important because it shows society is changing.*

These changes in society reflecting a deep revival of cultural policy seem to be conducive to the development of a knowledge economy, in particular for Lille as a post-industrial city; however, it clearly demonstrates that HST is essentially the first step in revitalising a region, but is not sufficient by itself. As Professor Paris argues in his interview,

> *For the size of the city, [Lille] is one of the cities in Europe where cultural activity and the level of interest is very high. We could not compare ourselves with Brussels because Brussels is a capital. But as I understand it, it is quite equivalent. And this point is very important for the knowledge economy and more important than TGV. Of course, TGV supports transportation, which facilitates the links and connections for people. But for the development of a knowledge economy, you have a former industrial area and you need to have revolution in your mind for each person and for local society. It is why we use this term "bifurcation". You had metropolitan bifurcation, so it was an old story and an old industrial city. At the moment, there is a quiet revolution.*

III. Challenges

The TGV Nord has been exploited by Lille Metropolis to diversify its economic base with a prestigious HST hub position in the European train network and to rebalance economic growth in a wider city-region. However, three issues are identified as constraints in the current situation regarding the building of a genuine European dynamic hub and a more balanced metropolitan area.

134 Kortrijk is located in the Flemish Region of Belgium.

135 "Lille 3000" was initiated to take the momentous journey forwards into the future. In 2006, Bombaysers de Lille took place, an event about India. In 2008, the topic of the event was central Europe.

Social Inequality within Lille Metropolis

Firstly, an increase in mobility and economic polycentricity within a wider metropolitan area did not guarantee a reduction of social inequality, especially with regard to the difference between Roubaix-Tourcoing and Lille. "A paradox of Roubaix" has occurred (Colomb, 2007). Roubaix has the second largest number of jobs within LMCU and there are more jobs available than can be filled by the working age population (1.1 jobs for one resident of working age in 1999); however, it has the highest unemployment rate (ADULM, 2004, cited in Colomb, 2007, p.14) and was the poorest city in France in 2009 with a highest poverty rate of 46%, compared with 15% in the national average (Cousseau, Maurin, & Mazery, 2012). This reflects the "inadequate match between supply and demand and skills mismatch" (Colomb, 2007). In particular, this problem became worse when the improved transport network significantly led to an increase in the travel-to-work catchment area and the separation of place of residence and workplace. This demonstrates that transformation is a long-term process, combining two critical battles. As Mr Baert points out, the battle is for attractiveness (retention of local skills and investors) and social cohesion (cited in Colomb, 2007, p.78). The initial outcome has been visible and positive after 10 years of proactive local intervention but it is not enough. Although it is suggested the time scale for a positive, long-lasting transformation is a 20-year horizon (Colomb, 2007), it could possibly need much longer time.

The Development in the Knowledge Economy

Secondly, the quantitative evidence in Chapter 5 suggests that the arrival of TGV in Lille has given rise to the decentralisation of public services to Lille (mainly) from Paris, whereas employment in knowledge intensive services in Lille is still lower than public services and commercial services. It suggests that it takes time for a newly created HST hub to become a dynamic knowledge hub attracting an influx of open-minded talent and an increase in private investment in knowledge intensive activities. At present, private businesses which are located in Lille at the European level, such as European research centres and commercial and logistic decision centres, are attracted by the efficient transport hub function. Mr Bartholeyns (CCI) uses the example of Tate & Lyle, a British-based multinational agribusiness, which opened a European innovation centre in Lille in 2008 to demonstrate this point. However, regarding the attitude and the language skills of local people, the capacity of the labour force does not yet seem sufficient to attract greater scale of private investment in the knowledge economy. This is illustrated by Mr Christopher Bartholeyns' (CCI) words.

> *The problem is that we have to change ourselves. The people (inhabitants) in Nord-Pas-de-Calais and the Metropolitan area have to change their habits and their culture to be more open and connected. For us, the Chamber of Commerce and Industry, it is a big trial and it is difficult to progress because the majority of people consider the region NPDC to be their territory and they consider only one location to be important - Paris.*

The Weakness of Lille in the Expansion of the European HST Network

Thirdly, transport connectivity is important but HST service pattern determines the significance of cities. Despite proximity to two large European Capitals and good interconnectivity between HST and the airport, the weakness of Lille's position looms large in the increasing expansion of the European HST network. As mentioned earlier in Chapter 5, the layout of the TGV-Nord system placed Lille in a disadvantageous situation. In order to overcome this drawback, the regional government proposed a new TGV station in NDPC outside Lille, but a huge debate erupted. Although this controversial proposal did not proceed further, these different viewpoints between the central, regional and metropolitan government clearly illustrate that there are complex negotiation processes at different government levels.

From the viewpoint of the regional government (including CCI for NPDC), a new TGV station on the existing TGV-Nord line near the former coal mining area could allow the Thalys trains to stop. This would better prepare the area for the future in terms of an expanding European rail network and increased traffic. In addition, it would provide a better connection with Lille airport and the Le Louvre museum in Lens[136]. But this regional view was strongly opposed by Lille Metropolis. The proposal was regarded as a threat to the current hub status of Lille. Professor Philippe Menerault from Lille One University, advisor to the Mayor of Lille, Martine Aubry, offers three main reasons for the opposition to this proposal, namely: the location of this third HST outside the city centre which would be difficult to reach except by car, the risk of weakening Euralille which has not performed so well and still has potential to explore, and the excuse for train operators (SNCF) to completely bypass Lille city centre. He further uses the HST station in Den Haag as an example to illustrate that there would be no sense in serving a brand new stop at the expense of political capitals.

In contrast to the worry expressed by regional and metropolitan governments, SNCF, the national train operator and a partner of the Railteam European train operator alliance, regards the expansion of the European rail network and competition within rail markets as an opportunity. Alternatives could be the application of the Swiss model in developing better connections and cross-border HST services with more intermediate stops. As Mr Michel Leboeuf (SNCF) notes, "even we have direct services to Belgium that do not stop in Lille. It is not the end of Lille at all." In this respect, instead of suggesting long-distance European trains to stop in Lille, SNCF proposed a joint-venture with regional government in the development of cross-border regional TGV services[137].

[136] Interview with Ms Anne-Sophie Legendre, a transport officer in the regional government. She explained the idea behind this proposal

[137] Interview with Mr Michel Leboeuf (the quotation is in Appendix 20- ML-7)

However, cooperation is contingent and difficult to be secured. Mr Christopher Bartholeyns (CCI) stresses that *"The potential and the limits are governed by how we can succeed through cooperation. We could have some cooperation and then it would be a competition. There are more chances that we might lose than succeed through cooperation. Cooperation is difficult to build".* Similarly, Mr Thierry Baert uses the example of the short-lived Lufthansa air service in Lille Lesquin airport to demonstrate how powerless the local government was when the logic of the market did not support local development[138].

8.3.2.2 Dunkerque in the Coastal Area- A Process of Exploiting Three Transport Assets: The Channel Tunnel, Motorways, and HST

The coastal area (*La Côte d'Opale*) resides in proximity to the densest area of north-western Europe, less than 300 km from Paris, London and Brussels. Traditionally, this peripheral area had been quite remote and isolated with its poor transport connectivity to its regional capital and national capital. The arrival of the Channel Tunnel brought about significant improvements in transport to the coastal area in the form of the TGV-Nord with Paris and two motorways (A16 and A26) to the UK and the central part of Europe. Additionally, with the arrival of the TERGV, coastal cities became much more efficiently connected to Lille.

Regardless of this much improved transport condition, Dunkerque has experienced huge population contraction, high migration, and slow employment growth to be the most problematic situation in this coastal area. Thus, Dunkerque is chosen to investigate further to understand the wider impact of HST on its transformation.

I. Economic Trajectory: Urban Fragmentation Inherited from the 1960s

Firstly, economic trajectory from the 1960s significantly shaped Dunkerque's future development. As introduced in section 5.5.2, from the 1960s to the mid-1980s, with state intervention, Dunkerque rapidly expanded as an industrial port. It resulted in the dramatic restructuring of urban form through the expansion of the industrial complex towards the west and away from the city centre in the east. Dunkerque city centre was peripheralised and neglected and, from the 1980s onwards, Dunkerque began to suffer from the decline of heavy industries. The crisis hit home when the heavy manufacturing industries withered. A major shipyard, *Les Ateliers et Chantiers de France*, was closed in 1987.

[138] Interview with Mr Thierry Baert (the quotation is in Appendix 20- TB-1)

II. Local Capacity and Political Leadership

Secondly, before the arrival of three new transport assets, there has been the existing of active local capacity and strategic planning authorities through the experience of a central-local conflict between the 1960s and 1980s. The confrontation cultivated local capacity in the exertion and exploitation of planning power. The arrival of a steel company USINOR imposed by the state caused the municipalities to join forces to protest and express the local power against the state without fearing a loss of independence (Oddone, 2011, p.5). The *Communauté Urbaine de Dunkerque* (CUD) was created in 1968, succeeding in the creation of an urban planning agency (AGUR) in 1972. The creation of CUD was initiated by local actors, in contrast with LMCU which was imposed by the state. The process paved the foundations of local capacity in strategic planning; as Ratouis describes, there was "a full-blown local system" with "procedures, institutions and actors" in the 1990s in Dunkerque (Ratouis, 2001, p.6). In addition, as another example of *cumul des mandates, s*oon after the construction of the TGV-Nord line, Michel Delebarre, who was elected as Mayor of Dunkerque in 1989, turned over a new leaf for Dunkerque. Mr. Joncquel from AGUR comments "*A lot of work was done in the 1970s and 1980s, but the revival of Dunkerque was because of the arrival of Michel Delebarre in our territory, which was really the beginning of something else*". Around the time of the campaign, Mr Delebarre was the Minister for Transports and Sea (1988-1989) and Minister for Equipment, Housing, Transport and the Sea (1989-1990); he thus emphasised his capacity to manoeuvre his national resources and network to redevelop this area[139]. Prat (2006) argues that *"*by focusing his campaign on his national status and economic support, there was a way out of the crisis" (Prat, 2006, p.49). Over the past 20 years, Mr Delebarre has been a major politician in Dunkerque and throughout the whole coastal area.

Local Interventions in the Opportunity of the TGV

Redeveloping the City Centre of Dunkerque

In contrast with the excessive expansion of peripheral areas (in the west) during the 1950s and 1970s, Michel Delebarre firstly shifted the focus back to Dunkerque city centre. A series of regeneration projects and strategies in relation to the arrival of the TGV were implemented and proposed under his leadership.

Firstly, the refurbishment of the TGV station was completed by the advent of TGV services in 1993; however, the TGV station is very disconnected from the city centre. Secondly, change was

[139] Such as meetings with senior management of the SNCF for the development of the station for TGV, and meetings with the Directorate for Inter-City on the rehabilitation of certain housing projects (Prat, 2006, p.50).

underway on the other side of the city. From 1989 onwards, in order to diversify the local economy, repopulate the city centre, improve public space and mend the urban fabric, three major urban regeneration projects were implemented. The first was the Neptune project on the outskirts of the city centre, which targeted over 35 hectares of abandoned shipyard and reclaimed 180 hectares of port wasteland. The Neptune project involved the creation of a new university- *l'Université du Littoral Côté d'Opale* (ULCO), offices, commercial, cultural and leisure facilities, new housing for rent and for sale and new public spaces to link these buildings and facilities (Division Transport et Deplacements Urbains, 2002, p.35). The allocation of a new university in the city centre reflected the strategy through which a state-led decentralisation policy- *Le plan Université 2000*[140]- could be capitalised to suit local regeneration purposes. Again it demonstrated the influence of Mr Delebarre. Ratouis and Segaud reveal that direct interaction between Mr Delebarre and his colleague Lionel Jospin who later became the Prime Minister of France (1997-2002) was the real impetus behind the decision to site ULCO in Dunkerque (cited in Prat, 2006, p. 66). The second phase of the Neptune project started in 2005. A project entitled "Grand Large" and based on abandoned shipyards was targeted to provide good quality urban space, including housing, sport, community, and cultural facilities. The third project, "*Cœur d'Agglo*", is scheduled to be completed by 2020-25 and aims to provide housing and retail space and improve accessibility throughout the main city centre from the TGV station to the beach. Regarding the poor connectivity between the TGV station and Dunkerque city centre will be addressed in this third phase[141].

The Implementation of TERGV between the Coast and Lille

Due to the peripheral location, the rail route for commuting between the coastal area and Lille had traditionally been less popular than that running between the former mining area and Lille. In 2000, Mr Delebarre who was holding two posts as the president of the region and the president of CUD asked SNCF to develop regional HST services with the available track capacity of the TGV-Nord between Lille and the coast area. The arrival of the TERGV potentially brought the coastal area within the commuting zone of Lille Metropolis. The popularity of the TERGV services was demonstrated by a significant increase in passengers. The number of seasonal tickets had risen from 151 in 2001 to 4242 in 2010[142]. For Dunkerque, the transport link of TGV/TERGV gave coastal cities an opportunity to play a complementary rather than a competitive role to a larger

[140] It was initiated in 1992 by the Ministry of Education to create two new universities in NPDC for the coast and the former coal mining area. The two new universities were implemented with polycentric campuses due to concern that urban density in these places was not capable of accommodating a single university (CNE, 1996).

[141] Interview with Mr Nicolas Joncquel (the quotation is in Appendix 20-NJ-1)

[142] Source: NPDC regional government.

place. It was acknowledged that without a proper link, the opportunity to diversify economies would not have been possible. Mr Joncquel opines that,

> *The regional TGV is a good thing for the territory of Dunkerque. It has strengths, but also has weaknesses because we saw that TERGV would be more positive for the strongest places. So HST is better for Paris than for Lille. Then it is better for Lille than for Dunkerque. We have to be strong to give people opportunities to stay in Dunkerque and to work in Lille, but not to leave Dunkerque. With the TGV link, we can develop a complementary role with Lille. We could not compete with Lille. We would lose. We are little. But we need to be complementary….I don't know whether TGV helped the development of the knowledge economy in Dunkerque, but I know if we didn't have this link, it would not help us to develop our economy. If we did nothing, it would not help us. People would find work and activities to do elsewhere. If you link transportation with the attractiveness of projects, we will win more activities than if there was no improvement in transport.*

A Strategy of Exploiting the Channel Tunnel, Motorway, and Port Activities

However, the TGV is just one of three key transport assets in the territory with which to diversify the local economy. The arrival of A26 and A16 significantly connects these sub-regions in the coast. In order to exploit the arrival of the Channel Tunnel and motorway, the *Syndicat Mixte de la Côte d'Opale* (SMCO) was officially created in 1996 by Michel Delebarre (Paris, 2007). As Mr Joncquel (AGUR) reveals,

> *The arrival of the A16 occurred in 1993. Before, all the cities were not quite connected. With the A16 highway, SMCO emerged. This is part of the SMCO history…. All the sub-regions have been grouped together. If we are working alone, we are too little to be a part of the European competition. So we try to be a metropolitan area. Together we are almost one million inhabitants….We have to work together.*

With the coastal geographical feature, port activities played a key economic role and will continue to do so. Nicolas Joncquel argues that *"The port is really Dunkerque's strength. Dunkerque port is the third largest in France and one of twenty ports in Europe. So it is a really good thing for Dunkerque to have this port and to develop it."* However, innovative evolution of the industrial legacy is a key challenge. Mr Delebarre expresses his view of the economic future in this territory.

> *"I do not think we can move from the industrial complex and port which establishes the existence of this city. It is essential to consider the evolution of the sector, a major part of which is related to the industry. We need to strengthen the relationship with research and the universities on the coastline. Hence my commitment to making this country a laboratory for sustainable development is in no way inconsistent with the presence of a powerful energy industry" (translation from French) (Le Mag', 2011).*

III. Challenges

Over past 20 years, new motorways which instantly helped to connect the scattered structure of nearly one million inhabitants in the coastal but the arrival of the TGV-Nord has failed to trigger the arrival of good public transport network for the coastal area. As Mr Nicolas Joncquel argued that

> *I think [the new highways] are the most important transport improvement in 20 years. TGV to Paris and to Lille is still the other really important point, but is not on the same scale. I think the highway puts Dunkerque on the European axis. The TGV for Dunkerque is more related to the national rail network.*

Three disadvantaged conditions are identified. Firstly, on the international scale, the Calais Fréthun TGV station, 7km distant from Calais city centre, has received very limited international rail services under the general rule of serving European capitals as fast as possible. Therefore, people need to travel to Lille for better international rail services. Secondly, direct national TGV services to Paris and other French cities have been progressively reduced. However, when the coastal area is more and more dependent on Lille for TGV through TER and TERGV services, the poor connection between national and regional rail services at Lille is problematic for the coastal area. This reflects the fact that under the separate responsibility between regional and national rail services, the concerns of SNCF have largely concentrated on major cities and ignored other peripheral towns. Mr Joncquel explains the difficulties.

> *SNCF gave us new timetables and now there are fewer and fewer direct trains from seashore cities to Paris. Most of the time, we have to change in Lille. The regional timetables are not always efficiently linked with national timetables. Sometimes you can arrive in Lille and the train for Paris left two minutes earlier, so there is no good connection. The SMCO district has to tell the national government that we exist. If we have HST across our territory without any stops, we are not interested. So we have to link national services with regional services. But it is quite difficult sometimes…The infrastructure is there, but sometimes the service is not there because the target at the national level is to go as fast as possible from Paris to London.*

Thirdly, poor rail connectivity within the SMCO has been largely ignored. The TGV line and TERGV services have made these coastal cities more accessible to outside regions rather than between themselves. The rail lines connecting various cities are either inadequate (the Calais-Dunkerque line is single track and non-electrified[143]), or non-existent (no line between Dunkerque and Saint-Omer; the line between Belgium and Dunkerque closed in 1994). The lack of littoral linkages (Boulogne-Calais-Dunkerque) was stressed by Dr L'Hostis as a significant missed opportunity for the coastal area. Mr Joncquel outlines the resulting problems and the need to develop public transport system within SMCO.

[143] The electrification of Dunkerque-Calais line was confirmed by SNCF in 2007, but will not come into effect until 2014 (source: (Delta FM, 2011).

> *If I want to go to Calais Frethun now by train, it will take two and a half hours from Dunkerque, but by car it will take 25 minutes. ... All the services are well-developed from the seashore to Lille, but not between our seashore cities…We have to keep strong links between regional centres i.e. Dunkerque, Boulogne, and Calais because different groups of people use cars or trains…A big metropolitan area cannot work without any public transportation network…the highway is not enough to link. We need to develop public transport between our cities.*

Fourth, these vulnerable transport conditions have been identified by the SMCO with a strategy to reconnect the SMCO through public transport links. However, there are practical difficulties in coordination for the implementation of a major transport hub in Calais Fréthun for the whole coastal area. Firstly, there is a lack of a planning agency in the Calais sub-region to participate in this strategy[144]. Secondly, due to politics and traditional rivalry which have played a role in the obstacles of co-operation. The different political parties[145]and traditional competition between Calais and Dunkerque cause difficulties, although the complementary roles have been identified in SMCO. As Mr Joncquel emphasises,

> *Historically there was competition between Calais and Dunkerque... Calais will never be an industrial port like Dunkerque and we will never be in the Channel like Calais. So we need to find complementary uses for the three ports of the SMCO such as Boulogne for fishing and all the transport of fish food, Calais for the Channel and the freight from the UK to Europe, and Dunkerque could be an industrial port complementary to other two ports for the South of the England… The SMCO needs one port with three specifications. But it is easier to say than to work on it!*

144 Interview with Mr Nicolas Joncquel (the quotation is in Appendix 20-NJ-2)

145 Interview with Mr Nicolas Joncquel (the quotation is in Appendix 20-NJ-3)

8.3.2.3 The Former Coal Mining Area

The quantitative findings in Chapter 5 have suggested that with the arrival of the TGV-Nord, the massive unemployment in the former coal mining has been arrested and even reversed in Valenciennois and Lens-Hénin. However, both have shown varying effects. Valenciennois experienced the least decline in manufacturing jobs and its public services increased less than other coal mining cities, whereas Lens-Hénin had the highest decrease in manufacturing jobs and the highest increase in public services. In this section, Lens-Hénin and Valenciennes are investigated further to understand their differences in performance when seizing the opportunities presented by TGV (for a map of this area, see Figure 8-6).

Figure 8-6 The Territory of the Coal Mining Area

Source: MBM (2008, p.81)

I. Economic Trajectory and Initiatives

Although both are classified as part of the coal mining area, Valenciennois and Lens-Hénin have quite distinct histories and traditions. Valenciennes was a medieval city with urban traditions before the coal and steel industry arose, whereas Lens is a city born out of the coal mining industry[146]. Since the mining heritage is stronger in Lens than in Valenciennes, the challenges and problems are bigger in Lens. The fundamental issue for Lens is the capacity to devise local initiatives, as there had been a lack of decision-makers. In the heyday of the coal industry, these coal mines were privately owned by the stock exchange, not by local people. In the 1960s, economic restructuring through the introduction of the car industry was developed by the state. A change of innovative culture is much more difficult than physical transformation. As CEO of MBM, Yves Dhau Decuyper outlines this difficulty.

> *The difficulty is to make these people become creators, to create new businesses. It's very difficult, because over the last two centuries they became used to obeying. They were very courageous, but they had to obey. They didn't take the initiative. Now a new economy exists, so they must be creative and this change in culture is more difficult than physical changes.*

A comparison between Lens-Hénin and Valenciennois does reflect the contrast regarding whether or not local strategies existed. As Professor Didier Paris (Lille 1 University) argues that these medium-sized cities in the coal mining areas, except for Valenciennes, lacked local projects in the centre of the agglomeration in parallel with the opportunities presented by HST[147].

II. National, Regional and Metropolitan Interventions

In addition to the arrival of the TGV-Nord, the coal mining area as a whole has been assisted by government interventions from other levels. Firstly, the University of Artois was created in 1992 by the Ministry of Education. Similar to the coastal area, with the initiative "*Université 2000*", University of Artois is another newly-branded university which was intended by the national state to address the growth in demand for higher education. The structure of the University of Artois is polycentric, distributed over eight sites within five cities: Arras, Béthune, Lens, Douai and Liévin. Arras was selected to avoid the conflict which may have happened if the major campus had been located in one of the coal mining towns (CNE, 1996). Secondly, the NPDC regional government led a series of symposiums known as the *Conférence Permanente du Bassin Minier* (CPBM) on the development of the coal mining area in 1996. The discussion mobilised local society to debate economic, cultural, environmental and social development in this territory. In 1998, the collective

146 Interview with Mr Yves Dhau Decuypere (the quotation is in Appendix 20- YDD-1)

147 The quotation is in Appendix 20- DP-1.

ambition was published in a white paper and became part of the *Contrat de Plan* 2000-2006 (continued 2007-2013). The *Mission Bassin Minier* (MBM) was subsequently created in 2000 by the national state and the regional government to assist this area to find a new method of development after coal and to solve the common problem of this area rather than local problems. Mr Decuypere stresses the aim of this mission,

> *Our task is to find new ways to develop after the coal. The problems are the coal, the state of mind, the structure, and the economy of this area, which are the constraints to redevelopment in new fields of economy. They're trying to make this land look more attractive because the image is very black, it's not attractive at all.*

Thirdly, an inclusive structure was created to assist the transformation of the coal-mining area, which is especially beneficial for Lens. The coal mining area has been included in the new cooperative structure of Lille Metropolitan Area (LMA) since 2005, as mentioned in section 8.3.2.1. Although it has been very challenging to make different parts of this extended territory work together, it is regarded as the right thing to do for a better common future.

III. Local Intervention: The Contrast between Valenciennois and Lens-Hénin

Apart from being part of the initial RAFHAEL campaign group to influence the decision to locate the new HST station in Lille city centre and later secure their TGV services, these two sub-regions, Valenciennois and Lens-Hénin, had demonstrated two distinct local interventions.

The Valenciennois Sub-region

Prior to the arrival of the TGV-Nord, three local initiatives taking place in Valenciennes had laid a good foundation for local transformation through local mobilisation. Firstly, with the advent of LOF in 1967, a local strategic plan (SDAU) was drawn up in 1967 at the arrondissement level with assistance from a "study groups and programming" (GEP) team set up by the Nord *Département*. GEP was composed of open-minded young people who specialised in sociology, economics and geography with new ways of thinking and doing. The team worked closely with various local elected officials in collaborative relationships (Frère & Richer, 2005). Secondly, 25 years earlier than the national decision to found a new university in the coal mining area, a new university was created in 1968 by the relocation of laboratories from Lille One University; it was collective local will and effort which led to the establishment of higher education in Valenciennes (Frère & Richer, 2005). Later this university was expanded to incorporate two neighbouring south-east sub-regions and was renamed the University of Valenciennes and Hainaut-Cambresis. Thirdly, a

well-connected motorway system was built around Valenciennes in the 1970s to tackle developmental problems and economic modernisation. It was the result of local intervention in the 1960s by the CCI of Valenciennes in the construction of A2 motorway connecting Paris to Brussels through Valenciennes (cited in Frère & Richer, 2005). For local business, "highways are there to bring in business" (Philippe Subra, cited in (Frère & Richer, 2005). Subsequently, the A23 linking Valenciennes with Lille and a bypass around Douai were constructed.

Political Leadership and Local Initiatives

Similar to Lille and Dunkerque, with the arrival of new leadership by Jean-Louis Borloo (1989-2002), Valenciennois transformed. "Before him, it was a sleeping beauty[148]." Firstly, a cluster specialising in car and railway manufacturing gradually took shape in Valenciennes after the establishment of Sevelnord in 1994, Bombardier and Toyota in 1997. Furthermore, in 2003, the European Railway Agency headquarters decided to locate to Valenciennes, despite the fact that its international conferences are held in Lille (Frère & Richer, 2005).

Secondly, the idea of a tramway project in Valenciennes emerged after the INRETS Vulcain study in 1991, which demonstrated that Valenciennes needed a high-capacity transport system and had the resources to build one. The realisation of this tramway project was not straightforward or without troubles. The Valenciennes Joint Municipal Transport Association (SITURV) was formed in 1976 with an initial group of 28 municipalities around the largest town. Over time, the boundary of SITURV greatly expanded to cover 65 municipalities in 1989. By then, almost the entire arrondissement was included. The *Loi ATR* (1992) led to a large number of smaller CCs being created primarily based on political relationships and divisions (Subra, 1996 quoted from Frère and Richer (2005)). So the inter-communal cooperation for implementing the tramway project became difficult and the fear of cooperation in turn led to defensive actions among them. Nevertheless, events started to improve when the municipality of Valenciennes realised the opportunity of a tramway was a strategy to revitalise the city (Frère and Richer, 2006). The tramway project "Transvilles" (phase 1 and 2) involved reorganising public transport between communities, reorganising the bus routes and introducing urban regeneration projects along the tramway line; it was finally completed in 2006.

The new tramway was used as a tool to restructure cities. Urban projects which amounted to 70% public space were defined along the tramway path. Through the tramway project, the image of the territory changed and it provided a better quality of life for its inhabitants. Since the construction of the tramway happened at the same time as the renewal of the local economy, the local officer

[148] Interview with Yves Dhau Decuypere CEO of MBM (Mission Bassin Minier).

from SITURV, Mr Antoine Plard, makes it clear that the opportunity presented by TGV may have saved the city from continuing decline, but the local transport project changed the city rather than TGV.

> *In the case of Valenciennes, it is not that the arrival of TGV changed the city. Rather, the local transport projects did so in the sense that local politicians decided the TGV would come to Valenciennes. We had to change the city in decline, so the tramway project was implemented to link the small cities around Valenciennes. The impact of TGV on Valenciennes is less than the impact of the tramway. If it hadn't occurred, perhaps the city would be just a poor city…a periphery of Lille. TGV is just a trigger for the renewal of the cities.*

Again, the integration of local projects with the arrival of TGV is heavily dependent on local strategic capacity. As Professor Menerault argues,

> *Everything depends on the city's ability not to think that TGV is the end of the redevelopment, but to see it as only a larger part of the project which involves players and actors other than just the TGV. So in Valenciennes, they were able to do that. The local authority was able to integrate the TGV in a much wider project and to use it as a sort of launch pad.*

The Lens-Hénin Sub-region

In contrast, due to a lack of local initiatives and strong leadership in Lens-Hénin, key interventions were made by the state, regional government and MBM to assist the transformation in Lens. The most demonstrable case is the establishment of Le Louvre-Lens. President of NPDC regional government, Daniel Percheron strongly and quickly responded to the proposed decentralisation of the Louvre Museum in 2003 (Musée du Louvre, 2008) and agreed to be the owner and the main source of funds for Louvre-Lens. The region funded up to 60% of the estimated total cost of the construction of the Louvre-Lens (around 127M euros in 2007), organised the international competition, and will finance the operational costs of the museum in the future. The local urban district (*la Communauté d'agglomération de Lens-Liévin*) and the city of Lens financed 10% of the cost and started to redevelop the area around the station. Lens was chosen because of its geographical location and the transformation challenges. It is located in the heart of the coal mining area and has good transport links through TGV (from Paris and Lille) and the motorway (the junction of A26 (Calais-Reims) and A1 (Lille-Paris)). However, weak local capacity has been revealed by the slow transformation progress. The decision to build a museum in Lens was the beginning of the transformation process, but the inter-communal responsibilities are too new for the local municipalities to be able to deal with these changes properly. As Mr Decuypere states,

> *The new council and the local institution were not ready at all, so it took several years of difficult work for the local authorities to appropriate the project. The museum is built and will open at the end of the year (2012), but the development of territory around here is very slow.*

The new branch of Le Louvre Lens is located in proximity to Lens TGV station. It was not until 2009 that an association called "EuraLens" was created by the regional government. The President of EuraLens is Mr Daniel Percheron, who intended to create a second metropolis within NPDC[149]. With advice from MBM, a new development project took shape around Lens TGV station, designed with new functions by good architects and urban planners. The slow progress of the new development means that it was not complete when Le Louvre opened at the end of 2012. "*The only thing we can show is maps with new projects, but when you are on the ground, you can't see it. It will be five years until you can see it.*"[150] The situation is well-illustrated by Ms Pauline Cassette, who is responsible for transport mobility for MBM. "*It's really sad, I think, to see these closed shops and everything when you think, at the end of the year (2012) when you leave the station, the first thing that you will see is so depressing.*"

The contrasting trajectory and intervention between Valenciennois and Lens-Hénin shows that, wihout local initiatives attempting to seize the opportunities presented by HST for local economy, there is no chance of an automatic wider effect of HST. Although both are still manufacturing-based, Valenciennois which had actively made several transformation interventions is more attractive to private services than Lens-Hénin. Thus far, the wider impact of TGV in Lens is limited and less direct for economic restructuring. It demonstrated that HST services are more directly linked with the tertiary sector than the manufacturing sector which needs good transport systems for goods more than for business men. As Mr Decuypere opines,

> *I think the high speed train is directly related to the tertiary sector which has relationships with the wider world and the businessmen who have to be in Lille, in Brussels, in London etc. very quickly, so the high speed train is very important. For the production of activities in Lens or in Douai, it's not so important – it's very important to have a good internal connection. For the Lens region, they need a very good transportation system, but not by TGV. It's a good transportation system for goods because most of the car industry had to have very good logistics. And for logistics, we need growth and a good railway system for goods and a good motorway system, this is more important than TGV.*

IV. Challenges

Three transport issues are challenging regarding the wider impact of HST for the coal mining area. The first one is associated with intra-regional rail services with Lille. Based on both historical and current reality, which is reflected in patterns of travel to work, resident migration and the

[149] http://www.villedelens.fr/rubriques-a-la-une/euralens/euralens.html

[150] Interview with Mr Decuypere (CEO of MBM).

relocation of companies (see Figure 8-7), the demand for intensive communication between Lille and mining areas is apparent. But the intra-regional transport capacity between them is not sufficient to meet the demand. 80% of the travel between the two is made by car, but the motorway is not sufficient; current worsening congestion every morning between Lille and the coal mining areas is a proof[151]. A new regional RER system between Lille and the former mining area has been proposed by regional government to enhance connectivity within the Lille Metropolitan Area (Nordéclair, 2010), but it has been strongly rejected by Lille Metropolis due to its incompatibility with the existing rail network and the separate location of stations outside city centres. LMCU argued that the proposed RER system along A1 and the TGV-Nord line could not integrate with current conventional links between Lille and the coal mining area. Dr. L'Hostis (LVMT) similarly emphasised that the need to improve the existing TER system (LibéLille, 2010). In addition, a political conflict between the Regional authorities and LMCU because LMCU hopes for an opening of the long-waited tram-train links in 2020-2022 and there will be a financial and spatial competition between the two systems[152]. Conventional regional trains are currently used by commuters in the early morning and the evening rather than running every 30 minutes between 9 am and 4pm. From a long-term perspective, it is not possible to achieve a genuine LMA with this service pattern. Mr Thierry Baert (ADULM) explains,

> *The regional trains are good for daily commuting flows, but we don't have the resources to offer trains every 30 minutes between Valenciennes and Lille. There are a lot of people between seven and eight o'clock in the morning, but afterwards nobody between nine and four in the afternoon. So there is a mismatch.*

Secondly, with the arrival of an internationally-renowned cultural facility in the Lens sub-region, the problem of external accessibility to Le Louvre emerges. There is serious concern regarding the current insufficiency of TGV services to Lens. Despite the fact that these sub-regions are served by TGV, the speed is the same as regional trains since the TGV trains run on a considerable distance on conventional lines. In addition, the TGV service from Paris offers only two trains to Lens: one in the early morning at 6am and another in the evening at 8pm[153]. Mr Decuypere explains the issue of accessibility.

> *At the end of the year, the Louvre will come to Lens- it's a problem, will we be connected to the high speed train because it's an international destination? All of these problems are not solved now and we have to work on this. How to develop a regional metropolitan area with only one door to go in and out of the metropolitan region– it's a problem.*

[151] Interview with Mr Decuypere (CEO of MBM).

[152] Email communication with Ms Cassette, responsible for transport mobility in MBM.

[153] This was the rail timetable at the time the interview was conducted in March 2012. Due to the need to add more trains for the opening of Le Louvre, SNCF now provides four direct trains from Paris to Lens and six direct trains from Lens to Paris (November 2012).

Figure 8-7 The Evolution of the Travel-to-Work Pattern between Lille and the Coal Mining Area (1999-2006)

Source: MBM (2011, p.20)

The third issue is a danger that over-concentration towards Lille and a deficiency in internal transport network within the coal mining area would widen polarisation within the region[154]. There are two underlying challenges. Firstly, two different transport systems compete for the same journey with stopping patterns. This is most evident between rail services and bus services. The stopping train service patterns need to be adjusted[155]. Secondly, there are service and integration gaps between different AOTUs in the coal mining area because each develops their own transport systems and transport plans (PDUs) (see Figure 8-8). A proposal for two new tramway lines, Béthune- Bruay-La-Buissiere and Liévin - Hénin- Beaumont- Lens is an example illustrating how local authorities do not have a strategy for transport and how difficult it is to make them work together. Mr Decuypere who was involved with these local authorities in an advisory capacity, argues that reinitiating the tramway project triggered them to consider integration between different systems because it was not thought out properly earlier.

