

*The Liberalisation of European Railway Markets –
Laissez-Faire versus Interventionism.*

A Comparative Analysis of the Approaches to Railway Privatisation in
the United Kingdom and Germany

Ph.D. thesis

University College London

Bartlett School of Planning

Submitted by: Oliver Knipping
Born 30 July 1971

Supervised by: Prof. Sir Peter Hall
Michael Edwards
University College London

London, 04 September 2002



PAGE
NUMBERING
AS ORIGINAL

*To Joanna,
in love*



*To my inspiring teachers,
Sir Peter Hall and Michael Edwards*

Acknowledgements

Special thanks to my parents, my grandmother and my friends for 24-hour moral and intellectual encouragement! I am very much indebted to the individuals at the Institute for Humane Studies and the Institute for Economic Affairs for their academic support and invaluable criticism. Here, I owe special thanks to my summer research fellows, the librarian Elaine Hawley, Dr. Paul Edwards and Prof. Jeremy Shearmur of the Institute for Humane Studies, Virginia and to Christine Blundell of the Institute of Economic Affairs, London. Also, I would like to thank my friends and colleagues at the Bartlett School, especially Dr. Stephen Marshall and Prof. David Banister for inspiring comments on my draft. Finally, I appreciate the Friedrich-Naumann-Stiftung's generous financial support of my research with funds of the German Department of Education, the Bundesministerium für Bildung and thus, the German taxpayers.

Thank you!

Abstract

This thesis comprises railway innovation in the 19th century, railway regulation, recent railway reforms across Europe and a theoretical analysis. The historical study is complemented by an investigation of the rationale for extensive regulations and eventual nationalisation of railway systems. The nationalisation schemes granted exclusive rights to public undertakings to provide a public railway and sometimes more extensive transport services. Notwithstanding subsidies and a protectionist railway policy, the railways could not compete successfully with other modes of transport; the railway industry's market share steadily declined across the European Community. As a result the European Community passed legislation to reverse the deteriorating trend. This legislation and its national interpretations are evaluated before proceeding to brief case studies of the railway liberalisation undertaken in France, the Netherlands and Sweden; the German and British approaches to railway reform are then analysed in greater detail. Arguing that liberalisation was often a watered down version of privatisation schemes that had been compromised in the political process, the thesis develops an alternative model of privatisation, centred on a concept of market-based integration and a competitive railway market. It is proposed that the current crisis on the British railways and the slow progress of railways in other countries could be resolved by means of this concept.

Table of Contents

<i>List of Abbreviations</i>	11
<i>List of Charts</i>	13
<i>List of Figures</i>	15
<i>List of Maps</i>	16
<i>List of Tables</i>	17
O. Introduction	18
I. The Early Railway Age:	
Innovation, Competition and Regulation	27
<i>A. The United Kingdom</i>	<i>29</i>
1. Opposition and the railway manias	29
2. Competition and concentration	33
3. Changing times - from entrepreneurial freedom to regulation	40
4. The World Wars, intermodal competition and nationalisation	52
<i>B. The Kingdom of Prussia and the German Reich</i>	<i>75</i>
1. The early railway promotion and the 1820 National Debt Law	75
2. Government interference and the 1838 Prussian Railway Law	81
3. National versus private railways	85
4. The motivations for nationalisation	91
<i>C. Conclusion</i>	<i>95</i>

II. Regulation and Nationalisation	97
<i>A. The market imperfections doctrine and interventionism</i>	<i>98</i>
1. Monopoly	101
1.1 Natural monopoly	105
1.2 Contestability	108
2. Public goods	111
3. External effects	113
4. Public policy	116
<i>B. Conclusion: Deregulation and privatisation</i>	<i>118</i>
III. Case Studies	121
<i>A. Railway reforms across Europe</i>	<i>122</i>
1. The liberating impact of the European Union	122
2. France	131
3. The Netherlands	133
4. Sweden	137
5. Conclusion: A market based integration of Europe's railway network	142
<i>B. Railway reform in Germany</i>	<i>146</i>
1. The nationalised German railway system on the path to reform	146
1.1 Reasons for the structural change in the transport market	149
1.2 Railway reforms postponed	155
2. The report of the Regierungskommission Bundesbahn	159
3. The Deutsche Bahn AG	162
3.1 The first stage of the reform	162
3.2 The second stage of the reform	167
3.3 The access price system of the DBAG and DB Netz	169
3.4 Regionalisation of social service responsibilities	177
3.5 Performance	181
4. Conclusion	185

<i>C. Railway reform in the United Kingdom</i>	190
1. The nationalised British railway system on the path to reform	190
1.1 Reasons for the structural change in the transport market	200
1.2 Early railway reforms	204
1.3 The Reshaping of British Railways	207
2. New Opportunities for the Railways – the Conservative’s policy	223
2.1 Reforming British Railways	223
2.2 Digression: Deregulation in the UK bus industry	228
2.3 The 1992 White Paper	232
3. The vertical separation of the British railway system	238
3.1 The Train Operating Companies	241
3.2 The Freight Operating Companies	248
3.3 Railtrack	251
3.4 Suppliers	261
3.5 Government authorities involved	262
3.5.1 The Rail Regulator	264
3.5.2 The Franchising Director	265
3.5.3 Rail safety bodies	267
3.6 A New Deal for Transport: New Labour’s transport policy	269
3.7 The railway crisis	274
4. An assessment of the reform process	279
4.1 Performance	279
4.2 Infrastructure and train operations	284
4.3 Regulatory interference	289
4.4 Safety	292
5. Conclusion	296

IV. Privatisation – An Alternative Model	299
<i>A. General assumptions</i>	<i>300</i>
<i>B. Network economies and the railway industry</i>	<i>304</i>
1. The mystified meaning of integration	309
2. Transaction costs	312
3. Regulating agencies and bottleneck regulation	316
<i>C. Horizontal integration versus separation</i>	<i>327</i>
1. Layer I: the physical railway track infrastructure (ROCs)	331
2. Layer II: the network of traffic and safety operations (SOCs)	334
3. Layer III: the train operations (TOCs)	338
<i>D. Vertical integration versus separation – market-based integration</i>	<i>343</i>
1. Model A: Integration of layers I, II & III	347
2. Model B: Integration of layers I & II	349
3. Model C: Integration of layers I & II with institutionally separate TOCs	352
4. Model D: Integration of layers I & III with institutionally separate SOCs	354
5. Model E: Full institutional separation of the three layers	357
<i>E. Assessment of the reform proposals</i>	<i>360</i>
1. Scale and scope economies	360
2. Open versus exclusive access rights	363
3. Pricing of infrastructure and congestion pricing	365
4. Market power and regulation	369
5. Cross-subsidies and social service subsidies	371
<i>F. Conclusion</i>	<i>373</i>

V. Synthesis	375
<i>A. Comparison of the privatisation processes in Europe</i>	<i>376</i>
1. Open access provision	377
2. Scope of privatisation	378
3. Interventionist potential	380
4. Extent of state subsidies	382
5. Model E implementation	383
<i>B. Concluding arguments</i>	<i>386</i>
VI. Appendix	389
<i>A. The United States of America</i>	<i>390</i>
1. The early railway promotion and organisational innovation	390
2. Land grants and the first transcontinental railway	401
3. The railroad cartels and the National Grange	409
4. Federal legislation	415
<i>B. Statistics and Legislation</i>	<i>419</i>
1. Railway Returns for the years 1850-1912	419
2. First Schedule of the Railways Act, 1921	421
3. The Royal Prussian Railway Law of 1838	425
4. Prussian Law for the Purchase of the Lower Silesian Railway, 1852	433
<i>C. Scope for research in transport economics – the pricing of roads</i>	<i>435</i>
VII. Bibliography	437

List of Abbreviations

AEG	Allgemeines Eisenbahngesetz
ASI	Adam Smith Institute
ATP	Automatic Train Protection
AWS	Automatic Warning System
BEV	Bundeseisenbahnvermögen
BMVBW	Bundesministerium für Verkehr, Bau- und Wohnungswesen
BR	British Railways
BRB	British Railways Board
BTC	British Transport Commission
BV	Banverket
CPTA	County Public Transport Authority
DB	Deutsche Bundesbahn
DB AG	Deutsche Bahn AG
DEAG	Deutsche Eisenbahn AG
DETR	Department of the Environment, Transport and the Regions
DTLR	Department of Transport, Local Government and the Regions
DM	Deutsche Mark
DR	Deutsche Reichsbahn
EBA	Eisenbahnbundesamt
EC	European Community
EEC	European Economic Community
EIBV	Eisenbahninfrastruktur-Benutzungsverordnung
ENeuOG	Eisenbahnneuordnungsgesetz
ETCS	European Train Control System
EU	European Union
EWS	English Welsh and Scottish Railways
FFG	Freight Facility Grant
FOCs	Freight Train Operating Companies
GG	Grundgesetz
GPS	Global Positioning System
GWB	Gesetz gegen Wettbewerbsbeschränkungen
HSC	Health and Safety Commission

HSE	Health and Safety Executive
IEA	Institute of Economic Affairs
ISCOs	Infrastructure Supply Companies
IRSA	Independent Railway Safety Agency
NS	Nederlandse Spoorwegen
NSB	Norges Statsbaner
OPRAF	Office of Passenger Rail Franchising
pkm	passenger-kilometres
POCs	Passenger Train Operating Companies
PP	Parliamentary Papers
PSO	Public Service Obligation
PSR	Passenger Service Requirement
PTE	Passenger Transport Executive
RFF	Réseau Ferré de France
RSL	Railway Safety Limited
ROCs	Rail Track Operating Companies
ROSCOs	Rolling Stock Leasing Companies
SJ	Statens Järnvägar
SNCF	Société Nationale des Chemins de Fer
SOCs	Safety Operating Companies
SPAD	Signal Passed At Danger
SRA	Strategic Rail Authority
SSD	Safety and Standards Directorate
SSRA	Shadow Strategic Rail Authority
tkm	ton-kilometres
TAG	Train Access Grant
TOCs	Train Operating Companies
TPS	Trassenpreissystem
TPWS	Train Protection Warning System
WWI	World War I
WWII	World War II