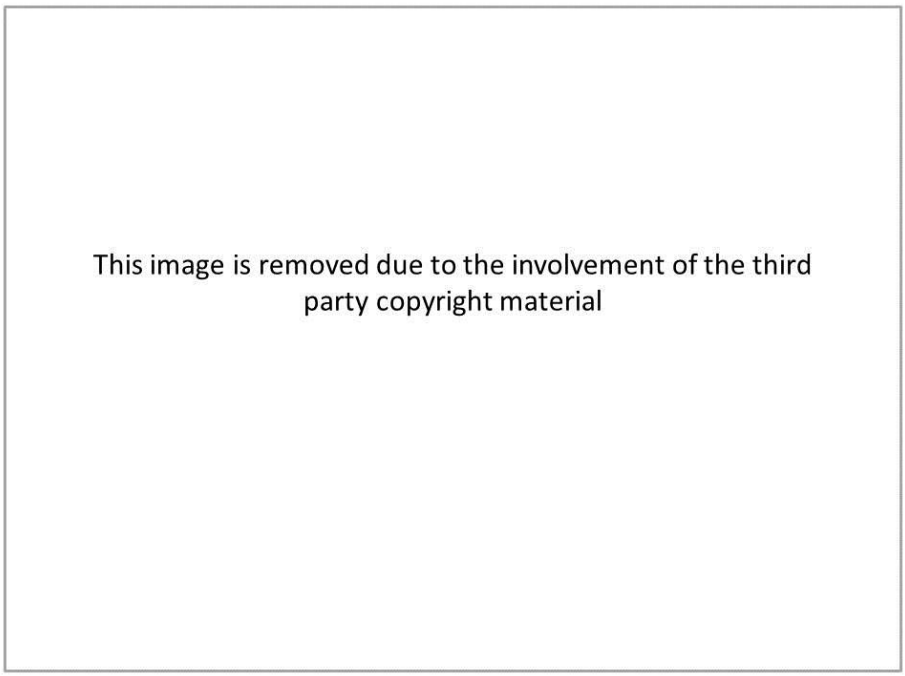
> *What we want to say is that it's not purely a transport problem, but that transport is part of the planning system that we must study together: transportation and urban-planning should be combined, to see the links between different parts. We can't study trams only at this scale, but we must understand the relationships*

[154] Interview with Dr Alain L'Hostis (the quotation is in Appendix 20- AL-1)

[155] Interview with Mr Decuypere (the quotation is in Appendix 20-YDD-2)

with Douai and the relationships with Lille…The tram at this moment is a part of the regional system too, because many people will take the tram to go to train stations… You can have a different transportation system here and here, but the problem is to connect them to the hubs, which is obviously very important.

Figure 8-8 Various Transport Authorities and Territories within the Region in 2008



Source: Richer (2009)

This situation relates to an inherited complexity within the French government system. Traditionally, under a centralised French national state, local municipalities were very small and fragmented with very little power. The decentralisation process is too new and immature. The coal mining area used to have 160 local authorities and now they are grouped into seven inter-communities. From the experience of Mr Decuypere, this history explains why these local authorities cannot work together.

I think this is French institutional heritage, which I think is very different from British heritage. France is a good example of a very centralised state: the decentralisation process initiated in 1981/82 by François Mitterrand when he came into his Presidency and it's something very new. This new institution was created after 1980, and the local authorities were created in 2000. When they were created, they were proud of their new power and very glad to manage their own competences and now we say to them: "it's not a good skill". I think cooperation is a new process and they were very busy trying to organise themselves inside, and forming inter-relationships between the different institutions was something that was not a priority for them. So it's difficult for them to learn this process and to cooperate on different fields like transportation.

Also, the cooperation between Lille and the coal mining area is contentious. LMA was created under the leadership of Pierre Mauroy, when he was the president of CU. Local authorities respected Pierre Mauroy and believed in his leadership, but fundamentally Lille's strong performance makes local authorities in the coal mining area hesitate to communicate with Lille. Mr Decuypere explains this controversial relationship.

> *Lille is strong and sometimes they think that talking with Lille and trying to make agreements with Lille is something difficult and they are too weak to talk with Lille. Sometimes they want to talk with Lille, sometimes they are reluctant, so it's not something very obvious. Mission Bassin Minier and Lille Development Agency work together in many fields. We work at this scale and we try to promote this scale with the president of the association of the metropolitan area.*

8.4 Discussion: Multi-Level Interventions

The French state actively intervened in the decision-making of the TGV-Nord and this was conducive to proactive intervention regarding the opportunity presented by HST for territorial redevelopment. The immediate endorsement and announcement of the construction of the TGV-Nord reflected the continual commitment to developing a strategic HST network. Given the osmotic central-local relationship by *Cumul des Mandates* and the concern for transport equality by LOTI in the French context, the decision-making process of the TGV-Nord was closely involved with and shaped by local interventions to influence the location of a new HST station in Lille city centre with collective regional consensus under strong political leadership of Pierre Mauroy. Meanwhile, regional government in return electrified conventional lines and constructing short branch lines to allow the TGV services to serve a wider region. For NPDC, it is not only about HST. The construction of A16/A26 is critically important to improve the transport connectivity for this post-industrial region for manufacturing sectors. At the same time, the traditional centralised state had experienced major reforms in government institutions and urban and regional planning approaches since the socialist President François Mitterrand was elected in 1981 to empower municipalities. Reform enables a strong association between government institutional structures with equivalent competence and resources at different levels.

Varying local interventions reflected three key local capacities accounted for these wider impacts, namely: political leadership and fragmentation, economic trajectory and transport need (the role of TGV), and constitutional capacity and policy priority with an inclusive, cooperative structure.

First of all, sub-regions in this study which were argued to have presented good political leadership throughout the process are those with strong links to the central power and the unique

French rule of *cumul des mandates.* Mr Joncquel insightfully emphasised the importance of this good relationship for local development.

> *The key point in France is that the government is really centralised in Paris. We had good opportunities when Michel Delebarre was the mayor of Dunkerque and was part of the French government. So at the beginning of the 1990s, he was the Minister of Transportation for France, so it was really convenient. It is like Lille. Lille had the TGV when Pierre Mauroy, the Mayor of Lille at that time, was Prime Minister. In France, if you want to have something, you need to have a strong link with centralised power. It is the same now with Valenciennes. The Mayor of Valenciennes was Jean-Louis Borloo who was a member of the Sarkozy government on the right side of the political field. It is the same. You need to have the link with the centralised power. It is easier to develop. The network, the state services are working in the same direction.*

In line with this condition, decentralisation is a double-edged sword. It assisted in cultivating the capacity of local authorities, though it is still a new process. Once political leadership is absent or immature, new structures with new competence became a hindrance for cooperation and lead to fragmentation and incapacity. As Cole (2006) finds that, NPDC has "a long tradition of urban rivalry, fractious state-region relationships and poor relationship between local politicians and business actors traditionally produced sub-optimal local outcomes" (Cole, 2006, p.41).

The second local condition is the economic trajectory which accounts for varying effects with different transport needs. The character of local economies has changed significantly after national intervention in the 1960s. Lille was invested with status, power and resources to develop a knowledge economy, whereas Dunkerque, Valenciennes, and Lens possessed manufacturing-based industries. This significantly resulted in these sub-regions' transport needs. For Lille, the TGV-Nord is the exact type of transport infrastructure needed to cater for the knowledge economy. For Dunkerque, two motorways and the TGV were both exploited, but two new motorways have proven to be more instantly useful for the extensive industrial development than the TGV which could assist to diversify the declining urban centre in a long-term transformation. Firstly, by the time when the TGV and TERGV services are available to Paris and Lille, urban regeneration projects had just begun to be implemented, which could not be apparently conducive to any immediate effect. Secondly, the motorway network is much more well-connected than the rail network. New motorways internally improve the transport link between coastal sub-regions and externally to a wider European level whereas the conventional rail linkage within SMCO was very problematic and did not well integrate with TGV and TERGV, which could not spread the wider HST effect widely.

In the coal mining area, similar to Dunkerque with its strong industrial characteristics, for Lens, the arrival of A26 and HST services were not actively exploited until regional intervention in creating a prestigious cultural branch of Le Louvre museum to assist Lens' transformation. For Valenciennes, its motorway systems have been well developed before the arrival of TGV. The

efforts were made to build a tramway to link all the regeneration sites with the TGV station. It could explain why Valenciennes' manufacturing base could be enhanced through a better image with physical transformation projects in city centre and a better transport integration of tramway and TGV. Thus the need of imposing public services was reduced. While, Lens lacked intervention in its transport opportunity with local transformation projects, which may lead to its unattractiveness to existing private manufacturing base and the increase of public services.

Thirdly, these different trajectories reveal that the existence of appropriate government structures endorsed with competence and resources in an inclusive approach led to the reduction of regional inequality through active interventions to spread the benefit. Under the national structural framework, an inclusive multi-level government intervention was made. On the one hand, NPDC was entitled to the legitimate status and resources of a region. It involved the decision making process of the HST route and station location and the TGV services for a wide range of regional towns outside Lille. After NPDC became the regional passenger rail authority, it further pioneered the development of TERGV by exploiting the available capacity of the TGV-line between Lille and coastal areas. On the other hand, it assists problematic sub-regions which are not used to taking initiatives such as *Université 2000,* MBM, Le Louvre-Lens, and a UNESCO candidate to celebrate the mining legacy in addition to transport projects. In addition, wider territorial cooperation was further encouraged by the state. Lille further evolved from Lille metropolis to Lille Metropolitan Area which embraces part of Belgian territory and the former coal mining area. But the transformation process is far from easy and instant. The co-existence of various government levels without hierarchy in the French system resulted in intensive negotiation and unavoidable conflicts of perspectives for different interests. Hence it takes time and needs consensus for any progress.

8.5 Chapter Conclusions

In summary, the French case suggests that the wider impact of HST in reducing the regional inequality is closely associated with multi-level interventions. The in-depth qualitative study found that the national TGV-Nord project was exploited in different ways based on constitutional capacity, policy priority, political leadership and governance, and local economic trajectory.

The French state demonstrated a state-led approach with a close central-local relationship in seizing the opportunity of the TGV-Nord. Meanwhile, various reforms in constitutional capacity and policy priority presented a conducive and inclusive approach: from a centralised to a state-enhancing approach with concerns for inequality through empowerment and decentralisation. Several institutional structures have been newly granted resources to tackle territorial development at the most suitable scale. The in-depth study of three economic zones demonstrates how local economic trajectory and political leadership and governance influenced the wider impacts of HST. The creation of a HST transport hub in Lille city centre enhanced the development of Lille metropolitan area towards the knowledge economy, strengthened the regional status of Lille, diversified local economies and expanded territorial cooperation in the wider metropolitan area, but it will take a long time to genuinely transform from a transport hub to a more knowledge-intensive hub. Beyond Lille Metropolis, the effect of TGV for the wider impact in these industrial sub-regions is less direct and apparent. The exception is Valenciennes which was making deliberate intervention in a tramway project alongside with urban regeneration projects. Dunkerque actively exploited HST and motorways, but the economic restructuring and physical transformation in its neglected urban centre takes a long time to have effects of TGV. The absence of active intervention in Lens leads to fragmentation and stagnation and is difficult to have the wider impact of TGV without regional intervention.

With the decentralised resources and responsibility, regional intervention critically exploited the TGV-Nord for regional development. It first intervened in enabling TGV services to a wider region and then significantly changed a Paris-oriented network to a Lille-oriented TGV network with the introduction of TERGV services. In addition, it intervenes to assist problematic sub-regions which did not actively take initiatives. For Lille metropolis, it is vital to include those sub-regions which are closely related within a metropolitan scale. However, these negotiation and communication between multi-level governments are always controversial, contested, and taking a long time to evolve and reach a step change. At least, these interventions and efforts made so far could explain why the regional inequality had been reduced in NPDC with slow economic progress (demonstrated in Chapter 5).

Chapter 9 The Synthesised Discussion of the Wider Impact of HST from the Comparative Case Study

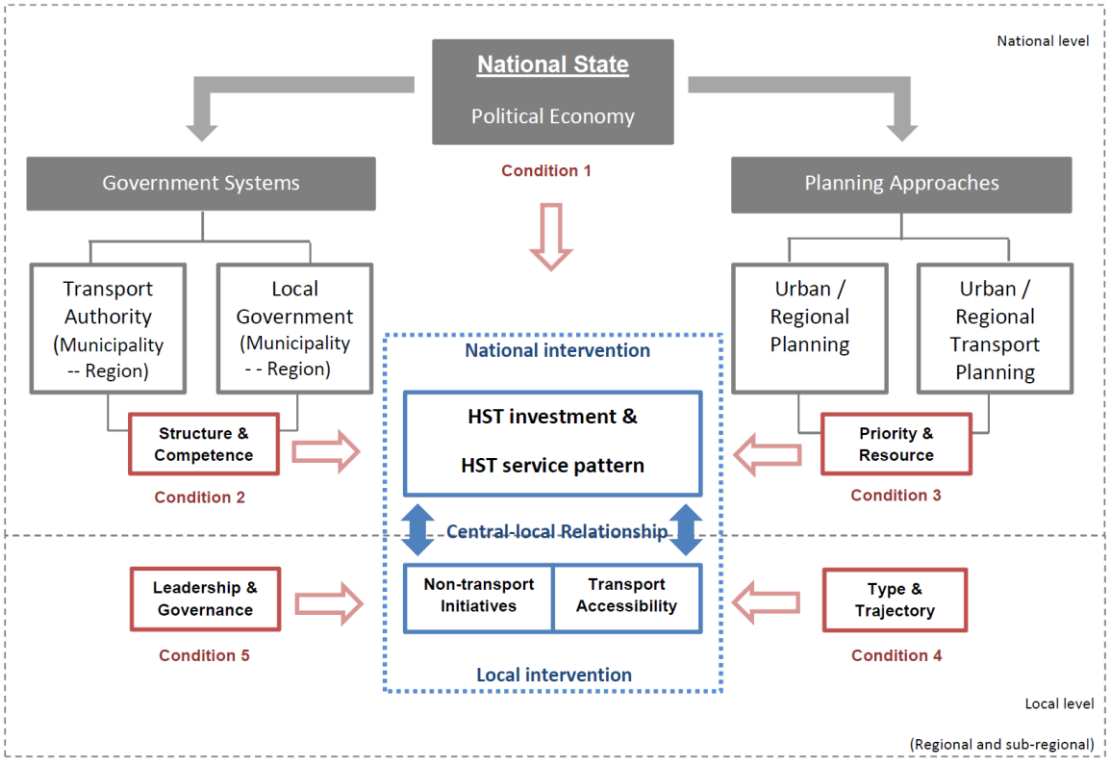
9.1 Introduction

This chapter is devoted to a synthesised discussion that draws together key conditions in relation to the role of government intervention both in the national and local contexts in previous two chapters. There are two main parts in the discussion (section 9.2). Firstly, based on research findings, section 9.2.1 highlights five conditions, which played critical roles in both national and local interventions with various combinations and interactions between five conditions. Secondly, section 9.2.2 explores how the HST opportunities have been exploited differently for regional development. A chapter conclusion is summarised in section 9.3 to answer the SRQ3.

9.2 Towards A Model of Government Intervention for the Wider Impact of HST

In the following section, each element is discussed in the light of research findings from the two studied regions. The interaction between these five conditions shapes the transformation process in relation to the opportunities of HST (see Figure 9-1).

Figure 9-1 A Model of Government Intervention for the Wider Impact of HST



Source: author

9.2.1 Key Conditions

Based on the comparative case studies, five key conditions (highlighted in red in Figure 9-1) are found to be critical in seizing the opportunities presented by HST for regional and urban development, namely three national conditions (1. national political economy, 2. constitutional capacity (structure and competence), 3. planning priority and resources) and two local conditions (4. city types and economic trajectory and 5. leadership and governance).

9.2.1.1 Condition 1- National Political Economy

First of all, national political economy proves to be the most fundamental condition which explained the varying wider impact of HST in both cases. As mentioned in section 6.3.2, the UK and France have presented distinctive traditional political culture and models of capitalism. In section 6.3.3, during the 1980s and 2000s, the UK's market-led and France's state-led approaches are particularly marked under two newly-elected political regimes. The British ideology signifies minimum public intervention, deregulation, and privatisation of transport investment, which determined the perception of the WCML modernisation as a technical issue as discussed in section 7.2. In contrast, the French state-led approach has been reinforced with a combination of state-enhanced and decentralised features. In addition to the concern of expanding rail market, the TGV-Nord project is fully supported by the national government as part of the long-term national high-speed network to properly serve the uneven economic geography as discussed in section 8.2.

9.2.1.2 Condition 2- Constitutional Capacity (Structure and Competence)

Condition 2- constitutional capacity (structure and competence) is associated with organisation, function, and power allocated between the central-local government, which is determined by Condition 1 and indicated by national law. In line with governmental restructuring discussed in section 6.5, a change in constitutional capacity has critically shaped national and local interventions.

The comparative case study shows a contrary situation. In the British context, rail privatisation reinforced the centralised rail authority and private rail operating companies at the national level and the traditional central-local separation. At the same time, the abolition of metropolitan county councils and the fragmentation of the regional mechanism resulted in the increased centralisation of power with direct control over local budgets (Banister, 1994). Capable local authorities have achieved transformations within their own territory, whereas, without appropriate regional apparatus, the transformative effect is harder for vulnerable places to bring about. These changes

led to a city-led intervention and an exclusive process in the British case. In contrast, in France, partial privatisation and progressive decentralisation has allowed more power to be delegated to multi-level local governments, in particular to elected regional governments. With multiple governance structures and without a fixed hierarchical order, the traditional osmotic relationship between the central and local levels has become more intensive than before.

Findings of the comparative study suggest that constitutional capacity is a necessary but not sufficient condition. On the one hand, proper regional operation is necessary. As shown with the British experience, a city-led transformation not only encourages competition, but also causes fragmentation and discourages spatial thinking among local authorities. Later on, under the Labour Government, a fragmented regional operation with three overlapping organisations and limited power has not been effective. Despite the fact that the regional planning operation in the North-West has been not effective, there was at least a responsible body which thought of the region as a whole and considered how different parts could be connected. As Professor Michael Parkinson emphasises, "*There was a kind of framework and some principles. Because they had money, people had to do something, even if they didn't believe it.*" Once the regional level does not exist, the responsibility of taking care of disadvantaged sub-regions will be given to the state itself. In the French case, with its resources and power, NPDC regional government exploited the HST services and assisted the weakest sub-regions for a regional territory as illustrated in section 8.3.1.

On the other hand, constitutional capacity itself is not sufficient to determine the conducive transformation, which also closely depends on Condition 5 (political leadership and governance). As Professor Michael Parkinson vividly annotates that, it is not just about institutions, but also political culture; otherwise, the created institution could not deliver.

> *Well, you know, if you ask what makes a city region successful economically, it's the politics… These people have to like each other; they have to trust each other; they have to be willing to say: "you first, me second, or you take the credit." So in a way, it's not really about institutions, it's about political cultures, leadership, trust, and ambition…Until you've got the individuals and the politics and the relationships and the processes right, you can create any number of institutional arrangements and they won't deliver.*

The British case demonstrated that although the metropolitan county was abolished, Manchester used strong political leadership and governance to actively integrate ten metropolitan districts within Greater Manchester (section 7.3.2.1), which is absent in other sub-regions. The exception is Liverpool which improved its leadership and governance with a catch-up process (section 7.3.2.2). Both well-established metropolitan cities have shown more apparent leadership than other sub-regions. However, the rivalry between Manchester and Liverpool has been hard to erase and their concern on the city-regional scale prevented a more inclusive regional development. In addition, the creation of UAs in England has effectively prevented sub-regional development such

as Blackpool in WCL and Blackburn with Darwen in PL when new power is exploit within UAs rather than sub-regions. Similarly, in the French case, although local authorities have been vested more power than before and regional government has intervened to assist weaker sub-regions, places which previously lacked the decision-making capacity do not know how to exert the new power; instead, they tends to enjoy the power for a narrow rather than strategic perspective. This is best demonstrated in the coal mining sub-region, Lens (section 8.3.2.3).

9.2.1.3 Condition 3- Planning Priority and Resources

Condition 3 is related to planning priority and resources. Similar to Condition 2, the national political ideology (Condition 1) manifestly shapes this condition. This is of serious concern for national political leaders, reflected in major initiatives, grants and subsidies. As indicated in section 6.6, Condition 3 is very different in the two contexts. British planning priority and resources demonstrate a period of massive reductions in public spending (including transport) with a guidance-led, competition-led and metropolitan-led approach. In contrast, French planning approaches have showed a revival of public transport with a concern for inequality. Additionally, progressive decentralisation has brought equivalent resources to multi-level local governments with contractual-led approach for capacity building at the local level. Again, it significantly influences national and local interventions during the process.

The Variation in National Political Judgment with Regard to Intra-regional Inequality

The comparative study reflects a critical planning priority based on value judgement at the national level towards inequality through a ground-breaking intervention; in other words, whether or not it is worthwhile to assist the most disadvantaged places. This condition should closely take Condition 4 and 5 into account because political leaderships and economic trajectory vary with places in capitalising upon the opportunities brought by HST. The fundamental difference between the British and French experiences is that in France, the regional council helped disadvantaged sub-regions with funding and prestigious projects; whereas in the UK, those incapable sub-regions are consequently suffering from further decline. The best examples are Blackpool in NWE versus Lens in NPDC. Blackpool lost its casino bid in 2005 because of the stated ideology “regeneration benefits of the proposal before us are unproven” (section 7.3.2.4 I), while the decision to relocate a branch of Le Louvre to Lens involved “a challenge that was the biggest and the most difficult!” (section 8.3.2.3 III).

9.2.1.4 Condition 4- City Type and Economic Trajectory

Fourthly, the wider impact of HST was found to differ with city type and economic trajectories, which reflects transport needs and path dependency. HST inclines to serve major hubs, in particular major metropolitan sub-regions where high-value agglomeration economies tend to develop. The time-space shrinkage by HST enables them to embrace a knowledge economy and reinforce urban dynamics. For other sub-regions, they play a supplementary role to metropolitan sub-regions and are dominant in manufacturing activities or dependent on a motorway-based mode of development. Thus, HST is not be as useful or appreciated as an improved regional and sub-regional network for people to access jobs outside their places of residence. Similarly, regarding a broader context of transport conditions, in addition to the arrival of HST, other transport improvements made in parallel would influence the wider impact of HST.

The comparative case study demonstrates that, in the British case, before the arrival of the WCML modernisation, NWE had a well-developed motorway system to serve the majority of sub-regions and since then, major motorway construction in this region has not been implemented further. Quantitative findings in Chapter 5 show that only metropolitan sub-regions Greater Manchester South and Merseyside (including Liverpool) have improved their economic strength after the completion of the long-delayed WCML modernisation. Although both are metropolitan cities, Condition 5 determined the difference between Manchester and Liverpool. Manchester which exploited its own international airport and extended the Metrolink system consolidated its role as the major regional centre for the knowledge economy and demonstrated its significant shift of the largest structure of employment from public services to knowledge intensive services after the arrival of the WCML modernisation. Liverpool caught up later. For other sub-regions, the WCML modernisation did not have similar positive effects but only reinforced existing uneven north-south divide within the region. In contrast, in the French case, the TGV-Nord was implemented with the Channel Tunnel and two new major motorways which significantly improve road connectivity in particular for the coastal area and part of coal-mining area. For Lille and Valenciennes, motorways had been well-developed before the TGV-Nord, so they aptly exploited HST with urban transit projects to develop the hub function of HST to benefit further its wider sub-region. For Dunkerque and Lens, although both HST services and motorways are improved, motorways have more instant effects of connectivity for these post-industrial sub-regions to be put on the international map than HST which did not trigger an integrated rail system yet for these sub-regions (challenges are discussed in section 8.3.2.2). Thus, differential effects of HST between metropolitan and non-metropolitan sub-regions are evident. Lille has the majority of public-led knowledge intensive activities (R&D), whereas other sub-regions have witnessed employment increase with a still manufacturing-led economic structure.

A related issue is worth noting that there is a significant difference between manufacturing-based sub-regions in the two regions. In NWE, with much disadvantaged transport connectivity, Pennine Lancashire is unpopular in terms of not only attracting service activities but also retaining manufacturing jobs. As illustrated in section 7.3.2.4 II, the role of rail improvement for them would be to develop a commuting sub-region related to large metropolitan cities. Thus, as long as the transport link is improved, efforts of housing renewal could pay off in improved quality of life with relatively cheaper property prices to attract skilled workers to live in PL and commute into Manchester. These high-income earners will spend their incomes in the local area. This development pattern is exemplified by towns within Greater Manchester North (GMN) (section 7.3.2.1 II); such towns have a similar economic trajectory to those in PL. But the difference between GMN and PL is the institutional territory and the geographic barrier. GMN is included within the political coalition of Manchester and is closer to Manchester than PL. As for NPDC, industrial activities still amount to a large proportion of the economic structure. The new motorways and the Channel Tunnel have assisted the industrial development. The arrival of TGV in these manufacturing sub-regions has a psychological effect to prevent manufacturing-led companies from moving to Lille.

9.2.1.5 Condition 5- Political Leadership and Governance

Fifth, the capacity of local political leadership and governance determines whether the opportunities presented by HST can be seized strategically or just wasted. This comparative case study has demonstrated the Condition 5 as a decisive factor. In addition to the service function of local authorities defined by law, these authorities have encountered direct pressures from local economic development involving job creation or losses. Strong leadership and governance display via proactive initiatives and a collective consensus to initiate a wider local economic strategy and local transport network before and after the arrival of HST.

The concept of political leadership has been captured from two perspectives. The first one argued that political leadership is a cumulative effect of historical trajectory, which is closely associated with Condition 4- city types and economic trajectory as mentioned earlier. Friedmann (1966) points out that local economic entrepreneurship and political leadership are associated with the historical trajectory of the region (Dawkins, 2003, p.140). Likewise, Judd and Parkinson (1990) who conducted several case studies of cities in North America and Europe argue that there is a close relationship between local leadership capacity and the type of regeneration strategies that cities pursue. They reveal that a local authority with a divided, unstable political structure and weak private-public partnership is associated with reactive policies, whereas an authority with a united, stable political structure and strong private-public collaboration implements aggressive and targeted policies. These findings led them to conclude that leadership is,

> *not a static, but a developmental phenomenon. Past experience matters a great deal. In cities with a history of development efforts, political battles encourage the creation of a rich institutional context (Judd and Parkinson, 1990, p. 296) (Judd, 2000).*

The second perspective maintains that political leadership and governance are not universal and need to take a combination of local and external factors into account, which further captures the interaction between political leadership and its contexts. DiGaetano and Klemanski (1999) argue that, although urban leaders have the ability to make choices, they are confined to the parameters imposed by external forces and local political arrangements. Economic restructuring (decentralisation towards the knowledge economy) and state restructuring (national policy and inter-governmental relations) will impose constraints on options for cities and consequently political arrangements evolve within cities (cited in Judd, 2000). This perspective highlighted the relationship between Condition 5 and Condition 1, 2, and 3.

Both perspectives have been critical in explaining the wider impact of HST. Through this contrasting comparative case study, the relationship between the two perspectives could be further comprehended with a new meaning. In the British case, Manchester's strong political leadership was argued to be a "cultural coherence" (section 7.3.2.1 I). However, under the negative external forces in the 1980s, Manchester was not confined. Instead, a new path has been recreated to reverse negative conditions resulting from the national state. Nonetheless, this strong leadership and governance is within the domain of Greater Manchester rather than operating at a wider regional scale. Other sub-regions which have no strong leadership and governance were understandably restricted to negative circumstances.

In the French case, strong political leadership is shown associated with the rule "*cumul des mandates*" and historical trajectory of cities. It is best demonstrated by Lille, Dunkerque, and Valenciennes (discussed in section 8.5). The national state has played a guiding role in planning and governance initiatives which significantly promote capacity building at the local levels. For the rest of sub-regions in NPDC, regardless of the benign decentralisation, it was found that French local authorities used to be small and tended to lack strong political leadership. But at least, the multi-level government structure creates an inclusive approach to help those disadvantaged sub-regions, so the regional inequality could be addressed. A summary of the British-French comparison is presented in Figure 9-2.

9.2.1.6 Other conditions

An intervention process involves more than these five conditions which were discussed in more detail above. Other important issues which are not highlighted are worth noting. Firstly, apart from national influence, funding mechanisms developed at the European level have increasingly played a decisive role in influencing national transport planning and large infrastructure projects; the European Regional Development Fund, European Investment Bank (EIB) loans, European Investment Fund, European Coal and Steel Community loans (Banister, 1994). In addition, for European integration, the Trans-European Transport Network (TEN-T) was defined in 1996, within which, a Trans-European HST network has been drawn and continually implemented. For example, a new rail terminal in UK Port of Felixstowe was highlighted by TEN-T Executive Agency (2013) as an illustration of TEN-T financing impact.

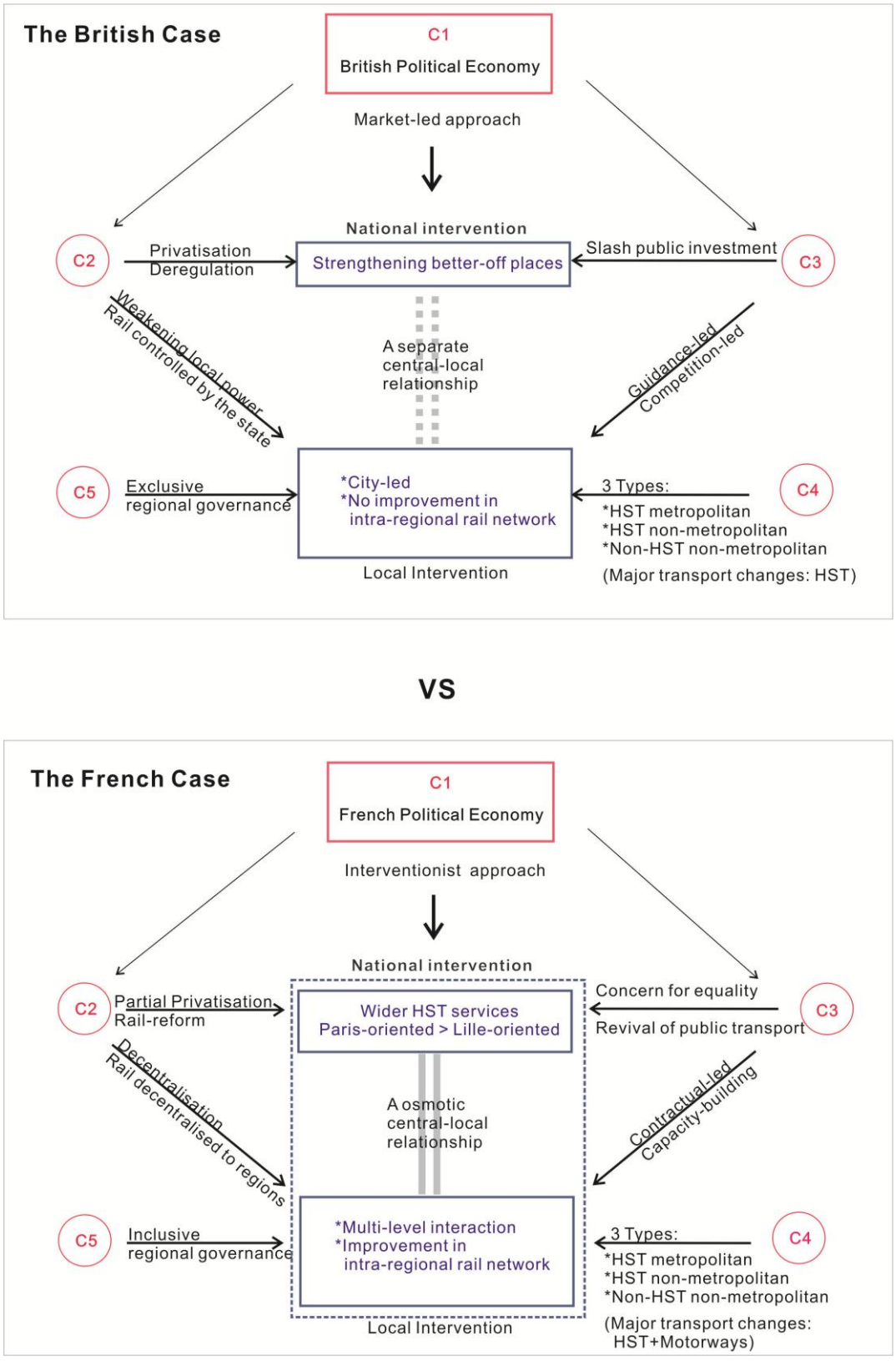
Secondly, the links between the public and the private sectors are critically underlain in these interventions. In section 6.6.2, the differing planning approaches in the UK and France have displayed a market-led/regulatory approach in the UK versus a public-led approach in France. Therefore, this difference manifests in the section 8.3.2.1 where a typical public-led redevelopment company (tool) was created in Lille to guide and channel private investment. Whereas, in the UK, the private and public partnership has been evolving through and closely related to the debate of the central-local relationship. The fiasco of the WCML modernisation was investigated in section 7.2 and was found to result from the traditional lack of putting public and private sector planning and investment together. On a smaller scale, due to huge controversy, there has been a decentralisation tendency of transferring redevelopment power from the central government to the local authority, as from Urban Development Co-operations (UDCs) to Urban Regeneration Companies (URCs).

Thirdly, the participation and inquiry process before the decision-making on investment is also influential. In the UK, taking all sorts of steps and procedures into account, a large transport infrastructure project like HS2 is usually expected to be completed in 20 years' time in contrast to a shorter period in other countries. In France, the "public inquiry stage is limited to debates on actual routes and the use of expert advisors is standard practice… Proposals are agreed and then discussed locally. The final decision of the Minister can only be challenged by instituting action in administrative courts, which could result in more protection without altering the layout" (Banister, 1994, p.113); while in the UK, the proposals are produced for local reaction and debate, and the final decision is made centrally. However, the British style of national decision-making and its consultation process have been increasingly challenged. A recent case is related to plans for future wind farms in the UK. A UN legal tribunal determined that "the UK Government acted illegally by denying the public decision-making powers over their approval and the "necessary information" over their benefits or adverse effects" (Pagano, 2013).

In the case of HS2, there have been several legal challenges made regarding this controversial project. Although only one of ten legal challenges was upheld in a High Court judgement[156], the government has decided to re-run the consultation process with further consideration of alternative compensation models. The Department for Transport and HS2 Ltd. stated that "*…property compensation consultation had been carried out, not the merits of the policies. In order to save time and public money and to limit the impact on residents affected, the Secretary of State for Transport has decided that instead of appealing this decision the government will re-run this consultation in line with the judge's finding that further consideration should have been given to other potential compensation models*" (DfT & HS2 Ltd., 2013). In this way, for a transport project as large and as controversial as HS2, the debate at the national level is fierce. No wonder the estimated period is much longer. Moreover, this decision-making difference is closely associated with the possibility of multi-level public intervention and to what extent, the opportunity offered by HST could be exploited more widely by different levels of government.

[156] The decision of High Court Judge was made 15 March 2013.

Figure 9-2 A Summarised Comparison between British and French Interventions



Source: author

9.2.2 Government Intervention in Capitalising on HST in Reducing Regional Inequality

The comparative study demonstrated these five key conditions collectively shape the wider impact of HST during the transformation process. The following discussion is focused on the interaction between national and local interventions which contribute to the reduction of regional inequality (the central part delineated by blue dotes in Figure 9-1).

9.2.2.1 National Intervention

1. HST Investment: A Short-term Solution vs. A Long-term Spatial-Economic Strategy

HST investment is, by default, a national decision. Whether HST investment is based on short-term problem-solving or the opportunity for long-term strategic development is a fundamental distinction of governmental reactions and perceptions between the two case studies.

The British upgrade approach demonstrates the problem-solving role of HST investment from a short-term perspective, constrained by an abundant railway network created in the 19th century. In the national context of the 1980s, central government cut public investment and expected the private sector to provide funding for transport services, which led to the privatisation of public transport services. In the case of the modernisation of the WCML, the whole process presented a lack of proper government involvement under rail privatisation and encountered serious technical obstacles, which were perceived and treated as a problem rather than an opportunity with over-extended construction period, overrun cost, reduction of the planned journey speed, and extremely unreliable services. In addition, the WCML upgrade involved modest transport improvement without physical transformation of new routes or new stations, which appeared to raise little awareness of this opportunity for local actors and demonstrated a separate central-local relationship.