List of Charts

Chart 1: Total mileage of UK Railways 1850-1910	32
Chart 2: Growth in mileage of UK Railways 1850-1910	32
Chart 3: Net Rate of Return on Capital of UK Railways 1870-1912	44
Chart 4: Operating Ratio of UK Railways 1854-1913	46
Chart 5: Growth in Passengers and Freight on UK Railways 1880-1910	46
Chart 6: Passenger Train Receipts per mile 1852-1913	49
Chart 7: Freight Train Receipts per mile 1852-1913	49
Chart 8: Changes in Freight and Passenger Receipts per mile 1853-1913	50
Chart 9: Increases in Railway Charges and Costs 1913-1921	54
Chart 10: Net Revenue 1854-1913 and 1919-1938	55
Chart 11: Operating Ratio of UK Railways 1919-1938	55
Chart 12: Decline in Passenger Railway Business 1919-1938	61
Chart 13: Decline in Freight Railway Business 1919-1938	61
Chart 14: Receipts of UK Railways per mile 1919-1938	62
Chart 15: Changes in Freight and Passenger Receipts per mile 1921-1938	62
Chart 16: Conveyance of Merchandise, Minerals and Coal 1920-1938	65
Chart 17: Length of German Railways 1835-1915	80
Chart 18: Increase of the German Railway Network 1835-1915	88
Chart 19: Prussian Railway Network 1860-1910	90
Chart 20: Freight Charges per ton-kilometre on Prussian Railways 1840-1909	93
Chart 21: Modal Split in the European Community's Passenger Transport	123
Chart 22: Modal Split in the European Community's Freight Transport	124
Chart 23: Modal Split in Germany's Passenger Transport 1960-1999	147
Chart 24: Modal Split in Germany's Freight Transport 1960-1999	147
Chart 25: Growth of the Transport Market between 1960 and 1990	150
Chart 26: German Railway Reform	163
Chart 27: Workforce of the DBAG since Privatisation	166
Chart 28: DBAG's Passenger Traffic since Privatisation	181
Chart 29: DBAG's Freight Traffic since Privatisation (ton kilometres)	182
Chart 30: DBAG's Freight Traffic since Privatisation (tons)	182
Chart 31: Total Investment in Railway Infrastructure	184
Chart 32: Federal Government Expenditure for Railways	184

Chart 33: Operating Returns of British Railways 1948-1966	192
Chart 34: Gross Receipts and Working Expenses of British Railways 1948-1962	194
Chart 35: Passenger and Freight Receipts of BR as % of Gross Receipts 1948-1962	194
Chart 36: British Railways Passenger and Freight Traffic 1948-1962	195
Chart 37: British Railways Freight Traffic 1948-1962	195
Chart 38: Private Road versus Public Road & Rail Passenger Transport 1950-1960	196
Chart 39: Modal Split of BR and Public Road Passenger Transport 1950-1960	197
Chart 40: Modal Split of Inland Passenger Transportation in the UK 1950-1960	197
Chart 41: Modal Split of Freight Traffic between Rail and Road 1952-1962	198
Chart 42: Modal Split of Freight Traffic between Rail and Road 1952-1962 (%)	199
Chart 43: Growth of the Inland Transport Market between 1950 and 1960	202
Chart 44: Reduction in Staff Levels 1958-1962	214
Chart 45: Government Support to the National Rail Industry 1985/6-2000/01	247
Chart 46: Franchise Payments towards Train Operating Companies 1996-2012	247
Chart 47: Share Prices of Railtrack 1996-2001	255
Chart 48: Total Passenger Kilometres 1986/7 to 2000/01	280
Chart 49: Total Passenger Journeys 1986/87 to 2000/01	280
Chart 50: Total Passenger Revenue 1986/87 to 2000/01	281
Chart 51: Freight Lifted 1982/83 to 2000/01	282
Chart 52: Freight Moved 1982/83 to 2000/01	282
Chart 53: Investment in the National Rail Industry 1986/87 to 2000/01	283
Chart 54: New York State Canals, Rivers and Railroads 1853-1898	391
Chart 55: Length of Railways in the United States 1830-1915	396
Chart 56: Increase in the Railroad Network of the United States 1830-1915	397
Chart 57: Freight Rates per Bushel of Wheat between Chicago and NY 1868-1893	411
Chart 58: Receipts from Passenger and Freight Traffic 1871-1892	412
Chart 59: Net Revenue of U.S. Railroads 1871-1892	412
Chart 60: Dividends of U.S. Railroads 1871-1892	413
Chart 61: Operating Ratio 1890-1935	417
Chart 62: Miles of Railroad operated by Receivers or Trustees 1895-1935	418

List of Figures

Figure 1: The Privatised Railway Industry Structure	239
Figure 2: Stages in the Franchising of the first three Passenger Railway Franchises	245
Figure 3: Railtrack's Asset Base	252
Figure 4: Vertically Integrated Railway System	301
Figure 5: The Layers of Railway Systems	305
Figure 6: Monopolistic Bottlenecks in a Railway System	319
Figure 7: The Limits of Markets in Large Technical Systems	320
Figure 8: Vertical Int. of Layers I & II, Network Provider(s) may run TOCs	349
Figure 9: Vertical Int. of Layers I & II, institutional Independence of Layer III	352
Figure 10: Vertical Int. of Layers I & III, institutionally separate Safety Operations	354
Figure 11: Full institutional Separation	358

List of Maps

Map 1: Map of the English Railways in 1848	28
Map 2: Map of England & Wales under control of the Principal Railway Companies	51
Map 3: Survey Map of the German Railways in 1911	74
Map 4: Density of Passenger Traffic	208
Map 5: Density of Freight Traffic	209
Map 6: Proposed Withdrawal of Passenger Services	213
Map 7: Flows of Freight Traffic	216
Map 8: Proposed Routes of Liner Trains	217
Map 9: Canals and Railroads in New York in 1840	391
Map 10: Railroads in 1840	393
Map 11: Railroads in 1860	393
Map 12: Newcomers to the United States between 1840 and 1850	393
Map 13: Newcomers to the United States between 1850 and 1860	394
Map 14: Urban Places in 1860	394
Map 15: Rates of Travel in 1800	401
Map 16: Rates of Travel in 1830	401
Map 17: Rates of Travel in 1857	402
Map 18: Major Trans-Mississippi and Pacific Railroads up to 1893	404
Map 19: Landgrants to the Railroads (election poster)	407
Map 20: Landgrants to the Railroads (actual)	407

List of Tables

Table 1: Revenue and Assessed Costs for British Railways, 1961	210
Table 2: The Franchised Train Operating Companies	242
Table 3: Past Payments and Receipts from the TOCs	243
Table 4: Future Payments and Receipts from the TOCs	244

Section O

Introduction

Today, British railways lie in shambles. This is despite the railway age starting its journey in 19th century Britain and a radical railway reform under the Conservative government of John Major at the end of the 20th century. Dreadful railway accidents in the last decades of the 19th century and at the turn of the millennium alike prompted government action and a reversal of deregulation and entrepreneurial policies so fashionable in Britain prior to the accidents. There is a further parallel between the events in the 19th and 20th centuries as it was alleged with regard to both that the accidents followed a lack of investment and increased capacity to accommodate growing traffic volumes. Also, it was claimed that railway directors put their customers' life at risk to squeeze higher short-term profits out of their railway business, whilst safety devices were deemed to be inadequate.¹

More moderate approaches to liberalising the railways in Germany and other European countries such as France, the Netherlands and Sweden have not yet collapsed, as has the British hybrid. Still, governments in these countries under closer investigation have a variety of controlling stakes in the industry, which is also heavily dependent on state subsidies. The railway reforms and the final collapse of Railtrack in 2001 clearly illustrate that much scope is left to determine strategic reform proposals for the railway markets that will achieve long-term stability in highly complex and competitive transport markets.

In the past, politicians generally resorted to the rationale of central planning of railway systems or entire transportation networks. However, the trends in the railway industry up to the 1990s were often alarming with regard to a declining market share and debt accumulation, increases in congestion and pollution that governments were virtually forced to re-think their policy prescriptions.² Many railway systems proved unable to provide a prospect of a high-quality public service to the entire populace, eradicating their basic rationale for public funding. Despite subsidies and a protectionist railway policy, the railways could not compete successfully with other modes of transport. The railway industry's market share in the transport market was on a steady decline across the European Community. Government budgets were challenged to provide ongoing and

¹ Gourvish (1980), pp. 51-52 and Simmons (1978), p. 81 provide the arguments prevailing in the 1870s. This is dealt with in section I, whereas the author's case study on the UK privatisation in section III draws upon the 20th century disasters. While the London & North Western was at the focus of the disgraceful record in the 19th century, the current debate mainly targeted Railtrack.

increasing public support to the railways, funded by the taxpayers. However, higher demands from the railways for funds meant either an increase in the tax burden or a cut in other public services with an inevitable outcry from their corresponding interest groups and the electorate.

By the 1990s railway systems across Europe had become a heavy burden to public finance and politics, making comprehensive reforms inevitable. The search for new solutions to deep-rooted problems was supported by a political climate favouring deregulation and privatisation policies coming out of the Reagan and Thatcher years. However, the privatisation of hallmarks of national protectionism, such as Rolls Royce, Jaguar, British Airways and British Petroleum created few burdens compared to the railway sector and other perceived public utilities that require networks of fixed infrastructure to produce their final product. As duplication of railway tracks, water supply mains and cables running right next to each other has generally been considered as a waste of resources, competition in network utilities was usually ruled out due to the alleged natural monopoly character in the infrastructure.

Evidently, railway privatisation is a very delicate issue, in particular in the land of origin of the railways, where closures of highly unprofitable lines with virtually no traffic volume were strongly opposed by the entire public during the 1960s, the era of the Beeching plans. Rather ironically, Hibbs suggested a preoccupation with childhood train sets as a determinant in the British passion for railways. *“Politicians and the public alike appear to possess certain fixed ideas about railways that are by no means related to reality. A certain sentimental attraction may be their association with childhood train-sets. Anyone who experienced the floods of quite irrational emotion that accompanied the resistance to close even the least-used lines during the 1960s will be familiar with the problems we face...”*² But this points exactly to the core of the transport crisis. Since the early days of railroading, politicians and the public had certain ideas how to run a railroad, which did not necessarily match the business perspective of a profitable railway industry. Though regulation was at first extremely limited, it already moved in by the 1840s in the UK and Prussia, whilst gaining pace after the 1870s. *Section I* is dedicated to the early railway age in the UK and Prussia up to their respective railway nationalisations.