In contrast, since 1981, French HST approaches have proved to be a long-term strategy associated with a spatial-economic concern for an over-concentrated Île-de-France and the rest of a thinly populated territory. In this context, investment in a new dedicated TGV-Nord, which demonstrated an immediate reaction to the construction of the Channel Tunnel, was in sharp contrast with the British reaction, displaying "essential coherence" (Mawson, et al., 1990). Moreover, there has been an evolution from separate HST lines radiating from Paris to an integrated HST network with international airport hubs around Paris, optimising transport resources over the national territory.

In addition, the newly dedicated TGV-Nord involved the issue of locating new HST stations/services, drawing local attention, and multi-level interventions to seize this opportunity. It displayed a close central-local relationship since it regarded as an great opportunity for the creation of an international HST rail market, the services for an uneven national spatial-economic geography, and a long-awaited opportunity for this European crossroads to transform its manufacturing economy towards "*la turbine tertiaire*".

2. HST Services for Regional Development: A Market-led vs. A State-led Approach

Different national political economies determined condition 2 and condition 3, which shaped whether and how HST could be exploited to serve a region in three aspects, namely HST service pattern, purpose, and prioritised orientation. In NWE, the modernisation of the WCML took place when British Rail had just been privatised under the conservative regime. WCML service patterns which were proposed by the private operator Virgin Trains and agreed by the state demonstrated a market-led (profit-oriented) approach. Virgin Trains served existing popular places, but skipped unprofitable stops. This point could be best exemplified by the different service patterns for Blackpool and Chester (see section 7.2). Furthermore, in order to compete with air, Virgin Pendolino services were prioritised for London-oriented inter-city travel, squeezing the overloaded capacity for intra-regional commuting services. The negative impact of the WCML on intra-regional rail capacity was highlighted in regional spatial strategy, but could not be actively addressed because the centralised authority of rail services and institutional conflicts and the ineffective operation of three non-elected regional bodies (see section 7.3.1.2 I). Thus, the existing uneven north/south intra-regional inequality has been reinforced.

On the contrary, in NPDC, in the early 1980s, a socialist president brought about two critical laws which enabled the opportunity of the TGV-Nord to be seized for urban and regional development. The first one was LOTI 1982 alongside the traditional osmotic centre-local relationship "*cumul des mandates*". Local actors collectively changed the national decision to suit local interests of locating Lille Europe TGV station in the city centre. The other is the decentralisation law 1982, which gave regions a legitimate position as another tier of local government with authority and resources for regional transport planning. The newly dedicated TGV-Nord line was meanwhile exploited by funding electrification of existing conventional lines to serve the region. Initially, many sub-regions, including peripheral areas, are directly served by HST to Paris (see section 8.3.1.1). Later on, after regional rail passenger services were decentralised to regional governments, NPDC introduced TERGV, for which the NPDC regional government pays a subsidy to SNCF. Since then, Paris-oriented HST services have been largely modified into Lille-oriented services, in particular for the peripheral coastal area (see section 8.3.1.2). However, two major issues arose. Firstly, the extended HST services in most sub-regions have encountered

worsening financial issues. Secondly, there has been an increasingly divided perspective regarding HST services between SNCF (an international and national view) and regional governments (a regional view).

9.2.2.2 Local Intervention: Transport Accessibility and Non-Transport Initiatives

On the other hand, local intervention in improving attractiveness played a critical role in the wider impact of HST. Two aspects, namely transport accessibility (hubs and transport networks) and non-transport initiatives (education, housing and physical transformation) prove to be essential to open up any opportunity for redevelopment. As discussed in section 3.5, the dynamic economic relationship between different types of cities could be better articulated through different levels of transport connectivity interchanged at key hubs for a more sustainable spatial-economic relationship in a region and thus the reduction of regional inequality. In the following section, the comparative discussion will begin with different levels of transport accessibility, which includes the creation of regional transport hubs, intra-regional rail network, sub-regional rail network (urban transit systems), and followed by the interlocked and indispensable relationship between transport and non-transport initiatives.

1. The Development of A Regional Hub Strategy: A City-led vs. A System-led Approach

Both metropolitan sub-regions have implemented a hub strategy, but through two distinctive approaches under varying conditions: city-led vs. system-led (state-led plus local intervention). In NWE, Manchester established its hegemony through an airport hub strategy which serves wider neighbouring regions, even beyond the north-west boundary. With the national context of privatising airports, abolishing metropolitan counties, and delaying WCML modernisation for rail privatisation, the City of Manchester was not constrained by these structural disadvantages. It exerted its strong leadership and governance by forming informal AGMA, keeping ownership of Manchester International Airport and developing it from the 1980s to enhance its external accessibility to the outside world, as well as its internal rail link with Manchester Piccadilly and beyond in order to expand the catchment of the airport. When the WCML modernisation was completed in 2008, bringing Manchester within two hours of London, a HST/airport hub strategy took shape and resulted in a noticeable decline in the London-Manchester air market[157]. In turn, this was a win-win situation for Manchester since the reduction in domestic flights provided available space for the growth of long-haul flights and a HST/air hub strategy strengthened

[157] Interview with Mr John Twigg from Manchester Airport (the quotation is in Appendix 19-JT-1).

Manchester's competitiveness and attractiveness to inward investment[158]. As the importance of Manchester International Airport has evolved to be indispensable to Northern England, an outward-looking cross-city regional growth strategy, "The Northern Way", was further promoted to combat north/south regional inequality. However, within the discourse of "The Northern Way" and an ineffective regional operation, inter-regional inequality was emphasised rather than intra-regional inequality. Disadvantaged peripheral sub-regions like Pennine Lancashire and West Coast Lancashire were excluded.

By contrast, the HST hub strategy in NPDC proved a good fit for the logic of the European high-speed transport system (HST lines connecting secondary cities with national capitals). The Lille HST hub is well-connected, with two large European capitals (Paris and Brussels) and their international airports within one hour, which exploits this locational advantage rather than its own international airport. Over time, this HST hub status has helped Lille to develop decentralised functions from two European Capitals. This cross-border metropolitan area has a centripetal attraction for its neighbouring area beyond Lille Metropolis, including the Belgian and the French territories. The decisions of the state have been instrumental in the transformation process of creating a regional hub around Lille, such as CU of Lille Metropolis created in the 1960s, the decision to build the Channel Tunnel, the TGV-Nord in the 1980s and the creation of the Lille Metropolitan Area (LMA)[159] promoted by DATAR in 2004. The LMA embraces coal mining area and non-industrial sub-regions such as Arras and neighbouring Belgian partners. Under this inclusive governance framework, developmental projects around transport and economic issues could be discussed on a broader scale to help disadvantaged sub-regions.

2. The Role of the Intra-regional and Sub-regional Transit Network Connecting with A HST Hub

Improving Intra-regional Rail Networks

Both Manchester and Lille show apparent benefits from developing knowledge intensive activities around their hub strategies, but this is not necessarily true for their neighbouring sub-regions. In order to encourage spill-over effects of HST, when large cities are served by HST, the critical issue is whether these sub-regions either with or without HST services could be connected to an improved intra-regional transport rail network.

[158] Interview with Mr Dave Whyte (the quotation is in Appendix 19-DW-5).

[159] This enlarged Lille Metropolitan Area involved 23 partners, nearly 500 municipalities, 3.4 million inhabitants within a territory of 75000 km² (SPIRE, 2005).

In NWE, the intra-regional rail network has largely been ignored and the condition was worsened when the capacity was squeezed by prioritised inter-city Pendolino services. The problematic intra-regional system and the bottleneck problem around Manchester were stressed in "The Manchester Hub railway study" (Network Rail, 2010). On the other hand, due to a lack of an equivalent regional rail authority, the attempts of improving intra-regional rail services with the revived centre around Manchester have been made by individual local authorities. However, funding is strictly controlled by the state and the fragmentation of local attempts has proved difficult in achieving any intra-regional rail improvement. The frustrated experience is illustrated by Pennine Lancashire (section 7.3.2.4 II). What is more, the historical rivalry between Manchester and Liverpool has impeded possible rail link improvement for a wider regional perspective (section 7.3.1.2 I).

In contrast, in NPDC, the regional government has gradually become responsible for regional transport investment and rail passenger services for an improved intra-regional network although there is still much to be done. The most ambitious intervention is the electrification of existing rail links to allow interoperability with HST lines and the introduction and extension of Regional TGV (TERGV) between Lille and the coastal area. However, the current commuting demand between the former coal-mining area and Lille reveals an insufficient rail capacity and the need for transport improvement to make a genuine LMA possibility a reality. The improvement of the intra-regional link between Lille and the coal mining area demanded intensive negotiation and communication facilitated among several structures such as MBM, ADULM and LMAA. The findings show that the whole decentralisation process is still new. Many French local authorities are proud of their new powers and tend to look inside their EPCIs rather than outside, so the cooperation is limited and not automatic (section 8.3.2.3 IV). It therefore involves lengthy negotiation process among multi-level organisations under an inclusive approach.

Developing Sub-regional Networks

In addition to the intra-regional rail network, the development of a sub-regional rail system with a form of either metro or tramway from a HST hub could further extend the wider impact into sub-regions. Although the development of urban transit systems could be found in both contexts, structural conditions have been distinct.

In the UK, centralised funding control has proved difficult for local authorities to organise their local transport systems. The metro link network in Greater Manchester has been implemented and expanded by political leadership and governance in securing transport funding with the respectable capacity in efficient delivery (section 7.3.2.1 I). Thus, it has resulted in a significant boost for Manchester's image as a successful European city. But this is not the case for the second

metropolitan city, Liverpool. With the early completion of the Loop & Link transport project in the 1970s, it has proved difficult to convince the Department for Transport to fund a new tramway project in Liverpool city centre.

On the contrary, in France, the national policy is beneficial and open to the development of local transport systems. But the key issue is how to exert political leadership in tackling fragmentation and securing a consensus among political partners for collective territorial development. In Lille, although the first VAL metro system was made possible by VT to link Lille with Villeneuve d'Ascq new town, only when the political leadership of Pierre Mauroy secured metropolitan consensus, was it possible to realise the subsequent extension of the metro system and the refurbishment of the tramway system to enhance Lille's connectivity with two post-industrial towns, Roubaix and Tourcoing (section 8.3.2.1 I). Likewise, political leadership overcame difficulties to bring about a second tramway system in NPDC, developed in Valenciennes. However, problems occurred in two new tramway schemes developed within the coal mining area. The lack of political consensus and leadership called a halt to the process. Recently, negotiation has restarted with assistance from MBM and regional government (section 8.3.2.3 III).

3. The Relationship between Transport Accessibility and Non-Transport Initiatives

Lastly, the findings demonstrated the interlocked relationship and need for both transport accessibility and non-transport initiatives to extend wider effects of HST. For both major regional centres, there is a match of transport improvement with urban projects. Several urban regeneration projects have created a new image with new economic space and quality of life in the transition from an industrial metropolis to a knowledge economy. A polycentric spatial-economic structure is efficiently linked with urban transit systems.

The difference between British and French cases lies in the relationship between the central and local interventions and whether it is a conscious or a subconscious association. In Britain, central and local interventions were separate. The arrival of the WCML modernisation proves to have a reactive impact whereas in France the central-local intervention was closely interacted, so there is a proactive intervention. Similar effects are found in small sub-regions such as Valenciennes, Roubaix, Tourcoing, and Dunkerque. All were implemented with urban redevelopment projects and transport schemes in city centres.

Two situations which were seen as incomplete interventions are classified as only having either transport improvement or non-transport improvement. Firstly, it is worth reiterating that transport accessibility of places is a necessary, but not a sufficient condition for wider effects. Examples were found in both regions. The ignorance of the HST opportunity in Warrington, Preston and Lens were typical examples. Secondly, without transport accessibility, local regeneration alone

could not make any significant change either. This is best exemplified by local intervention in Pennine Lancashire in NWE. Although considerable efforts were made with a housing market renewal scheme and other improvements such as education and training in the local area, prospects are still bleak without any improvement in transport to provide a commutable "city-offer" (BBC, 2011b) to attract more highly skilled residents to commute to work in larger cities. This is widely anticipated by the local regeneration officer as a possibility for change in the long term. In addition, there is a common belief from local authorities in the importance of rail improvement with large regional cities for local regeneration. Jake Berry (MP for Rossendale and Darwen) admits the economic driver of Manchester resulted in a need for people in his constituency to work in Manchester and spend in the local area (House of Commons, 2012).

Vulnerable sub-regions in both regions exactly display these two contrasting conditions. Both interviewees (CEO of MBM and the regeneration officer in Pennine Lancashire) point out that most staff working in the office do not live in the locality. For PL, the reason is because of the isolated location. If PL was easily accessible from the large city, the staff would consider living locally. For the former coal-mining area, however, the reason is because of a lack of attractiveness. As the CEO of MBM expresses, if the infrastructure is not good, they will not be able to work there. Transport is the first step to break the limitation, but transport alone is not enough.

9.3 Chapter Conclusions

In response to the SRQ3: *How could the impact of HST be spread as widely as possible throughout a region by government intervention, which could ultimately reduce regional inequality?* Chapter 6 demonstrated contrasting national conditions in both cases. Findings from Chapter 7 and Chapter 8 further illustrate how the opportunity presented by HST was perceived, and at the same time, how multi-level intervention in the transformation process over 30 years varies with different national and local conditions, which explains the contrasting economic performance demonstrated in Chapter 5 in reducing regional inequality both on the inter- and intra-regional scales. Through the lens of the comparative findings, there are four major conclusions.

Firstly, this has to begin with the national state, which regards HST as a long-term strategy rather than a short-term solution. HST investment is a major national transport planning decision and needs to integrate high-speed transport planning with a long-term strategy, which could respond to the existing spatial-economic patterns and future need. This is illustrated by the two cases: the British "market-led' perspective providing a short-term solution to the need for HST services versus the French "state-led" approach in implementing a long-term spatial-economic strategy progressively developing HST hubs in regional capitals and integrating the HST network with long-haul airport hubs.

Secondly, a conducive national spatial-economic planning framework enables local governments to intervene and negotiate with local interests supported by constitutional responsibility and resources. In the two cases, national political economy significantly influences national reforms which determined planning priority and resources in two distinct ways, namely fragmented local government structure and tightened local responsibility and resources in the UK versus the decentralisation policy for multi-level local governance and a contractual approach of building local capacity with available funding resources. As a result, two distinct kinds of central-local relationship present themselves: a "separate" relationship with a "profit-oriented" pattern of Pendolino services in the NWE and an "osmotic" relationship with a "equality-oriented" pattern of TGV services in NPDC. Thus, during the decision-making process, the intra-regional inequality has been widened in NWE but has been addressed in NPDC.

Thirdly, the focus shifts to local interventions on both transport and non-transport initiatives. Local intervention needs to seek regional-wide consensus with the recognition that a complementary city relationship is vital within a region between different types of cities. Then, a wider impact on intra-regional inequality could be achieved with reconstruction of a spatial-economic landscape by a hub strategy in regional major centres, with simultaneous intra-regional and sub-regional rail

network linking with HST hubs, and efforts made on urban regeneration. This is particularly contrasting in the two regions.

In NWE, due to the separate central-local relationship and a constrained national spatial-economic framework, the regional transformation process proves to be city-led without regional consensus and inclusive regional governance. Firstly, a city-led Manchester hub strategy, the extensive Metrolink network, and the polycentric city-regional transformation were achieved by Manchester's strong leadership and governance in response to the national context. The arrival of the WCML modernisation well matched with efforts made on regeneration and transport connectivity in the city-region, so Manchester became an air/HST hub with renewed economic growth. Liverpool also showed apparent improvement. However, the prioritised intercity rail services had squeezed the capacity for intra-regional rail services and no serious improvement was made to alleviate the problem. The cross-regional rail link from and to Manchester Airport is based on the expansion of the airport catchment rather than a concern for regional development. Secondly, for other HST sub-regions, local intervention had little to do with the HST opportunity. For instance, a lack of leadership and sticking to a motorway-based development mode in Warrington helps to explain why the economic performance of the Warrington sub-region was overtaken by the Manchester sub-region. Thirdly, the disadvantage of transport connectivity in non-HST hinterlands has further widened the intra-regional inequality. Despite efforts to implement regeneration projects, both peripheral Pennine Lancashire and West Coast Lancashire were relatively powerless, suffering from poor transport accessibility and weak leadership without effective improvements.

In NPDC, the national context resulted in decentralised, state-enhanced, capacity-building, and inclusive approaches to local intervention. Firstly, a Lille hub has been established through a conscious and collective intervention on a HST opportunity. Lille metropolis has physically transformed with city-regional wide economic strategy supported with the expansion of urban public transit network, in particular for the large-scale urban redevelopment project- Euralille intermingled with the HST hub. Meanwhile, regional consensus led to a series of intervention on spreading the wider impact of HST for regional development. Further, a cross-border metropolitan cooperation was initiated by the state, but was conducted and continued by local leadership. Secondly, the wider impact of HST has to consider the impact of new motorway development and to be examined in a long term. For some manufacturing-led sub-regions like Lens and Dunkerque, the arrival of TGV is not as immediately useful as new motorways for its restructured manufacturing economy. However, the intervention in seizing the opportunity of the TGV with urban redevelopment projects has largely created a good image for Dunkerque and Valenciennes in a long-term transformation. Thirdly, a lack of local intervention has been a problem for the wider impact. In the case of Lens, despite being served by TGV, these local authorities lack

initiatives to capitalise on the opportunities presented by HST, so transformation effects are limited. But at least these vulnerable and weak sub-regions have been assisted by regional and national special missions over the years, focusing on a transformation in their attractiveness and capacity building over the long term.

Lastly but not least, the comparative finding suggests the ignorance of intra-regional inequality may explain the worsening inter-regional inequality. No matter how conducive the national spatial-economic framework may seem, strong political leadership and the concern for poor sub-regions in reducing intra-regional inequality for a regional territory is very fundamental. The British case has demonstrated that the absence of strong regional government has led to a city-led approach on a city-regional scale for the best without a serious concern for a regional perspective. In contrast, the French case has displayed that a multi-level intervention in this opportunity is complicated but inclusive, which needs a long term to allow regional transformation to transpire.

Nevertheless, despite the fact that government intervention is essential, genuine equilibrium appears difficult. As Hirschman (1958) reminds us, "it is illusory to think that a balanced development is possible. Given the lumpiness of transport infrastructure projects, one will often have relatively long periods of excess supply or demand" (quoted in Rietveld, 1989, p.255). Similarly, Richardson reveals that "even when peripheral regions have economically converged and achieved partial equilibrium, inter-regional growth differentials can persist" (Prestwich & Taylor, 1990, p.98).

Chapter 10 Conclusions

10.1 Introduction

It is time to conclude. This thesis has aimed to tease out the controversial relationship between HST investment and wider spatial-economic development. The main research question and three sub-research questions have been answered in the preceding chapters. This concluding chapter will first highlight concluding remarks in section 10.2, followed by a summary of detailed findings in section 10.3 and a short re-examination of research methods adopted and recommendation for future research in section 10.4, prior to a final thought in section 10.5.

10.2 Concluding Remarks

Within the wider context of a post-industrial society in which uneven inter- and intra-regional development has been pervasively widened. The arrival of HST offers a major opportunity to reshape uneven spatial-economic development, because once less prosperous places are served by HST, they could potentially attract businesses which value F2F (face-to-Face) contacts for tacit knowledge during their economic restructuring towards the knowledge economy. The research journey started by identifying the enduring debate and research gaps in the wider spatial-economic impact of HST and justifying the need to deepen our comprehension through (Aim 1) conducting new empirical research to gain hard evidence and (Aim 2) the adoption of a planning approach to unveil the significant role of government intervention.

In the course of the research, a conceptual spatial-economic framework for HST in reducing regional inequality has been proposed. New empirical evidence has been produced through a combination of quantitative and qualitative methods, based on the British experience of IC125/225 and British-French comparative practice from the WCML modernisation and the TGV-Nord. The research culminated in generating a model of government intervention in seizing the opportunity of HST in the transformation process for regional development. The research findings significantly enrich the literature in this field, leading to the following three key concluding remarks.

First, gains from the arrival of HST does not automatically and necessarily lead to losses elsewhere and the wider effects of HST for regional development need to be understood at least on two inter-related spatial scales. At the national level, the findings suggest that HST has had demonstrable and varied effects on cities within 1 hour and 2 hours from the capital city, thus helped to generate renewed economies. However, these effects have not been automatic or universal. 1-hour HST accessibility from the national capital could benefit from exploiting both commuting and economic functions, while 2-hour HST accessibility from the national capital could benefit mainly from exploiting economic functions. Beyond a 2-hour distance, the effect

appears weak (Here, the 1-hour or 2-hour classification could be slightly variant in specific contexts).

At the regional level, the findings show that major regional cities have been reinforced by their HST hub position, but the effects have not been necessarily spread to surrounding sub-regions. Although there may be several sub-regions which are served by HST, in addition to their regional centre, the nature of HST systems tends to reinforce the inter-city connectivity. A distinction needs to be made between those sub-regions with direct HST services and those without. Hence, HST should well-integrate with urban and regional transport networks, so that a spatial-economic relationship between a regional centre and its hinterland could be fostered to produce and magnify the wider effects.

Secondly, it is worth reiterating that transport alone is not sufficient to determine the wider effects in reducing regional inequality. HST is just the central piece of infrastructure in a comprehensive development package. In particular, path dependency is problematic for post-industrial places to easily adapt to HST opportunities, or even not to be peripheralised if bypassed by HST. Complementary measures are indispensable. Five conditions are found and highlighted to be vital, namely national political economy, constitutional capacity, planning priority and resources, city types and economic trajectory, and leadership and governance. In DATAR's latest publication (2013) on the territorial effect of HST, a vital message with a vivid analogue echoes the findings and arguments in this thesis: whether HST will have "irrigation" or "*assèchement* (dewatering)" effects essentially depends on interventionist approaches including the mobilisation of local actors and strategic policies for territorial development.

Thirdly, one of major inherent challenges of carrying out a transport impact study is the net effect and causality. Since the nature of a developmental process is complex, dynamic and long-term. There is a need to emphasise synergetic measures which could lead to anticipated effects instead of discerning net effects.

10.3 Summary of Key Findings

Detailed research findings to answer three sub-research questions are summarised below in order.

Re-SRQ 1: What is the potential relationship between HST and the development of a knowledge economy?

Following an extensive literature review, the first findings addressing SRQ1 were presented in Chapter 3 with a conceptual spatial-economic framework of HST in the era of the knowledge economy. The unprecedented time-space shrinkage of HST representing "the second railway age" has continued to coexist with pervasive economic restructuring in major advanced industrial countries since the 1970s. The definition and the evolution of the knowledge economy were reviewed in section 3.2.2. Three major types of knowledge intensive activities were identified to discern changes in developing the knowledge economy over time, namely (1) financial and business services; (2) high-tech and medium-high tech manufacturing (science and technology); (3) cultural and creative industries. Then, the chapter moved to distinguish the locational characteristics of knowledge-intensive and routine-oriented activities and disentangle the cluster development through examining factors leading to both centralisation and decentralisation of spatial patterns. The driving forces for concentration include cost-productivity, social relationship, and innovation and creativity (section 3.4.2.1), whereas decentralisation forces are technology, investment in infrastructure, product-profit cycle, and other changes caused by public intervention (section 3.4.2.2). Despite this, economic restructuring towards the knowledge economy involves the diffusion of innovations which need both technological and socio-institutional conditions (section 3.2.1). Similarly, path dependence could hamper places from adapting to economic restructuring (section 3.4.2.3).

The relationship between economic connection and dynamic spatial development has been demonstrated in the *Polynet* study (Hall and Pain, 2006) and the *City Relationships* study (The Northern Way, 2009a). These findings clearly show that market forces tend to favour agglomeration economies and thus increase uneven development. Government intervention in assisting the redistribution of spatial-economic functions is indispensable through improved transport connectivity and other interventionist policies. The wider impact of HST in reducing the regional inequality implies a two-sided feature at major transport hubs, highlighting the importance of transport connectivity and a need for two spatial scales in studying the wider impact of HST. This conceptual framework effectively directed the quantitative and qualitative data collection and analysis to answer SRQ2 (for Aim 1) and SRQ3 (for Aim 2).

Re-SRQ2: Whether and to what extent has HST accessibility boosted a knowledge economy and led to a reduction in regional inequality?

SRQ2 is answered on two spatial scales (national and regional, or inter- and intra- regional) with quantitative findings in Chapter 4 and Chapter 5 respond to four hypotheses generated in section 3.5.

Firstly, the inter-regional impact of HST was reported in Chapter 4. In response to hypothesis 1 and 2, the findings present varying effects on local economic strength and knowledge-intensive development not only between HST and non-HST serviced towns but also within HST towns. The potential time-space effects are illustrated with three train time zones, namely, one-hour, one-two hours, and over two-hours journey time. Within one hour of London, spillover effects appeared favourable in places with HST services. These were decentralised locations like Reading, Swindon and Peterborough. Non-HST towns such as Chelmsford, Colchester, Basingstoke, Winchester and Ashford largely showed an attraction to high-income commuters rather than economic decentralisation. Cambridge was the exception. Within two hours of London, different HST effects were present. Well-established regional capitals such as Bristol, Leeds and Cardiff revived from decline with a growth in high-GVA activities and aggregated highly knowledge-intensive industries; but there were exceptions. Doncaster and Newport, both old industrial towns, continued to suffer from path dependency. Non-HST towns were characterised by weaker economic performance, but Southampton and Bournemouth were exceptions because these places are within two-hours from London with a high-frequency train service and have established a long-lasting close economic relationship with London prior to the arrival of IC125/225. Beyond the two-hour limit, HST effects appear weak. Darlington, Swansea and Newcastle upon Tyne showed relative economic weakness, while Edinburgh, more than three hours from London by HST, displayed strong economic performance, along with a significant growth in air travel to London.

Secondly, the intra-regional impact of HST was reported in Chapter 5. In response to hypotheses 3 and 4, through a quantitative examination, the wider intra-regional impact of HST has proven to be challenging. The findings show both similarities and differences in this comparative study. The similarity is that the connection with the national capital by faster train services did economically strengthen both regional capitals (Manchester and Lille) in developing the knowledge economy, but not necessarily the sub-regions around them, especially former industrial sub-regions. On the other hand, there are three major differences between the two regions. Firstly, knowledge-intensive activities in Greater Manchester South have been the largest sector of employment since 2004, whereas in Lille Metropolis, although the growth in the knowledge economy has been apparent after the arrival of HSR, public services account for the largest part of the economic structure. Secondly, the intra-regional inequality was widened in NWE but reduced in NPDC. Thirdly,

although a big gap remains, the overall inter-regional disparity between NPDC and Île-de-France has been reduced, whereas the uneven regional development between NWE and London has actually widened. These variations strongly suggested that the wider impact of HST involves more than a HST connection and naturally lead to an in-depth qualitative study.

Re-SRQ3: How could the impact of HST be spread as widely as possible throughout a region by government intervention, which could ultimately reduce regional inequality?

The comparative study further delved into the in-depth qualitative study of the development process to answer SRQ3 on the strategic relationship between HST opportunities and multi-level government interventions. Prior to the in-depth empirical chapters in Chapter 7 and 8, Chapter 6 reviewed both British and French government systems and planning approaches during the 1980s and 2000s to establish an analytical spatial-economic planning framework for local government interventions and suggest three critical national conditions (section 6.7). Firstly, regarding national political economy, British market-led ideology contrasted with the French state-led perspective, which was reinforced by a concern for equality (section 6.3.3). Thus, the opportunities presented by HST could be appreciated and realised better in France than in the UK (section 6.4). Secondly, government systems and their restructuring played a critical role in generating enabling or constraining conditions for planning and taking action at the local level. Although the UK and France are both unitary countries, over the same period of time, the UK had gone through a centralisation process with constraining conditions (section 6.5.2.1) while France had implemented a decentralisation process with enabling conditions (section 6.5.2.2). This suggests that the decentralised local government system in France appears to be more capable of generating appropriate tiers of government to enable competence than that of the UK. Thirdly, concerning national planning priority and resources, British private-, competition- and guidance-led approach (section 6.6.2.1) is in contrast with French public-, contractual-, and capacity-building-led approach (section 6.6.2.2). In addition, transport resources are more available for local levels in France than in the UK where transport resources have been largely controlled by the state. Therefore, the French planning approach appears to be more conducive than the British one for encouraging local intervention and achieving the wider impact as a result of HST.

Chapter 7 presented the multi-level government interventions in the British case. Complying with a traditional central-local separate relationship, the modernisation of the WCML was a pure transport project, which was delayed and implemented under rail privatisation to solve the bottleneck problem at the national level. Based on a market-led approach, the WCML service pattern catered to better-off places and withdrew services from poor places. The prioritised capacity for the inter-city long distance service pattern has squeezed the capacity of intra-regional

services and reinforced regional inequality (section 7.2). The British national spatial-economic planning framework during the 1980s-2000s demonstrated a weak regional intervention from absence of regional government (1979-1997) to ineffective regional governance (1997-2010) and led to a city-led transformation process (section 7.3.1). At the sub-regional level, four varying local interventions were found closely associated with the central-local separate process with two different local conditions (political leadership and economic trajectory). This explains the re-centralisation of regional hegemony around Manchester (section 7.3.2.1) and a catch-up process in Liverpool and Merseyside (section 7.3.2.2). A lack of active intervention in the non-metropolitan HST sub-regions shows a stable, less strategic, and path-dependence process (section 7.3.2.3). For non-HST sub-regions, an arduous but frustrated process was persistent (section 7.3.2.4). There is little wonder that the intra-regional and inter-regional inequality had been widened.

Chapter 8 next reported the multi-level government intervention in the French case. Under a state-led approach, the TGV-Nord line was regarded, beyond a pure perspective of transport, as a part of a long-term spatial-economic strategy and was strongly supported by the French central government (section 8.2). The osmotic central-local relationship has proven to be advantageous in influencing the national decision making process for local interests i.e. locating a major new HST station in Lille city centre, which was supported by collective regional consensus. At the regional level, with decentralised resources and responsibility, regional intervention critically exploited the TGV-Nord for regional development. It began to enable TGV services for a wider region (section 8.3.1.1) and then significantly changed a Paris-oriented to a Lille-oriented TGV network with the introduction of TERGV services (section 8.3.1.2). In addition, it intervened to assist problematic sub-regions which did not actively take initiatives. At the sub-regional level, although various reforms presented an enabling approach for local intervention, negotiations between multi-level governments are always controversial, contested, and taking a long time to evolve and reach a step change. And the in-depth study of three economic zones demonstrates that local economic trajectory and political leadership and governance influenced the wider impacts of HST. Strong political leadership in Lille metropolis led to the creation of a HST transport hub in Lille city centre which has enabled Lille to develop the knowledge economy, diversify local economies and expanded wider territorial cooperation into an European metropolitan area, but it will take a long time to genuinely transform from a transport hub to a more knowledge-intensive hub (section 8.3.2.1). Beyond Lille Metropolis, the wider effect of the TGV in these industrial sub-regions is less direct and apparent. The exception was Valenciennes which made a deliberate intervention in a tramway project alongside with urban regeneration projects. Dunkerque actively exploited HST and motorways, but the economic restructuring and physical transformation in its neglected urban centre takes a long time to show effects of the TGV (section 8.3.2.2). The absence of active

intervention in Lens leads to fragmentation and stagnation and is difficult to have the wider impact of the TGV without regional intervention (section 8.3.2.3).

Chapter 9 brought together key conditions (section 9.2.1), exploring how HST investment was exploited by national and local interventions to reduce the regional inequality in the two regions (section 9.2.2) to answer the SRQ3 in the concluding remark (section 9.3). In the light of the comparative study, the resultant model of exploiting HST for reducing regional inequality can be further examined and applied to other contexts. Four aspects need to be taken into account. Firstly, a strong state-led approach with vision and concern for equality is fundamental. Secondly, a conducive/inclusive spatial-economic framework enables local governments to intervene and negotiate with local interests supported by constitutional responsibility and resources. Thirdly, the opportunity of HST should be exploited to reconstruct regional spatial-economic landscape with a hub strategy in regional major centres, with simultaneous intra-regional and sub-regional rail network linking with HST hubs. In addition, local interventions should combine transport and non-transport initiatives. Lastly, regional transformation is a long-term process, in particular for post-industrial regions. Local conditions vary with their city types, economic trajectories, leadership and governance. A regional consensus recognising the complementary relationship between centres and sub-centres is essential. In the absence of a regional apparatus, strong local authorities would need to expand outward to include weaker sub-regions first in order to avoid sub-regional rivalry, because less capable sub-regions need help. Otherwise, a struggle against path dependency in disadvantaged sub-regions will persist.

10.4 Revisiting Research Methods and Recommendation for Future Research

10.4.1 Revisiting Research Methods

This thesis has embarked on a long-term impact study of British upgraded HST systems and a cross-county (UK-France) comparative case study. The inherent difficulty and weakness of this research in claiming causality, data availability, and comparability have been well-recognised and discussed at several places in Chapter 2, 4, and 5. Here, a brief summary is made. The difficulty, firstly, lies in the selection of a group of non-HST cities to be exactly equivalent to HST towns. Since HST towns largely enjoy major agglomeration economies in large settlements, they tend to have motorway accessibility so it appears difficult to claim causality. More than one line in each category is selected to give a better understanding. Secondly, due to the 30-year long term assessment of impact, harmonised data at the same geographical level through time was not available. The research methods are largely descriptive statistics by analysing several collected datasets with careful classification and due judgement rather than applying statistical modelling to interpret data. Although the findings are not absolutely clear-cut, the process of analysis involves a

certain degree of qualitative research which is useful in providing plausible explanations for the presented findings. Thirdly, the comparative study in two national contexts poses major challenge. Section 5.4.2 illustrates in more detail the issue of data comparability such as the definition of the NUTS 3 level which was different in the UK and France, so the key point is to ensure the consistency of the statistical data used for comparison among sub-regions within each context.

Similarly, the strength of research methods adopted here should be emphasised. Firstly, it looks beyond a conventional way of conducting empirical studies ("before" and "after", "HST" and "non-HST" cities at the urban level). Instead, it traces the development process with more than two reference points in time if suitable, and looks at differential effects within each group. Secondly, the different spatial catchment or influence between HST and other urban transit systems is highlighted through two major studies on two interrelated scales. Thirdly, through in-depth interviews and policy analysis between two post-industrial regions in two countries respectively (the UK and France), this research has vividly unveiled how different spatial-economic planning systems have created enabling or restrained circumstances for public intervention to make possible changes during the process. In particular, varying central-local interactions led to differential achievements, difficulties and problems. In turn, the synthesised discussion explains the severe divergence of intra- and inter- regional inequality in the British case and the slow convergence of inequality in the French case.

10.4.2 Future Work

This thesis has made a step forward by providing new empirical evidence and focusing on the role of government intervention. In comparison with forecasting approaches based on modelling, there are still relatively few empirical impact studies of HST. More empirical evidence is needed for further comprehension. Here I list a few possible directions for future work in this field.

1. Empirical research at the micro (firm) level based on a long-term perspective should be useful, as in Bonnoufous (1987). There could be a cross-national comparison over a long period of time. This type of research could provide critical insights into practical business location, agglomeration in relation to the opportunity offered by HST for technological breakthroughs and dynamism. Both quantitative and qualitative methods could be applied to look at the other factors such as types of firms, the location of businesses and their relationship with rail and other transport modes, the reasons for relocation, the links between their branches and business partners, the link with public policy or other factors, the national difference or local contexts. Geographical and visualisation tools such as Arc-GIS could be applied to present the changed patterns of urban or regional settlement (forms) in addition to the statistical results.

2. Currently, varied impact and development processes for different HST station locations - e.g. inside or outside the city centre - have emerged as a symbol of good or bad decision-making, because those located outside have exhibited a slow property development process, in particular in western Europe. For most cases, this may be true. However, the type of development around the HST station is not necessarily and should not be treated uncritically in the same way as for a metro or LRT station. Some other issues such as the geography between a group of cities and the different development strategic process to serve a wider area should be taken into account. All these issues are worth exploring.

3. Instead of trying to isolate the net effect of HST, investigating specific factors influential in relationship to territorial development should be emphasised. This will involve the development of a new tool of evaluating transport investment which could look beyond the traditional indicators used in traditional cost-benefit analysis. The issue is how the wider effects could be properly evaluated and applied over a wider territory within which the impact of HST could be induced, even though some of these effects are not necessarily taking place as an effect of using the infrastructure. More in-depth case studies would be beneficial.

4. The development process closely involves multi-level transport governance and funding mechanisms. With wide implementation of rail reform, more and more rail authorities are not in the public sector. Privatization and rail reform have significantly changed transport policy, with critical consequences in exploiting HST for regional development, due to the interactions and negotiations among different perspectives and a need for cross-level intervention and integration. A planning approach, teasing out the relationships and concerns among these evolving transport authorities at different levels, could prove very insightful.

5. A related issue, suggested by this thesis, is that the widespread perception of inter-regional inequality in the UK (i.e. the North-South divide) needs to be re-examined and disaggregated at the intra-regional scale, because there is a derived hypothesis from the empirical findings that ignorance of intra-regional inequality is responsible for inter-regional inequality.

10.5 A Final Thought

HST involves a certain degree of disturbance to the existing environment (both urban and rural), which results in costly and sometimes controversial transport investment. This controversy is hard to avoid. The wider impact of HST on regional development is an inter-disciplinary subject. HST could play a role as a supply-led long-term strategy, but, at any rate, HST by itself will not be a sufficient condition for reducing regional inequality. The findings of this research take on importance for evidence-based policy, strategy, and decision-making. By the time of completing this thesis in early 2013, both Phase 1 and Phase 2 of HS2 had been announced and undergone initial stages of the long-term project. Regarding arguments for and against HS2, a timeline of developing the HS2 proposal, and the implications for HS2, more details are summarised and discussed in Appendices 22, 23, and 24.

There is an acute dilemma at the heart of the HST controversy: the deep scepticism that HST can help lagging regions. This thesis urges a long-term planning perspective and the need for academic attention to look beyond traditional forecasting modelling and a single-scale investigation of empirical research. Active public policies and intervention are indispensable and should be devised to achieve this long-term vision of reducing regional inequality by HST. A closely relevant implication could be learnt from a recent review of LRT/ MRT impact by Feitelson and Rotem-Mindali (2014). They argue that

> *"…This is often the case, as LRT and BRT systems are bundled with other measures as part of wider policy packages...Thus, while it may be possible to try and discern the net effect of transit systems on the urban and metropolitan structure, the utility of doing so can be questioned. As transit use is enhanced by coupling the improvement of such systems with complementary measures, its spatial effects are likely to be enhanced by the combination with synergic measures. The emphasis should thus be on identifying the synergic measures which will augment the desired effects on the urban structure rather than on discerning the net effects of LRT or BRT systems…"*

Given the nature of dynamics and complexity in conjunction with transport connectivity, spatial-economic relationship and institutional governance, a new research dimension in the field of transport and development needs to emerge in order to advance the current state of debate.

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Appendix

Appendix 1: Semi-structured Questionnaire

(For the British Case)

Semi-structured interview sheet

Research Topic	**High-speed Trains (HST) and Space Economy: The UK experience 1976-2001 and Prospects for High-speed two- A Manchester-Lille Comparison**		
Date	**Time/duration**		
Interviewee	**Position**		
Organisation	**Voice Recorded**	Yes	No
Location	**Notes taken**	Yes	No

Questions

1. Which of the following sectors represents you best? Please select from one of the list:
   1) Public sectors (national, regional, and local governments, or QANGO[1]s)
   2) Professional adviser (consultants)
   3) Academics (scholars)
   4) Others……

2. Could you briefly describe your position in your organization (sector)?

3. What is your assessment of public sector interventions (national, regional, sub-regional, metropolitan, or local levels) which were made in order to seize the opportunity brought by the West Coast Main Line (WCML) Modernisation?

4. How would you assess spatial-economic impacts of the WCML modernisation on Manchester and its wider sub-regional development towards the knowledge economy?
   1) Regarding current WCML-virgin Pendolino services, what are the potential and limitation (or constraint) for economic development in Manchester and its sub-regions?

   2) Can you please provide your view and experience regarding transport improvements and the possible relation to the regeneration of Manchester and its sub-regions?

   3) Can you please identify, if any, key historical points in relation the transformation of Manchester and its sub-regions? Do you think is it related to the arrival of the WCML modernisation or any other transport improvement?

5. In your view, for the future, what will be the most important single transport investment to take place in assisting Manchester and its sub-regional transformation? If there is more than one, can you please rank them according to their significance?

End of interview, I very much appreciate giving me your time!

[1] "Quasi-autonomous non-governmental organisation".

The Bartlett School of Planning, University College London
22 Gordon Street, London WC1H 0QB
Tel: +44 (0)20 7679 5596
Fax:+44 (0)20 7679 7502

(For the French Case)

Semi-structured interview sheet

Research Topic	**High-speed Trains (HST) and Space Economy: The UK experience 1976-2001 and Prospects for High-speed two- A Manchester-Lille Comparison**		
Date	**Time/duration**		
Interviewee	**Position**		
Organisation	**Voice Recorded**	Yes	No
Location	**Notes taken**	Yes	No

Questions

1. Which of the following sectors represents you best? Please select from one of the list:
   1) Public sectors (national, regional, and local governments, or QANGO[1]s)
   2) Professional adviser (consultants)
   3) Academics (scholars)
   4) Others……

2. Could you briefly describe your position in your organization (sector)?

3. What is your assessment of public sector interventions (national, regional, sub-regional, metropolitan, or local levels) which were made in order to seize the opportunity brought by the TGV-Nord?

4. How would you assess spatial-economic impacts of the TGV-Nord on Lille and its wider sub-regional development towards the knowledge economy?
   1) Regarding current TGV-services (Regional TGV and National TGV), what are the potential and limitation (or constraint) for economic development in Lille and its sub-regions?

   2) Can you please provide your view and experience regarding transport improvements and the possible relation to the regeneration of Lille and its sub-regions?

   3) Can you please identify, if any, key historical points in relation the transformation of Lille and its sub-regions? Do you think is it related to the arrival of the TGV-Nord or any other transport improvement?

5. In your view, for the future, what will be the most important single transport investment to take place in assisting Lille and its sub-regional transformation? If there is more than one, can you please rank them according to their significance?

End of interview, I very much appreciate giving me your time!

[1] "Quasi-autonomous non-governmental organisation".

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22 Gordon Street, London WC1H 0QB
Tel: +44 (0)20 7679 5596
Fax:+44 (0)20 7679 7502

Appendix 2: List of Interviewees

(For the British Case)

No.	Title	Name	Sector	Role	Date of interview
1	Prof.	Michael Hebbert	Academia	School of Environment and Development, University of Manchester	14 Oct 2010
2	Dr.	Martin Hess	Academia	School of Environment and Development, University of Manchester	15 Oct 2010
3	Mr.	Dave Whyte	Public	City team leader, City of Manchester	15 Oct 2010
4	Prof.	Brian Rubson	Academia	School of Environment and Development, University of Manchester	15 Oct 2010
5	Prof.	Cecilia Wong	Academia	School of Environment and Development, University of Manchester	15 Oct 2010
6	Prof.	Alan Harding	Academia	Director of IPEG, University of Manchester	18 Oct 2010
7	Mr.	Ian Wray	QUANGO	(Former)Chief planner, North West Regional Development Agency	19 Oct 2010
8	Mr.	Paul Hildreth	Academia	Visiting policy fellow, University of Salford	20 Oct 2010
9	Mr.	Chris Anslow	Public	Group manager of Public transport policy, Lancashire County Council	20 Oct 2010
10	Mr.	Brian Cookson	Public	Regeneration director, Pendle Borough Council	25 Oct 2010
11	Mr.	John Crellin	Public	Planning manager, Preston City Council	26 Oct 2010
12	Mr.	Stephen Clark	QUANGO	Rail programme director, GMPTE	12 Nov 2010
13	Mr.	Darren Kirkman	QUANGO	GMPTE	12 Nov 2010
14	Prof.	Sir Peter Hall	Academia	Regeneration Professor, University College London	10 Feb 2011
15	Mr.	Chris Green	Private	Former CX of Virgin Trains	9 May 2011
16	Mr.	David Thrower	Private	Transport advisor to North West Business leadership team	22June 2011
17	Mr.	Aidan Manley	QUANGO	Head operating office for the support team in Cheshire & Warrington LEP	19 July 2011
18	Mr.	John Twigg	Private	Planning and Infrastructure director, Manchester Airport Group	22 July 2011
19	Prof.	Andrew McNaughton	QUANGO	Chief Engineer, HS2 limited	20 July 2011
20	Mr.	David Bayliss	Private	An independent professional advisor	18 Jan 2012
21	Mr.	Ste Lingard	QUANGO	Director of Corporate, Regenerate Pennine Lancashire	8 Feb 2012
22	Prof.	Michael Parkinson	Academia	Director of the European Institute for Urban Affairs, Liverpool John Moores University	8 Feb 2012

(For the French Case)

No.	Title	Name	Sector	Role	Date of interview
1	Mr.	Reg Harman	Private	Interfaces (consultancy)	15Nov 2010
2	Mr.	Thierry Baert	Public	Head of international affairs, ADULM	17Nov 2010
3	Prof.	Didier Paris	Academia	Professor and Conseil de développement of Lille Metropole	17Nov 2010
4	Ms	Anne-Sophie Legendre	Public	Direction des transports service cellule d'appui stratégique, NPDC	18Nov 2010
5	Dr.	Alain L'Hostis	Public	Researcher, INRET	19Nov 2010
6	Mr.	Christophe Bartholeyns	Public	Responsible pôle Aménagement du territoire, CCI	19Nov 2010
7	Prof.	Philippe Menerault	Academia	Professor and director of L'Aménagement et Urbanisme de Lille	19Nov 2010
8	Mr.	Antoine Plard	Public	Chargé de mission Plan de Déplacements Urbains , SITURV	19Nov 2010
9	Prof.	Hugh Clout	Academia	Professor in Department of Geography, UCL	3 Dec 2010
14	Prof.	Philippe Marliere	Academic	Professor of French and European Politics at University College, London	6 Jan 2011
10	Mr.	Michel Leboeuf	Public	Head of Major Infrastructure Projects, Passenger Department, SNCF	26May2011
11	Mr.	Nicholas Joncquel	Public	Chargé de mission urbanisme/ mobilité référent Littoral Côte d'Opale	23 Jan 2012
12	Mr.	Yves Dhau Decuypere	Public	CEO Mission Bassin Minier Nord - Pas de Calais	1 Mar 2012
13	Ms	Pauline CASSETTE	Public	Chargée de mission Transport-Déplacement, Mission Bassin Minier Nord - Pas de Calais	1 Mar 2012

Appendix 3: Two Types of Agglomeration Economies

Two forms of agglomeration economies (localisation and urbanisation economies) can be found in dynamic city-regional territory. Hoover (1937) highlights the distinction between the two in the era of manufacturing economy. Localisation economies denote "all the firms in a single industry at a single location, consequent upon the enlargement of the total output of that industry at that location", while urbanisation economies account for "all firms in all industries at a single location, consequent upon the enlargement of the total economic size (population, income, output, or wealth) of that location, for all industries taken together" (Hoover, 1937, pp. 90-91). In the era of the development of the knowledge economy, these two agglomerations co-exist, but their definitions and the relationship between the two need to be re-examined.

Localisation economies

As early as Alfred Marshall's time, localisation economies existed and were identified as similar or related small firms working together for a dominant industry in particular places such as steel industries around Sheffield or cotton industries around Manchester. Manchester served as the commercial hub of a production system built on the cotton industry, which was operated in an interwoven network and experienced "a unique synergy" (P. Hall, 1998, p. 344) between the core city and its surrounding towns.

The discourse of a "new industrial district" (Best, 1990; Goodman & Bamford, 1989; Scott, 1988a, 1988c) emerged as a new concept inspired by regional industrial development in the Emilio-Romagna region of Italy under economic crises and uncertainty and the rise of technology based production zones in the USA and elsewhere (Hutton, 2008, p. 50). The key concept is that small, innovative firms enhance regional economic growth through highly cooperative and collaborated networks, which allowed them to adapt, flourish and expand into a mature industry (Hutton, 2008; Markusen, 1996). Storper and Walker describe the "dematurity of an industry" and argue "[i]ndustries can be renewed through dramatic product modifications, revolutions in production methods, or complete reorganisations" (Storper & Walker, 1989, p. 91). Similarly, "flexible specialisation" (Piore & Sabel, 1984; Storper & Christopherson, 1987) parallels the concept of "new industrial district" and it is argued that the economic crises in the 1970s stemmed from dependence on the mass production of standardised goods by semi-skilled workers (Piore & Sabel, 1984, p. 4). When the situation turned to become unknown and unstable, stable mass production was unable to precisely fit the dynamic situation (Storper & Christopherson, 1987, p. 105).

Through the study of industrial districts in Brazil, Japan and the US, Markusen (1996) classifies alternative types of industrial districts as 'sticky places', defining that an industrial district is 'a sizable and spatially delimited area of trade-oriented economic activity which has a distinctive economic specialisation, be it resource-related, manufacturing, or services' (Markusen, 1996, p. 296). The criteria for this classification centres on firm size, interconnections and internal versus external orientations; she identifies four types. In addition to the Marshallian industrial districts and its variant: the 'new industrial district' or 'flexible specification', the three other types are (1) a hub-and-spoke industrial district, (2) a satellite platform district, and (3) the state-anchored district. A hub-and-spoke industrial district indicates the regional industrial structure hinges on one or more chief vertically integrated firm in one or more sectors, surrounded by smaller and less powerful suppliers. A satellite platform district is a congregation of unconnected branch plants within the region, embedded in external organisation links. These districts are often assembled at a distance from major conurbation initiated by entrepreneurial governments to trigger regional development outside the centres by offering attractive incentives to lower business costs. The state-anchored district focuses on the regional economy which is anchored by one or more public sector institutions, such as a capital city, a key military installation (see Markusen, Hall, Campbell, & Deitrick, 1991), research facilities, or public corporations. Markusen (1996) stresses these four types of industrial districts are not fixed; rather, they might evolve or mutate from one to another, concluding that the success of industrial districts should not only focus on local institutions and behaviours because sticky places are complex products of multiple forces: corporate strategies, industrial structures, profit cycles, state priorities and local and national politics. Both cooperation and competitiveness are essential to their commitment and success.

However, Malmberg and Maskell (2002) argue that cooperative and complementary relationships within localisation economies have been very much adopted, while competitive relationships seem to be relatively ignored. They state that there are two types of agglomeration process in localised economies, namely horizontal (similar) and vertical (complementary), but the horizontal process of agglomeration has been largely ignored and should be distinguished from the vertical process. They maintain that knowledge spillover should not merely concern specialisation, interaction, exchange, coordination and collaboration between complementary firms (the vertical process); rather, variation, observation, comparison, selection and rivalry between similar firms (the horizontal process) are equally important. Malmberg and Maskell (2002) opine that co-located firms that are similar could be observed to establish the small differences in the solutions they choose. Hence, within localisation economies, it is reasonable to suggest that similar industries have a greater need to be in close spatial proximity than complementary industries because, regarding complementary functions, F2F is crucial, but does not demand the degree of spatial proximity for close observation.

However, the spatial scale for localisation economies is problematic. Malmberg and Maskell (2002) argue that the definitions of 'local' and 'regional' are extremely elastic and they are often used as synonyms in the literature. Furthermore, 'local' could indicate several geographical scales including a local neighbourhood (a street, a block in the city), a city, an entire nation, or a group of nations (such as a core area of heavy industrialisation during the 19th century). Since it is not possible to precisely define a specific geographical scale for agglomeration economies, they suggest that it is reasonable to allow the scale to vary in accordance with the type of analysis.

Urbanisation economies

Urbanisation economies entail the collocation of diverse industries in a parasitic relation. Even though Hoover (1937) obeys the neo-classical tradition, namely citing cost as the main criterion for agglomeration, he discerns the difference between 'transfer cost' and 'production cost' for industries. He goes into greater detail than Weber's (1929) main focus of transfer cost (distance) due to awareness of the effect of locational factors on different types of industries such as those that are market-oriented, labour-oriented or material-oriented. The principle is that high land value in the city centres stimulates the de-urbanisation of manufacturing industries, which demand large spaces rather than urban locations to develop specialised centres of production. Therefore, cities attract market- and labour-oriented industries which benefit from flexibility and a diversified labour supply, despite the high operating costs.

In the trajectory of economic restructuring towards a knowledge economy, urbanisation economies have placed more emphasis on the increasing concentration of the diversity and knowledge intensity of economic activities in large cities. Jacobs (1969) argues "urban diversity is central to certain kinds of economic creativity because of specific advantages of unplanned and haphazard, inter-network contact" (quoted from Storper & Venables, 2004, p. 365). In the work of Four World Cities (Llewelyn Davies Planning, 1996), four groups of advanced service industries were identified by their co-location in large world cities where cross-fertilisation takes place, not only among these driving sectors, but also ancillary industries. The four groups of advanced service industries include: (1) finance and business services (banking, fund management, securities and insurance); (2) power and influence (government, headquarters, trade associations and international agencies); (3) creative and cultural industries (fashion, design, publishing, film/ TV, music and the arts); (4) tourism (hotels, visitor attractions and entertainment).

Furthermore, knowledge production and strong networks between key sectors are evident. Storper and Venables (2004) use "Buzz" to stress that the close interaction between high technology and government gave rise to a major high-technology region in Washington DC; similarly,

cross-fertilisation between design/entertainment/communication is found in New York, Los Angeles, London and Paris, and there is also a network between higher education, finance and government. Similarly, important linkages between inner city clusters and other agglomerations within a metropolis contribute to regional growth and development (Hutton, 2004a). Two primary sets of flows operate from new inner city production spaces: inward (or 'centripetal') linkages to corporate clients within proximate CBD and 'centrifugal' connections between subcontracting firms in the inner cities and major advanced technology corporations on the urban periphery. These inward flows can be illustrated by the exchange of information and services between firms in London's City fringe and corporations in the City proper, while the centrifugal flow could refer to the growth impetus for software developers and Internet providers to the south of the Market Area of San Francisco, in association with their subcontracts for large corporations in Silicon Valley (Hutton, 2004a, p. 100).

Three of the four economic sectors in "buzz cities" (Storper & Venables, 2004) are highlighted by Llewelyn Davies Planning (1996), and the only different aspect is the identification of localised economies such as "science, technology and high technology, and research" in urbanisation economies (Acz, 2002; Darby and Zucker, 2002 Storper & Venables, 2004, p. 365). The difference could be explained by the matter of scales. If the scale zooms into the core city centre, this economic group of "science, technology and high technology, and research" is not necessarily situated within it. But as soon as the scale zooms out, that group of economic activities is evidently located within a wider city-regional territory, particularly in the case of large R&D institutions. A typical example is Silicon Valley, which was initially founded in Santa Clara Valley between San Jose and Palo Alto by venture capital, using knowledge of R&D from the university and scientific infrastructure of the area. Rather than being confined in a large city centre, it thrives in a place which possesses three key features: "the general atmosphere of scientific excitement and advance", an agreeable physical and social environment, and external economies of agglomeration (P. Hall, 1985). Meanwhile, it is located within the wider mega-city region of the San Francisco Bay Area, within one hour by car to and from UC Berkeley University on the east side of the bay and the large metropolitan city San Francisco.

The relationship between localisation and urbanisation economies

In order to distinguish clearly the features of the knowledge economy, the diagram below suggests the evolution of agglomeration economies via two different models. In Hoover's time, based on the demand-supply relationship of dealing with "goods", urbanisation economies represent a major cluster for consumption activities, while localisation economies focused on production activities. Both were separately situated. Hoover (1937) suggests that, in urbanisation economies, the

concentration of one primary industry would give rise to a subsidiary concentration of dependent industries. Several kinds of relationship exist between primary and dependent industries, such as suppliers (dependent)-consumers (primary) or vice versa. The dependent industries might be located within or outside the city to carry out the linkages. As Hoover (1937) observes, in some cases the auxiliary growth to the primary industry in the city is an important element for localisation economies. But, in his discourse, localisation economies of shoe and leather manufacturing are separated physically from urbanisation economies, but still have industrial linkages between the two (referring to the left hand side of the diagram below).

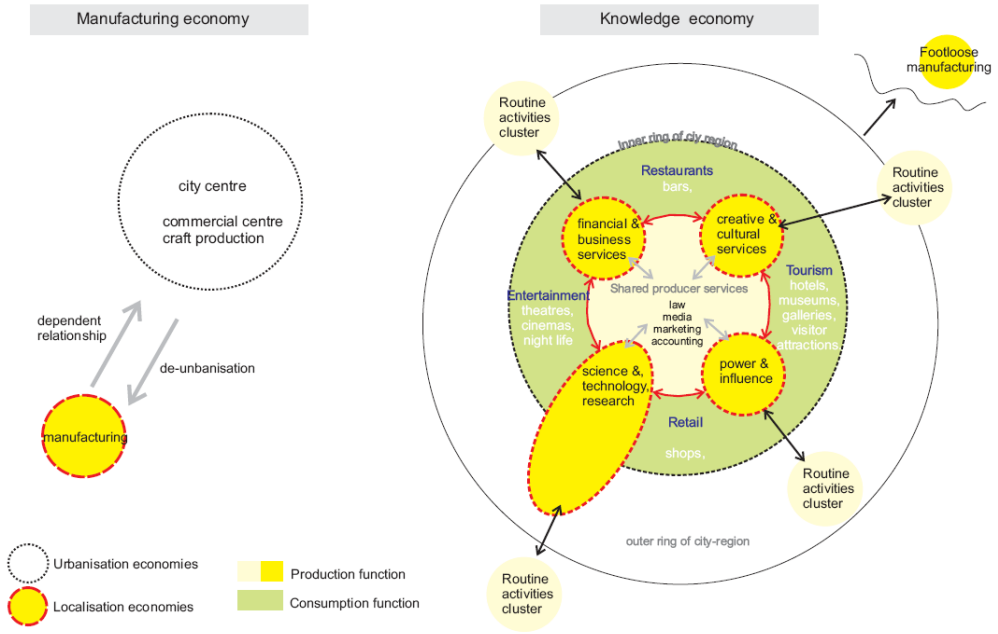


Diagram- The evolution of agglomeration economies (localisation and urbanisation economies)

In contrast with the separation of production and consumption functions in the era of the manufacturing economy, large cities contain both consumption and production functions in the era of the knowledge economy. Each knowledge intensive economic activity identified in section 3.3 is actually a form of localisation economy consisting of similar and related industries producing immaterial knowledge or vital information nearby. Localisation economies are literally located within urbanisation economies, forming a larger urban milieu rather than being separate from one another. A shared pool of ancillary industries co-exists as shared resources for these knowledge intensive sectors to support both production (accounting, law, marketing, advertising and media) and consumption (restaurants, retail, tourism and entertainment) functions. Take financial and business services, for example; the increasing globalisation, digitalisation and liquefying of illiquid assets provokes innovations in the financial industry, enhanced by coordination with other supporting producer services such as legal services, accounting, software design, insurance and others (Sassen, 2001, p. 112). In the city of London, the agglomeration of large banks, insurance

and law companies in physical proximity is evidently important to enable F2F contact and relationship-building (Cook, Pandit, Beaverstock, Taylor, & Pain, 2007, p. 1341). Overall, an increasingly sophisticated division of labour (Mensch, 1975; Scott, 1988b) produces specialised innovative activities clustered in different locations. In contrast, manufacturing and routine activities like clerical processing, routine sales and convenience shopping have decentralised from them (P. Hall, 2006; P. Hall & Pain, 2006; Llewelyn Davies Planning, 1996).

Appendix 4: British Transport Networks and Passenger Traffic 1900-2007

	National Rail					Motorways				Air		
Year	Total route	Electrified [2] route	Open to Passenger traffic	Passenger journeys (million)	Passenger kilometres (billion)	Trunk (kms)	Principal (kms)	Total (kms)	Private cars licensed	aircraft landings or take-offs (thousands)	Terminal passengers (thousands)	Passengers on domestic flights (millions)
1900	29,783	..	..	..	..							
1919	32,420	1,321	..	2,064	..							
1928	32,565	1,901	..	1,250	..							
1938	32,081	3,378	..	1,237	30.6							
1948	31,593	1,455	..	1,024	34.2							
1950	31,336	1,489	..	1,010	32.5				1,979	195	2,133	
1959	29,877	1,799	22,632	1,069	35.8	13	0	13	4,416	358	7,867	1.7
1968	20,080	3,182	15,242	831	28.7	869	11	[4] 884	9,285	560	24,845	5.0
1976	18,007	3,735	14,407	702	28.4	2,062	93	2,155	13,184	740	44,666	6.1
1977	17,973	3,767	14,413	702	29.3	2,131	106	2,237	13,220	759	45,927	5.5
1978	17,901	3,716	14,396	724	30.0	2,287	107	2,394	13,626	862	52,829	6.4
1979	17,735	3,718	14,412	748	30.7	2,340	116	2,455	14,162	924	56,992	7.2
1980	17,645	3,718	14,394	760	30.3	2,445	111	2,556	14,660	954	57,823	7.2
1985	16,752	3,809	14,310	686	30.4	2,705	108	2,813	16,454	1,097	70,434	8.6
1990	16,584	4,912	14,317	809	33.2	2,993	77	3,070	[5] 19742	1,420	102,418	13.1
1995	16,666	5,163	15,002	761	30.0	3,197	72	3,269	[5] 20505	1,551	129,369	14.3
2000	16,652	5,167	15,042	957	38.2	3,422	45	3,467	23,196	1,986	179,885	18.2
2005	15,810	5,205	14,356	1,082	43.2	3,466	54	3,519	26,208	2,333	228,214	23.3
2007	15,814	5,250 [3]	14,484	1,232	49.0	3,518	41	3,559	26,878	2,409	240,722	22.3

Source: Transport Statistics Great Britain 2008

Notes:

1. From 1994/95 route length is for the former Railtrack.
   'From 1995/96 data are for National Rail, former British Rail and
   'Train Operating Companies. Excludes rail routes managed by PTEs.
2. Pre 1947 figures refer to track length, not route length, and include electrified sidings.
   In 1947 electrified track kilometres totalled 3,370.
3. Break in series due to a change in methodology.
4. Includes other motorways i.e. those not at the time allocated to either the Department for Transport or local authorities.
5. Changes to the taxation system have meant that there are some discontinuities in the series.

Appendix 5: Travel-to-Work by Distance (1981-2001)

Part 1

Workplace Employment				<5 km			5-9 km			10-19 km			≥20 km		
				1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
		GB	%	53.89	52.05	40.19	21.23	20.83	18.30	13.19	15.81	15.31	7.61	11.31	12.56
	TrainTimes	LA													
HST towns	Over 2 h	Edinburgh		-	48.55	-	-	21.97	-	-	16.76	-	-	12.73	-
		Newcastle		44.12	41.45	35.53	31.87	29.58	26.13	18.95	22.06	23.49	5.06	6.91	8.49
		Swansea		55.36	53.78	42.22	27.49	27.11	24.68	11.70	13.71	15.19	5.45	5.40	7.78
		Darlington		68.92	66.31	51.10	8.82	8.13	7.58	13.88	16.04	17.53	8.38	9.52	13.18
	1-2 h	Leeds		51.17	45.75	35.80	29.31	26.09	23.15	13.63	17.51	18.36	5.88	10.65	13.64
		Cardiff		51.24	46.58	41.08	26.87	23.89	20.99	13.30	15.72	15.45	8.58	13.81	14.45
		York		71.55	64.62	52.16	15.26	14.55	12.78	6.85	9.47	9.24	6.34	11.35	15.23
		Newport		58.18	52.62	42.33	21.01	17.77	17.08	15.48	18.47	20.46	5.33	11.15	12.14
		Doncaster		60.64	55.16	41.70	24.53	23.35	21.23	10.23	14.26	14.50	4.59	7.22	9.63
		Bristol		53.29	50.45	45.52	26.54	23.80	20.82	13.82	14.94	12.76	6.35	10.81	11.45
	1 h	Swindon		72.28	64.00	52.17	16.94	15.69	15.56	5.92	7.62	7.18	4.86	12.70	15.76
		Peterbourogh		62.69	53.74	43.23	17.40	20.42	19.15	11.57	13.40	13.42	8.34	12.44	15.45
		Reading		58.09	53.94	47.67	21.68	18.77	16.21	9.52	10.78	8.91	10.71	16.52	17.84
	London														
Non-HST towns	1 h	Chelmsford		59.12	52.67	38.27	12.16	10.90	9.23	18.52	20.47	20.01	10.20	15.95	17.65
		Basingstoke & Deane		65.10	53.64	41.17	14.05	13.20	11.50	11.14	11.97	10.04	9.72	21.18	22.94
		Cambridge		55.00	47.71	41.65	18.53	16.73	13.62	15.28	16.62	15.30	11.18	18.95	21.91
		Colchester		62.12	55.98	44.80	16.58	15.96	13.17	13.89	16.37	14.10	7.42	11.69	13.49
		Winchester		50.98	39.34	30.13	17.98	17.75	15.33	21.33	26.94	23.52	9.71	15.98	17.03
		Ashford		67.38	57.42	41.62	12.38	13.93	9.77	11.70	12.58	13.56	8.55	16.07	16.92
	1-2 h	Southampton		55.83	53.68	48.00	27.94	26.23	21.68	9.38	10.73	9.24	6.86	9.36	11.07
		Ipswich		68.53	63.67	53.29	13.54	11.65	12.02	11.61	14.07	13.48	6.32	10.61	11.92
		Canterbury		58.39	51.27	39.48	19.61	21.76	16.62	13.12	14.44	13.82	8.88	12.52	14.77
		King's Lynn & West Norfolk		58.21	56.81	40.75	17.72	17.40	13.31	16.62	16.03	15.68	7.45	9.75	12.52
		Norwich		60.16	54.65	46.22	18.05	18.46	17.60	12.49	13.96	12.94	9.30	12.93	16.99
		Bournemounth		63.08	62.45	52.27	24.83	21.30	17.73	8.87	10.98	9.10	3.23	5.27	5.28
		Thanet		77.86	74.25	58.14	14.46	15.44	13.76	3.96	5.03	4.65	3.72	5.29	6.35

Residents in Employment				<5 km			5-9 km			10-19 km			≥20 km		
				1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
		GB	%	56.19	52.09	40.02	22.13	20.85	18.22	13.74	15.82	15.24	7.94	11.23	12.60
	TrainTimes	LA													
HST towns	Over 2 h	Edinburgh		-	63.84	-	-	24.12	-	-	6.67	-	-	5.37	-
		Newcastle		60.82	59.61	49.59	29.51	27.88	24.47	6.63	8.05	9.25	3.04	4.45	3.65
		Swansea		55.93	55.57	45.16	28.06	25.78	24.08	9.92	10.90	10.41	6.09	7.74	5.42
		Darlington		73.84	66.97	53.54	10.33	10.01	8.68	7.27	9.26	10.44	8.56	13.76	12.35
	1-2 h	Leeds		54.61	52.10	41.98	30.84	29.08	26.43	10.92	13.83	14.06	3.63	4.99	4.32
		Cardiff		63.97	62.39	51.38	27.19	25.00	21.76	5.27	7.05	8.10	3.56	5.56	5.72
		York		73.73	67.79	55.40	15.25	15.28	13.40	4.18	6.49	6.07	6.83	10.45	10.68
		Newport		66.93	62.64	52.40	19.23	17.18	16.02	9.73	12.74	11.76	4.11	7.44	7.07
		Doncaster		59.15	52.20	38.33	23.94	23.11	20.77	9.89	13.33	14.04	7.01	11.36	11.64
		Bristol		68.54	69.08	56.95	24.18	20.43	18.92	4.90	6.27	7.15	2.38	4.22	3.05
	1 h	Swindon		77.16	72.75	59.66	14.22	14.99	15.76	3.40	3.55	3.91	5.22	8.70	6.17
		Peterbourogh		75.48	65.90	52.85	15.33	18.83	18.71	4.07	5.21	5.60	5.12	10.06	6.84
		Reading		69.96	65.70	54.24	11.74	10.28	10.63	6.18	7.11	8.33	12.12	16.91	11.64
	London														
Non-HST towns	1 h	Chelmsford		53.07	45.57	36.13	11.23	9.08	8.97	10.27	13.63	13.91	25.43	31.72	24.79
		Basingstoke & Deane		59.88	54.01	41.94	14.70	14.13	12.86	12.03	13.64	12.40	13.38	18.22	13.87
		Cambridge		84.51	78.81	64.32	6.79	7.95	7.44	3.42	4.38	5.47	5.28	8.86	5.11
		Colchester		62.38	56.58	43.59	15.61	14.46	12.33	7.97	9.10	9.05	14.04	19.86	11.65
		Winchester		52.75	43.49	32.84	16.27	16.33	11.97	20.33	22.39	18.19	10.65	17.79	12.72
		Ashford		60.51	52.19	39.46	12.92	13.79	9.68	10.59	11.31	10.47	15.99	22.71	14.54
	1-2 h	Southampton		69.80	66.18	55.07	22.51	20.40	17.66	4.08	7.04	6.94	3.61	6.37	5.15
		Ipswich		78.16	73.75	60.78	9.70	10.14	10.41	7.14	8.21	8.42	5.00	7.90	5.00
		Canterbury		55.12	50.37	38.80	17.93	19.60	15.43	10.64	10.44	11.09	16.31	19.60	12.56
		King's Lynn & West Norfolk		57.29	53.99	38.83	18.99	18.70	13.85	16.77	15.46	15.40	6.94	11.85	10.54
		Norwich		86.61	83.68	66.99	8.39	7.99	8.45	2.03	2.79	4.69	2.97	5.54	5.46
		Bournemounth		67.03	66.44	51.23	22.74	20.94	18.46	4.17	6.02	6.25	6.06	6.59	4.74
		Thanet		67.31	62.06	48.93	15.14	16.45	14.49	5.49	5.61	5.71	12.07	15.88	10.69

Source: NOMIS (1981, 1991, 2001 Census data)

Note:

1981

1. Workplace employment data source from SWS Table 6 Persons Working in Zone (including at home) (B): Distance from Home / Working at Home / Workplace Imputed by Sex.
2. Residents in employment data source from SWS Table 2 Residents in Employment (A): Distance to work by Sex (Excluding working at home, no fixed workplace and inadequately described).

1991

1. Workplace employment data source from SWS Table WB4 Distance to work: Employees & self-employed with a workplace coded (SWS Set B- Persons working in zone) [10% Sample].
2. Residents in employment data source from SWS Table WA4 Distance to work: Employees & self-employed with a workplace coded (SWS Set A- Persons resident in zone) [10% Sample].