² European Commission (1996), paragraphs 10 15

³ Hibbs (2000), p. 47

The nationalisation schemes granted exclusive rights to public undertakings to provide public railway or even comprehensive transportation services, as in the case of the British Transport Commission. Whereas politicians and the public proclaimed to be readily aware of the dangers of private monopolies, they were either unaware of similar dangers arising from public monopolies or were placing an enormous trust in the workings of public undertakings. Though short-sighted, it was a common practice to judge monopolists exclusively on their potential danger to exploit their dominant market position. *“Economists, government agents, journalists and politicians in this country obviously love the word because it has come to be a term of opprobrium which is sure to rouse the public’s hostility against any interest so labeled. In the Anglo-American world monopoly has been cursed and associated with functionless exploitation ever since...”*⁴ In 1939 Schumpeter highlighted the beneficial effects of monopolies on innovation and stated that the monopolists would lose their market, if they were unable to stay ahead in the innovative race.⁵

Indeed, the nationalisation of the railway industry created the only type of monopoly that cannot be challenged by competitors, however outstanding their innovations or quality of products might be.⁶ The governments created legally protected national monopolies and eradicated both actual and potential competition. The 1947 Transport Act to nationalise the British railway system stated as the main objective of the British Transport Commission *“...to provide, or secure or promote the provision of, an efficient, adequate, economical and properly integrated system of public inland transport and port facilities within Great Britain for passengers and goods...”*⁷ Though the UK government very much hoped for the creation of an efficient transport system by central planning, Hayek had already, in 1944, issued his warnings about central instead of individual planning. Only the price system inhibits the capability to oversee the co-ordination of an opaque system like the operation of railways.⁸ In the aftermath of WWII, economists and politicians alike were nonetheless in favour of centralised public railways due to the assumed *special characteristics*

⁴ Schumpeter (1943), pp. 98-100

⁵ Schumpeter (1939), p. 102

⁶ Greenspan (1967), pp. 64-65 illustrates the danger of legal protection of markets with the example of the American Railroads. However, it must be emphasised that the railway has never had a monopoly of the market for movement, whether for passengers or goods. Thus, when using the term monopoly, great care must be taken with regard to the relevant market. Defining a market in narrow terms, such as the *railway market between Abergwyth and Shrewbury during the festive season* would designate a corresponding tram connection as monopolistic, whilst a wider definition, such as the *market for movement in Britain during the same period* leads to a different perspective with according implications for the regulation of the relevant market. This issue shall be dealt with further below.

⁷ Public General Acts 1947: Transport Act, §3

of the railway industry.⁹ Mises was probably one of their most outspoken critics. While nationalisations and the *Middle Way* or *New Deal* policies gained ground, he was a prime advocate of the free market economy as opposed to a centrally planned economy.¹⁰ Planning “...is the antithesis of free enterprise, private initiative, private ownership of the means of production, market economy, and the price system. Planning and capitalism are utterly incompatible. Within a system of planning production is conducted according to the government’s orders, not according to the plans of capitalists and entrepreneurs eager to profit by best filling the wants of the consumers.”¹¹

Section II investigates the rationale behind the nationalisations and their corresponding justification. It is commonly argued that the case for state owned railways must not be limited to pure *economic* arguments, but *social* and *environmental* considerations have to be taken into account. However, the assumption that the government must run railway systems as a public service to the benefit of the nation was increasingly eroded with the system’s growing dependence on state subsidies and the corresponding drainage on the country’s resources.¹² While the provision of railway services as a social service produced extremely poor results in terms of quality and value for money, the environmental argument also vanished with highly subsidised and protected railways that were constantly losing market shares in freight and passenger traffic.¹³ Neither social nor environmental challenges were met by the state-owned railway systems. Increasingly, decision makers had to confront doubts about the railways’ contribution to society’s welfare when the system required high subsidies, but offered a bad public service

⁸ In his 1944 critique of central planning in *The Road to Serfdom*, Hayek proved the superiority of competition and the free price mechanism over central planning with regard to the co-ordination of production activities due to the complexity of the decisions. See Hayek (1946), pp. 35-37 and Hayek (1999), p. 17

⁹ Ewers and Meyer (1993), pp. 15-26 note that German transport economists invented the *Besonderheitentheorie* to argue that conventional economics does not apply to the railway sector.

¹⁰ Mises (1952a), pp. 36-49. Similar to Hayek, he opposes a middle way between planning and *laissez faire*. In a very strong statement, Mises concludes: “*Laissez faire* means: let the individual citizen, the much talked about common man, choose and act and do not force him to yield to a dictator.” Thus, he arrives at the same conclusion as Hayek (1946) in *The Road to Serfdom* that central planning and interventionism lead directly into dictatorship and serfdom. See also Mises (1952b), pp. 527-543 and Mises (1997), pp. 83-94 on his critique of interventionism and its philosophy. Boettke (2000), pp. 19-22 sums up the main propositions of the Austrian school.

¹¹ Mises (1952a), p. 1

¹² Leaving the vast subsidies aside, the railway debt was indeed alarming. European Commission (1996), Annex I/2. The figures are in billion ECU: Italian railways: 42,1 (1994), German railways: 33,8 (1993), French railways: 28,7 (1994), British railways: 10,7 (1994), Spanish railways: 8,1 (1994).

¹³ Nash and Preston (1994), p. 19 note that “...the failure of rail companies even to perform well in those sectors in which they have a comparative advantage, such as long distance international passenger and freight traffic, and the perpetual complaints about the price, quality of service and inflexibility of rail transport leads to doubts as to whether railways are currently running efficiently.”

compared to a more efficient private provision of other means of transportation.¹⁴ This implies the question, whether society needs an extensive public railway system at all costs and also whether railways are assumed to be superior to other modes of transport according to some mystic principle. The European Commission's 1998 White Paper on transport clearly stated that railways were *better than all* other modes of transport by some, however, mystically unknown standard. Still, the Commission appeared to be startled by the *paradoxical* downward trend of the railway industry's share of the transport market. The White Paper notes "...that the railway is, on principle, better than all other means of transport and that it is 'paradoxical' that its market share is diminishing..."¹⁵. The author rather considers it as paradoxical that the railway industry, which is supposedly better than all other modes of transport, requires both heavy subsidies and massive market distortions in its favour in order to keep it from bankruptcy. Railway passengers and freight customers apparently preferred other modes of transport in recent years.

The policy of state intervention to achieve social and environmental goals produced exactly the crisis the railways were facing at the outset of the reforms in the 1990s. The railway protectionism of the past led to an antiquated railway system in urgent need of a general overhaul. The complex regulations and policies of the 20th and 19th centuries pressed the railway system into a straitjacket, crippling its potential to reply to intermodal challenges. In a competitive global market, national economies require efficient transport systems as basic inputs into their production. An innovative and flexible railway system is an integral part of an efficient transport system and may foster economic growth. When initial attempts to reform European railway undertakings did not have the desired outcomes, several countries resorted to more radical reforms, not least under the pressure exercised by the European Commission. *Section III* investigates the impact of the European Union on liberalisation of European transport markets with specific case studies. The special focus rests on the reforms in Germany and the United Kingdom.

¹⁴ The general railway and underground strike in France in 1995 highlighted the doubts about the necessity to uphold an extensive public railway system with vast public funding: Gerondeau (1996), p. 158 noted that the strike "...clearly revealed precisely where the railway was still necessary and where it has ceased to be vital. For the first time, contrary to what might have been thought and what was often said, the paralysis of the railways did not paralyse France." An opinion poll revealed that 80% of the French were unaffected by the strike action, while only 1% had been prevented from going to work. The strike caused some discomfort with 19% of the population, though the strike had its greatest impact on the Paris region. This was, however, only due to the strike of the Paris metro and bus system and was independent from the national railway network.

¹⁵ European Commission (1998b). Gerondeau (1997) makes a strong argument to leave the decision to the marketplace whether or not society needs railways. In the 1970s Hall and Smith (1974, pp. 17-19) came up with an unconventional proposal to convert railways into roads with limited access. Their findings suggest that lorries, cars and buses could be transferred from residential streets to the road ways which would improve the environment in those areas

This thesis aims to illustrate that the railway industry is a *business like any other business* in theory and may be so in practice.¹⁶ However, it will become obvious in sections I, II and III that other objectives were prevailing from the government's, the public's and lobbyists' standpoints, which rendered a corresponding operation impossible. Therefore, *section IV* develops models to reform current railway systems. Meticulous planning of privatisation would however contradict a thorough reform process, as the optimal structure of a railway system is an unknown variable. If the optimal structure were known, the British Transport Commission or similar planning boards would have incorporated the knowledge long ago. Different models of horizontal and vertical separation are proposed which are then discussed in the light of their likely potential and outcome. The basic idea of a strict vertical separation into three instead of the more commonly used two layers is based on Knieps' comparison of the railway industry to air traffic.¹⁷ When drafting railway reforms, special concern is taken to leave the privatised railway system the freedom to adjust according to the entrepreneurial and innovative potential without a tight government straitjacket. The railway market may best be regulated by self-regulation of competitive market forces.¹⁸ Thus, the models are based on Hayek's insight that scientific predictions in market processes are impossible because knowledge is dispersed across the individual members in society. Accordingly, individual planning is superior to central planning.¹⁹ The strength of the models developed in section IV is their capability to offer economic solutions to the railway problem, which may also be adjusted to states with a moderate approach to railway reform, though certain beneficial effects would be lost in a compromised reform.

Prior to any reform it is assumed that the property rights in the railway industry are clearly distributed. As the government *owns* and *operates* the railway system, section IV suggests that contractual arrangements between the government and the private sector railway industry may be negotiated at the time of privatisation. Those arrangements may include a non-discriminatory open access provision or obligations to run (un-)subsidised trains to remote villages with virtually no traffic volume but high costs. As long as these or

¹⁶ The European Commission 1996 White Paper stated a similar goal in paragraph 21: "To overcome these weaknesses and to exploit future opportunities, the Community needs a new kind of railway. It should be first and foremost a business. It should have the independence and resources to compete."

¹⁷ Knieps (1996b)

¹⁸ Blundell and Robinson (2000), pp. 15-18 and Hibbs (1982), p. 77

¹⁹ This was the focus of Hayek's 1974 Nobel Prize Memorial Lecture on *The Pretence of Knowledge*, see Hayek (1996), p. 14: *Die Anmaßung von Wissen*. Hall also questioned the basic rationale of planning in Hall (1969): *Non Plan: An Experiment in Freedom* and Hall (1977): *Planning's museum of disasters*.

any other contractual arrangements are agreed upon *prior* to the actual privatisation at full information to the bidders for the services, they are not infringing upon the railways' property rights, as they are simply derived from the previous state ownership and in the end from the ambiguous processes which led to nationalisation in the first place. Nonetheless, it must be perfectly clear to decision makers that corresponding obligations have an effect on the sale price of the industry and on the final success of the railway reform. The governmental requirements might even be such that no private company applies to run the infrastructure. Alternatively, applicants may ask the government for subsidies to fulfil the demands or the government could opt to run the infrastructure as a public company, while only the train companies would be sold off. A utopian task to dream up a railway structure from a state of nature environment, where the railways would be left to themselves might be easier, as logically no final predictions about the outcome can be made. Still, the variables in the real world scenario were set by government regulation and nationalisation. Therefore, the possibility to start from scratch is ruled out. Now, it's the governments' responsibility to release the industry, so that the railways may flourish, if the market so demands.

This thesis neither takes on a *pro-rail*, nor an *anti-rail bias*. However, a privatisation in accordance with the structure suggested in section IV cuts back on regulation, promotes the opening up of the railway market and encourages competitive and innovative entrepreneurs to enter the industry. As a result, it is expected that the railways will exploit their competitive advantages over other transport modes and adapt their structures accordingly. Complementary to this, a full-scale reform of the entire transport and communication markets is required to establish a level playing field between the diverse actors in the markets. In addition to improving the situation for the railways, a comprehensive railway reform could bestow reform-minded politicians with further arguments to liberalise other markets by releasing them entirely to the private sector, which could result in pricing schemes in road, water and air transport.²⁰ Such reforms offer a great potential to enhance the transport market's efficiency, the country's material wealth and its competitiveness in the global economy. As the reforms induce a more efficient use of scarce resources, they also benefit the natural environment.