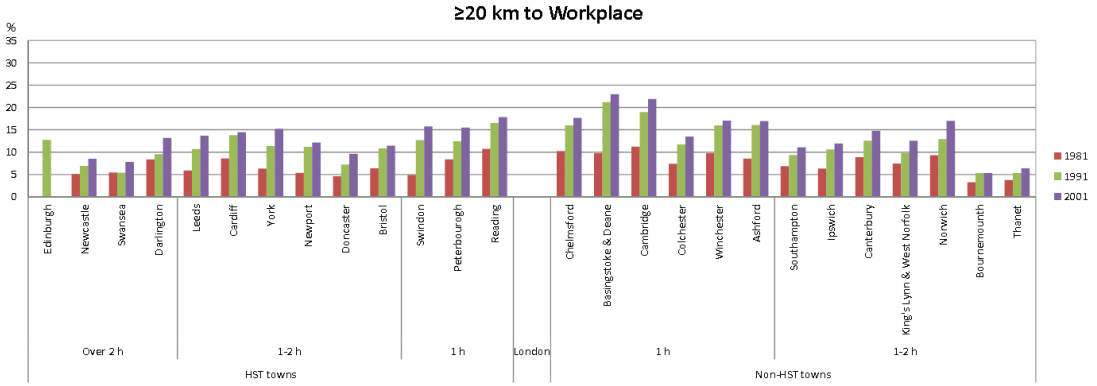
2001

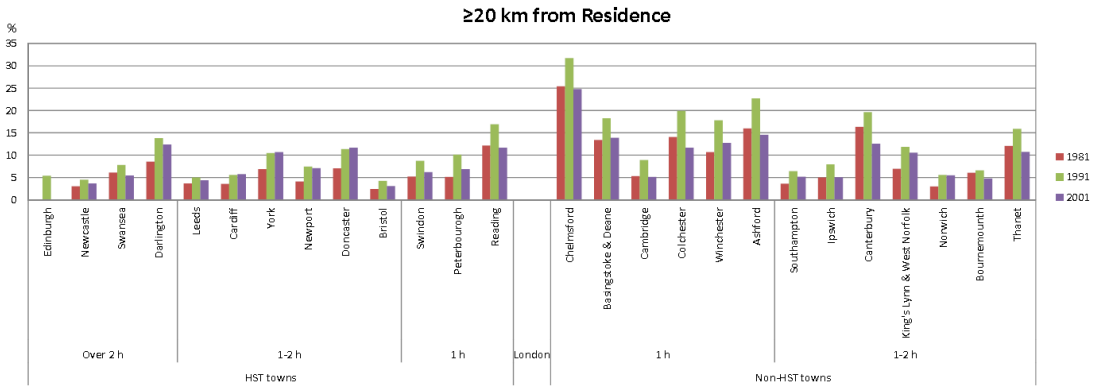
1. Workplace employment data source from Standard Table S129 Sex and distance to work by method of travel to work (workplace population)
2. Residents in employment data source from Standard Table S121 Sex and distance travelled to work by methods of travel to work.

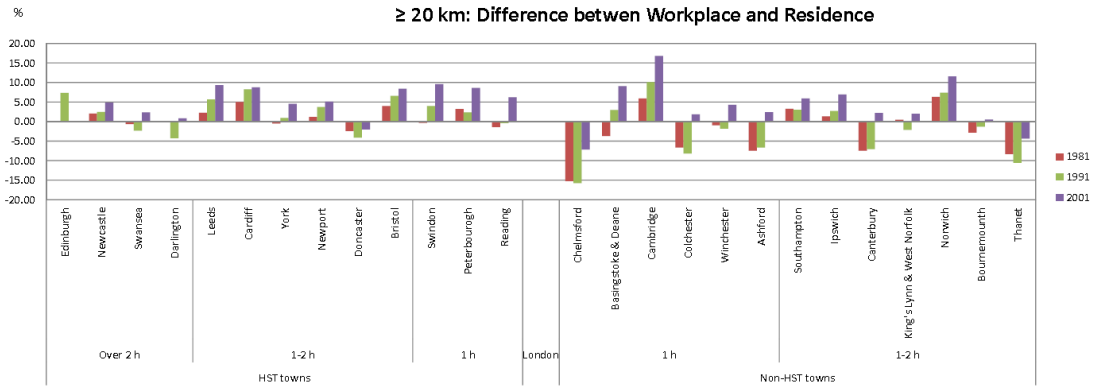
Appendix 6: Travel-to-Work by Distance (1981-2001)

Part 2

The Percentages of Travel- to-Work Employment over 20km (Workplace vs. Residence) (1981-2001)







Source: NOMIS (1981, 1991, 2001 Census data)

Appendix 7: Travel-to-Work by Transport modes (1981-2001) at Residence Place

				British Rail Train			Underground			Bus			Car-Driver			Car-Passenger			Motor Cycle		
				1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
		GB	%	3.89	3.86	4.08	2.06	2.10	3.00	15.20	9.86	7.40	38.79	53.09	55.23	7.97	7.67	6.25	2.95	1.45	1.09
	TrainTimes	LA																			
HST towns	Over 2 h	Edinburgh		0.87	0.94	-	0.05	0.04	-	39.91	31.09	-	27.53	39.57	-	5.95	5.79	-	1.12	0.45	-
		Newcastle		0.50	0.63	0.94	0.96	5.36	5.51	36.59	25.17	18.87	29.52	41.71	45.87	7.29	7.83	7.13	1.02	0.37	0.48
		Swansea		0.47	0.43	0.51	0.06	0.05	0.08	16.72	9.42	7.25	43.23	60.22	62.59	13.35	11.15	9.47	1.92	1.11	0.77
		Darlington		2.09	1.20	1.12	0.02	0.05	0.08	19.02	13.09	10.15	35.85	52.76	56.06	8.77	9.43	8.09	1.89	0.76	0.64
	1-2 h	Leeds		1.25	1.34	1.54	0.10	0.11	0.08	26.89	19.97	17.20	36.99	51.67	53.06	8.23	7.65	7.19	2.08	0.81	0.71
		Cardiff		1.91	2.07	1.97	0.02	0.07	0.08	21.22	14.40	10.95	39.01	53.76	55.87	8.25	8.00	7.14	2.00	0.82	0.60
		York		1.07	1.06	1.54	0.03	0.04	0.06	10.70	6.85	7.23	33.31	48.26	48.19	7.06	5.81	5.50	6.99	4.53	1.75
		Newport		0.94	1.40	1.37	0.02	0.02	0.07	20.82	13.23	9.86	40.34	55.58	60.49	9.47	9.30	8.94	2.71	1.25	0.95
		Doncaster		0.82	1.35	1.50	0.03	0.08	0.07	27.33	15.23	9.85	32.10	50.64	58.45	6.20	7.76	8.13	3.14	1.50	0.83
		Bristol		0.56	0.86	0.86	0.07	0.03	0.09	16.32	13.96	12.56	39.92	51.35	50.56	8.94	7.26	6.26	4.48	2.80	1.55
	1 h	Swindon		0.73	1.12	0.92	0.01	0.04	0.03	12.60	9.32	7.65	38.84	56.86	58.98	9.92	9.30	7.27	5.13	2.65	1.76
		Peterbourogh		0.77	2.16	2.17	0.02	0.03	0.08	7.88	6.46	6.53	40.60	53.61	57.70	10.20	9.62	7.87	4.85	2.00	1.02
		Reading		4.08	4.23	6.44	0.10	0.10	0.13	23.78	15.82	12.16	35.83	49.24	47.81	7.35	6.43	4.97	2.41	1.27	0.96
	London																				
Non-HST towns	1 h	Chelmsford		12.16	12.91	12.10	0.08	0.25	0.26	7.47	4.32	3.83	41.06	55.23	56.08	7.11	5.77	5.04	3.53	1.32	0.96
		Basingstoke & Deane		3.46	3.63	3.95	0.12	0.03	0.09	9.03	5.51	3.73	44.61	61.15	63.60	10.37	8.20	6.54	3.37	1.45	0.88
		Cambridge		1.41	2.08	3.09	0.02	0.00	0.19	9.51	4.49	5.18	29.61	39.73	37.46	6.12	4.37	3.71	5.12	2.68	1.24
		Colchester		5.52	6.24	6.94	0.07	0.09	0.14	12.13	7.58	6.11	40.71	54.67	55.28	8.18	7.66	5.74	3.94	1.81	1.10
		Winchester		2.75	3.65	4.09	0.05	0.13	0.10	6.66	3.87	3.23	46.86	58.55	58.80	7.50	6.26	4.92	3.41	1.24	0.99
		Ashford		8.77	6.31	5.36	0.11	0.07	0.11	6.63	4.47	2.88	40.92	55.78	60.30	8.13	7.15	6.49	4.27	2.10	0.88
	1-2 h	Southampton		1.93	2.32	2.03	0.01	0.06	0.08	21.91	13.06	11.43	36.85	53.55	52.95	7.54	7.85	6.89	4.47	2.04	1.53
		Ipswich		0.97	1.04	1.81	0.04	0.04	0.07	16.16	11.42	10.39	37.00	51.30	52.01	7.88	8.03	7.28	6.62	2.92	1.52
		Canterbury		6.25	4.80	3.87	0.11	0.04	0.16	7.41	3.89	3.48	42.38	56.83	56.49	8.45	7.48	6.40	3.78	1.79	1.02
		King's Lynn & West Norfolk		0.35	0.53	0.92	0.00	0.07	0.09	5.71	2.67	2.51	45.47	59.03	62.72	9.65	7.82	6.84	2.97	2.24	1.15
		Norwich		0.27	0.44	0.88	0.04	0.08	0.08	12.10	8.72	8.42	34.71	43.76	43.81	7.26	7.17	6.20	4.33	3.75	1.49
		Bournemounth		1.23	1.05	1.41	0.04	0.02	0.12	14.32	9.16	7.33	42.63	57.16	58.20	6.78	6.62	5.87	4.69	2.26	1.69
		Thanet		3.52	3.67	2.67	0.17	0.02	0.13	9.93	4.96	5.52	39.18	51.19	55.82	9.33	9.72	7.74	4.85	2.40	1.35

				Pedal Cycle			On foot			Other (1981,2001) / Not Stated (1981,1991)			Works at home			Total			Car Pool (1981)/Taxi or Mini cab (2001)		
				1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
		GB	%	3.85	2.97	2.76	15.32	11.81	10.01	2.28	2.50	0.47	3.72	4.89	9.19	2076332	2345131	2.4E+07	3.97	-	0.52
	TrainTimes	LA																			
HST towns	Over 2 h	Edinburgh		1.35	1.82	-	7.24	14.45	-	2.25	2.17	-	1.55	3.68	-	19764	18989	-	2.97	-	-
		Newcastle		1.34	1.40	1.76	6.46	12.45	11.07	2.87	2.31	0.55	1.16	2.78	6.96	11035	9540	101506	2.49	-	0.88
		Swansea		0.62	0.89	1.16	4.72	10.64	9.34	2.41	2.49	0.59	2.89	3.61	7.55	8743	8198	88126	5.47	-	0.69
		Darlington		4.30	2.78	2.20	8.45	14.29	11.82	2.62	2.10	0.59	2.31	3.54	8.26	4117	4094	42999	4.52	-	0.99
	1-2 h	Leeds		1.32	1.18	1.30	5.72	11.93	10.48	1.74	2.07	0.29	2.93	3.27	7.43	30028	29151	322831	3.30	-	0.72
		Cardiff		3.16	2.57	2.70	5.78	12.86	13.20	2.35	2.14	0.41	2.27	3.31	6.67	11184	11191	130278	4.01	-	0.42
		York		18.06	15.12	12.04	6.52	13.56	14.95	1.79	2.19	0.37	3.83	4.59	7.87	7213	7663	87297	2.76	-	0.50
		Newport		1.72	1.44	1.46	5.71	11.81	9.32	2.32	1.88	0.36	2.96	4.09	6.77	5342	5214	56331	4.23	-	0.50
		Doncaster		4.62	4.49	2.89	8.89	12.13	9.71	1.80	2.13	0.38	2.74	4.70	7.79	11525	10625	118364	3.54	-	0.38
		Bristol		3.12	3.30	4.58	6.48	14.70	15.59	2.12	2.30	0.32	2.65	3.62	7.31	16647	15983	177062	4.50	-	0.31
	1 h	Swindon		9.43	5.99	5.08	6.42	10.87	10.34	1.44	1.33	0.31	2.29	2.51	7.09	6731	8515	93947	4.06	-	0.56
		Peterbourogh		13.53	10.76	7.70	6.53	9.21	8.54	2.17	2.33	0.34	2.12	3.80	7.54	5571	6653	73282	4.13	-	0.51
		Reading		3.90	2.83	4.11	5.66	14.84	15.36	1.62	2.11	0.35	2.24	3.13	7.41	6110	6070	73598	4.16	-	0.30
	London																				
Non-HST towns	1 h	Chelmsford		7.84	5.49	3.52	5.12	9.74	8.73	1.70	1.43	0.32	2.37	3.53	8.94	6544	7503	80255	3.88	-	0.23
		Basingstoke & Deane		4.81	3.01	2.40	6.58	10.89	8.68	1.88	1.57	0.38	2.80	4.56	9.40	6077	7472	82638	4.06	-	0.35
		Cambridge		26.66	26.06	25.91	8.73	12.54	13.99	2.39	2.80	0.34	3.44	5.45	8.57	4103	4186	49231	3.07	-	0.31
		Colchester		6.89	5.20	4.30	7.24	10.78	10.19	2.07	1.97	0.70	2.87	4.00	9.16	5887	6557	75118	3.89	-	0.35
		Winchester		3.07	2.32	1.90	8.81	13.54	13.11	2.45	2.26	0.69	5.59	8.38	11.98	4042	4521	53294	3.88	-	0.20
		Ashford		8.16	3.56	2.72	7.10	11.89	9.17	2.22	2.06	0.46	6.10	6.60	11.34	3605	4181	48869	3.44	-	0.29
	1-2 h	Southampton		5.61	4.30	4.30	5.02	11.39	13.30	2.17	2.04	0.49	2.11	3.38	6.63	8767	8320	98209	4.19	-	0.38
		Ipswich		9.91	7.35	5.71	5.40	13.62	13.84	1.61	1.99	0.39	1.61	2.28	6.68	5168	5168	54101	4.20	-	0.28
		Canterbury		4.91	3.81	3.06	6.56	13.30	14.52	2.55	2.66	0.56	4.38	5.60	9.99	4545	4962	57029	3.83	-	0.46
		King's Lynn & West Norfolk		9.88	7.73	5.40	5.82	10.49	8.55	2.17	2.45	0.48	8.58	6.96	11.09	4849	5499	60195	3.73	-	0.26
		Norwich		12.60	9.75	8.76	8.66	20.38	22.70	1.85	2.74	0.53	2.91	3.20	6.65	5126	5034	53616	2.89	-	0.49
		Bournemounth		5.03	4.09	4.00	4.89	9.51	10.92	2.44	2.71	0.46	6.71	7.43	9.85	5292	6193	72402	4.27	-	0.35
		Thanet		4.94	4.32	3.21	6.12	14.95	12.76	3.06	3.43	0.54	5.14	5.34	9.03	4148	4495	49199	3.66	-	1.23

Source: NOMIS (1981, 1991, 2001 census data)

Note:

1981 1. Data source from SAS Table 47 Residents aged 16 or over in employment (10% sample)

1991 1. Data source from SWS Table WA5 Transport to work: Employees and self-employed (SWS Set A - Persons resident in zone) [10% sample]

2001 1. Residents in employment data source from Standard Table S121 Sex and distance travelled to work by methods of travel to work

Appendix 8: Travel-to-Work by Transport modes (1991 & 2001) at Workplace

The Percentages of Travel- to-Work Employment by Transport Modes (at Workplace) (1991 & 2001)

				British Rail Train		Underground		Bus		Car-Driver		Car-Passenger		Motor Cycle	
				1991	2001	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
		GB	%	3.65	4.07	2.11	3.00	9.88	7.40	53.14	55.31	7.68	6.26	1.45	1.09
	TrainTimes	LA													
HST towns	Over 2 h	Edinburgh		3.08	-	0.02	-	30.55	-	41.35	-	6.75	-	0.49	-
		Newcastle		1.28	1.77	9.55	8.76	23.46	17.99	43.61	49.04	8.82	7.81	0.42	0.61
		Swansea		0.44	0.57	0.01	0.04	9.41	7.42	59.67	63.64	11.88	9.79	1.11	0.73
		Darlington		0.60	0.56	0.02	0.04	13.34	10.24	53.24	57.83	9.82	8.38	0.77	0.66
	1-2 h	Leeds		2.56	3.51	0.09	0.08	18.54	15.76	53.69	55.60	7.58	7.05	0.88	0.75
		Cardiff		4.66	4.72	0.02	0.06	13.16	10.13	55.81	58.15	9.26	7.94	0.87	0.68
		York		1.62	1.91	0.01	0.05	7.27	7.68	46.72	49.80	6.13	5.47	4.28	1.67
		Newport		0.90	0.58	0.00	0.03	12.67	9.05	57.94	64.98	10.46	9.49	1.42	0.98
		Doncaster		1.02	1.12	0.04	0.04	15.58	10.20	49.37	57.18	8.03	8.09	1.58	0.82
		Bristol		1.52	1.69	0.01	0.04	13.46	12.77	56.39	54.97	7.94	6.17	2.50	1.62
	1 h	Swindon		1.44	1.34	0.05	0.10	8.43	7.12	60.20	62.51	8.98	7.06	2.51	1.63
		Peterbourogh		0.95	0.78	0.04	0.05	5.86	6.33	59.23	64.11	10.15	7.82	1.90	1.03
		Reading		5.49	7.03	0.06	0.23	15.39	13.04	54.42	52.14	6.36	5.09	1.19	1.03
	London														
Non-HST towns	1 h	Chelmsford		2.77	3.21	0.06	0.18	5.16	4.53	60.13	62.04	7.13	5.77	1.57	0.97
		Basingstoke & Deane		1.80	2.36	0.07	0.10	5.79	3.81	62.88	65.02	8.20	6.58	1.18	0.82
		Cambridge		1.38	2.28	0.03	0.08	5.65	7.09	53.95	52.51	6.73	4.86	2.47	1.40
		Colchester		1.57	1.72	0.02	0.08	7.91	6.65	58.68	58.81	8.09	6.12	1.99	1.13
		Winchester		1.86	2.23	0.06	0.08	4.48	3.85	60.37	62.37	7.11	5.82	1.74	1.24
		Ashford		2.81	1.90	0.08	0.07	4.08	3.21	57.25	61.72	7.70	7.09	2.21	0.89
	1-2 h	Southampton		1.54	2.13	0.06	0.05	11.89	10.91	59.44	57.07	7.37	5.91	1.91	1.53
		Ipswich		0.80	1.12	0.00	0.03	10.93	10.30	56.06	58.12	7.97	6.86	2.55	1.35
		Canterbury		2.27	1.98	0.00	0.07	4.23	3.96	57.83	57.45	8.08	6.58	1.90	1.08
		King's Lynn & West Norfolk		0.31	0.32	0.02	0.05	2.58	2.59	58.51	61.85	7.96	6.77	2.01	1.12
		Norwich		1.05	1.15	0.03	0.07	8.69	10.27	55.76	56.42	9.42	7.02	3.31	1.66
		Bournemounth		0.55	1.06	0.01	0.03	9.54	7.91	59.23	58.87	6.99	5.83	1.77	1.39
		Thanet		1.80	1.30	0.00	0.06	4.87	4.93	49.20	53.69	9.58	7.62	2.34	1.18

				Pedal Cycle		On foot		Other (2001) / Not Stated (1991)		Works at home		Total		Taxi or Mini cab (2001)
				1991	2001	1991	2001	1991	2001	1991	2001	1991	2001	2001
		GB	%	2.97	2.76	11.83	10.00	2.39	0.37	4.90	9.23	2341719	2.4E+07	0.52
	TrainTimes	LA												
HST towns	Over 2 h	Edinburgh		1.50	-	11.56	-	1.84	-	2.86	-	24429	-	-
		Newcastle		1.17	1.37	8.23	7.31	1.69	0.27	1.77	4.45	14966	158708	0.63
		Swansea		0.91	1.06	10.69	8.70	2.33	0.31	3.54	7.10	8364	93786	0.65
		Darlington		2.65	2.11	14.09	11.06	1.97	0.37	3.49	7.80	4153	45527	0.94
	1-2 h	Leeds		1.08	1.15	10.78	8.91	1.88	0.22	2.91	6.34	32707	378004	0.63
		Cardiff		2.06	2.18	9.91	10.29	1.77	0.29	2.48	5.21	14890	166752	0.35
		York		14.35	11.26	13.11	13.99	2.10	0.28	4.41	7.42	7951	92594	0.48
		Newport		1.39	1.24	9.97	7.50	1.77	0.24	3.48	5.46	6118	69736	0.45
		Doncaster		4.67	3.08	12.67	10.33	2.09	0.28	4.95	8.48	10073	108697	0.39
		Bristol		2.38	3.60	11.24	12.58	1.78	0.27	2.77	6.01	20916	215427	0.27
	1 h	Swindon		5.30	4.41	9.60	8.95	1.24	0.24	2.24	6.15	9562	108181	0.49
		Peterbourogh		9.03	6.25	7.65	6.89	2.02	0.23	3.17	6.10	7984	90619	0.42
		Reading		2.43	3.34	10.76	11.76	1.66	0.30	2.24	5.81	8475	93809	0.22
	London													
Non-HST towns	1 h	Chelmsford		6.28	3.78	11.31	9.42	1.57	0.34	4.01	9.51	6607	75489	0.25
		Basingstoke & Deane		2.58	2.08	11.10	8.78	1.57	0.32	4.83	9.77	7061	79536	0.36
		Cambridge		16.91	17.14	7.67	8.79	1.97	0.26	3.25	5.36	7014	78706	0.23
		Colchester		5.14	4.49	10.79	10.57	1.88	0.66	3.95	9.40	6638	73160	0.36
		Winchester		2.64	1.98	12.42	11.47	1.98	0.61	7.34	9.99	5160	63923	0.34
		Ashford		3.80	2.85	12.95	9.60	1.95	0.35	7.18	12.02	3846	46109	0.31
	1-2 h	Southampton		3.63	3.72	9.35	11.42	2.02	1.09	2.77	5.86	10134	111048	0.31
		Ipswich		6.19	4.83	11.77	11.37	1.78	0.29	1.93	5.49	6109	65888	0.25
		Canterbury		3.84	3.14	13.60	14.67	2.56	0.45	5.69	10.14	4890	56176	0.49
		King's Lynn & West Norfolk		8.07	5.70	10.81	9.11	2.41	0.42	7.33	11.84	5228	56362	0.24
		Norwich		7.00	5.90	11.45	13.09	1.50	0.27	1.78	3.85	9065	92557	0.29
		Bournemounth		3.76	3.72	8.94	10.76	2.39	0.34	6.83	9.73	6737	71841	0.36
		Thanet		4.92	3.60	17.33	15.00	3.78	0.45	6.18	10.76	3884	41274	1.40

Source: NOMIS (1991, 2001 census data)

1991 1. Data source from SWS Table WB5 Transport to work: Employees and self-employed (SWS Set B - Persons working in zone) [10% sample]

2001 1. Workplace employment data source from Standard Table S129 Sex and distance to work by method of travel to work (workplace population)

Appendix 9: Employment around Rail Stations at Workplace (1981, 1991) - Part1

Employment around Station Area at Workplace (within 0.5km, 1km, and LA) 1981 and 1991

				0.5km				1km				LA	
				1981		1991		1981		1991		1981	1991
				Count	%	Count	%	Count	%	Count	%	Count	Count
	TrainTimes	**LA**	**Station names**										
HST towns	Over 2 h	Edinburgh	Edinburgh	-	-	-	-	-	-	-	-	-	-
		Newcastle	Newcastle	5043	31.81	3471	23.19	8210	51.79	6734	45.00	15852	14966
		Swansea	Swansea	2679	33.73	2760	33.00	3956	49.80	3363	40.21	7943	8364
		Darlington	Darlington	2240	53.78	1921	46.26	2607	62.59	2179	52.47	4165	4153
	1-2 h	Leeds	Leeds	8582	29.16	8850	27.06	12154	41.30	12605	38.54	29432	32707
		Cardiff	Cardiff Central	6994	53.52	6766	45.44	7777	59.51	7428	49.89	13069	14890
		York	York	3051	44.09	3188	40.10	3744	54.10	3878	48.77	6920	7951
		Newport	Newport	2237	39.19	2280	37.27	2641	46.27	2876	47.01	5708	6118
		Bristol	Bristol Temple Meads	4564	23.73	9108	43.55	9510	49.44	10019	47.90	19236	20916
		Doncaster	Doncaster	4596	45.04	4224	41.93	5265	51.60	4895	48.60	10204	10073
		South Gloucestershire	Bristol Parkway	240	3.42	473	5.08	303	4.32	585	6.28	7022	9313
	1 h	Swindon	Swindon	3291	49.02	3866	40.43	3600	53.63	3995	41.78	6713	9562
		Peterbourogh	Peterbourogh	2473	39.32	3345	41.90	4892	77.77	5481	68.65	6290	7984
		Reading	Reading	4041	54.32	4378	51.66	5347	71.88	5293	62.45	7439	8475
	London												
Non-HST towns	1 h	Chelmsford	Chelmsford	3139	57.93	3536	53.52	3773	69.63	3720	56.30	5419	6607
		Basingstoke & Deane	Basingstoke	2390	49.67	2856	40.45	2390	49.67	2856	40.45	4812	7061
		Cambridge	Cambridge	2528	43.38	2758	39.32	4202	72.10	4678	66.70	5828	7014
		Colchester	Colchester	2361	45.25	2926	44.08	2447	46.90	3106	46.79	5218	6638
		Winchester	Winchester	1639	42.67	2207	42.77	2265	58.97	2780	53.88	3841	5160
		Ashford	Ashford International	1278	44.79	1359	35.34	1576	55.24	1815	47.19	2853	3846
	1-2 h	Eastleigh	Southampton Parkway	627	18.68	640	14.10	627	18.68	640	14.10	3356	4538
		Southampton	Southampton Central	4728	46.55	4385	43.27	5434	53.50	5148	50.80	10157	10134
		Ipswich	Ipswich	3252	58.31	3492	57.16	3321	59.55	3745	61.30	5577	6109
		Canterbury	Canterbury West	1336	35.12	1772	36.24	2249	59.12	2778	56.81	3804	4890
		King's Lynn & West Norfolk	King's Lynn	1479	34.77	1291	24.69	2127	50.00	2626	50.23	4254	5228
		Norwich	Norwich	4522	55.72	4397	48.51	5504	67.82	5805	64.04	8116	9065
		Bournemouth	Bournemouth	1836	35.58	2018	29.95	3037	58.86	3395	50.39	5160	6737
		Thanet	Ramsgate	920	28.56	1147	29.53	977	30.33	1254	32.29	3221	3884
			Margate	406	12.60	577	14.86	974	30.24	1075	27.68	3221	3884

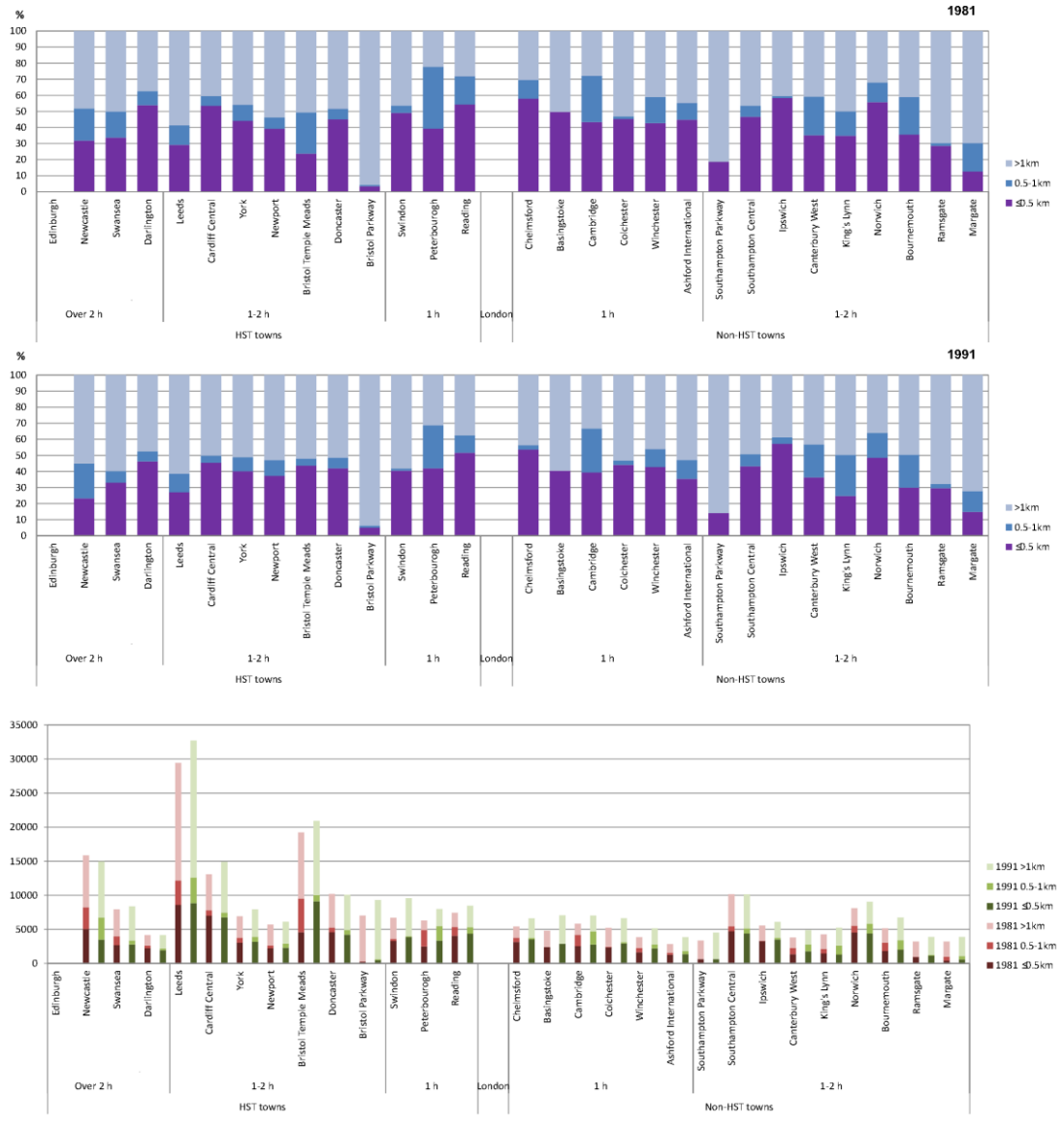
Source: NOMIS (1981 & 1991 Census data), EDINA (1981 & 1991 ward boundary data)

Notes:

1. 1981 Census: SWS Table 10_ Employment status by industry division and class by sex- 10% sample (SIC 80)
2. 1991 Census: SWS Table WB9 Industry divisions and classes (SIC 80) (Persons with workplace in each zone - 10% sample)

Appendix 10: Employment around Rail Stations at Workplace (1981, 1991) - Part 2

Percentage of Employment around Station Area at Workplace (within 0.5km, 1km, and LA) 1981 and 1991



Source: NOMIS (1981 & 1991 Census data), EDINA (1981 & 1991 ward boundary data)
Notes:
1. 1981 Census: SWS Table 10_ Employment status by industry division and class by sex- 10% sample (SIC 80)
2. 1991 Census: SWS Table WB9 Industry divisions and classes (SIC 80) (Persons with workplace in each zone - 10% sample)

Appendix 11: Changes in population density around stations at residence place (1971, 1981, 1991, 2001)

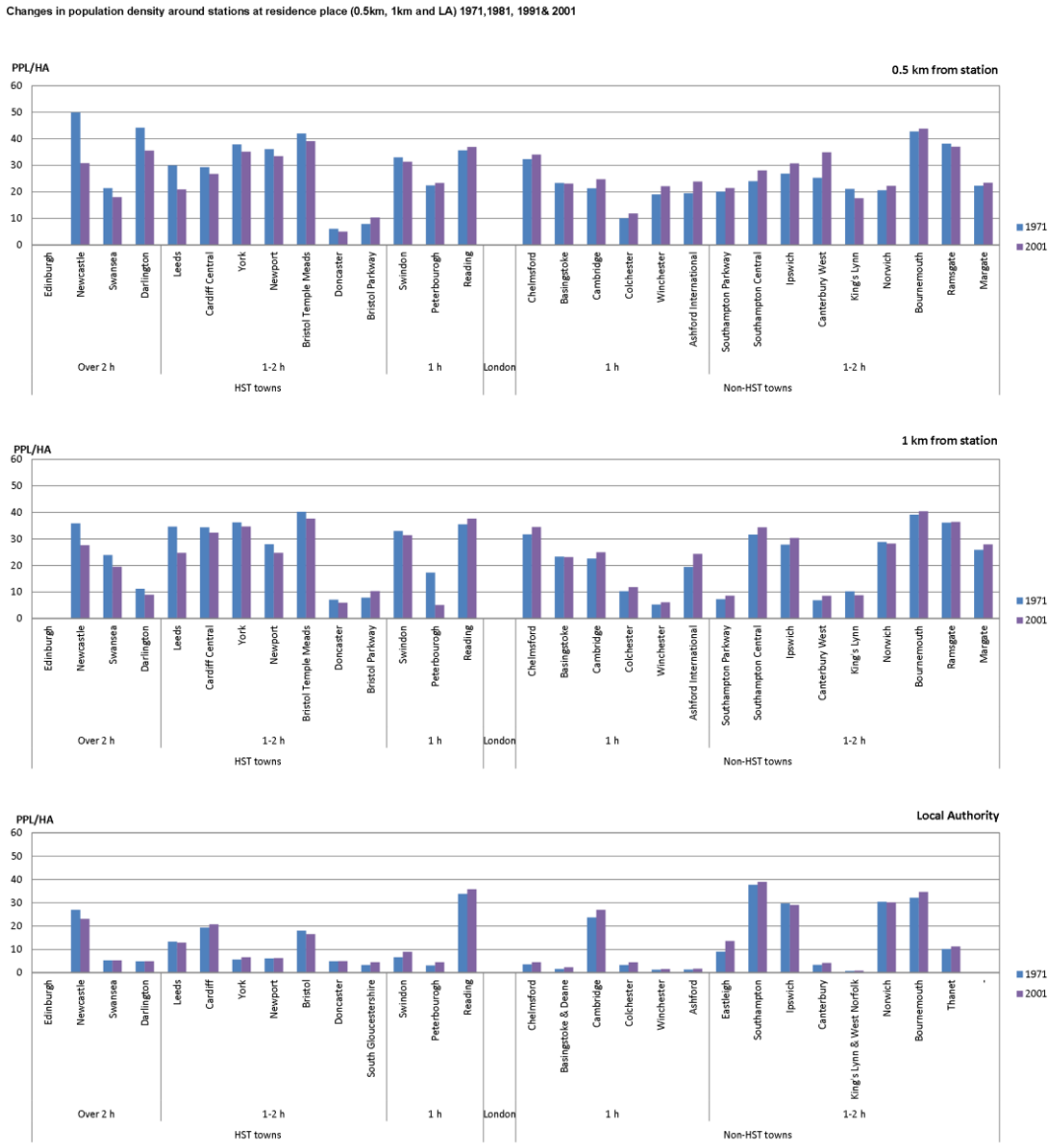
Part 1

				0.5km				1km				LA			
		GB	PPL/HA	1971	1981	1991	2001	1971	1981	1991	2001	1971	1981	1991	2001
												2.29	2.36	2.40	2.47
	TrainTimes	LA	Stations												
HST towns	Over 2 h	Edinburgh	Edinburgh	-	-	-	-	-	-	-	-	-	-	-	-
		Newcastle	Newcastle	49.91	40.70	33.66	30.81	35.88	30.09	28.21	27.61	26.99	24.69	23.89	23.13
		Swansea	Swansea	21.40	18.82	19.13	18.03	23.94	21.83	21.70	19.51	5.33	5.44	5.45	5.31
		Darlington	Darlington	44.23	39.12	37.01	35.57	11.21	10.27	9.91	8.98	4.92	4.99	5.03	4.96
	1-2 h	Leeds	Leeds	29.98	22.52	22.15	20.95	34.63	26.49	26.37	24.76	13.35	13.01	12.81	12.97
		Cardiff	Cardiff Central	29.33	23.85	24.75	26.75	34.38	29.36	30.18	32.38	19.39	19.19	19.86	20.74
		York	York	37.88	34.80	35.10	35.16	36.23	33.64	34.15	34.65	5.69	6.08	6.33	6.66
		Newport	Newport	36.13	32.62	33.43	33.46	27.98	24.18	25.02	24.77	6.17	6.07	6.20	6.30
		Bristol	Bristol Temple Meads	42.01	37.69	37.64	39.12	40.21	36.64	36.54	37.61	18.08	17.05	16.66	16.57
		Doncaster	Doncaster	6.13	5.61	5.40	5.08	7.12	6.58	6.34	6.01	4.94	5.11	5.13	5.05
		South Gloucestershire	Bristol Parkway	7.89	7.96	9.75	10.38	7.89	7.96	9.75	10.38	3.39	3.78	4.14	4.58
	1 h	Swindon	Swindon	33.02	31.35	30.95	31.39	33.02	31.35	30.95	31.39	6.69	7.39	8.53	9.00
		Peterbourogh	Peterbourogh	22.43	23.48	23.84	23.33	17.35	5.61	5.40	5.08	3.12	3.90	4.49	4.58
		Reading	Reading	35.69	33.06	32.70	36.93	35.54	34.08	33.65	37.62	33.85	34.02	33.37	35.81
	London														
Non-HST towns	1 h	Chelmsford	Chelmsford	32.30	31.52	32.75	34.08	31.72	31.04	32.83	34.51	3.62	4.07	4.48	4.59
		Basingstoke & Deane	Basingstoke	23.35	25.67	24.16	23.14	23.35	25.67	24.16	23.14	1.63	2.08	2.29	2.41
		Cambridge	Cambridge	21.36	24.86	24.49	24.77	22.60	22.66	23.52	24.97	23.75	24.81	26.21	27.01
		Colchester	Colchester	10.07	10.55	11.39	11.88	10.33	11.27	11.57	11.88	3.38	4.01	4.22	4.50
		Winchester	Winchester	19.04	18.81	18.69	22.14	5.32	5.39	5.41	6.12	1.31	1.41	1.49	1.62
		Ashford	Ashford International	19.47	22.31	23.04	23.88	19.41	21.92	23.64	24.33	1.35	1.50	1.60	1.77
	1-2 h	Eastleigh	Southampton Parkway	20.09	17.64	17.64	21.43	7.31	6.88	7.25	8.62	9.08	10.89	12.50	13.63
		Southampton	Southampton Central	24.06	20.93	22.70	28.09	31.62	26.35	28.76	34.38	37.79	37.22	36.32	38.94
		Ipswich	Ipswich	26.85	31.02	31.55	30.72	27.84	30.73	31.13	30.37	29.78	29.80	29.37	29.07
		Canterbury	Canterbury West	25.32	30.65	36.31	34.93	6.91	7.53	8.18	8.57	3.43	3.81	4.04	4.22
		King's Lynn & West Norfolk	King's Lynn	21.17	18.22	18.97	17.64	10.25	9.15	9.44	8.81	0.73	0.81	0.87	0.90
		Norwich	Norwich	20.63	23.42	23.73	22.25	28.87	30.36	29.95	28.24	30.41	31.09	30.82	30.17
		Bournemouth	Bournemouth	42.75	36.23	40.45	43.78	39.11	33.56	38.21	40.42	32.21	30.43	33.38	34.71
		Thanet	Ramsgate	38.19	37.35	37.74	37.05	36.12	35.81	36.42	36.44	10.21	10.84	11.22	11.28
		-	Margate	22.30	21.95	22.26	23.44	25.92	26.01	26.94	27.95				

Source: CASWEB
Note: The harmonised dataset (1971-1981-1991-2001) thanks for the courtesy of Dr Paul Norman from Department of Geography in University of Leeds

Appendix 12: Changes in population density around stations (0.5km, 1km, entire LA) at residence place (1981, 1991, 2001)

Part 2



Source: CASWEB
Note: The harmonised dataset (1971-1981-1991-2001) thanks for the courtesy of Dr Paul Norman from Department of Geography in University of Leeds

Appendix 13: Average Distance Travelled by Surface Rail and Purpose (Part 1)

Average DistanceTravelled by Surface Rail and Purpose: Great Britain, 1995/97 to 2012

	Surface rail miles per person per year												
Purpose	1995/97	1998/00	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Commuting	139	152	159	148	168	155	167	180	182	160	189	173	188
Business	32	70	68	60	69	88	60	102	88	81	62	74	99
Education / escort education	13	16	15	21	18	21	22	19	19	21	24	17	24
Shopping	23	25	17	22	24	27	27	22	27	25	27	28	34
Other escort	4	4	4	3	5	3	7	7	6	6	8	7	7
Personal business	22	23	20	18	22	17	20	23	23	21	34	22	27
Leisure[1]	121	155	173	155	172	196	209	206	200	201	221	210	234
Other (including 'just walk')	3	1	0	0	-	0	-	0	-	0	0	0	0
All purposes	**356**	**446**	**455**	**427**	**478**	**508**	**514**	**559**	**546**	**515**	**564**	**530**	**612**
Unweighted sample size: surface rail trips	4,627	5,051	3,622	4,521	5,071	5,192	5,395	5,720	5,581	5,689	5,994	5,273	6,215

Source: National Travel Survey, Department for Transport
Note:
[1] Visit friends at home and elsewhere, entertainment, sport, holiday and day trip.

- = negligible (less than half the final digit shown)

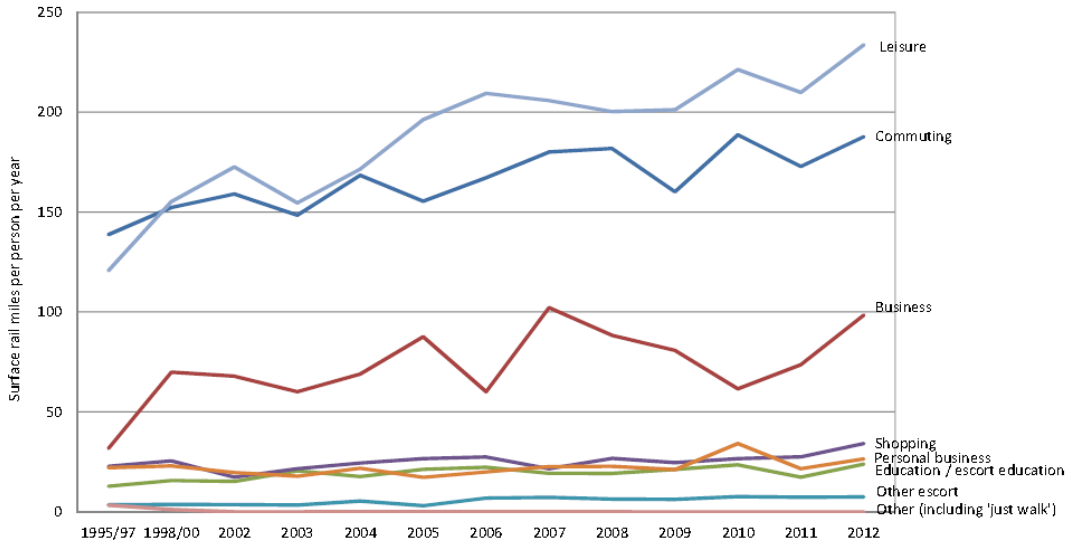
The Percentage of Surface Rail Usage Among All Modes and Purpose: Great Britain, 1995/97 to 2012

	The percentage of surface rail miles per person per year among all modes												
Purpose	1995/97	1998/00	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Commuting	10%	11%	11%	11%	12%	11%	12%	13%	14%	13%	14%	13%	14%
Business	4%	10%	10%	9%	10%	12%	9%	15%	14%	15%	10%	13%	16%
Education / escort education	5%	5%	5%	6%	6%	7%	7%	6%	6%	7%	7%	6%	7%
Shopping	2%	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Other escort	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	2%	1%	2%
Personal business	5%	5%	4%	4%	5%	3%	4%	5%	5%	4%	7%	4%	5%
Leisure[1]	4%	6%	6%	5%	6%	7%	7%	7%	7%	7%	9%	8%	9%
Other (including 'just walk')	7%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: National Travel Survey, Department for Transport
Note:
[1] Visit friends at home and elsewhere, entertainment, sport, holiday and day trip.

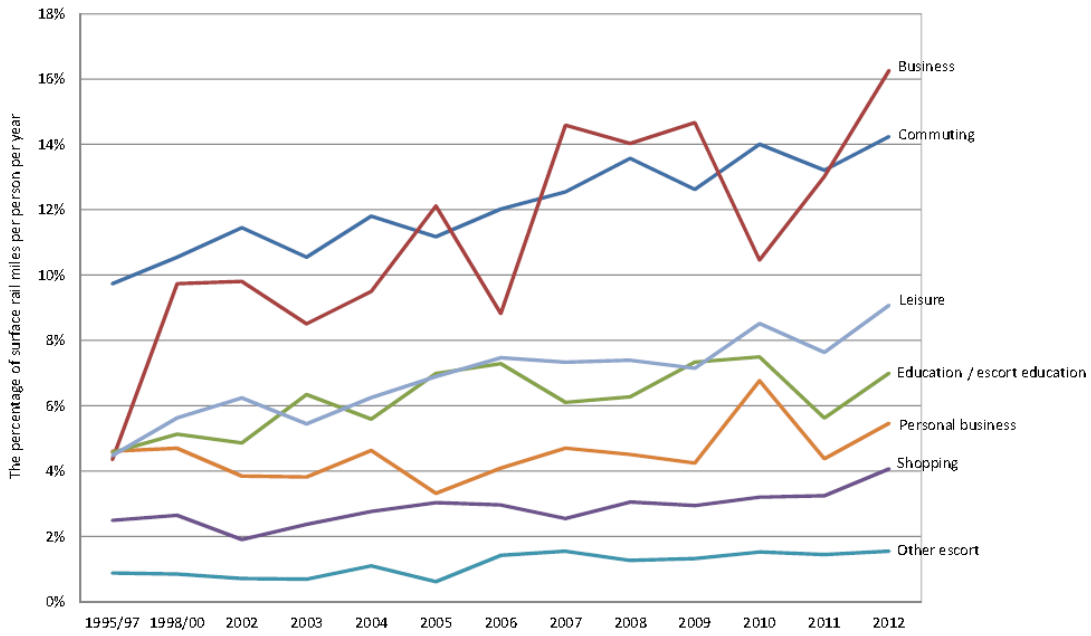
Appendix 14: Average Distance Travelled by Surface Rail and Purpose (Part 2)

Average DistanceTravelled by Surface Rail and Purpose: Great Britain, 1995/97 to 2012



Source: National Travel Survey, Department for Transport

The Percentage of Surface Rail Usage Among All Modes and Purpose: Great Britain, 1995/97 to 2012

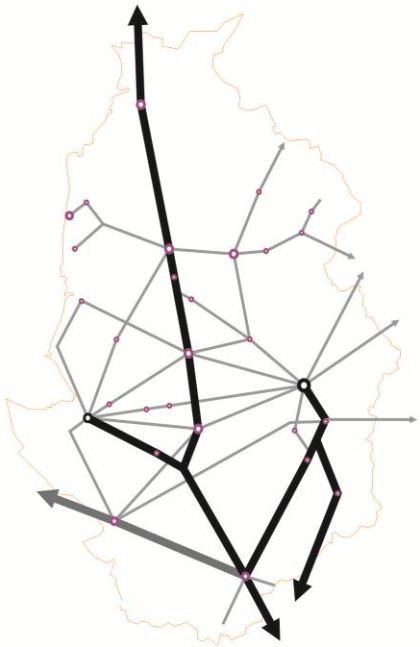


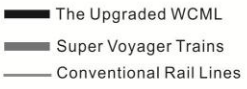
Source: National Travel Survey, Department for Transport

Appendix 15: Defining Unit of Analysis for the Comparative Case Study

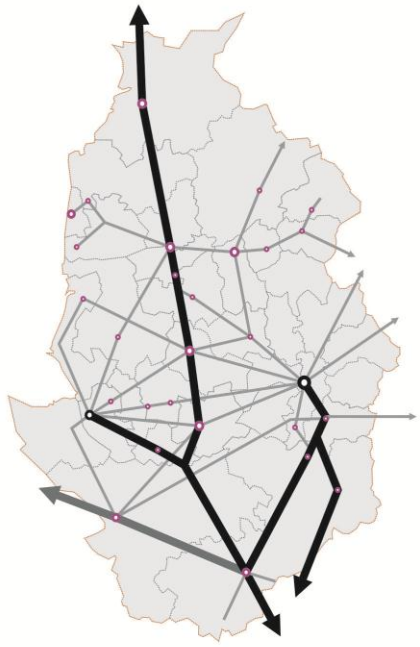
The British Case

NWE Regional Boundary (excluding Cumbria)





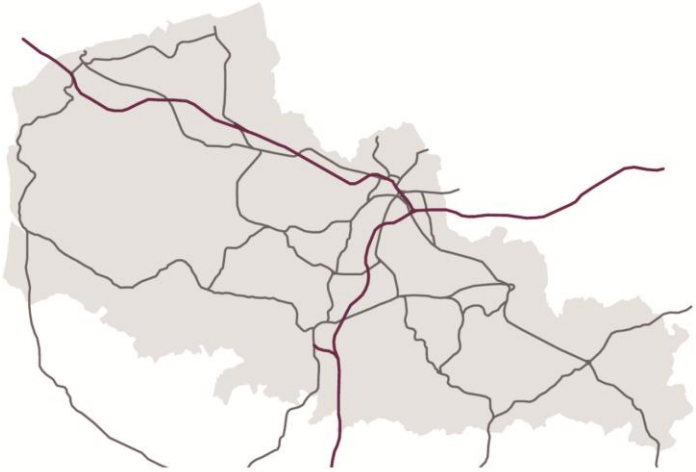
Local Governments in NWE



Sub-regions in NWE

The French Case

NPDC Regional Boundary



Communes in NPDC

Sub-regions in NPDC

Appendix 16: Post-war Capitalism in Western Europe (Germany and Sweden)

Post-war capitalism in Germany

Unlike the UK and France as a unitary state, after WW2, the territory of Germany was divided into several Länder (states) and a federal government was formed. Large enterprises and banks were split into smaller versions. Regarding management of the economy, the power of the state was deliberately weakened. This effort was consciously made by the Minister of Economics at the time, Dr. Erhard, who envisaged economic liberalism as a way of limiting the overweening power of the state and thus future economic activities could be kept small, divided and competitive (Shonfield, 1965).

Despite the intention to develop a system of liberal capitalism, historical characteristics and trajectory determined the unique German model. As BBC reporter Steve Rosenberg was informed by German economist Ralph Brugelmann: "There's definitely something in our history and philosophy that makes us Germans demand more regulation" (Rosenberg, 2009). Shonfield (1965) argues that the most striking characteristics were the overwhelming instinct to centralise economic decisions based on four key elements underlying a well-organised industrial system. Firstly, the country has hierarchical industrial associations dating back from imperial Germany. Secondly, it has well-established industrial collaboration. Industrial associations traditionally play a critical public role in managing the long-term interests of national industries and guiding the consensus of industrial decisions. Thirdly, commercial banks play a very important role in the centralisation of economic decisions with a close relationship between banks and their industrial clients through the representation of bankers on the supervisory board of important businesses. Fourthly, industrial collaboration is further encouraged by powerful trade associations in certain industries, which are given an unusual consultative status with regard to general practices in governmental ministries in the German constitution. From the government's side, the arrival and the operation of Marshall Aid led to a model which was characterised by the collaboration between public authorities and banks in leading and implementing national investment planning and the development of a modern system of public finance. A special institution, *Kreditanstalt für Wiederaufbau* (Reconstruction Loan Corporation, hereafter as KfW), was created to be a "banker's bank", namely a source of extra funds in addition to the resources of commercial banks. This type of public enterprise played a critical role as an adjunct of national economic policy, in particular with regard to those economic activities which were overseen by commercial banks and areas requiring special assistance under the government's regional development schemes (Shonfield, 1965).

Post-war capitalism in Sweden

Due to their late industrialisation processes, Sweden and other continental European countries avoided the rapid industrialisation process that occurred in Britain and which brought about a widespread industrial urbanisation pattern; instead, Sweden attracted capital investment from large firms and experienced a highly efficient industrial process (P. Hall, 1998). Although Sweden is classified in the same category of Rhineland model as Germany, its complete welfare state model is the best example in the world. Unlike three key elements in the German model, namely trade associations, banks and the state, the Swedish model put the industrial unions (workers), employers and a social democratic government as its core of operations, which achieved a three decade period of post-war prosperity. As Hall notes, its originality was such that "its political leaders and its business elite and its bureaucrats constituted a very coherent group…tried to create a different kind of society" (P. Hall, 1998, p.842). Most importantly, cultural and historical drivers determined its direction. Hall (1998) stresses that the national characteristics of Swedish society are: collectivity, equality, people's homes and caring for the weak.

The first critical element is the honourable actions of the social-democratic party government, which are rooted in the policy of full employment, which Shonfield calls "manpower planning" (Shonfield, 1965, p.199). The Swedish government rejected total socialisation and realised there is no necessary causality between the nationalisation of industries and the management of a capitalist economy. Instead, the focus of national economic policy is on the full use of the labour force, namely an "Active Manpower policy", "how to increase its size, how to improve its quality, how to achieve its more rapid deployment in response to changing needs" (Shonfield, 1965, p.201). Two measures were implemented to achieve this goal. First of all, an important agreement was signed in 1938 between industrial unions and employers. Secondly, an annual bargain regarding the level of the national wage was conducted (P. Hall, 1998). Meanwhile, many active social welfare policies were implemented, such as social security programmes, housing benefits, social benefits, housing loans, etc. The role of the government was characterised by an active search for consensus, which was regarded as a preliminary to any important action through an extended dialogue between experts from a variety of bodies. Despite unavoidable compromise among these different bodies, Shonfield stresses that the Swedish government managed to "act in a decisive fashion when circumstances require it" with innovative policies which "boldly lead, rather than follow public opinion" (Shonfield, 1965, p. 200).

The second key element is employers. Apart from agreement with the industrial unions, the government introduced a policy of tax exempt investment funds. The tax could be used for further investment in businesses. The employers would not tend to squeeze the workers' wages for their business as a result. "Firms which make good profits in times of boom are given the opportunity of avoiding tax on them if the money is frozen in a special reserve fund, to be used later for

investments whose content and timing have been approved by the authorities" (Shonfield, 1965, p.202).

The third key element is industrial unions and workers. Unlike elsewhere, where the trade unions were acting largely as followers and resisters, a trade union movement in Sweden made a significant intellectual contribution to the development of the system. Shonfield argues that the leaders of the trade unions seem to actively adapt their doctrines to the social needs of a mixed economy of the modern capitalist type. Another reason was political; "The circumstance of having its allies in the socialist party running the government at the same time favoured the effort" (Shonfield, 1965, p. 200). For the workers, wage bargaining enabled wages to be increased for low-paid workers and social wages to be subsidised; this therefore reduced the requests for wages from the employees.

Appendix 17: National Styles of Transport Investment and HST Approaches in Western Europe (Germany and Spain)

The UK and France are illustrated as the main content of the thesis. Here two other major countries in Western Europe are explored: Germany and Spain.

Germany

Germany's style of transport investment

With the pressures of economic crises and external forces, Germany was not an exception to privatisation and deregulation measures. Widespread privatisation took place step by step (Streeck, 2009), but was introduced a little late in the early 1990s (Schmidt, 2002). Despite these continuous pressures, Article 72 of the Basic Law which emphasises the value of "the uniformity of living conditions" over the whole state territory plays an important part in justifying the role of the federal government (T. Marshall, 2010). The German federal government manages to maintain central decision making power with regard to inter-regional transport accessibility, including roads, railways and waterways.

Privatisation in 1994 converted the national rail sector from a governmental institution to a private company, Deutsche Bahn (DB), which is still 100% owned by the federal government and receives massive subsidies from the federal and regional governments for running rail services and managing rail infrastructure (T. Marshall, 2010). Unlike France and Spain, which divided infrastructure and train operation into two separate companies, the German federal state retains overall control and responsibility under Deutsch Bahn AG. This incorporates DB Reise & Touristik which is responsible for all long distance passenger services and DB Netz for all infrastructure, despite the fact that the operation of some local and regional services has been outsourced to private sectors (Steer Davies Gleave, 2004).

From the 1990s onwards, although ownership of DB is still held by the federal state and the investment plan, the changed character of DB as a private company resulted in a shift of focus to a business mentality that maximises profit and minimises costs with expanded markets. Firstly, since 1994, 455 stations have been closed and the rail network has reduced from 42,787 to 33,896 km. Secondly, domestic rail investment has been neglected due to the expansion of global logistics ownership. Rail operation only accounts for 40% of its turnover (cited in T. Marshall, 2010). Also, it was reported that a lack of investment by the state-owned enterprise was responsible for the

winter maintenance problems of Berlin's commuter services, which could not exceed 60kph (The Economist, 2011).

The financial crises in 2008 suspended a further plan for radical privatisation. Despite privatisation still being listed on the government's agenda, the implementation of privatisation has been controversial. The German Transport Minister, Peter Ramsauer, publicly voiced his doubt over privatisation of DB. "Privatisation at every cost often proves to be the wrong path" because "Deutsche Bahn has a societal duty to guarantee standards of rail traffic." Thus, the federal government was determined to invest in transport infrastructure. In 2011, investment in the railway was promised to be €3.9 billion ($5.2 billion), roughly the equivalent of its annual revenue (The Economist, 2011). A managed capitalism model through coordination and negotiation still maintains this balance, despite emerging pressure from competitive federalism (T. Marshall, 2010).

Furthermore, the commercial priorities of DB has stirred doubts regarding its negligence of wider social needs and long-term strategies, which has resulted in conflicting ideology between DB and the federal transport ministry. For instance, a route between Leipzig to Nürnberg was regarded as important by planners, but not by DB due to poor returns (T. Marshall, 2010). Similarly, Engartner criticises that DB tends to serve major corridors rather than linking up other cities, which do not fit the geographical features of Germany- a wide scatter of urbanisation (cited in T. Marshall, 2000). Improving the situation without a coherent overall transport strategy at the national level is a dilemma. As Marshall (2010) opines "the government fails to make a coherent overall transport strategy, and DB pursues its own, not public interests. The failure is double sided and systemic" (T. Marshall 2010, p.36).

The development of an HST network

Second to France, work on the first German new HST line between Hannover and Würzburg (327 km) launched in 1973 and it opened in sections between 1988 and 1991. Around the same time, the second new HST between Mannheim and Stuttgart (100 km) opened between 1987 and 1991. After the reunification in 1990, the Berlin-Hannover line (258 km), which was prioritised over the Cologne-Frankfurt (177 km) line, operated in 1998 and was followed by the Cologne-Frankfurt line which opened in 2002.

HST development in Germany has gone through three major stages. According to German federal transport plans (Bundesverkehrswegeplan, hereafter BVWP), in the 1970s (1973 BVWP) when the division of West and East Germany remained, a north-south oriented network was proposed. The aim was to tackle the congestion problem on the conventional rail line through 2,225 km of new lines up to 300 kph and 1,250km of upgraded lines up to 200 kph (Ebeling, 2005). The

Hannover-Wurzburg, Mannheim-Stuttgart and Cologne-Frankfurt lines were originally proposed. In the 1980s (1985 BVWP), the focus shifted to competition between rail and air. The commercial concept was "half as fast as an aeroplane - twice as fast as the car" (Ebeling, 2005, p.42). In the 1990s (1992 BVWP), the reunification of Germany brought about significant geographical changes and political consideration. The role of the federal government was important to rebalance the uneven development, which was an overall benefit for all the citizens in Germany. As Schmidt argues, the poorer Länder in the north outnumbered the richer Länder in the south, which gave the federal government space to manoeuvre (cited in T. Marshall, 2010). The classic example is the aforementioned priority of the Berlin-Hannover line over the Cologne-Frankfurt line.

The HST approach: Existing quality, geography, assessment

Investment in the HST network has been continuous since the 1970s. It could be argued this is due to three major reasons. Firstly, there is a systematic need for investment. The original railway construction in the 19th century was built without sustainable quality. "In mainland Europe most railways were built more cheaply, with far sharper curves and frequent *at-grade* crossings that severely limited operating speeds" (P. Hall, 2009b, p.60). Secondly, WW2 caused severe damage to the railway network, which needed comprehensive investment to fix (Ebeling, 2005). Thirdly, evaluation of the HST investment was applied using a multi-criteria method. In addition to traditional CBA, the evaluation of HST investment encompasses spatial and environmental impacts. These three aspects constitute the major appraisal for the BVWP investment. The consideration of spatial and environmental multi-criteria analysis avoids the neglect of potential impacts which could not be quantified and given a monetary value during the decision making process (Steer Davies Gleave, 2004). As Rothengatter (2005) opines "the treatment of the spatial and environmental elements shows that the German method is on the way to a more system-based analysis. The interdependence analysis for interrelated projects also tends in this direction" (Rothengatter, 2005, p.33).

But the style of investment has been implemented in a piecemeal manner through point-to-point sections of lines using a combination of two approaches: upgrading lines and building new lines. This pattern could be attributed to urbanisation. Germany's geographical characteristics of urbanisation and dense population have critically determined how the HST network should be developed and how HST serves the territory. No single city has a dominant position over other cities. Instead, there are a number of competitive city-regions with populations of more than half a million inhabitants such as Hamburg, Munich, Berlin, Frankfurt, Dusseldorf, Cologne, Stuttgart and Hannover. Only three cities have a population of more than one million (Berlin, Hamburg and Munich) and only one of these (Berlin) has a population of more than two million. In addition, the German urban distribution is presented in a scattered form. Between these major cities, there are several vital small and medium sized cities along the corridors (Knapp, Scherhag, & Schmitt, 2006,

p.154). As a result, long distance trains need to make multiple stops to serve the potential market and this tends to increase journey times. The high-speed train between Munich and Hamburg makes a minimum of seven intermediate stops (Steer Davies Gleave, 2004).

The decision-making process

Despite the fact that HST investment has been strongly supported and promoted by the public and politicians (Steer Davies Gleave, 2004), its decision making process demands longer negotiation and discussion involving many stakeholders, due to the nature of the federal system. Traditionally German was a country with several states until the unification of the national state by Otto von Bismarck in 1871. Knapp et al. (2006) argue that several trade relationships forged in the Middle Ages and the decentralisation of the federal system of government follow this pattern. At the same time, the German federal system has three fundamental political levels in Germany, namely federal, region (Länder) and community. With the nature of the federal political system, decision-making power is largely decentralised to the hands of the regional government (Länder) in Germany. Since the federal government holds the power to make major decisions, there is a distinctive feature of the German decision making model, which involves the establishment of consensus among all stakeholders including different government levels, political parties, NGO groups and local communities etc. (T. Marshall, 2010). Pressure groups in Germany have been influential in public policies since the rise of environmental groups in the 1970s. In 1987, the Green Party became the 3rd largest political party (Banister, 1994). Therefore, the decision making process of a federal transport master plan requires the participation of all three levels and thus needs a great deal of time before a plan can be finalised. In addition, the issues raised by stakeholders (land owners and even citizens) and non-governmental organisations (NGOs) could further lengthen the whole process (Rothengatter, 2005).

Spain

Spain's styles of transport investment

When other countries reduced their public investment and ownership in transport sectors in response to economic crises and market forces in the 1980s, Spain showed little inclination to follow that direction. Instead, the role of government intervention has been maintained and enhanced. "The composite state of centre and regions together retains public control of some of the main infrastructure levers, often through public ownership" (T. Marshall, 2009c, p.540). The strong role of the state in transport provision has historical origins stretching back three hundred years ago. In the early 18th century, after the War of Succession of Felipe V, Spain adopted French models in building the country and attempted to construct a capital like Paris (Bel, 2011). Bel (2011) examined the trajectory of transport infrastructure development in Spain from 1720 to 2010

and argues that Spanish transport infrastructural policies were developed to maintain the national control of territory (road building in the 18th century, railway creation and building in the 19th century, motorway expansion in the 20th century and high-speed train development in the 21st century).

The state-led intervention in transport investment has its origins in three aspects, namely assisting the development of tourism, the geographical position in the EU context and beyond, and achieving economic convergence among the EU countries. Firstly, tourism plays a key role in the Spanish economy with around 11% of GDP and 13% of employment in this sector; such figures are the highest among OECD and non-OECD countries (OECD, 2010). Spain, only second to France, has stabilised its status as a popular destination for tourists. In 2008, there were 97.8 million foreign visitors and tourism receipts of nearly €41.9 billion (OECD, 2010). Secondly, the linkage of the Spanish national transport network to the Trans-European Transport Network was regarded as a strategic priority for Spain. In the state's view, "our location as a peripheral country makes access to central European markets more difficult and makes transport less competitive; the economic importance of tourism means that Spain requires good transport links; and our location on the southern borders of the European Union makes us a transit country for the Maghreb region" (Izquierdo, 2005, p.55). Thirdly, the catch-up resolution by the state fuelled the development of transport infrastructure in Spain. As Spanish scholar Rafael Izquierdo states, "[I]nfrastructure has now become a major tool of economic policy. For Spain, the main objectives of that policy today are to achieve real convergence with our most developed community partners and full employment, making up the historic lags in infrastructure construction which have accumulated over the years" (Izquierdo, 2005, p.46).

From the 1980s onwards, strong government intervention in transport investment has been clearly demonstrated. In 1982, when the socialist party came into power, a model of budgetary finance was implemented to build new motorways planned in the General Road Plan (PGC) from 1984 to 1991. This model was in contrast with the model for constructing toll roads in the 1960s. It was argued that high taxes in Spain and available funding from the EEC were the two main reasons for this change (Bel, 2011). As a result, a massive expansion of the motorway network was achieved in 1993. A length of 3,045km of PGC toll-free motorways radiating from Madrid was completed.

A change in financial models with regard to developing transport infrastructure came inevitably in the late 1990s, but the state managed to retain its dominance in these developments in compliance with EU criteria and the progressive construction of the transport network. On the one hand, this large-scale transport investment gave rise to a deepened budget deficit, which violated the regulation of the EU and forced Spain to change its financial model of transport infrastructure in 1996 for concession models to replace the budget-financed model. On the other hand, the implementation of this new approach involved the creation and development of public corporate

bodies financed by the state or other financial resources and encouraged the participation of the private sector. By offering a diverse and flexible financial mechanism, the infrastructure master plan was expected to be implemented efficiently with greater private involvement (Izquierdo, 2005). A new Public Works Concession Contract Regulatory Act came into force in 2003, which amended the concession model introduced in 1996 and emphasised the inclusion of diverse funding methods, namely expanding the wide range of approaches to public financing and joint public-private financing, the revenue from additional commercial or industrial activities, etc. The improvement in the financial mechanism and contracting methods appeared to speed up the implementation of the national infrastructure plan. Izquierdo (2005) shows the plan was 7% ahead of schedule as the result of the reform.

Despite flexible financial mechanisms in transport investment with private participation, governments still largely owned and managed the majority of the airport market and rail network. In the railway sector, compliant with European law and similar to the French and German models, the separation of train services and infrastructure was maintained. RENFE is the national rail passenger operator and is a state-owned company, controlled by the ministry of public works (Ministerio de Fomento). ADIF took over all of Spain's rail infrastructure (Steer Davies Gleave, 2004). In addition to RENFE, there are other rail operators; only FEVE runs long distance journey. Regional rail services vary within different regions and are different from national rail systems.

The development of the HST network

The development of the high-speed train (AVE) network began in 1986. The Spanish government decided to build the first high-speed train line of 293 miles (472km), designed to run at speeds of 300 kph to bring down rail travel time to two hours and 20 minutes between Madrid and Seville in 1992, ready for the opening of the World Expo in Seville.

The first AVE line has been successful and popular in terms of both transport and economic effects. "Journey times are about 60% less than via the old line, and 99.8% of trains arrive within three minutes of their scheduled arrival time (the corresponding figure for UK InterCity trains is 70% within 10 minutes)" (Steer Davies Gleave, 2004). The first success led to growing public and political pressure, as all the remaining regional governments wanted to be connected to the network (Steer Davies Gleave, 2004). The expansion of the AVE network gathered rapid pace. The second HST line eastbound opened in 2003 between Madrid and Lleida, totalling 291 miles. In 2008, AVE arrived in Barcelona from Madrid in two hours and 30 minutes over a distance of 621 km. In 2010, Valencia was connected to Madrid by AVE; over 391 km can be travelled in 95 minutes. In 2010, the cross-border line Perpignan–Figueres was completed. A through route from Barcelona to Perpignan was expected to open in 2012. The overall HST network has reached 2,665

km, and became the largest network in Europe in terms of length at the end of 2010 (Bel, 2011). However, despite the fast development of the network, the usage of HST is relatively low. HST passengers in Spain equal around 6% of those in Japan, fewer than 20% of those in France, and approximately 30% of those in Germany (Bel, 2011). By the end of 2010, the accumulative investment was nearly €45 billion and showed very low rates of return (cited in Bel 2011, p.700). Bel (2011) argues that two reasons account for the low volume of traffic: the small number of inhabitants served by HST and severe competition from air travel.

The HST approach: Existing quality, geography, assessment

There are four aspects underlying the investment styles of HST in Spain. Firstly, geography and urban distribution is a fundamental factor. Spain is the second largest country in terms of area in Europe. There are four major administrative divisions, namely state, region, province and municipality, running from the highest to the lowest level. Currently there are 17 regions and 50 provinces. The creation of the regional tier arrived in 1978 with the new constitution. Prior to that, provinces were traditionally the major intermediate level between the state and municipality.

It has been widely argued that Spain's space economy is similar to France regarding the scatter of dense cities and population across a vast territory, rather than continual conurbations similar to England. However, unlike the French capital, Madrid, the capital city, resides at a precisely central position with over three million inhabitants and another three million in the metropolitan area. The second largest city and metropolitan area is Barcelona, with about a population about half that size. Most major cities are located on the coastal areas about 400-600 km distant from Madrid (Steer Davies Gleave, 2004).

The geographical distribution of cities provided a key foundation for HST development in Spain. Unlike the French model, which focuses on serving the largest urban agglomerations, the Spanish government intended to use the HST network to serve a wider population at the provincial level. This rationale was clearly expressed by the Prime Minister at the time, Jose´ Marı´a Aznar, on 25th April 2000 "A high-speed rail network that, in ten years, will place all provincial capitals within four hours from the centre of the peninsula" (quoted in Bel, 2011, p.701) . In 2010, the Ministry of Public Works reported 40% of the Spanish population had a high-speed train station within 30 miles (50kms). This number is expected to increase to 90% by 2020.

Secondly, the large scale of building an HST network was associated with the technical issues of conventional rail. Firstly, Spain joined the European Union in 1986 and its conventional broad rail gauge (1.668m) was not compatible with the international standard gauge. Thus rail mobility for goods and passengers between European countries was not able to be achieved under these circumstances. Secondly, the condition of the conventional rail lines was poor. Rail capacity was limited to long sections of single track and speeds were low as a result of curves and gradients. For

instance, to travel from Madrid to Barcelona, a similar distance to London to Edinburgh, would take seven hours by conventional trains (Steer Davies Gleave, 2004). In contrast, AVE has effectively slashed almost two thirds of the journey time by reducing travel time to two hours and 30 minutes over the same distance.

Thirdly, after becoming a member of the EU, massive funding from the EU has encouraged and supported Spain in constructing their infrastructure network. Despite the contingency of continual large funding from the EU in the future, past funding has been used to pay for the majority of the infrastructure costs (Steer Davies Gleave, 2004). Over the period between 1986 and 2006, EU funding for all infrastructure amounted to €118 billion (T. Marshall, 2009c).

Fourthly, the evaluation and decision-making methods regarding transport infrastructure investment are less than transparent and greatly driven by political will. The first high-speed line served another ambitious national project, as it had to be ready for the opening of the World Expo in Seville. Steer Davis Gleave (2004) stresses that there is no evidence of an economic appraisal to justify the decision to build this line to the fourth largest city, Seville, earlier than Barcelona, the second largest. In addition, the commonly-applied method of cost-benefit analysis (CBA) was not used as a tool to determine the feasibility of the transport project. An evaluation shows that HST investment has not been justifiable economically. De Rus and Inglada conducted an ex-post CBA analysis of the Madrid-Seville HST line and the findings show that if CBA had been used to determine this project, the decision to build this line would not have been made (De Rus & Inglada, 1997). Likewise, with regard to the Madrid-Barcelona HST line, the potential demand would not offset the large-scale investment and the time savings would be too small (quoted in Bel, 2011, p.700). Instead, CBA is used to decide the priority of implementing cases listed in the infrastructure investment plan. "Although detailed economic appraisal is carried out, the purpose of this analysis is to prioritise schemes rather than to make a decision in principle as to whether they should be undertaken. In effect, the political decision was made when the government committed that all regional capitals should be within 4 hours of Madrid and hours of Barcelona by high-speed train" (Steer Davies Gleave, 2004).