²⁰ A brief digression into the privatisation of roads is made below in appendix VI.C. Also, the author gave a lecture on the private supply of roads in a paper presented to the 1999 Institute of Electrical and Electronics Engineers Conference in Cape Town, Knipping (1999). Efficient pricing schemes are a prerequisite to creating a non-distortive transport system across all modes.

The last *section V* reconsiders the case studies investigated in the light of the model developed in section IV to locate the flaws in past railway reforms and most urgent fields for further action. Though none of the case studies under closer investigation came close to a *laissez faire* model with government intervention being absent, the scope of the reforms in the EU varies markedly, despite the influential EC Directive 91/440. The synthesis then draws a conclusion with a brief outlook to future reforms and research in transport economics. This thesis shows how interventionism hampered the development of the railway industry throughout its history. Notwithstanding the privatisation efforts, the government is still present at all stages in European transport markets, limiting their potential. Though political reasons may support regulatory control of the transport industry, a compromise between a free market and interventionism often leads to worse outcomes. *“Both competition and central direction become poor and inefficient tools if they are incomplete; they are alternative principles used to solve the same problem, and a mixture of the two means that neither will really work and that the result will be worse than if either system had been consistently relied upon.”*²¹ The European Union and her member states have mounted the first step towards a private supply of transportation services that already led to visible improvements in railway markets. The EU must continue to liberalise the European transport and communication markets. Social considerations should be dealt with in social policy. The railway industry is a business like any other industry. Now, they must run *free*.

The complexity of this thesis ranges from the early days of the first railways to their regulation, nationalisation and partial liberalisation with a comprehensive theoretical analysis of the railways’ scope for reform. In the discipline of planning studies, the thesis is centred at the interface of economic history, political science and economics.

²¹ Hayek (1946), p. 31

Section I

The Early Railway Age – Innovation, Competition and Regulation

Image removed due to third party copyright

MAP 1: Map of the English Railways in 1848

Source: Cleveland-Stevens 1915), facing p. 332

A. The United Kingdom

1. Opposition and the railway manias

The 1825 Railway Act on the Stockton and Darlington Railway announced the advent of the era of steam-powered locomotives. The arrival of the 40 mile-stretch of an iron rail road in 1825 constitutes an innovative leap, soon to be leaving the horse-drawn carriage behind. The next decades experienced the rapid construction of a modern railway network with an impact on the entire British economy. Britain pioneered the railway age, with the entire globe to follow suit. The *Stockton & Darlington's* use of steam-powered locomotives was, however, limited to the conveyance of freight. Nevertheless, it revealed the diverse opportunities the innovation offered to the public, such as faster and cheaper transport of goods and passengers, as well as increased means of communication and commerce. Railway construction further stimulated demands in other industries. It created the need for innovations in engineering, management, organisation, finance and a demand for labour, building materials and coal. New institutions emerged, focussing on the financial requirements of large private enterprises, as railway companies could not raise enough funds. The railway industry considerably contributed to the growth of the London Stock Exchange and to the emergence of local stock exchanges, when provincial demand for railway shares took off.²² The railway innovation revolutionised transportation, thereby promoting trade and economic growth, stimulating further innovations, whether in communication, in transport and finance markets or in management theory due to new organisational requirements.

The *Liverpool & Manchester Railway* was a further move forward in railway promotion when the line was officially opened in 1825 to provide freight and the first regular steam-powered passenger services. The motion for the construction of the railway was decided upon at a convention of merchants in Liverpool. The merchants formally inquired with the canal operators as to whether they would reduce charges for canal transportation. As a consequence of a decline to their request, the merchants decided to invest in the construction of a railway, connecting Liverpool and Manchester. The first prospectus of the Liverpool & Manchester in 1825 presented the case for a mode of transport that was cheaper and safer compared to the existing alternatives. The canal system carried goods between Liverpool and Manchester on average in 36 hours, whereas

²² Reed (1969), pp. 162-183 gives evidence on the railways' impact on capital markets.

the railway would reduce the passage to four or five hours. In contrast to the canals, the railway was independent from weather conditions, regardless of lack of water in the summer or frozen canals in winter resulting in interruptions of commerce. Charges were expected at least one-third below the prices of the competing canal companies, drawing a line under the canal operator's dominant position in the transport market. *"The immediate and prominent advantages to be anticipated from the proposed railroad are, increased facilities to the general operations of commerce, arising out of that punctuality and dispatch which will attend the transit of merchandise between Liverpool and Manchester, as well as an immense pecuniary saving to the trading community. But the inhabitants at large of these populous towns will reap their full share of direct and immediate benefit. Coals will be brought to market in greater plenty, and at a reduced price; and farming produce...will find its way from greater distances, and at more reasonable rates."*²³

Facing strong opposition, the Liverpool & Manchester Company was fighting for Parliament's authorisation, which was the only prerequisite for new railroad companies to start operations. The competitive pressure threatened the incumbents in the transport industry, most obviously canal and turnpike operators, but also sea traffic. Landowners facing expropriation might feel certain mischief with the innovation. Opposition was also rational from complementary industries, which were dependent on the incumbents' business and were forced to diversify. The campaigns against the innovation accommodated the public's concerns and fears, to discredit the railways and prevent parliament's approval. *"Next to the canal owner, the most important opposition was naturally expected from the landholder, and by both interests every art was used to produce an effectual hindrance. Every report which could promote a prejudice, every rumour which could affect a principle, was spread. The country gentleman was told that the smoke would kill the birds as they passed over the locomotive. The public were informed that the weight of the engine would prevent its moving; and the manufacturer was told that the sparks from its chimney would burn his goods. The passenger was frightened by the assertion that life and limb would be endangered. Elderly gentlemen were tortured with the notion that they would be run over. Ladies were alarmed at the thought that their horses would take fright. Foxes and pheasants were to cease in the neighbourhood of a railway. Farmers were possessed with the idea that oats and hay would no more be marketable produce; cattle would start and throw their riders, cows even, it was said, would cease to yield their milk in the neighbourhood of one of these infernal machines."*²⁴ Arguably, the opponents were concerned about their own business and

²³ Douglas (1977), pp. 546-548. Francis 1851, pp. 94-98 provides details about the convention of the merchants in Liverpool, their resulting railway promotion and their prospectus.

²⁴ Francis (1851), pp. 101-102. Clapham (1967), pp. 380-384 gives some account on the difficulties, the early railways had to surmount. He states that the promoters successes were remarkable in the face of systematic opposition.

engaged in protectionism of their incumbent industries by lobbying for legal, and therefore insurmountable, mobility barriers to the transport market. Such was the environment surrounding the arrival of one of the most influential innovations of the 19th century. Notwithstanding the railway opposition's lobbying efforts, the British government took a rather passive role, authorising the construction of rail roads by Acts of Parliament and thus adopted a lighter regulatory touch.

The first decade after the opening of the Liverpool & Manchester Railway saw several lines going into operation, with London becoming the centre of railway links. In the decade from 1825 to 1835 parliament passed 54 Railway Acts, resulting in nearly 500 miles of railways in operation in 1838. The railway mania reached its peak in 1836 and 1837, when parliament sanctioned another 39 projects, followed by a massive slow-down thereafter, culminating in a temporary halt in new railway promotions in 1840 and an economic depression.²⁵ *"The press supported the mania; the government sanctioned it; the people paid for it. Railways were at once a fashion and a frenzy. England was mapped out for iron roads. The profits and percentage of the Liverpool and Manchester were largely quoted. The prospects and power of the London and Birmingham were as freely prophesied."*²⁶ Though few direct long-distance connections came into being, it was possible to travel as far north as Lancaster or York by train in 1838. Still, the railways had to overcome a number of technical difficulties, as engines were unreliable and regular breakdowns on the line placed a high risk of accidents to the traveller. Braking power was by no means more reliable, with some trains having no brakes at all. Railway operators had no information about a train's location if it was delayed for some reason. Cooke's and Wheatstone's invention of the electric telegraph in 1837 was a welcome innovation and by 1848 nearly half of the railway lines equalling 1800 miles were equipped with the new tool of communication.²⁷

The consequence of the first railway mania with the Acts of Incorporation passed in the 1830s was a rapid increase in total mileage with 1952 miles in operation by the end of 1843. Soon, the second mania was at the doorstep. Parliament granted its approval to the construction of 805 miles in 1844, 2700 miles in 1845 and 4538 in 1846. The figure rapidly dropped in the following two years to 1354 and then to 330 miles of newly approved lines, reaching a total of 6021 miles of track open for traffic in 1850 with a steady increase thereafter (*charts 1 and 2*). Before entering a new depression, the second

²⁵ Clapham 1967), pp. 387

²⁶ Francis (1851), p. 290 as quoted in Clapham (1967), p. 387

investment mania in additional railway infrastructure peaked in 1847 with levels of nearly 7% of the national income and fresh capital raised through loans and shares amounting to £40.7 million.²⁸ According to Parliament, employment levels in construction reached 256,509 men in May 1847 and 188,000 a year later. The downward trend continued with 104,000 in June 1849, when British railway companies employed 56,000 persons on their lines.²⁹

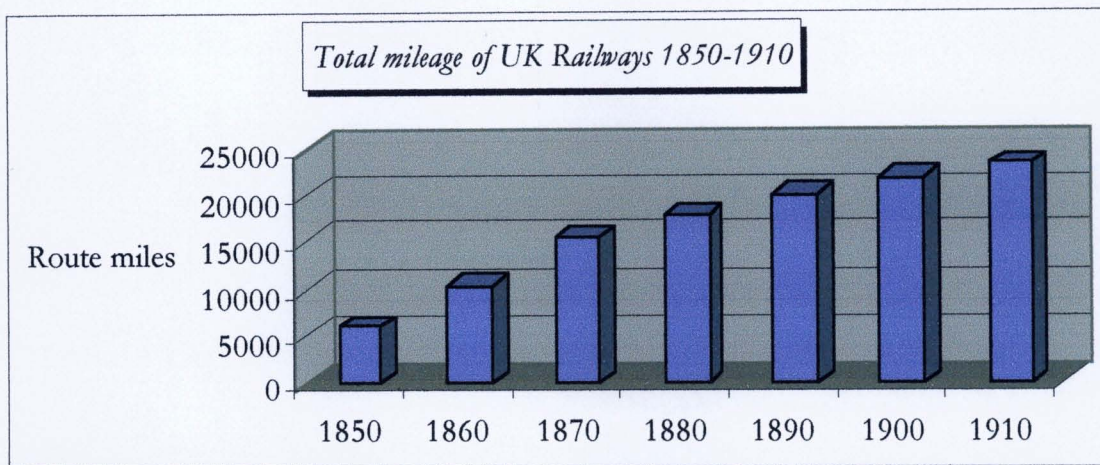


CHART 1

Source: Railway Returns, PP 1913

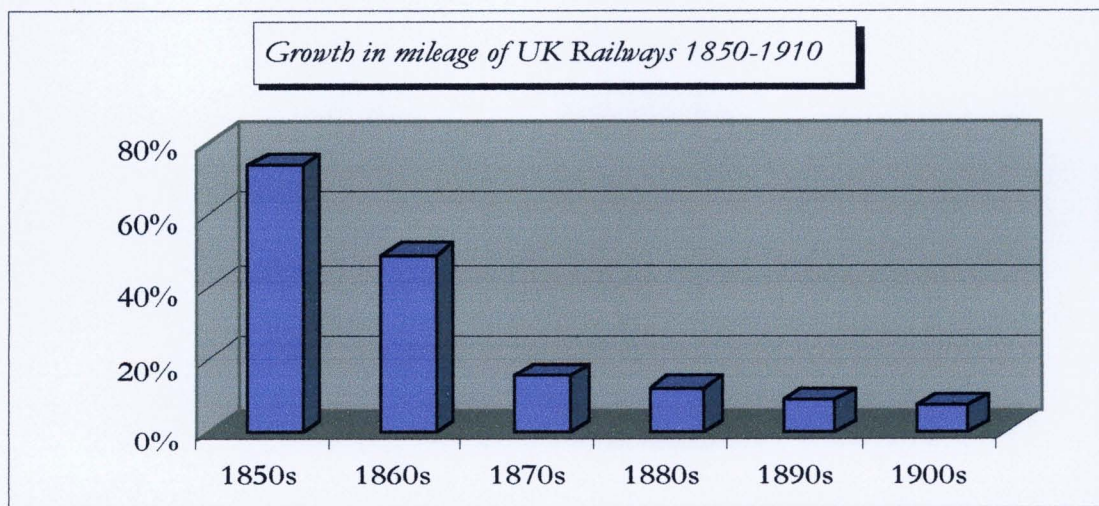


CHART 2

Source: Own calculations based upon Railway Returns, PP 1913

²⁷ Clapham (1967), pp. 383-387 on the difficulties and pp. 395-396 on the electric telegraph. See also Parris (1965), pp. 4-7

²⁸ Clapham (1967), p. 391 and Schumpeter (1939), p. 343

²⁹ Clapham (1967), p. 406 and Gourvish (1980), pp. 13 and 20

2. Competition and concentration

One reason for the relative absence of state interference in the early days of the railways was the strong conviction in British politics, that private enterprise and as a result the public welfare were best served by the absence of regulations in an unhampered market economy. Also, the railways gathered a strong lobby in parliament, totalling 215 railway directors as members of the Houses of Parliament in 1866.³⁰ Britain was unique in her political approach to the railways, leaving the development of the railway network to private companies without government aid³¹. And private investors were willing to commit their funds to the railways, as the country was densely populated between the main metropolitan areas and promised profitable traffic. Johnson and van Metre suggest that parliamentary sanction to run a railway business was simply based on the assumption that the country was already well supplied with dense transportation networks of canals and turnpike roads. Therefore additional facilities had to be beneficial to the general public. *"In the United Kingdom the creation of the early railway network, from the choice of routes and the raising of capital to the operation of services, was left to private enterprise. The sole restraint on the free market was imposed by the private act procedure of Parliament, which required each new project to pass the scrutiny of committees of both Houses before obtaining powers to purchase land, and raise capital...Competition, it was hoped, would protect consumers from the threat of monopoly. British policy was in sharp contrast with that followed in continental Europe, where the state's presence at all stages - planning, construction, and operation - was readily apparent."*³²

Notwithstanding this relatively free market stance, fairly modest government regulation of the railways arrived on the agenda in 1840 with more interference to follow in the name of safeguarding competition between the railway companies and other means of transport. Due to a petition of the trading community, a Select Committee was appointed in 1839 to investigate charges against the railways.³³ Several of the petitioners had approached the recently opened London & Birmingham Railway for the transportation of their goods, which the company declined. The petitioners considered the railway's denial as an unfair discrimination, which the company could exercise without

³⁰ Gourvish (1980), p. 55

³¹ Johnson and van Metre (1916), pp. 389-413 emphasize that the UK "...affords the best example among European countries of private ownership and operation of railways, and is the only country in the world in which the railways have been developed practically without public aid." (p. 413). In a footnote (p. 389) they explain that Ireland's railways received some public funds and a city council in northern England supported a rail connection.

³² Gourvish (1980), p. 49

³³ Gourvish (1999), pp. 118-119

immediate punishment from the market only due to its regional monopoly in transport. The monopoly power, however, was not derived from their superiority in the market of transportation. Parliament's Acts of Incorporation granted the railways exclusive rights.³⁴ The Select Committee found that it *"...does not appear to have been the intention of Parliament to give to a Railway Company the complete monopoly of the means of communication on their line of road; on the contrary, provision was made in all or most of the Acts of Incorporation to enable other persons to place and run engines and carriages on the road, upon payment of certain tolls to the Company."*³⁵ Theoretically, access rights were granted to other operators though the report foresaw some burdens. Accordingly, it cannot be sufficient to allow other engines on the track. Their successful operation furthermore depends on access to the railway owner's water supplies as well as train stations. Additionally, the entrants were required to comply with the rules and regulations set by the incumbent company in order to guarantee the passenger's personal safety. Therefore, the management of the traffic would need to be exercised by one company being in sole charge and control of its line, even if they would thereby acquire a monopoly. In order to curb the monopoly power which parliament had in effect granted in the acts of incorporation, the 1839 Select Committee concluded that the companies must be checked in order to protect the public from any abuses. It is interesting to note that access rights to competitors were envisaged in the original Acts of Incorporation, whilst they became the focus of debate in the late 1830s. The situation in Prussia was very similar, as the next chapter will reveal. Eventually, the arguments on open access provision and competition on the track in the 1990s were drawing upon the ideas of the very first railways.

In its early legislation incorporating the railway companies, Parliament naturally assumed that the railways would function similar to the canals, with the companies owning the way and allowing access to other carriers and locomotives in exchange for an access price or toll. In their report in 1840 the Select Committee cited the London & Birmingham Company as an example, which granted all carriers access to its infrastructure,

³⁴ According to Hansard (1839), pp. 1220-1221, Lord Somerset presented a petition in Parliament, "...connected with the conveyance of goods from London to Birmingham and other places...The petition stated, that soon after the opening of the London and Birmingham Railway, applications had been made by several of the petitioners to the company, for the purpose of having their goods conveyed by the railway, but the answer which they received was, that the company had no means upon their line of conveying the goods. The petition went on to state, that other parties, however, also carriers, had their goods carried by the trains, and complained of the great injustice which this unequal exercise of the monopoly possessed by the company had produced...The petitioners hoped, therefore, that the house would take into consideration the consequences which had arisen from the monopoly granted to the railway company..."

³⁵ Parliamentary Papers (1839), Vol. X, p. 132

but subject to rigid conditions. The Directors of the London & Birmingham were still in charge of deciding upon the arrival and departure times and they were providing both the engines and carriages, leaving not actually much leeway for competition on its own line. Though the Grand Junction Railway permitted locomotives of other operators, the latter had to agree not to undercut the Grand Junction's prices. Even though competition on the track was to some extent provided for in the incorporating acts, the arrangements of the incumbents undermined any real competition on their lines. Competition on the track could have eased the public's concerns of the abuses of market power, but the theoretical possibility was replaced by competition between lines.³⁶ The 1840 Select Committee advised Parliament to set up a government agency to preserve competition. As a result a regulatory body, the *Railway Department of the Board of Trade*, was established but fell short of Parliament's ambitious endeavour. The early railway regulator was hardly more than a supervisory authority, leading a 1872 Joint Select Committee on Railway Amalgamation to comment rather ironically, that the Railway Department had "*...no power but that of requiring returns and enlightening the public as to the condition of the traffic and of the rates...The Acts passed in consequence of these Reports contained nothing which had any effect in checking or regulating monopoly.*"³⁷

William Gladstone's motion as President of the Board of Trade for further regulation in 1844 was the first serious threat to the railway industry. However, the following act was a more moderate version.³⁸ Nonetheless, it allowed for price regulation and state acquisitions of railway companies after 21 years, if their profits were exceeding 10% for three consecutive years. The 1844 Act also implemented the first social service obligations, demanding *parliamentary trains*, i.e. low-tariff passenger trains. From now on,

³⁶ The Parliamentary Papers (1840), Vol. XIII, p. 176 provide the examples of the London & Birmingham and Grand Junction Railways, while the Parliamentary Papers (1872), Vol. XIII, p. 4 give evidence to Parliament's early notion, that companies would act as owners of the way, granting access: "*It was also supposed that railway, like canal, companies would be merely the owners of the way, receiving tolls for the use of it, and that amongst the carriers and owners of locomotive power using their own engines and carriages upon the line there would be ample room for competition. The companies were consequently bound by their Acts to admit the carriages and engines of other persons on their lines at a certain rate of toll, whilst in many cases they were also bound, if acting as carriers themselves, to certain maximum rates specified in their several Acts. But as the railway companies were not bound to furnish any accommodation except the use of the way, and as single management was necessary, the competition between different carriers on the same line never took effect.*"

³⁷ Parliamentary Papers (1872), Vol. XIII, p. 5. Clapham (1967), pp. 415-423 and Gourvish (1980), pp. 49-50 confirm the 1872 Committee's statement.

³⁸ Gladstone's rise to the President of the Board of Trade and the 1844 Railway Act are covered in Jenkins (1995), pp. 66-69. Notwithstanding the "moderacy" of the 1844 Act, nationalisation of the track system was on Gladstone's agenda in 1864 to avoid more "*unco-ordinated building*"; Jenkins (1995), p. 249. Though Gladstone's motion resulted in a Royal Commission, it came up with a negative report. Apparently, Gladstone's design resembled the institutionally separate railway system in modern Sweden with a state-owned track system and emerging private companies in the train operations.

every new company was required to provide at least one train a day on each line at fares not exceeding a penny per mile.³⁹

The regulatory legislation commencing in the 1840s originated from the well-meant intention to protect and promote competition for the benefit of the public.⁴⁰ The same period was characterised by a closer co-operation within the railway industry, culminating in a trend towards amalgamation and concentration within the railway sector and between the railway and canal companies. An 1846 Select Committee on the Amalgamation of Railways and Canals estimated that about 161 bills for England and another 56 for Scotland contained clauses on amalgamation, whereas 32 of the bills were related to amalgamations between railways and canals.⁴¹ In their First Report in April 1846, the Select Committee considered the benefits of amalgamations. The committee anticipated that the amalgamated companies could provide better quality services. They were also expected to pass their cost reductions on to their customers. Operations under a single system of management were assumed to be more efficient, thus resulting in increased safety and faster travel, though the absence of proper regulation could also lead to the exact opposite effects.⁴² The Second Report in the following month examined the competition between canals and railways. Being a check on the abuse of powers of either party, the *“...competition materially reduced the expense of conveyance. Instances have been adduced before Your Committee in which the charges for the conveyance of merchandize have been lowered by these means to one-seventh of their former amount; and there are now few parts of the country which have not derived material advantage from the competition between Railways and Canals. It is obviously of importance that Parliament should not lightly sanction any arrangements which would tend to deprive the Public of this advantage; ...Did Your Committee believe that the two systems could be preserved in entire independence one of the other, they might be disposed to recommend The House to adopt this course.”*⁴³ The Select Committee recommended parliamentary sanction, if the individual amalgamations do not place the public at a disadvantage.