Despite the rapid expansion of the HST network, propelled by state intervention at a provincial level, a coordinated plan is lacking. T.Marshall (2009) reveals that the conventional network was ignored and left without proper investment, so some lines had to close. Since the state still owned these conventional networks, if necessary, the regional government could develop its own regional system to compensate for the deficit of national rail services within regions. In addition, a conflict in HST stopping patterns also easily occurred based on different concerns between the state and the regional government. This led to a difficulty in the shift to rail since the HST could not serve the population where demand was greatest and road travel was comparatively much more accessible (T. Marshall, 2009c).

Appendix 18: Materials for Interviews

Covering Letter for Interview Request (the British Case)

THE BARTLETT SCHOOL OF PLANNING

UCL

Dear Sir/ Madam

I am a PhD research student in the Bartlett School of Planning, University College London under the supervision of Professor Sir Peter Hall, who suggested that I should try to conduct an interview with you about the impacts of the upgraded West Coast Main Line (WCML) on Manchester and its sub-regions.

This interview is the second stage of my research project following my previous quantitative analysis of economic geography - before and after the arrival of UK upgraded InterCity 125. This will be published soon and I enclose an uncorrected proof copy. The focus of the new study is to understand better the main structural factors underlying the economic restructuring process associated with the effects of an upgraded WCML.

Ideally, I would like to schedule a 45-60 minute interview with you at your premises or UCL, whichever suits you best. If you feel available to accept my invitation, I would be most grateful if you could please reply by email (chia-lin.chen@ucl.ac.uk) to arrange a mutually convenient time/date for the interview.

Please find attached more details regarding this research project and the draft of semi-structured questionnaire that I propose to employ for the meeting. If you have any question or need more information please do not hesitate to contact me.

Thank you very much for your attention in advance and I look forward to hearing from you.

Yours sincerely
Chia-Lin Chen

Chia-Lin Chen

PhD Research Student in Planning Studies

The Bartlett School of Planning, University College London
22 Gordon Street, London WC1H 0QB
Tel: +44 (0)20 7679 5596
Fax:+44 (0)20 7679 7502

Covering Letter for Interview Request (the French Case)

THE BARTLETT SCHOOL OF PLANNING

Dear Sir/ Madam

I am a PhD research student in the Bartlett School of Planning, University College London under the supervision of Professor Sir Peter Hall, who suggested that I should try to conduct an interview with you about the intra-regional spatial-economic impacts of the TGV-Nord on Lille and its sub-regions.

This interview is the second stage of my comparative case study, following my previous quantitative analysis of economic change of Lille and its sub-regions before and after the arrival of the TGV-Nord. The interview focus is to understand better the economic restructuring process associated with the effects of the TGV-Nord.

Ideally, I would like to schedule a 45-60 minute interview in English with you at your premises. If you feel available to accept my invitation, I would be most grateful if you could please reply by email (chia-lin.chen@ucl.ac.uk) to arrange a mutually convenient time/date for the interview.

Please find attached more details regarding this research project and the draft of semi-structured questionnaire that I propose to employ for the meeting. If you have any question or need more information please do not hesitate to contact me.

Thank you very much for your attention in advance and I look forward to hearing from you at your earliest convenient.

Yours sincerely
Chia-Lin Chen

Chia-Lin Chen

The Bartlett School of Planning, University College London
22 Gordon Street, London WC1H 0QB
Tel: +44 (0)20 7679 5596
Fax:+44 (0)20 7679 7502

An Introduction Letter for Interviewees Endorsed by Supervisor

1 October 2010

Dear Potential Interviewee

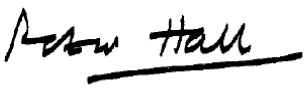
I hope that you will find a few minutes in a busy schedule to meet Cha-Lin Chen and answer a few questions from her.

Her research has already broken new ground. The objective is to discover whether there is any hard evidence to support the argument that investment in high-speed rail boosts the economic performance of cities and their regions. Her research so far suggests that it can, but that the effect is not automatic.

Now, she wants to understand how this works at the more local level. She has chosen two similar old industrial regions: the Nord-Pas de Calais region of France and the North West Region in the UK. Hence her request to you with this letter.

I think that if you can spare the time, you will find the interview not merely interesting but illuminating.

Yours sincerely



Professor Sir Peter Hall
Bartlett Professor of Planning and Regeneration

Professor Sir Peter Hall FBA MAE, Bartlett Professor of Planning and Regeneration
Bartlett School of Planning, UCL Faculty of the Built Environment, Wates House, 22 Gordon Street, London WC1H OQB
Tel: +44 (0)20 8810 8723 Fax: +44 (0)20 7679 7502
p.hall@ucl.ac.uk www.bartlett.ucl.ac.uk/planning

Information Provided for Interviewees (Summary of Research Project)

Appendix

Summary of research project

This research concerns wider spatial-economic impacts of high-speed trains (HSTs). In a broader research context, the dynamics of post-industrial regional development has been associated with three main interwoven phenomena, namely (a) the economic competitiveness lies in developing high value-added knowledge economy,(b) metropolitan areas tend to grow as a poly-centric city-region between centralisation and de-centralisation forces, and (c) the growth of personal travel in parallel to the unprecedented investment and provision of telecommunication and transport infrastructure. The arrival of HSTs ushers in "the second railway age" (Banister and Hall, 1993) and brings an unprecedented shrinkage of time and space: "the shrinking continent" (Spiekermann and Wegener, 1994). More and more government leaders place great importance on the potential of HSTs investment, anticipating HSTs accessibility would benefit previously declined or less-developed regions and therefore could further reduce the regional disparity.

Yet, the wider spatial-economic impacts of HSTs are still in dispute. Inter-regionally, predictive models have suggested HST links would benefit major cities at the expense of smaller cities, thus widening regional inequalities. But individual case studies have adduced empirical evidence against the latter assertion. In addition, even though there have been some studies about the intra-regional ex-post impacts of HST on specific cities, these studies focus only on quantitative figures of land value, office space, commercial activities, or transport impacts rather than interrogating the relationship between HST approaches and potential knowledge-intensive economy, which could function an agent of change in city-region transformation process. Thus, it is impossible to form a fair judgement due to the lack of such studies since the early 1990s and most studies have been used only fragmented and anecdotal evidence.

The research question concerns: whether, to what extent, and how would cross-border HSTs accessibility influence the transformation process of post-industrial regions towards knowledge-intensive economy. Empirical approaches at inter- and intra- regional scales would be conducted through quantitative analyses of economic indicators and qualitative investigation of structural factors in the transition process, which would offer insightful interpretation of quantitative figures attained. Inter-regionally, a sample research with quantitative analysis had been conducted to understand the impacts of UK upgraded InterCity125. The inter-regional study concludes that HST has had substantial and demonstrable effects in aiding this transition within a 2-hour travel limit of London, thus helping to generate renewed economic growth, but that the effects have not been automatic or universal. Needless to say, the prestigious HST hub is only one factor among many in improving economic prospects of languishing urban centres that have lost their old industrial roles and have failed so far to make a full transition to new knowledge economy. The potential HSTs could lever has to be adapted to different contexts and systems: The baseline conditions, the nature and limits of HSTs, wider context changes, how governmental strategic interventions respond to them and evolve, and other factors would eventually affect the spatial-economic effects of HSTs. These relate to a strong case for a finer-grained and deeper-probing analysis at an intra-regional level of the potential for rail improvement as an agent of change in city-region development.

The intra-regional study draws on a comparative case study of two city-regions in course of transformation from the industrial to the post-industrial knowledge-based economy: Lille and its sub-regions in Nord-Pas-de-Calais (France) and Manchester and its sub-regions in North West England (UK), which implemented two HST approached respectively: the TGV-Nord and the Upgraded West Coast Main Line (WCML). In the first stage of Manchester-Lille comparative case study-by studying the effect of time-space shrinkages and economic strength structural change, the preliminary findings suggest that the transformation of two post-industrial city-regions and its wider sub-regions proves a complex and difficult process. The available evidence shows that for both regions, connection with the national capital by faster train services did economically strengthen the regional capital, but not some sub-regions around it, especially former industrial sub-regions. The effects of time-space shrinkage vary in the two cases, suggesting that a dedicated HST can generate economic change but that there are real limits in exploiting an upgraded existing track. Even in the Nord-Pas-de-Calais region, with TGV connectivity for most sub-regions, wider economic transformation is still to happen, while the laboriously-upgraded WCML seems to show limits to its transformative power. These two post-industrial regions are still in the course of a long transition process towards the knowledge economy. This process involves much more than connection with high-speed rail – a question requiring further investigation by conducting interview in the second stage of comparative case study.

Informed Consent Form for Participants in Research Interview

Research Topic
High-speed Trains and Space Economy: The UK experience 1976-2001 and Prospects for High-speed two- A Manchester-Lille Comparison

Participant's Statement

I …….... (Print Name)

agree that I have

- read the information sheet and/or the project has been explained to me orally;
- had the opportunity to ask questions and discuss the study;
- received satisfactory answers to all my questions or have been advised of an individual to contact for answers to pertinent questions about the research and my rights as a participant and whom to contact in the event of a research-related injury.

I agree that information I provide will be recorded electronically and taken notes. I understand such information will be handled and stored in accordance with the provisions of the Data Protection Act 1998.

I agree that information I have provided might be quoted in academic publications (a Doctoral dissertation, conference paper, or journal paper). The transcript of my interview will not be published.

I understand that I am free to withdraw from the study without penalty if I so wish and I consent to the processing of my personal information for the purposes of this study only and that it will not be used for any other purpose.

Signed: Date:

Data Collector's Statement

I ……..confirm that I have carefully explained the purpose of the study to the participant and outlined any reasonably foreseeable risks or benefits (where applicable).

Signed: Date:

The Bartlett School of Planning, University College London
22 Gordon Street, London WC1H 0QB
Tel: +44 (0)20 7679 5596
Fax:+44 (0)20 7679 7502

Appendix 19: Quotations from the Interviews:

The British Case

Codes	Quotations	Corresponding pages
CG-1	*They (OPRAF) said on West Coast definitively we wanted a railway which would get you from Manchester to London in less than two hours….. The only way you could do that was a tilting train. Technically there was no other way. Actually OPRAF forced all the bidders to go for tilting trains at 125 mph. Virgin trains was the only one who said we wanted our trains to go 140mph.*	p.239
CG-2	*We decided which station to serve by the business model which is available to everyone… What people were doing was to test whether it should be Wilmslow or the other…whether it should be Macclesfield or Congleton. And out of that came the answer where the market was… The model said Liverpool was in decline. There was not much business from London. Business probably would be in Runcorn. I think it proved to be true. Liverpool now is served by long 9-coach trains. That was a good result.*	p.240
CG-3	*"British Rail had run it well. British Rail knew the market and knew the timetabling problems. You could not take three trains that way if you took all three trains from Manchester to Stoke that way and then there is no room for local train services. So you take the third one off to Wilmslow. Wilmslow is a rich middle class area and has an airport. Arguably Wilmslow should have two trains an hour".*	p.240
CG-4	*The model also said that there was frustrated business in Chester which had to change at Crewe or had very slow trains. It was a middle-class town, not industrial, and a tourist area. It is more likely to make money... The government decided to run the diesel trains all the way to London, which is proved right.*	p.240
CG-5	*It was more complicated than that because your rival is stopping at one of these stations. If you stop you will get half income. So if you have 5 trains and I have 5 trains, we share 50% income of the station. So you will be motivated to stop to take money from your rival. There is nothing to do with passengers.*	p.240
DT-1	*When the Channel Tunnel was opened at that time which brought European trains to our notice, significant in the middle of the country… We felt that we should have proper freight link right to the north England, higher passenger link which would be west coast and also international link becoming part of the through European Network. It gradually took hold of people's imaginations and the original plan of the WCML upgrade was 500 million pounds. It was very poor, very small. Really could not do much at all. We campaigned to have a more significant upgrade…and to improve connectivity with London, potentially*	p.241

	with Europe.	
MP-1	*I'm not sure how much public conversation there was about West-Coast Mainline and upgrading it… I'm trying to ask "was this a very politicised debate or not, or was it a more technocratic transport theme or not". Clearly it's in the newspapers saying that "the service isn't good enough, it's too slow". But I can't recall very much conversation around here about the strategic significance of this.*	p.252
MP-2	*There were a lot of forces going on in the mid-nineties, which means Liverpool started to change its view of itself - it needs different politics, it needs better public, private coalitions; it needs to think more of itself in European terms. It begins to see what success different European cities are doing, such as Hamburg and Rotterdam. And a lot of our work was underpinning this because we did the work for the core cities, making the point of trying to get Liverpool as a European city.*	p.254
IW-1	*I had been pushing Greater Manchester for 3 or 4 years, trying to get them support the electrification of Liverpool-Manchester railway line, which will bring down the journey time between the two cities to 30 minutes and to support the electrification of Preston-Chorley-Bolton-Manchester rail which similarly will link together pretty buoyant economies. But they are not interested at all.*	p.242
IW-2	*"There are two biggest cities in the North West. For almost the last 30 or 40 years, Liverpool has been completely shameful …the place was falling apart economically, socially, and politically. That had been an enormous advantage for Mancunians, wasn't it? No competition. So the natural point to think about it, when you're coming to the North West, put your investment in Manchester because Liverpool just came across a place with no cases basically".*	p.253
AH-1	*We are in a highly centralized country, where we have two levels elected politicians we have national government and local governments. All the initiatives we have taken over the years to try building institutions at the local in between the locality and the national level have been pretty unsuccessful, it seems to me.*	p.242
AH-2	*From that point onwards, Manchester city council was extremely welcoming to national government initiatives…economic restructuring of the city was extremely positive in terms of the relations with the business community locally. Basically it would talk to everyone who has invested money available for the restructuring of particularly the centre of the conurbation. I think that is the turning point, basically economically because what enabled Manchester to do is to put in place the whole range of schemes.*	p.247
AH-3	*From the Manchester Independent Economic Review, if you look at the effects on house price for example, they tend to heat off these lines to places like Bury. There has been fairly determined campaign to get extra investment into the Metrolink network. In*	p.252

	order that other rears could be connected.	
PH-1	*The development corporation concentrated all its efforts on the edge of town and it has obvious problems with the existing city council because all the development wrapped around the edge in the Business Park next to the motorway. And the city centre just was a mess and remains a mess.*	p.257
PH-2	*They just started to do it in the early 1970s when the Labour government decided that the priority was inner city regeneration. This was in the 1977 White Paper and the 1978 Inner Urban Areas Act. They pulled all the money away from the New Town and it suffered very badly. So strange bits and pieces were done around motorway junctions- business parks in Leyland, and north of Preston, but they didn't tie up as a coherent town. It should have been a linear town. It would have been quite interesting.*	p.257
PH-3	*The argument to support the case was based on fact: there would be enormous traffic and people coming in the weekends in particular to gamble, including from London. And of course when we lost the super casino, the strong case effectively for a direct service was greatly weakened. So everything kind of unravelled together, unfortunately.*	p.261
SL-1	*I think the problem is as ever, both are now related, in that internal problems really significantly limit Pennine Lancashire capacity to access external opportunities. Not just physically. If you were to ask – and we did ask – we did surveys about it back when it was known as East Lancashire (we branded it Pennine Lancashire but that's not what it's known as. It probably is still known as East Lancashire). We did survey people in Manchester and Leeds and other areas. What do you think of East Lancashire? Well, the sheer number of people who had very negative conceptions of it, which there're all kind of potential reasons for. They couldn't pin it down to a specific place. They weren't quite sure where or what it was. If they did think of it at all, they thought of it because of the riots that took place in 2001 or as almost a black and white photograph of Victorian cotton industry. External perceptions of it indicated that there was very little market as a leisure destination, as a potential, cost effective place you can retire to where you can have a good quality of life. That affected the way the potential investors saw it. They didn't see it as somewhere they could do – they saw it as a rural backwater, rather than somewhere where they could bring impact.*	p.263
SL-2	*Having this sort of lifestyle offered in a small town with services you'd expect from a town but with countryside immediately around where you live, access to outdoor activities and the benefits of being within short commuting distance to a major city.*	p.264
SL-3	*The people who worked on my team who did live there, were born there and had moved away to go to university and then came back in their forties. And that's a pattern that repeats itself…It (PL) remains a sort of island, over the hill from Manchester, with very little social or economic interaction.*	p.266

DW-1	*"What the situation is that we have no space to put more services, what we want to do is to reduce the journey time as well. For example, journey time to Leeds still 50 mins for a 50 miles journey, which is not very fast; it is still 45 or 50 mins to Liverpool for a shorter journey, but again because of the lack of capacity, it is difficult to put on more services. We like services every 15 mins to Liverpool like metro services; we like services about every 12 mins to Leeds because the demand is so high. But that's constrained by not just HSTs, but the fact we've got HSTs every 20 mins in Piccadilly makes that difficult".*	p.240
DW-2	*The executive and the leader of council have been working as a team for a long time. They have been really good at promoting Manchester, encouraging people to come here, to do business here, and getting money from the government for regeneration, or for transport… When one does want some big developments would have happened, they haven't had this very good working relationship between the bureaucracy officers and members between the CX and the leader because they work very well as a team.*	p.246
DW-3	*The Bomb just makes the process speed up. That kicked-start a total change in the way Manchester wasn't. I came to Manchester before the bomb happened and I went through the whole transformation of city centre. It wasn't recognizable from what it was 15/ 20 years ago. It's been upgraded. It's become more attractive.*	p.247
DW-4	*In fact, we are getting some prestigious companies locating here. I think the transport link has got a very important factor in that. For example, Bank of America put one of their key offices in Manchester (maybe 4-5 years ago). And I think it is the combination of two things. It is the fact we got the most important international airports outside the South East England. Also at the same time, we've got very good connection to London.*	p.269
DW-5	*"The CX of airport said that they are quite happy that a large proportion of the London to Manchester market has switched to rail, as that released the capacity for other connections, they don't necessarily want to compete with the rail network. They cannot because city centre to city centre rail always wins, but that means they can offer a good international airport and network, so links to other countries or that combined is really making much more attractive places for people to locate their business."*	p.323
DB-1	*It has a very weak road structure. The town boundary is very tightly drawn around the urban area and the north/south route in Blackpool is basically the promenade, but that's also the major public realm area: It's where people walk, play, and enjoy themselves, but it's also now the main traffic route. And there's no parallel satisfactory route. So Blackpool has to make choice about improving the quality of the promenade as a public realm and providing traffic in the area there has been done some work recently, they've narrowed the carriage way between Chapel Street and Talbot Road and down to...it's a sort of shared-space type scheme. And that makes it a rather nicer area to be, but it*	p.259

	means travelling north-south in Blackpool is more difficult as a result. So in terms of a weak internal road system, which is one of its problems.	
DB-2	*That's all changed. And some people go on holiday by train now – youngster who can't drive; people who are very poor and don't have a motor care; people who are too old to drive – so these are not a premiere section of the market: This is down market tourism. Blackpool needs some down market tourism, but it also needs higher quality tourism. And higher quality tourism and domestic tourism these days generally go by car, families with children and money to spend, they would go by car than by train. So it's road access that's probably more important.*	p.259
JT-1	*I think the WCML probably has an impact on our domestic services…it was not the only factor, but I think it played a part in the decline of London-Manchester services because the WCML upgrade gave more reliability and greater frequency. Quite frankly, during the upgrade period and previously, the WCML to London journey was dreadful. It was a disaster. The airline in a sense took the opportunity of the shift from rail to air. Once when the disruption and the upgrade settled down, it switched back again.*	p.322
BC-1	*I spoke to one of the new deputy head-masters. He said to me… he has new intake of children 11 years old. He said to them, put your hand up those who think after their education they are going to become a doctor, nobody put hands up; those who may become solicitors or lawyers, nobody put hands up; those who might become teachers, maybe one or two; those who think I would work in Tesco, then that is when people started to put their hands up… and that is that low level of aspiration even at that age…Really you have to raise that. People don't think those kinds of career offered to them. It is like a feel of vendetta. If you don't aim high, you certainly won't even get half way, will you? So turning that around, reinvigorating the enthusiasm of the communities is really a difficult task.*	p.263

Appendix 20: Quotations from the Interviews:

The French Case

Code	Quotations	Corresponding page
ML-1	*For an operator like SNCF, when we build the HSL, we want to have new traffic. Where does the traffic come from? It is from the air sector….The main traffic mainly comes from people travelling more or people coming from the air sector. But from Paris to the north of France, you don't have air traffic because it is too short. There is nothing to be expected from that. But from Paris to London, yes- there was a lot of air traffic.*	p.272
ML-2	*People are going to travel more and more as the distance is short, and there will be people who buy season tickets and will not pay more. If we take the route Paris-Lyon, there was a lot of air traffic before TGV, so people travel more without having season tickets. Some will use them, but many others won't. Therefore, they will pay more. So that is the difference…We prefer the TGV in the south to the north because of the location of Paris in France. [Similarly], the market from Paris to London is more important than the market from Paris to Lille, not comparing the number of passengers, but in terms of revenue. … In terms of business, it is not in our interests to serve the city of Lille, but it is in our interests to serve London, Paris, and Brussels.*	p.272
ML-3	*Our idea was that in France, historically speaking, the network is like a star round Paris. So it is very easy to go from Paris to the provinces, but very difficult to go from one province to another because everything is Paris-oriented. So once we had built the Paris-Lyon line, Paris-Lille, we had the idea that we could overcome the difficulty of going from one province to the other with just a link between these two HST lines. With this solution in mind, we discovered that we could make a link through the airport of CDG and it would be the best result because we could have the synergy between people going from province to province and people going from province to Paris region and Paris airports. And this synergy is very efficient …People living in Lille can access the airport easily, but also the south-east and south-west of France, even the east and west of France. So this is a commercial synergy that works.*	p.272
ML-4	*The choice we made was to link all the cities to Charles de Gaulle (airport) and make it a very strong hub. And we used the possibility and potential of the provincial airports.*	p.272
ML-5	*The more we extend this network, the more we extend the possibilities for regional high-speed trains… If we develop all these regional services which are very often services with high frequency, we will lose capacity from high-speed lines for long-distance trains. So this is the problem of competition*	p.278

	regarding capacity on the lines.	
ML-6	*The second point is that sometimes, there is a competition between these regional services and our trains (TGVs) because SNCF gets no subsidy for running the TGV whereas the regional trains have a lot of subsidy from the regional government because people do not pay and pay back the expenses. So it is unfair competition.*	p.278
ML-7	*What we said to them, instead of paying us quite a lot of money each year, we could run a joint-venture. That is what we proposed to the NPDC region, to build a joint-venture with them and to operate international and regional services between London, Paris and Belgium. For example, trains can go from London to Brussels with many intermediate stops. We are OK even with the participation of many other operators from Belgium or from England, but we think this is really an exception. There is no other similar case elsewhere in France in our opinion because of the human geography, economic geography, density of population and the short distance.*	p.289
PM-1	*The consensus was to place the station neither in Amiens nor in Saint-Quentin, where either of the two cities could legitimately claim TGVs. They built it in the middle, which means you need to take the bus for half an hour from Amiens or Saint-Quentin to get to the TGV station. Previously, the major international routes were either going to, then with the arrival of TGV-Nord, the major international routes all went through Lille. This illustrates what we might call political constraint, which is reaching a consensus in order to have the project accepted by other cities, even though there are winners and losers in this process. You need to somehow gain the consensus of the losers, which in that case was Amiens and Saint-Quentin.*	p.276
TB-1	*It is not something we have control over. I think the biggest question is: who will do what in this and how will they treat cities like this one when they make decisions? This is sometimes difficult to understand. I give you an example, a few years ago, Lufthansa decided to serve Lille and schedule a direct flight from Lille to Munich. The idea was to develop Munich to serve the south-east of Europe. It started very slowly because in fact people didn't take the plane to Lille… when people realised it existed. The first time the plane was empty. Two or three months later, the plane was starting to be full and then they cancelled the flight because they didn't recognise the time needed for people to realise there was a route to Munich.*	p.290
NJ-1	*The TGV station was renewed in 1993 when the TGV arrived. At the same time, Michel Delebarre and the council decided to develop all the new cities and central facilities around the old part of the derelict ports and shipyards. So it was the same project. We are continuing this project now with another town planner, Joan Busquets, who was the town planner in Barcelona for the Olympic Games. He is really involved in public places. We are continuing urban regeneration of the city centre of Dunkerque. The TGV station will have interchanges between*	p.292

	different transport modes around the station as part of the project. There is no difference.	
NJ-2	*Due to historical issues, Calais doesn't want this kind of organisation. Calais district is really little. There are only five towns around Calais. They don't want to forge a link with the state… they don't want to develop partnerships. They want to work alone in their cities, so it is very difficult sometimes.*	p.295
NJ-3	*In order to achieve that, the SMCO needs to work together and to be strong enough while negotiating with the SNCF to say we exist, we want to increase services to put people on trains instead of in cars (highways). There is still a long way to go and we are working on it. But it is not so easy because Calais has a different political orientation than Dunkerque. So we have to discuss.*	p.295
YDD-1	*The difference comes from history and tradition. Lens is a town which was born with mining, so problems are more intense with Lens, stronger than in Valenciennes which has traditions and an image – good museums, theatres, a university- it's not the same. In Valenciennes there are people with money and the house prices are very different. Douai and Béthune are in between the two. The miners' heritage is stronger in Lens. That's why they chose Lens to build the Louvre: the challenge was the biggest and the most difficult!*	p.297
YDD-2	*People moving from Lens to Douai, they can take a bus or train since trains stop everywhere too. So it's a problem. You cannot have two different systems. The train must be integrated into the regional system and have fewer stops than before. If you have fewer stops than before, the opportunities for another system may be taken by local authorities. And all these different systems must be studied together to be coherent. Now it's not.*	p.303
AL-1	*In Lille Metropolis, all links go to Lille and there is a very weak link between Béthune, Lens, Douai, Valenciennes and Lille. This should be changed. Also, better articulation with the HST system is needed. In addition, it needs to be modernised. Speed could be improved on the regional HST system… As a pole (hub) function, Lille could not compete with Paris, but the system may increase polarity inside the region.*	p.303
DP-1	*I think it is necessary for medium-sized cities of the region to have their own development projects and their own strategies. Certain cities, over a long time, have developed their own strategies … In Valenciennes, they changed their mayor 15 /20 years ago. A new team launched a new strategy for Valenciennes… focused on the centre of the agglomeration. In all other cities, in Douai, Lens, and Béthune (in this part of a former mining area), it was not so evident whether they had a strategy in the 1980s and 1990s.*	p.297

Appendix 21: Urban Redevelopment Schemes in North West England

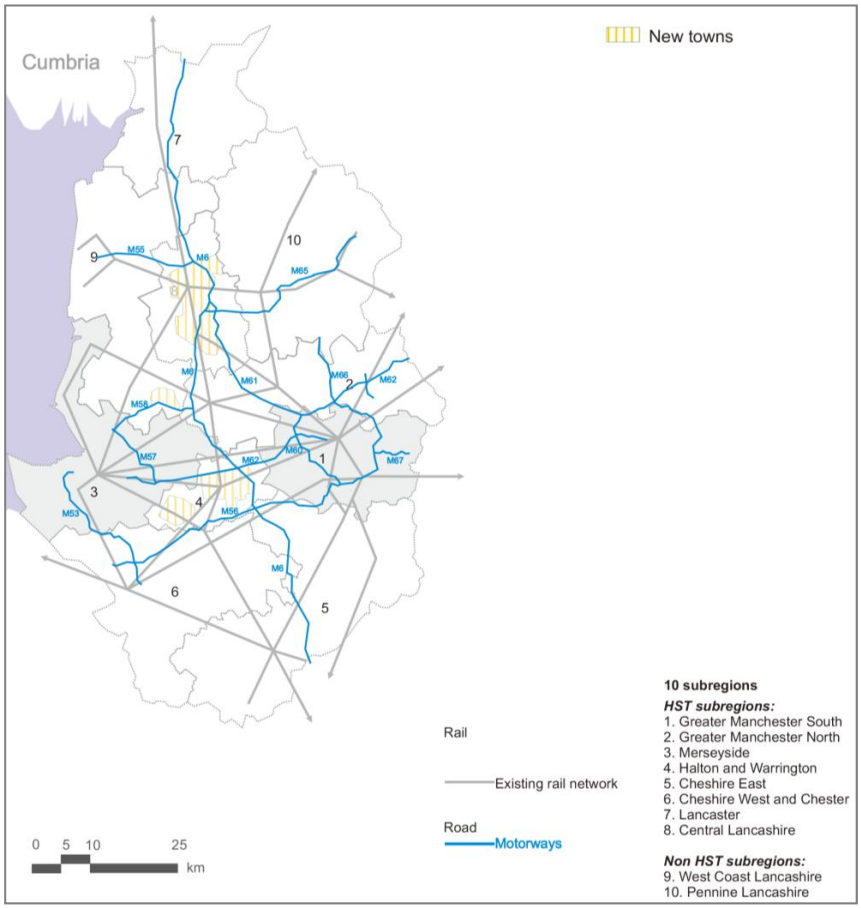
- **Strong Intervention in Manchester during the Transformation Process**

Time frame	External link	Internal link	Urban redevelopment / Events
1980s	The expansion of Manchester Airport	Manchester Metrolink tramway network	Urban Development Corporation
	Mid-1980s, the ownership of Manchester Airport kept on hands of 10 local authorities	Mid-1980s, the tramway project was proposed.	1988 Central Manchester UDC
		1988- Phase1 began to construct.	
1990s	The rail link to city centre and beyond	The Metrolink expansion	The transformation of city centre and poly-centralisation
	1993- Manchester airport station and the northern rail link to Manchester Piccadilly	1992- Phase 1 competed to reach Bury and Altrincham.	1996-IRA bomb led to city centre rebuilding
	1996- The southern rail link from Manchester airport to Crewe 1997- the second runway approved		1997-Spinningfield office complex's proposal emerged
	1998- The cooperation with Trans-Pennine Express to expand the catchment area by rail	1999- Phase 2 competed to reach Salford Quays (December)	1999-East Manchester URC
2000s	The consolidation of the Northern Hub	The Metrolink expansion	The transformation of city centre and poly-centralisation
	2001- The second runway completed	2000- Phase 2 competed to reach Eccles.	Enhancing major transport gateways 2003-Manchester Piccadilly Partnership to link station with city centre.
	2002-the creation of an integrated interchange stations in Manchester Airport		2002- Commonwealth Games and East regeneration 2002- Urbis Centre opened
	2002-Manchester Piccadilly remodelling for Common Wealth Game	2004- Phase 3a approved by DfT	University Complex 2003-"The knowledge capital partnership". 2004-The merger of UMIST & Manchester metropolitan Uni.
			2006- Media City Salford was decided as the preferred location
		2008- The congestion charge referendum failed, which resulted in a crisis for carrying on Phase 3b. 2009- Phase 3 funding was secured.	Relocation of government office around Manchester Piccadilly station 2009-GONW relocation 2009- A government quarter plan "The white hall of the north"

A Glossary of Regeneration Projects in Manchester and Liverpool

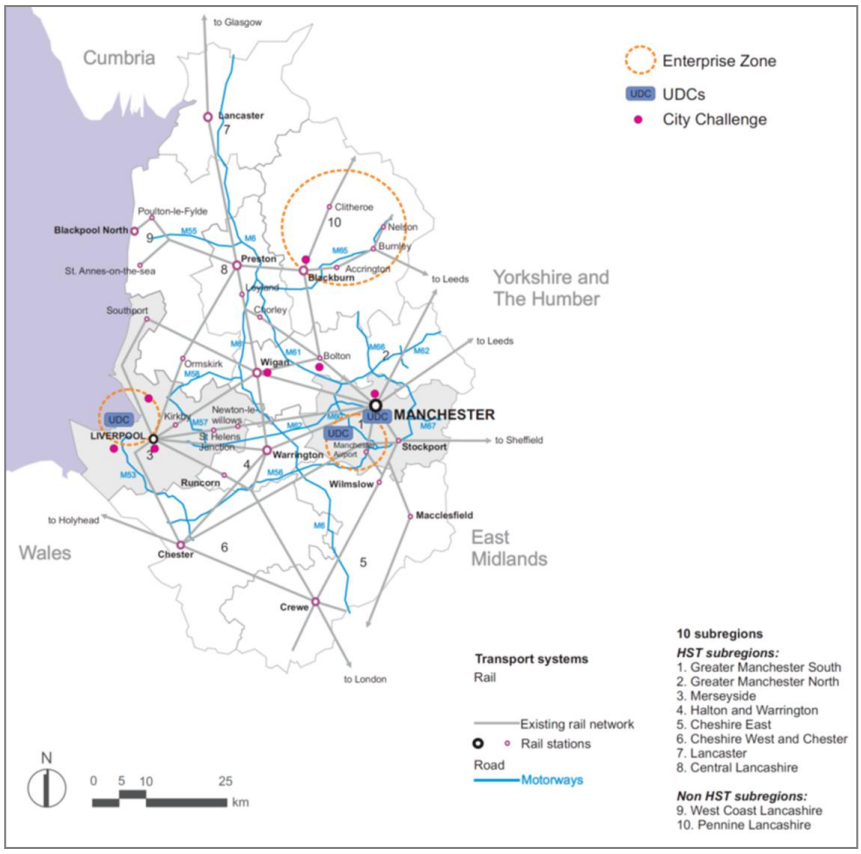
Central Manchester Development Corporation	For Central Manchester Development Corporation, Castlefield and Bridgewater are two well-known flagship projects. The Castlefield area which was converted into mixed housing, office development, culture, and leisure activities became a popular tourist site attracting more than 2 million visitors per year. As for Bridgewater Concert Hall and Great Bridgewater Office complex which were developed in partnership between CMDC and Manchester City Council catered for new types of economic activities in the expanded city centre (Mann, 1998).
Liverpool City Centre Redevelopment	The waterfront / the commercial district/ live work area/ lime street gateway/ cultural quarter/ retail/ rope walks/ Liverpool One/ Hopes/ university district/ public realm and movement/ utility infrastructure/ city living
Liverpool Lime Street Station	The remodelling Liverpool Lime street station area was crucial. Although the refurbishment of the rail station was not completed fully before the ECOC in 2008 and the arrival of the full completion of the WCML in December 2008, the recreation of a key gateway had transformed the public space and changed people's perception. The Council leader Joe Anderson said, "This is a key gateway to the city and many visitors' first sight of Liverpool and now we have a station that befits a city of Liverpool's status which I'm sure will leave a lasting impression" (NWDA, 2010)
Liverpool Waterfront	The waterfront areas were intensively transformed with the improvement of its Canal link and the enrichment of its cultural offers and facilities in addition to the Tate Liverpool which was opened in 1984, including the new Echo Arena Liverpool (Arena and Convention Centre) located on the former King's Dock opened in 2008 and the Museum of Liverpool on the Pier Head which was just opened in July 2011.
Liverpool One	The largest retail scheme developed by the Grosvenor Group was an extraordinary mending plan of Liverpool urban fabric. New public space, parks, gardens, and 40 individually buildings including two largest departments stores John Lewis (240,000 sq ft) and Debenhams (180,000 sq ft) filled existing urban settlements covering 42 acres across six districts.
Manchester Airport	Manchester Airport established in 1938 is located in the south of City of Manchester about 14 km from Manchester city centre. The escape from the requisition by the Ministry of Defence after WW2 allowed it to develop a major civil aviation hub as a municipal enterprise. In 1971, Manchester Airport had already been a key airport for both passenger and freight outside London and South East, much more significant than another two regional airports, with about 2 million passengers in contrast to 496,500 passengers in Liverpool Airport and 143,944 passengers in Blackpool Airport.
Media City UK	Media City UK located in a brownfield site of 200 acres of former dockland at Salford Quays belonging to Salford and Trafford two local authorities. It began with BBC's vision for rebalancing a "London-centric" BBC with a potential move of major departments to the North of England (BBC Press Office, 2007). The two major candidates were Salford Quays and Whitworth Street in Central Manchester (BBC, 2006). In 2006, BBC announced Salford as the preferred bidder, and developed a partnership consisted of the Central Salford Urban Regeneration Company, Peel Holdings, Salford City

	Council and the North West Regional Development Agency. ITV and University of Salford also followed to collectively relocate in Media City. The whole project began construction in 2007 and completed its first phase in 2010. In late 2010 a Metrolink extension to Media City was accomplished. In 2011, the University of Salford opened unique digital learning, teaching and research space at Media City UK.
New East Manchester Urban Regeneration Company	In 1999, New East Manchester Urban Regeneration Company (URC) covering an area of 1,100 hectares located immediately east of Manchester's city centre was established to regenerate this previously industrialised brown field through the creation of "a new town in the city" envisaged to accommodate 60000 over 10-15 years with a transport corridor formed by Metrolink extension from Manchester Piccadilly into this area (planned to be completed in 2012). This area is the home of the 2002 Commonwealth Games which received strong government support for investment and the legacy was continued to develop as a genuine Sport city in a sustainable way. Economically, a 160 hectare business park plus 200 hectare of commercial and industrial land was created to specialise in new and emerging technologies. However, the achievement showed the regeneration is a long-term process with contingency. Even though the 2002 Commonwealth Games was successfully delivered, the set objective is still far from being achieved fully. In 2010, the proportion of people wanting to move from the area has reduced from 40% to 24%, but the population has increased by over 4,000 since 2001 and only a little under 5,000 new homes built (New East Manchester Ltd, 2010).
Spinningfields	Spinningfields is located in the western side of the city centre between the River Irwell and Deansgate, developed in partnership between Allied London properties and Manchester city council to offer approximately 220000 square metres of flexible offices and the potential for 25000 jobs (Hebbert, 2010).
The Piccadilly Partnership	The Piccadilly partnership created in 2003 is a strategic public and private partnership bringing together a range of stakeholders like Manchester city council, City co., GMPTE (now called TfGM), Marketing Manchester, and other public sector and local occupiers. The aim is to regenerate Manchester traditional "heart and soul" which is a linear area from Piccadilly station to Piccadilly Garden into a transport and commercial hub.
The Knowledge Partnership	The knowledge partnership provide a clear knowledge economy strategy based on the academic and cultural aspect in the combination of a wider spatial strategy "Arc of opportunity", stretching across two local authorities from University of Salford in the west to Piccadilly station in the east and the higher education campus (UMIST, Manchester University, and Manchester Metropolitan University) in the south.