³⁹ The 1872 Report of the Joint Select Committee compares Gladstone's original Bill of 1844 and the cut-down version of the later Act of Parliament in the Parliamentary Papers (1872), Vol. XIII, p. 6. See also Clapham (1967), pp. 419-420, Gourvish (1980), p. 50 and White (1982), p. 174.

⁴⁰ Preceding the legislation was an ongoing debate, started off in James Morrison's influential speech in 1836, when he was arguing for more government regulation. As the Acts of Incorporation would award monopoly rights to the train company in question, he advocated the right to interfere with railway rates in future acts. An unabridged version of his speech is published in Hansard (1836), pp. 977-988.

⁴¹ The First and Second Reports of the Select Committee on the Amalgamation of Railways and Canals, on which the following data is based, are published in the Parliamentary Papers (1846), Vol. XIII, pp. 85-97.

⁴² Parliamentary Papers (1846), Vol. XIII, p. 88

⁴³ Parliamentary Papers (1846), Vol. XIII, p. 95

The trend towards concentration led to fifteen companies controlling 75% of the UK's gross traffic revenue in the aftermath of the investment mania of the late 1840s. In the next two decades the figure rose up to 83%, when the *North Eastern*, the *Midland*, the *Great Western* as well as the *London & North Western* companies taken together accumulated 44% of the revenue. Two of those, the Great Western Railway and the London & North Western Railway acquired 52 smaller enterprises in the years 1850-1875 to build their own railway systems.⁴⁴ The amalgamations were the reaction of the market, as the railway firms had to cut costs after the construction mania of the 1840s. Complementing intra-industry mergers, the railway firms acquired about a third of the canal network until the mid-sixties, thereby restricting the competitive threat. *"But coastal shipping remained a powerful competitor, frequently upsetting the most meticulous agreements to stabilise or raise rates. Moreover, the competitive area was far from small: in 1872 a Select Committee stated that sea competition influenced some rates at no fewer than 60 per cent of all railway stations."*⁴⁵

While real competition within the railway market was limited to the potential threat of constructing parallel lines, many new lines or alliances were beginning to undermine the dominant market positions of incumbents from the 1850s.⁴⁶ In 1857 the *Sheffield Railway* went into an alliance with the Great Northern to get their share from the London to Manchester traffic, which was formerly dominated by the London & South Western Railway. The Midland Railway joined in with a third express route between London and Manchester in 1867. Competition in Devon and Cornwall was taking place between the Great Western and the London & North Western Railways from the late 1850s and very strong competition arrived in the South East at the same time. The *South Eastern Railway* happily enjoyed a monopoly until the *East Kent Railway* received approval in 1853, later being named the *London Chatham & Dover Railway*, after it had secured a link to London. When the Chatham was still the small rural East Kent, the South Eastern missed an offer to purchase the company. Soon both companies offered services to most of Kent's towns. When the South Wales coal trade increased towards the end of the 1850s, the London & North Western and the Great Western Railways did not want to lose their potential share and competed to extend their systems by means of acquiring Welsh lines.

⁴⁴ Gourvish (1980), p. 10 and p. 50. Schumpeter (1939), pp. 342-344 states that the amalgamations were unavoidable due to the construction boom.

⁴⁵ Gourvish (1980), p. 30

⁴⁶ For the following examples and a detailed story of the emerging competition see Simmons (1978), pp. 62-76. White (1982) offers a comprehensive discussion of the developments in the English regions.

In contrast, the period prior to the 1850s was dominated by intermodal competition in the entire transport industry instead of fierce direct competition between the railways. Intra-industry competition was largely due to the expanding railway network and the construction boom. The railways' original zeal was to break the monopoly of canal companies, and so they did not only on the Liverpool & Manchester. *"Everywhere the canal interest was in natural opposition to railway projects; but down to about 1840 railway competition developed so slowly that the canals made no attempt to improve their own competitive capacity. Although a few, specially open to railway attack...had suffered heavily in pocket, some had improved their financial position between 1825 and 1840...As soon as a directly competitive railway was opened a canal had to cut its rates; but nothing is heard of rate cutting to forestall competition."*⁴⁷

The reaction of the canals is characteristic for dominant incumbents. Rather than innovating, they often tend to take a break and enjoy their dominance until they realise that their market dominance had been undermined or even lost to a direct competitor in the market or that a new market had been created. When the canal operators realised the challenge, they lobbied parliament against the unwelcome entrants. Still, wherever the canals had a competitive advantage over the railways and were not burdened with various locks to pass, they were able to carry traffic and survive.⁴⁸ But the story was rather bleak for the turnpike operators. *"The blow was far deadlier for the trusts than for the canals, because it was precisely from that passenger and parcel traffic which the railways took over at once that the trusts had drawn most of their tolls. Farm carts used the roads free and low-grade bulky loads paid little or nothing. The effect of a railway on the tolls was instantaneous...Between 1837 and 1850 the receipts of the trusts fell off by a third."*⁴⁹

Generally, the transport market was turned upside down by the newcomer and the incumbents had no choice but to adapt to the challenge one way or the other. The railway innovation changed the market structure in the transport industry.⁵⁰ Instead of offering long-distance travel by coach, horse-drawn traffic had to focus on shorter distances and railway feeder services, whereas the canals had to concentrate on bulk freight. Though the

⁴⁷ Clapham (1967), pp. 396-397

⁴⁸ Regarding the competitive advantage of the canals, Barker and Gerhold (1995), p. 44 note that the bulky, lower-value freight traffic *"...and especially the steam-powered coastal vessels, were better able to withstand the new competition."*

⁴⁹ Clapham (1967), pp. 402-403

⁵⁰ Clapham (1967), p. 398 underlined the intermodal mergers between the railways and canal operators. In 1845-1847 the railways acquired 948 miles of canals, with 2750 miles left to independent canal operators.

canal and turnpike operators suffered from the consequences of the railway innovation, new opportunities arose with a potential benefit to society as a whole. Notwithstanding the transport lessons from the 19th century, the railways were similarly unprepared to meet the challenge of motorised road traffic or air travel in the 20th century.

Barker and Gerhold 1995), pp. 44-45 illustrate a similar trend in road transport with both intra- and intermodal mergers.

3. Changing times - from entrepreneurial freedom to regulation

The speculative investment boom in the early 1860s was boosted by the insurance business and emerging finance companies investing in railway shares. Trade in unsound shares, however, was a main factor behind the financial collapse in 1866, when important railway companies were passing right into receivership. The period prior to the 1866 crisis was marked by renewed amalgamations and working agreements in the railway industry, bearing some resemblance to the mania evolving in the 1840s. However, the investment in the 1860s went largely into the extension of already existing networks and the construction of branch lines. In the aftermath of the crisis, the positive attitude of the public and government towards free enterprise railways now rapidly changed into a more hostile environment.⁵¹

The trading community became increasingly concerned about foreign competition and discovered the railways as an easy scapegoat for their own competitive struggle, blaming them for keeping rates at a far too high level. Therefore, of course, the international competitiveness of British merchandise would suffer, as the carriage to the ports was believed to be far too expensive. Claims alike were underlining the new role that was attached to the railways. Instead of being regarded as any other private business, train operators were considered to serve the public interest more effectively, if they received special regulatory treatment. Dreadful railway accidents provided further food for advocates of more government control, as the safety of passengers was in question. The London & North Western led the disgraceful record, as nearly a third of all accidents in 1870 occurred on their line. The accidents were supposed to be a consequence of a lack of investments in new equipment, maintenance and increased capacity in order to accommodate for growing traffic. Further focuses for complaints were inadequate safety devices and excessively long working hours for signalmen and other railway labour.⁵² Thus, it was obvious for the public that the railway directors were putting the life of their customers at risk for squeezing out higher short-term profits.

Rising costs prevailed in railway transport from the early 1870s. The growth of third-class travel required investments in order to adjust the capacity to the larger number

⁵¹ Cleveland-Stevens (1915), pp. 227-231 and Simmons (1978), pp. 76-82 report on the origins and the consequences of the 1866 crisis and the failure of the London Chatham & Dover, the Great Eastern and the London Brighton & South Coast Railways, while Gourvish (1980), pp. 47-53 concentrates on the shift in public opinion.

⁵² Gourvish (1980), pp. 51-52 and Simmons (1978), p. 81

of passengers. As a response to the rather unfriendly environment, the railways often raised the quality of their services for third-class accommodation, which was in turn reflected in an increase in labour costs. In addition, lavatories, heating and lighting were usually installed to improve travelling conditions and special excursion tickets or other deals were on offer that were not even close to covering operating expenses.⁵³ The restrictive legislation passed in the decades after 1870 further imposed considerable costs on the railways and rather checked than promoted the competition between the companies. Paradoxically, Parliament's original intention was the protection of competition in order to curb monopoly power, but by 1894 any further legislative protection of price competition was made redundant by parliamentary action, as it rigidly fixed rates without much hope of any variations. *"The Railway and Canal Traffic Act of 1873, the Cheap Trains Act of 1883, and the legislation of 1888-94 were all part of a significant shift in public opinion. Railways were seen more as public corporations than as profit-making businesses..., and the companies responded to this change all too readily. It was in this environment that railways experienced diminishing returns, while producing substantial benefits for society as a whole."*⁵⁴

The events following the 1866 crisis mirror the situation after the 1847 crisis. The depression was superseded by an upswing, tendencies for more concentration in the industry, a resultant concern about market dominance of a few players in the railway market and eventually, an inquiry by Parliament.⁵⁵ The 1872 Joint Select Committee of the Houses of Lords and Commons on Railway Companies Amalgamation scrutinised the merger Bills before Parliament and highlighted their trade-off. They found that fare reductions were a common result of amalgamations, with increases in ticket prices rather being an exception. The Committee cited the example of the amalgamation of the North Eastern in 1854, when rates were cut, while facilities of the railway were enhanced and the company's dividends increased. However, the Committee was readily aware of the dangers entailed. Because the role of actual or potential competition would be diminished,

⁵³ Gourvish (1980), p. 52 and Aldcroft (1968), pp. 6 & 16. Irving (1976), pp. 274-277 shares their view, arguing that the companies reacted to the public opinion by improving their services and "...if our conclusions are right, it is almost certain that labour costs on the railways were rising throughout the 1870s and 1880s, partly because wages and hours were sticky after 1873, and partly because the trend in business anyway was towards the provision of an increasing supply of services in all areas of business, which pushed the wage bill upwards irrespective of rates of pay and hours of work." His conclusion on rising costs in the last three decades is then given on the following page: "Though statistically the 1890s were the years in which the railways' costs really went sour, many of the seeds were sown in the 1870s and were growing rapidly in the 1880s."