1960s-1980s

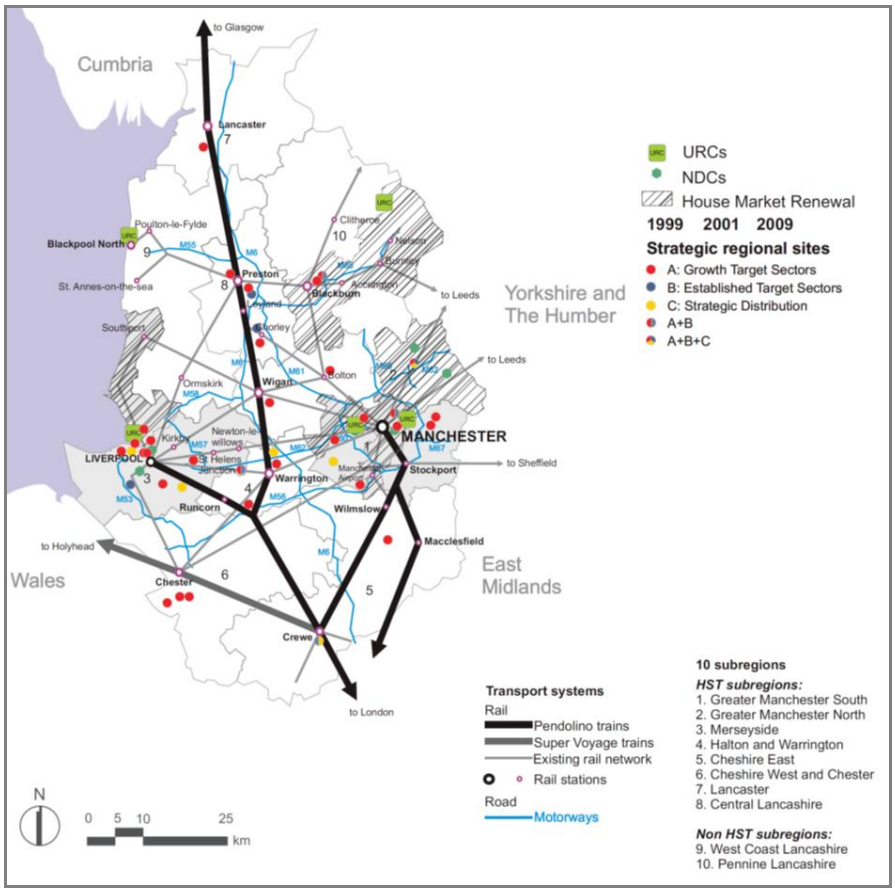
- Electrification (WCML-60s)
- New Towns (1961-1980s)
- Motorways -until early 1980s



1980s

National Urban Policy

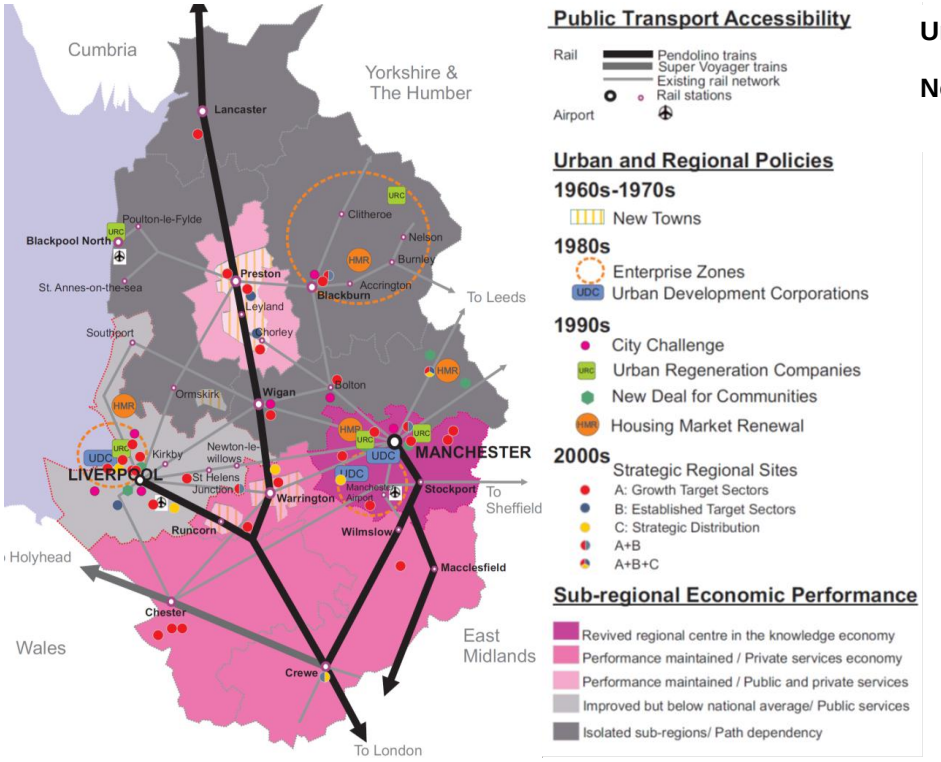
- Enterprise Zone
- Urban Development Corporation
- City Challenges



Late 1990s:

National Urban/Regional Policy

- The construction of the WCML upgrade
- Urban Regeneration Company
- New Deal for Community
- Housing Market Renewal
- Strategic regional Sites



Uneven Growth within North West England

Appendix 22: Arguments For and Against the HS2 Proposal

	The case for HS2	The case against HS2
1	**Underinvested new rail infrastructure:**	
	•The UK's HST network is under-invested behind international competitors.	•Whether HST is right for the UK is not justified from abroad experiences; and the evidence is mixed.
2	**The demand for rail capacity:**	
	•In response to projected demand for extra rail capacity, HS2 is the only option.	•The forecast is dubious and the need for new lines is not certain. •The lack of context and a coherent transport strategy. •Alternative solutions by upgrading existing lines and lengthening trains.
3	**Affordability and Business case:**	
	•HS2 is affordable for taxpayers and passengers.	•HS2 is too expensive and a rich man's railway. •High uncertainty and opportunity cost
	•Calculating the benefit of time savings, the government assumes that all time spent on trains is unproductive.	•A flawed economic case and overstated benefits. •The assumption of all time spent on trains is unproductive is erroneous.
4	**Modal shift and operational capacity:**	
	•HS2 could encourage modal shift from short haul aviation to rail, reducing carbon impacts and helping the UK meet its climate change targets.	•Evidence that HS2 will encourage modal shift is slight. The domestic aviation is already in decline and significant modal shift from road to rail is unlikely. •The unproven technical and operational assertion.
	•Future technological developments are expected to see that increased to 18 trains per hour on a wider high speed network.	
5	**Environmental impacts:**	
	•HS2 will be carbon neutral and have no adverse climate impacts. Any immediate environmental impacts will be properly mitigated.	•HS2 will have no positive carbon impacts and its impact on local environment, particularly through the Chilterns, could be catastrophic. •The need for considering alternative routes
6	**The impact on the conventional network:**	
	•The capacity of the conventional network could be freed up for better intra-regional rail services and freight.	•The government's plans stopping services on the conventional WCML line will actually be reduced.
7	**The wider impact on the productivity of urban economies:**	
	•HS2 will shrink the time-space distance between London and provincial cities and encourage economic development in these provincial cities.	•There is evidence that closer to a major centre, such as London, could adversely affect smaller economies rather than stimulate them.
8	**Regional economies**	
	•HS2 could rebalance British uneven regional economies.	•No evidence that HSR will deliver any economic benefits to the regions. •Unfounded claims for economic regeneration and rebalancing.

Source: (Butcher, Keep, Rehfisch, & Minnis, 2011; House of Commons Transport Committee, 2011a)

Appendix 23: The Timeline of Developing the HS2 Proposal

July 2007	[...] it would not be prudent to commit now to 'all-or-nothing' projects, such as network-wide electrification or a high-speed line, for which the longer-term benefits are currently uncertain and which could delay tackling the current strategic priorities such as capacity (DfT, Rail White Paper, Delivering a Sustainable Railway, Cm 7176, July 2007, p 9)
Jan 2009	A new Secretary of State for Transport Geoff Hoon announced an investigation into a high-speed line between London and the West Midlands and potentially beyond the West Midlands.
Jan 2009	High Speed 2 (HS2) Ltd is a company set up by the DfT to advise the Government on high-speed rail. It was incorporated on 14 January 2009 and was subsequently classified as an Executive Non-Departmental Body. The remits: 1. To identify a route between London and the West Midlands with the primary aims of increasing passenger capacity on the corridor and optimising journey times. It was a requirement of the remit that the route should include an interchange between HS2, the Great Western Main Line and Crossrail, with convenient access to Heathrow. The nature and scope of the interchange were for HS2 Ltd to advise on. 2. A further requirement was that there should be no intermediate stations between this interchange station and the West Midlands. It was for HS2 Ltd to advise on whether stations should be city centre or parkway or both. 3. The remit also invited HS2 Ltd to consider how transport and land use planning could be properly integrated in respect of the new line, particularly in relation to housing and economic regeneration in the West Midlands. 4. The remit required the company to "pay close attention" to the environmental impacts of the new line.
Mar 2010	White Paper High Speed Rail -The feasibility study by High Speed 2 (HS2) Ltd
May 2010	Coalition Government committed developing a high-speed rail network (though not necessarily HS2), stressing the low-carbon benefits (HM Government: The Coalition: our programme for government, 20 May 2010, p 31)
Nov 2010	DfT, Business Plan 2010-11, November 2010, (updated May 2011) http://transparency.number10.gov.uk/transparency/srp/view-srp/39
Feb 2011	The then Secretary of State for Transport, Philip Hammond, launched a major public consultation exercise on this Government's proposal for HS2. DfT and HS2 Ltd, High Speed Rail: Investing in Britain's Future, Consultation, February 2011
July 2011	HS2 consultation ended.
Jan 2012	After the consultation, the government announced the policy statement for HS2 with some amendments to initial proposals.
Jan 2013	HS2 Phase 2 proposal was announced on 28 January 2013.

Appendix 24: The Implications for High-Speed Two

This research has great relevance for future HST policies in the UK, in particular for the HS2 proposal which is still under development by the time of completing this thesis. With the exception of the 113 km Channel Tunnel Rail Link (HS1) linking London with continental Europe, the UK is situated at a turning point, making a move from an incremental approach (low-speed high speed) in the 1970s to major construction of new lines (high-speed high speed). However, a mega-transport project as significant as HS2 is unavoidably controversial. Regardless of a cross-party political support, the Government's HS2 case has caused strong reactions, both for and against. Written evidence from both sides of the debate have collected and discussed in two major parliamentary documents (Butcher, et al., 2011; House of Commons Transport Committee, 2011a). The perspective of critics is wide-ranging. Major aspects involving both sides of views are listed in Appendix 22.

Undoubtedly, the new lines will, in their turn, cause major spatial-economic effects, just as the lower-speed version of HST has done over the past thirty years. One might argue that the existing upgraded HST system is fast enough, offers more access points well integrated with other rail operations in comparison with a newly dedicated HST system. However, it is not speed in itself that will prove important, but the effect of speed in shrinking critical time-distances. The motto of the Swiss Railways, in their Rail 2000 strategy, "*not as fast as possible, but as fast as necessary*", is thus correct. But in the UK's larger space economy, 200 miles (320 km) from London to Manchester or Leeds, 400 miles (640 km) from London to Edinburgh or Glasgow, the rule must be modified: as fast as possible has proven to be crucial to achieving as fast as necessary (P. Hall, 2009a, p.352). The new network will bring cities like Birmingham, Manchester and Leeds around one hour of London, folding them potentially into London's commuter belt. Equally, they will bring distant cities like Newcastle within a two-hour range of London, potentially conveying the same kinds of economic benefits that have been brought to places like Manchester and Leeds.

It is beyond the remit of this thesis to discuss all aspects to reach a final judgement. Instead, the major concern is, in line with this thesis, on the strategic role of HS2 in supporting long-term regional growth and rebalancing British uneven economic geography- what implications from this research could draw. The French experience is relevant, but, in some aspects, needs to be adapted for the UK. This section began with an overview of the HS2 proposal and its anticipation for regional development. Next, the discussion will focus on the challenges for rebalancing British uneven economic geography and what needs to be done for wider regional effects.

1.Overview of the HS2 Proposal

The Wider Policy Context

Since 2000, prior to the HS2 proposal, there had been a general awareness of growth in inter-city long distance rail demand and the need for substantial additional rail capacity by the government at several stages. In 2003 the now-defunct Strategic Rail Authority (SRA) published a strategic document "*Everyone's Railway: The Wider Case for Rail*" to urge a long-term agenda for investment to overcome capacity constraints on the principal north–south routes. It said that "Looking ahead 15 years, it is clear that the principal north–south rail routes in the country will be overloaded" (Strategic Rail Authority, 2003a, p.64). The Eddington Transport Study (2006) revealed unprecedented growth in demand for rail travel had occurred over the last 10 years. In 2007 White Paper *Delivering a Sustainable Railways*, the DfT reveals demand growth of 40 per cent in the last decade and forecasts a further 30 per cent of growth for the decade ahead. Long-distance passenger demand will lead to severe overcrowding both on commuter services into London and on the longer distance inter-city business network by 2030 (Department for Transport, 2007a). This trend virtually continues. The DfT showed that the total number of long-haul rail passenger journeys more than doubled in the 15 years from 18 billion in 1994/5 to almost 32 billion in 2009 (House of Commons Transport Committee, 2011b, p.249).

However, by then the focus emphasised the problematic aspect of meeting potential rail demand for economic growth rather than a strategic role. Consequently, whether a new north–south High Speed Line (HSL) is the solution for demand was not convinced by the government. In 2007 White Paper, the then Secretary of State for Transport, Ruth Kelly, argued that it would not be prudent to commit because long-term benefits of HST are currently uncertain. "On the basis of the present carbon footprint of electricity generation, the balance of advantage would appear to favour services running at conventional speeds on reopened alignments" (Department for Transport, 2007a, p.67). Similarly, in a report *Towards a sustainable transport system*, a narrow view towards HST as one of various options to tackle future capacity problems and congestion was demonstrated (Department for Transport, 2007b).

The support for HS2 began to gain momentum before long. In the wider context of the evolution of national transport policy, unlike the rejection of investment in additional motorways and the expansion of the third runway at Heathrow, the case for building a HST network has gathered cross-party support (Brown, 2008; House of Commons Transport Committee, 2011a). By the time when the WCML modernisation was fully completed in December 2008, a new wave of political engagement led to the planning of HS2 by the Government. A timeline of developing the HS2 proposal is illustrated in Appendix 23.

A Core HS2 Network

According to the latest version of the HS2 proposal (January 2013), the HS2 project aims to deliver hugely enhanced rail capacity and enhance connectivity between Britain's major conurbations. A new, dedicated Y-shaped HST network catering for speeds of up to 225 mph (with the potential to rise to 250 mph) will be constructed in two phases, namely phase one, extending from London to Birmingham in the West Midlands and a link to mainland Europe through HS1; phase two, further extending to Manchester and Leeds. Interoperability between new HST lines and conventional tracks will be applied to serve a wider catchment such as Derby, Nottingham, Sheffield, Liverpool, Edinburgh, Glasgow, and Newcastle (a proposed diagram of the future HS2 network).

A Proposed Diagram of the Future HS2 Network

Source: Department for Transport (2012, 2013)

The Role of HS2 for Reducing Regional Inequality

With cross-party support, the HS2 proposal has been continually developed under two political regimes, but the strategic role of HS2 for regional development has been emphasised differently.

Supporting regional economic growth and prosperity

In the White Paper *High Speed Rail* published in March 2010 (Department for Transport, 2010), a strategic case for HS2 was denoted expressively, beyond purely addressing problems, to achieve multiple objectives of capacity, connectivity, and sustainability. At this stage, it was highlighted that such a scheme could "provide important support for long-term regional economic growth in the UK" through the following four aspects.

- *Faster and more reliable inter-urban journeys could increase the productivity of the UK's urban economies.*
- *The enhanced links between provincial cities through HS2 new lines in combination with improved Trans-Pennine services could enable the major cities in the Midlands and the North to compete and collaborate more effectively and incentivise greater specialisation and promote investment in these regions.*
- *The use of released capacity on existing lines could provide enhanced commuter services and support housing growth in the Milton Keynes/ South Midlands growth areas (MKSM).*
- *The provision of efficient connections between urban, national, and international networks could promote London's long-term competitiveness. (Department for Transport, 2010,p.55).*

It was well recognised that the growth opportunity which HS2 could deliver needs to be assessed further and involve the future development of regional strategies and local development framework. Although this view has an implicit suggestion to address an unbalanced North-South Divide by HS2 through supporting regional economic growth and regional prosperity in a long term, this rebalancing argument had not be explicitly stated yet.

Rebalancing the North-South Divide

The Coalition Government continued the HS2 policy, officially announcing the decision to invest in Phase 1 of HS2 for Britain's future in January 2012 after public consultation (Department for Transport, 2012) and the Phase 2 scheme in January 2013 (Department for Transport, 2013). The issue of rebalancing the widening North-South Divide has been specially highlighted. Regarding this ambitious regional perspective, the then Secretary of State for Transport, Philip Hammond, stated on the launch of the consultation process on 18th February 2011.

> *"I believe that a national high-speed rail network from London to Birmingham, with onward legs to Leeds and Manchester, could transform Britain's competitiveness as profoundly as the coming of the railways in the 19th century. It would reshape Britain's economic geography, helping bridge the north-south divide though massive improvements in journey times and better connections between cities—slashing almost an hour off the trip from London to Manchester"* (House of Commons, 2011).

2.Challenges

Although the current Government's perception and support for HS2 investment demonstrates a significant move away from a market-led approach in the 1980s and makes a resolution to address the persistent North-South regional divide through the HST investment, the challenge is enormous. This thesis has demonstrated that the advent of HST has simultaneous impacts on both inter- and intra-regional scales. One spatial scale interacts with and influences the other scale. In a national HST system, national capitals and large well-established regional capitals tend to be revived much more easily than their wider sub-regions. The ignorance of intra-regional inequality may lead to worsening inter-regional inequality. Without deliberate interventions, spreading the benefits for intra-regional development is problematic. In response to the HS2 proposal and the current government spatial-economic planning framework, the following discussion focuses on the challenges for the wider impact of HST in reducing regional inequality at these two scales.

Reducing Inter-regional Inequality

The Absence and A Need for An Overarching National Strategy of High-Speed Networks

The French experience demonstrated an evolving national spatial strategy of integrating air and HST, which has converted an over-dominant Île-de-France into an enhanced national high-speed transport network. 2-hour domestic TGV services could effectively outperform air services by transporting people from regional cities to catch long-haul airline services in Paris CDG Airport which, with four runways, has the largest airside capacity in Europe (Aéroports de Paris, 2011a). Consequently, Lille's international airport has had no chance to develop so far. The Lyon Satolas Airport-HST hub which is located outside Lyon city centre initially suffered from an underused HST station though the condition is improving with the construction of urban transit systems to and from the city centre.

The current HS2 proposal has been questioned about its integration with the other high-speed transport system, aviation. In the UK, air and HST have not been well integrated yet. The long-term aviation policy has been questionable due to the controversy of the third runway in the Heathrow Airport, which has resulted in the constrained aviation capacity and could hamper UK's international connectivity without active intervention. It has been argued that an overall transport strategy which could specify how HS2 fits to be part of the strategy has been absent (House of Commons Transport Committee, 2011a). "Investors find it extraordinary that we are taking decisions over high-speed rail and aviation in isolation"(Eagle, 2012). What is more, the UK's

major hub airport is currently poorly connected to Britain's main rail lines and the rail access to HS1 is difficult (Department for Transport, 2012).

The French approach of integrating air and HST needs to be adapted to British economic geography and national contexts. Gradually, a different model of integrating airs and HST has emerged in the HS2 proposal. HS2 stations in Birmingham and Manchester have been proposed with two stations for each city: one in the city centre and the other outside the city centre, with good connectivity for airports, motorways and the existing national railway. The allocation of the two stations outside city centres appears to address the constrained aviation capacity in Heathrow.

> *"Heathrow is not the only airport whose customers might make use of any high speed network. HS2 Ltd's report also recommends that a second interchange station should be built close to the National Exhibition Centre, providing direct access to Birmingham Airport, as well as to the [WCML] and the M42 and M6. The Government agrees that such an interchange has great potential to support wider connectivity […] HS2 Ltd will evaluate the business case and options for a similar interchange providing access to Manchester Airport on similar terms" (Department for Transport, 2010, p.20).*

Given that Manchester Airport has become a key international airport hub outside London, and concerning the constrained capacity of Heathrow, better connectivity of airports and HST hubs in regional cities seems to be an alternative.

However, apart from the Birmingham Interchange HS2 station has been approved, according to the latest route of Phase 2, Manchester Airport HS2 station is not a through station on the national HST network but on a spur to Manchester Piccadilly. It does not have an equivalent and serious hub position as Birmingham Airport, which in the long term could possibly shrink half of the air market which Manchester Airport has so far established, because major cities in the east coast and midlands even Liverpool could easily take high-speed services to Birmingham Airport. It is untimely that Sir Howard Davies' Airport Commission is not completed until 2015. But an interim report should be released in 2013 and closely integrate with the HS2 Phase 2 scheme to vitally address these concerns.

The HS2 Route and New Stations

Owing to the French economic geography, France demonstrated the hub-and-spoke architecture of a national HST system between national capital and major provincial cities although Paris is not centrally located. There is a clear pattern that two regional cities Lille in NPDC and Lyon in Rhône-Alpes have benefits the most from their HST opportunity and connectivity through a key decision of locating new HST stations in the city centre to integrate with urban redevelopment

projects and interchange with multi-modal connections into their city-regions or wider regional territories. The key is not a stop on TGV lines but the service pattern of HST because HST naturally tends to favour major hubs with more frequencies than other intermediate stops. TGV Haute-Picardie, Calais-Fréthun, Le Creusot, and Mâcon stations which are located outside city centres as intermediate stations between two hub cities are typical examples to illustrate this point. The lesson learnt here is to avoid creating new Beetroot stations in the future (Monde, 2004). In addition, the decision-making process of the TGV-Nord route and Lille Europe station presented in Chapter 8 is a classic example to illustrate how a hub location was critically decided and created with regional consensus that they needed to be in the same boat: Lille is traditionally a regional capital, deserving to be a major hub; meanwhile, the rest of region will mutually benefit too from TGV services as a result of the interoperability through the electrification of conventional lines implemented by decentralised regional government.

For the UK, the decision of locating two HS2 stations around Birmingham in Phase 1 as mentioned above did not arouse much opposition except the concern for the poor connection at the proposed location in Birmingham Curzon Street, which will be discussed further later. However, regarding new HS2 stations in Phase 2, two relevant problems could be identified from the French experience mentioned above.

First, a regional consensus on decisions of HS2 stations in NWE in the long term is absent, which inevitably leads to intensive speculation over winners and losers from HS2. The Financial Times vividly reported the tensions from these fragmented views before the proposal of Phase 2 was announced. Liverpool city region local enterprise partnership (LEP) has concerned that the rail time from Liverpool to London will be nearly 40 minutes longer than from Manchester. The Cheshire and Warrington LEP lobbies for a stop at Crewe with a new proposal campaigned by Cheshire business and political leaders (Bounds, 2013). As for all these reactions, Manchester is mainly concerned that the fastest connectivity to London would be weakened if many intermediate stops are made (Bounds & Odell, 2012). Later, the lately announced Phase 2 scheme (HS2 will connect with the WCML at Crewe, which further reduced 10 minutes between London and Liverpool) demonstrated that, in the absence of regional operation, the DfT (HS2 Ltd.) proposed this scheme based on the attempt to relieve political pressure from individual local authorities.

This lack of regional consensus is worsened and more difficult to tackle after the abolition of regional strategies and mechanism post-2010. All local authorities and LEPs are concerned about their own connectivity to London rather than with a regional perspective and, in this case, it has an inherited negativity and impossibility for intra-regional development. In fact, without a strategic solution endorsed by regional apparatus, the possible result will be the case, as we have seen, that larger cities will have the most frequent services and benefit the most, while other cities could

have marginal effects although they are served by HS2. This does reflect serious implications for regional development through HS2; this part will be further elaborated in section 10.3.2.2.

Secondly, the proposed HS2 stations in the east branch such as Sheffield Meadowhall and East Midlands Hub are intermediate stations outside city centres, which will have fewer stops than large provincial core destinations such as Birmingham, Manchester and Leeds. This circumstance does not necessarily mean that they will lose. The key point is that whether local authorities could collectively develop strategies exploiting the arrival of the HS2 opportunity for the wider East Midlands to enhance their interchange function with several traditional city centres and avoid Beetroot stations from the French experiences.

The Integration of New HS2 and Existing Stations

Due to the well-developed and compact urban fabric, the integration of new HS2 stations with existing stations in the city centre with urban regeneration projects is a big challenge too. According to the essential guidelines for developing the HS2 project, since HS2 stations will be limited to large regional cities, special attention needs to be paid to their locations in city centres, otherwise potential may not be maximised. Firstly, regarding the integration of stations, two HS2 hub stations have been planned in London by the government: one in central London with a rebuilt Euston station and the other in suburban London with a Crossrail interchange station at Old Oak Common in West London, where a massive confluence of different transport modes is planned: national rail, regional express train (Crossrail), metro, a link to Heathrow International Airport, and motorways. A direct link between HS1 and HS2 is included too, but the terminal station of HS1 in St. Pancras and HS2 in Euston station are still treated in isolation, despite the fact that the two are located less than a half mile apart. An extended super hub in central London could replace the Euston scheme if an imaginative solution could be worked out. Also in Birmingham, a new HST station in the city centre is proposed at Curzon Street, 800 meters away from the existing Birmingham New Street station, which seems poorly designed to serve as a regional super-hub. The Lille experience provides a relevant lesson: the interchange function between Lille Flandres and Lille Europe stations has been carefully designed to make the 400-meter transition as smooth as possible, though it is not perfect. For both challenges, Sir Terry Farrell proposed a new dedicated pedestrian link to connect Euston station with St. Pancras and King's Cross for a Europe's super rail hub which is estimated to serve more than 250 million passengers per year, and an anticipated new rail hub which would improve interchange between the three stations (new HS2, Birmingham New Street, and Moor Street stations) with a major urban regeneration area in East Birmingham. Secondly, in order to realise the anticipated place-making through the HS2

opportunity, the funding mechanism and cooperation will be critical to realise the vision and projects as EuraLille and its following urban projects have achieved.

Reducing Intra-regional Inequality

Based on the comprehension of North West England in this thesis, the following implication in reducing intra-regional inequality further is drawn out for North West England as follows.

The Need to Ensure the Improved Intra-regional Connectivity for Regional Interest

The experience of the WCML showed that a market-led upgraded approach prioritising the inter-regional HST services has resulted in a negative impact on intra-regional development. Clearly, HS2 will relieve the pressing capacity problems on existing main lines and major hubs, freeing space for growth in freight usage and short-haul commuter journeys, and present the opportunity to integrate the region's economy using the conventional rail networks. However, the released capacity is just the first step. A strategic role will be needed for long-term regional revival.

Firstly, it is well-established that HS2 should not be treated in isolation. Before the completion of HS2 by 2032/3, the rail capacity of conventional lines into the regional hub in Manchester will be significantly improved. Manchester hub rail enhancements across Manchester city centre, the North West electrification, the North Transpennine electrification, and Todmodern curve reinstatement which were approved by the British Government in 2011 could remove the bottleneck and technical barrier from which the regional centre and the wider region have suffered, including Manchester–Preston via Bolton, Manchester–Liverpool, Preston-Blackpool, Manchester-Burnley, Manchester -Leeds and York. The "high-speed high speed" HS2, the existing "low-speed high-speed" WCML, and regional electrification will need to be closely integrated in order to melt away the relentless, long-lasting North/South intra-regional unequal structure (P. Hall & Wray, 2011). Also, Hall (2013c) emphasises the importance of irrigating hosepipes which connect the local links to HS2.

Secondly, the long-awaited electrification or reinstatement to improve connectivity is not enough to ensure the rail services work for regional interest. Under rail privatisation, these different rail systems HS2, the WCML, and other transport operators naturally concern for different rail markets. A devolved transport authority (or at least a partnership) responsible for a region beyond the metropolitan cities will be needed and empowered at the local level to take care of any blind spots and ensure these train operators could work collectively to benefit region development, in

particular due to rail privatisation in the UK, regional rail services are not provided by the government, but through specific train operators on specific routes. Moreover, the experience in NPDC has shown that SNCF and regional government have gradually divided views on train services when the regional passenger rail services were decentralised. The lesson from the issue of financial sustainability for running TERGV services has illustrated a need for proper involvement from private input rather than pure public money. In addition, as IPPR North has maintained, a need for a reform of decision-making process on transport funding (the way transport projects are assessed and prioritised) beyond BCR (benefit-cost-ratios) and high population densities (IPPR North & The Northern Economic Futures Commission, 2012).

The Absence of An Enabling and Inclusive Regional Planning Framework for Regional Intervention

This thesis demonstrates that it is not the arrival of TGV alone that achieves the reduction of regional inequality. As the French experience shows that decentralised regional governance, the concern for transport equality, and supportive funding for capacity building are critical. Given that the current HS2 proposal has well recognised that HS2 alone is not enough and a number of key factors are needed to maximise the wider effects, it is unclear and confusing that the "region" which is termed by British Government actually means a genuine "regional" territory or a "sub-region" type of city-region (regions and sub-regions were defined in section 2.5.2). According to the HS2 decision report, the concern for the distributional impacts of HS2 depends on integrated transport network, rail market and demand, leadership, and city planning- an "effective integration of high speed rail into city centres and local transport networks, serving corridors where markets are well understood and where demand justifies providing a high frequency service, strong local leadership, and […] the integration of high speed rail with wider city planning" (Department for Transport, 2012, p.66). In line with this awareness, the Government stressed the importance of developing strategies by cities' leaders to capitalise on those opportunities offered by high-speed links and to maximise the long-term positive impact on local and regional economic development. In order to extend the benefits beyond the station vicinity, the Government promises to establish a broader local policy framework (local and regional planning frameworks and wider policies) which will facilitate effective delivery in both cities with new HST and non-HST stations which would benefit from integration with a HST network (Department for Transport, 2012, p.67).

However, there is a contradiction between these statements and national spatial-planning policies. Although the British government sets the vision on rebalancing the North-South divide, its statement and approaches have been subconsciously concerned with the urban scale or, at the best,

with the city-regional scale rather than a regional scale. In fact, in England post-2010, regional strategies and mechanisms had been abolished and replaced by local enterprise partnerships (LEPs) which have been largely based at the city-regional level. Without a clear and effective transport and spatial-economic strategy for a region, benefits may be reduced. And in the absence of any regional tier, effective regional planning becomes a responsibility of government itself, and its agencies. This view could be subtly perceived from this statement in the HS2 proposal below.

> *"The Government and HS2 Ltd will work with local authorities as detailed plans for the proposed high speed rail network are developed, but it will be for the authorities themselves to ensure that effective integration happens" (Department for Transport, 2012, p.67).*

In addition, the delivery would depend on strong and visionary political leadership alongside effective institutional governance which is Condition 5 identified in this study (section 9.2.1.5). But there is a danger of ignoring the need for political leadership and governance at the regional level. In North West England, five LEPs have been established, namely Greater Manchester LEP (10 UAs), Liverpool City Region LEP (Merseyside & Halton), Cheshire and Warrington LEP, Lancashire LEP, and Cumbria LEP. However, these LEPs possess different capacities and strength. In fact, Lancashire LEP embraces the two non-HST sub-regions which had delivered the weakest economic performance in this study. Without strategic regional intervention, the disadvantage will possibly remain and regional inequality will be persistent.

At the national level, strong LEP development is important to develop strong hubs. It could be regarded as the first step for the wider impact of HST as the experience of city-regional development Lille and Manchester offer. But it could not guarantee positive regional development as the contrasting outcome between NWE and NPDC. In particular, when several LEPs in NWE are competing with each other for a fastest link with London rather than seeking a regional consensus, it is not constructive for regional prosperity. As Will Hutton, Executive Vice Chair of the Work Foundation, has stated the clear implication, from the *City Relationships* study, is that "parochialism is the enemy of prosperity"(The Northern Way, 2009c, p.1). Although this statement is based on a study regarding city-regional prosperity, it is also true and applicable to regional prosperity. Among the five LEPs in NWE, the Manchester city-region may be well placed (and well organised) to take advantage of the arrival of a dedicated high-speed rail route.

Spreading the benefits more widely and promoting balanced growth across the region will be a challenge. These necessary transport investments could not sufficiently guarantee the transformation of post-industrial towns which have suffered from path dependency and a lack of indigenous innovative capacity. The experience of Lens in NPDC has proven this point. Therefore, the second aspect must be an emphasis on social change in parallel with economic change in these peripheral areas. Hall (2012) points out there are "the endless unaltered people" who find it

difficult to adapt to changes even if transport improvements are made; thus, other conditions are needed. The same learning point could be taken from NPDC. An inclusive governance structure and concern for equality is very important for any possible transformation.