⁵⁴ Gourvish (1980), p. 48. According to HMSO (1907), pp. 10-16, the 1873 Act was cited as the *Regulation of Railways Act, 1873* and amended the *Railway and Canal Traffic Act, 1854*.

⁵⁵ Cleveland-Stevens (1915), pp. 232-235

the mergers would discriminate in favour of the incumbent companies in the market.⁵⁶ The conclusions of the Joint Committee's report focussed on preserving the effective competition between sea and rail traffic by means of preventing railway companies to gain control over harbours. The report favoured to increase competition from river and canal transportation by investments in the system of inland waterways. Though the Committee was opposed to a state purchase of the railway network to date, the report already considered a possible nationalisation at a future date. Accordingly, a state purchase of the railways might arise as a necessity if the process of amalgamation led to a few powerful companies.⁵⁷ The report's immediate consequence was the *1873 Regulation of Railways Act*, which established the *Board of Railway Commissioners*. Though the Act conferred the jurisdiction of the rather ineffective *Railway and Canal Traffic Act of 1854* upon the Commission, the approach to regulation was half-hearted. In order to become legally binding, the Commission's orders had to be enforced by court action, and were therefore not posing an immediate threat to violating companies. "*Any decision or any order made by the Commissioners for the purpose of carrying into effect any of the provisions of this Act may be made a rule or order of any superior court, and shall be enforced either in the manner directed by section three of the Railway and Canal Traffic Act, 1854, as to the writs and orders therein mentioned, or in like manner as any rule or order of such court.*"⁵⁸ The enforcement mentioned in section three of the 1854 Railway and Canal Traffic Act states that parties who are complaining about unreasonable facilities may apply by motion or summons to superior courts. So far, the railway industry was not obliged to comply with the Commission's instructions until they were confirmed by a court ruling.

However, more serious legislation was on the agenda. The *Cheap Trains Act of 1883* granted both the Board of Trade and the Railway Commission the right to order railways to provide for proper third-class accommodation and workmen's trains at fares, which either the Board of Trade or the Commissioners considered to be reasonable.⁵⁹ The *1888 Railway and Canal Traffic Act*, which was to be construed as one with the Regulation of Railways Act of 1873, replaced the Railway Commission with the *Railway and Canal Commission*, which was equipped with considerably extended powers to interfere with a railway company's business decisions. The Act also required all railway companies in the

⁵⁶ Parliamentary Papers (1872), Vol. XIII, p. 31 and Douglas (1977), Vol. XII(1), p. 319. Cleveland-Stevens (1915), pp. 317-318 supports the argument that amalgamations generally led to reduced charges.

⁵⁷ Parliamentary Papers (1872), Vol. XIII, p. 31

⁵⁸ HMSO (1907), pp. 10-16: *Regulation of Railways Act, 1873*. Cleveland-Stevens (1915), pp. 268-272 comments on the limited powers of the Railway Commissioners.

⁵⁹ HMSO (1907), pp. 19-24: *Cheap Trains Act, 1883*

United Kingdom to submit to the Board of Trade revised classification of merchandise tables and suggested maximum rates for the merchandise. The outcomes were uniform classifications and laws in the following years to introduce maximum rates.⁶⁰ *“Many of the new rates put into effect by the laws of 1891-1892 were substantial reductions under the rates previously charged, and to offset the losses occasioned by the reductions, the railway companies raised to the authorized maximum virtually all rates previously in force which had been below the new maxima. A storm of complaint immediately arose from shippers, and to meet the situation the Railway and Canal Traffic Act of 1894 was passed...The law of 1894 virtually constituted as standards of reasonableness all rates in effect on December 31, 1892, except such rates as were reduced by the rate laws of 1891 and 1892, and gave to the Railway Commission broader discretionary powers with respect to rates than it had previously possessed.”*⁶¹

Section two of the 1894 Act obliged any railway company concerned to prove the reasonableness of an increase of rates, further stating that it shall not be sufficient to show that the increase was within the boundaries prescribed by law. Following the *1893 Railway Regulation Act*, which attempted to limit the excessive working hours in the industry, the *Railway and Canal Traffic Act, 1894* put a halt on companies' independence in pricing decisions, while costs were simultaneously rising due to the legislation passed.⁶² Notwithstanding the costly arrangements that had been imposed upon the railways in the last quarter of the nineteenth century, the government further curtailed the railways' flexibility, dictating preposterous restrictions in the Act of 1894. Had the previous acts regulating the railway still acknowledged competition as an effective force to curb potential monopolistic abuses arising from consolidation in the market, the principle was now turned upside down and competition was throttled. *“Incidentally, this removed whatever danger there might have been of rates being raised on amalgamation, but the noticeable point is that the Act was more destructive of competition than any number of amalgamations. The possibility of raising a rate became a remote hazard, contingent upon satisfying the Railway Commissioners on points which in many cases were incapable of proof. The most enterprising competitor will hesitate to cut his prices when he knows that he may not be able to raise them again should his experiment fail. The English railway managers appreciated this. They had voluntarily refrained from active competition in rates for years before this, but there had been no compulsion, and had they wished to experiment they were free to do so.*

⁶⁰ HMSO (1907), pp. 25-55: *Railway and Canal Traffic Act, 1888* and Johnson and van Metre (1916), pp. 403-408

⁶¹ Johnson and van Metre (1916), pp. 408-409 and HMSO (1907), pp. 59-60: *Railway and Canal Traffic Act, 1894*

⁶² Gourvish (1999), pp. 121-122

After 1894 they had the positive restraint of an Act of Parliament to convince them of the folly of direct competition in rates. Such competition is dead.⁶³

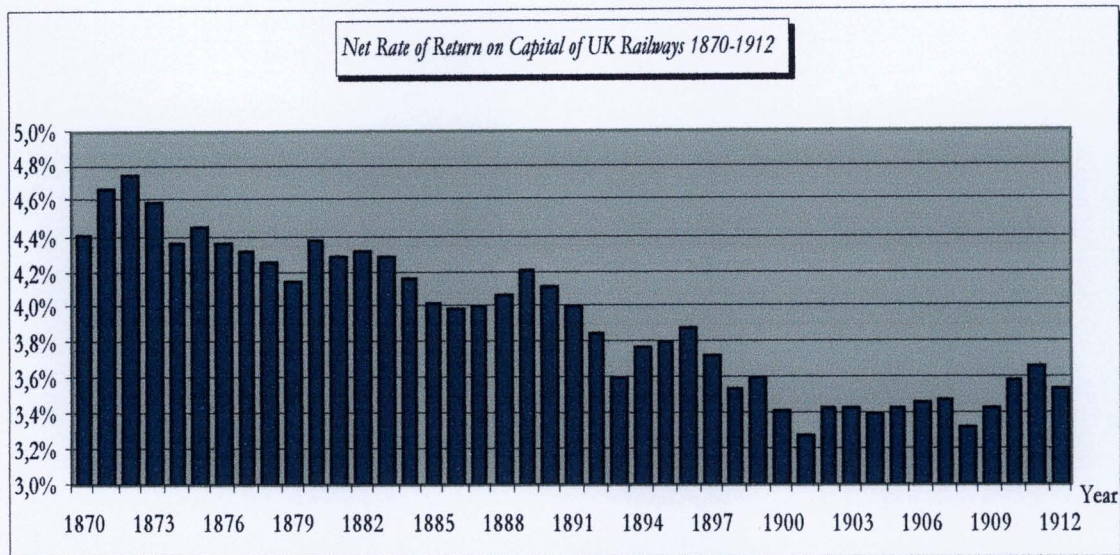


CHART 3

Source: Railway Returns, PP 1913

Despite the changing climate, the railways further extended their infrastructure networks from 15,537 miles in 1870 to 23,441 miles in 1912, but a considerable proportion of the new mileage went into branch lines of already existing railway networks.⁶⁴ In many cases, however, the population density along these lines was by no definition high. As a result the revenues were either negligible or did not even cover operating expenses in some companies, notwithstanding the high fixed costs, which resulted in an average return on capital decreasing steadily from 4.41 in 1870 to 3.27% in 1901. Leaving aside a minor setback in 1908, the next years were marked by a recovery until 1911, when the net rate of return amounted to 3.67% as illustrated in the chart above (*chart 3*). In other words, the capital has been used more efficiently in the first decade of the twentieth century, as the rate of return represents the net revenues in proportion to the total capital paid up. While an under-utilisation of capital was fairly obvious on many branch lines, the same applied to several main-line services due to competitive parallel lines and a duplication of other facilities, such as railway stations and freight depots in the towns. The construction of rather uneconomic lines seems odd, though it may be explained by the railway managers' desperate search to obtain extra traffic in competition with rival firms. Aldcroft even suggested that the managers might have confused gross and net revenues, believing that growth in the former would

⁶³ Cleveland-Stevens (1915), pp. 321-322

automatically result in an increase in net revenues.⁶⁵ Due to the absence of proper railway statistics, British railway managers were often unaware that they were investing into lines with a negligible or even no return, instead of focussing on their core business.⁶⁶ In stark contrast, American railroads were making extensive use of railway statistics and accounting principles from mid-century in order to co-ordinate traffic flows.⁶⁷

The British situation was further aggravated by an inefficient and distorting pricing policy in freight haulage that was not based on the actual costs imposed upon the railway, but on the value of the products carried. The imbalance between charges and operating costs made cross-subsidies from profitable to less or even unprofitable services necessary, thereby disguising their poor record and preventing the management from closing lines. Yet it is admittedly doubtful whether closures could have been a viable option in times when public opinion was moving towards the conviction that the railways had a social obligation and were to serve the benefit of the public, rather than their shareholders. Not surprisingly, the proportion of the railways' total expenditure to gross revenue, excluding miscellaneous receipts from tolls, canals, steamboats, hotels etc, rose from 45.6 to 63.2% in the period from 1854 to 1913 which is reflected in the operating ratio's steady deterioration (*chart 4*). After 1908 the pressure on the railroads temporarily eased due to the counteracting growth of both passenger and freight traffic until 1912 (*chart 5*). However, the volume of traffic was not retained after WWI, with disastrous consequences for the railways.

⁶⁴ Aldcroft (1968), pp. 8-26 and Irving (1976), pp. 278-279

⁶⁵ Aldcroft (1968), p. 13

⁶⁶ The statistical information on traffic costs did not improve markedly before the establishment of the British Transport Costing Service.

⁶⁷ For the American railroads see the study in the appendix, section VI.A. Chandler (1997) gives a detailed account of innovations in organisation, management and accounting principles. The main points are summarised in the appendix.

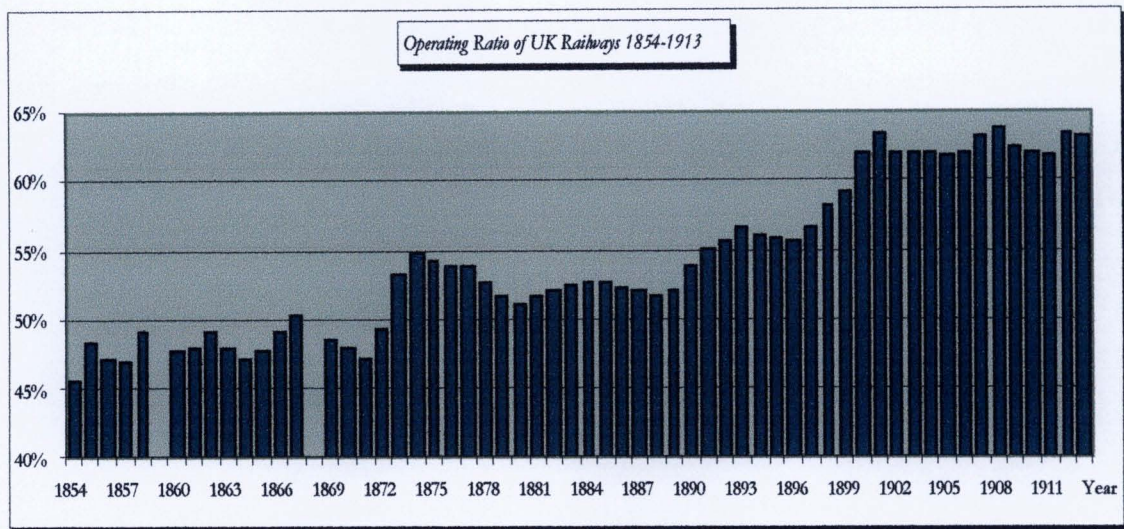


CHART 4

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

Note: Data for 1859 and 1868 is unavailable

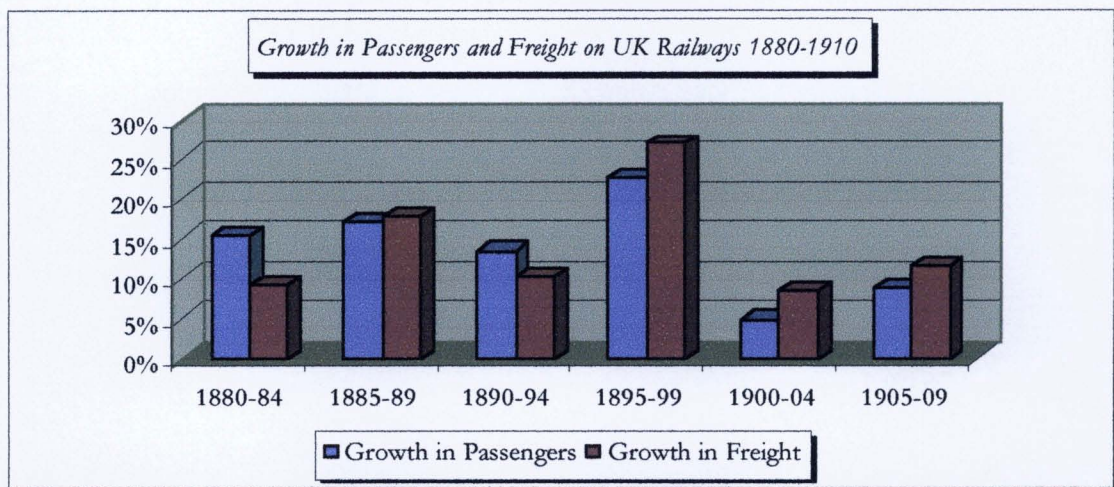


CHART 5

Source: Own calculations based upon Railway Returns, PP 1913

The excess capacity of the network, car loads and facilities exacerbated the already high pressure on operating costs when the railways were struggling to meet growing public expectations on improved services and regulations imposed by legislation. Whereas the companies were lagging behind in developing proper statistics and efficient pricing mechanisms, the *1894 Railway and Canal Traffic Act* was the last drop in creating an inflexible and highly inefficient pricing regime. The legislation removed the vague possibility of any improvements in rate setting, even if the companies should finally reach the conclusion that their pricing decisions would need a general overhaul. As stated above, closures and necessary rationalisations were likely to result in a public outcry in late Victorian society. Thus, the railways were trapped in a vicious circle, as they had to

increase prices or cut costs, if they were to retain the existing network and the quality of services. Public perception and regulation blocked both ways of easing the pressure on the railways.

Though rate increases were ruled out due to the restrictive legislation, reductions were extremely unlikely, even if they made sense from an economic point of view. Every company would better consider possible reductions more than once, as a later increase might be unattainable due to regulatory constraints. It is rather startling, that Johnson and van Metre praise the *admirable system of rate control in Britain*, before acknowledging the long-term defects the system produces.⁶⁸ They argue that the control of rates due to the established standards of reasonableness would protect the public from exorbitant rates, but also prevent the companies' engagement in destructive competition. The resultant inflexibility of rates, however, is then agreed upon as the chief defect of the regulatory regime. Apparently, you can't have the cake and eat it, too. The companies themselves were naturally reluctant in reducing rates voluntarily, as they were likely to encounter opposition in raising them to their former level. Indeed, if there was a real need for rate increases, an act of parliament was required to agree upon new upper limits.

Accordingly, the companies' leeway in cutting costs was limited. The railway managers' capabilities, however, added to the situation. Instead of concentrating on profitable business, their egomaniac or misjudged notion of building railway empires by length of track led them to invest in unviable extensions. Thus, they made it even more difficult to eliminate the prime reason for the exorbitant costs by scrapping unprofitable branches. Consequently, the railway's escape route led right to increases in productivity. Those could have easily been accomplished, were the companies prepared to alter the nature of their competition. In order to satisfy trader's demands, they were collecting small consignments that were delivered immediately to their location with many wagons carrying half their capacity. In the course of events the competitive advantage the railways naturally had in delivering heavy wagon loads over long distances in through trains was sacrificed to small trader's requirements.⁶⁹

The government interventions in the last decades of the nineteenth century were alleged to protect competition and the consumer from abuses of monopoly power. In the

⁶⁸ Johnson and Van Metre (1916), pp. 410-411

⁶⁹ Aldcroft (1968), p. 15. Irving (1976), pp. 278-279 comments on the consequences of Victorian society's expectations towards the railways, which helped to prevent rationalizations.

short term, the government's goal was partly achieved. Notwithstanding, whether or not competition might have offered a superior protection than government regulation, the consumer did not have to worry about monopolistic rates. However, he could neither expect rate reductions due to price competition, productivity gains or innovations. The long-term side effects of the regulations arrived rather by surprise to the contemporary observer, preparing the ground for the future difficulties and the railroads' inability to challenge the competition from road traffic and airways. Had the railway industry been free from politicians' wisdoms and desires, some obvious malpractices were almost certain not to have occurred.

Nonetheless, the figures were pointing upwards after the turn of the century with a slight but only temporary recovery in the return on capital and the operating ratio, as has already been demonstrated (*charts 3 & 4*). The relevant data were published by Parliament in 1913 and are enclosed in the appendix, chapter B.1. for the years 1850-1912. Far more startling, however, is the massive upturn in freight earnings per mile as shown in the chart below. The passenger train receipts could by no account match the figures achieved by the freight operations, instead they were almost a mirror image of the results from freight traffic in the early years of the twentieth century, showing a decreasing trend since a peak in the 1870s with a short-lived minor revival around 1910 (*charts 5-8*).

The trend in passenger receipts per mile partly reflects the train companies' commitment to satisfying the public's expectations, when they extended their network of partly uneconomic branch lines and offered a growing number of third-class trains that were not as profitable as other services. The significant increase in freight receipts per mile in the early twentieth century suggests that the railways must have realised some sort of efficiency gains, which mainly affected the freight business. Most likely, the improvements were based on reductions in mileage, increases in labour productivity, a more effective use of the freight capacities and loading facilities, respectively freight depots following inter-industry mergers and further alliances.⁷⁰ Notwithstanding the extraordinary recovery in freight, the railways' weaknesses remained the near absence of proper statistics and the organisational (non)-development, lagging behind the innovations in the US railroad industry. Though the exogenous factors such as the hostile public opinion and regulatory

⁷⁰ Irving (1976), pp. 280-284 points out that the precise origin of the efficiency gains was not absolutely clear, though cuts in the network were likely to be most significant. More could have been achieved with a full-scale reform of organisational structures and the introduction of at least basic statistical data collection and evaluation.

legislation placed the railways in uninspiring surroundings, the endogenous elements such as mismanagement further aggravated the situation.

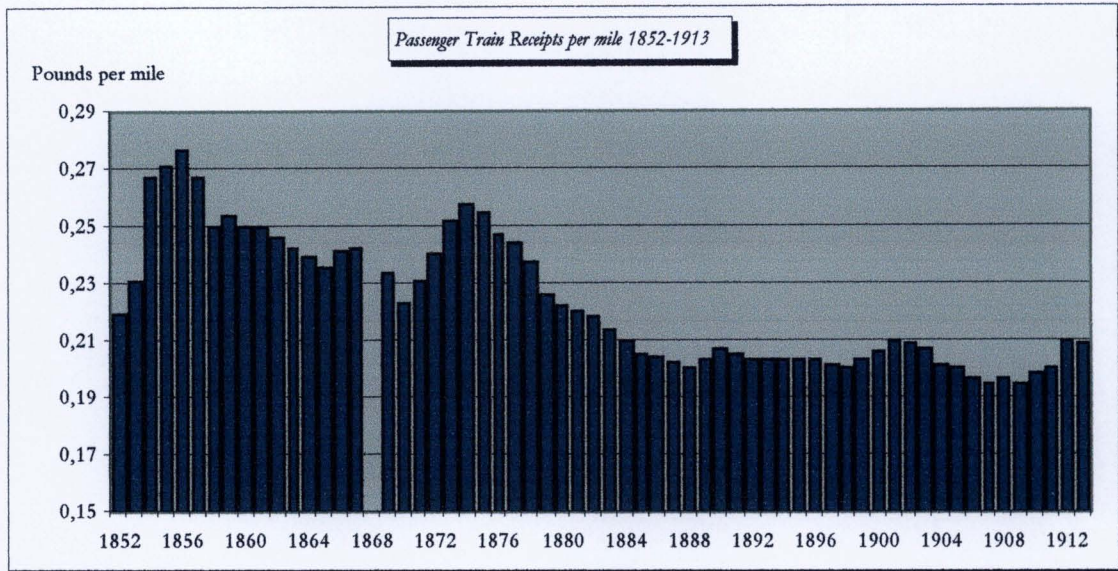


CHART 6

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

Note: Data for 1868 are unavailable

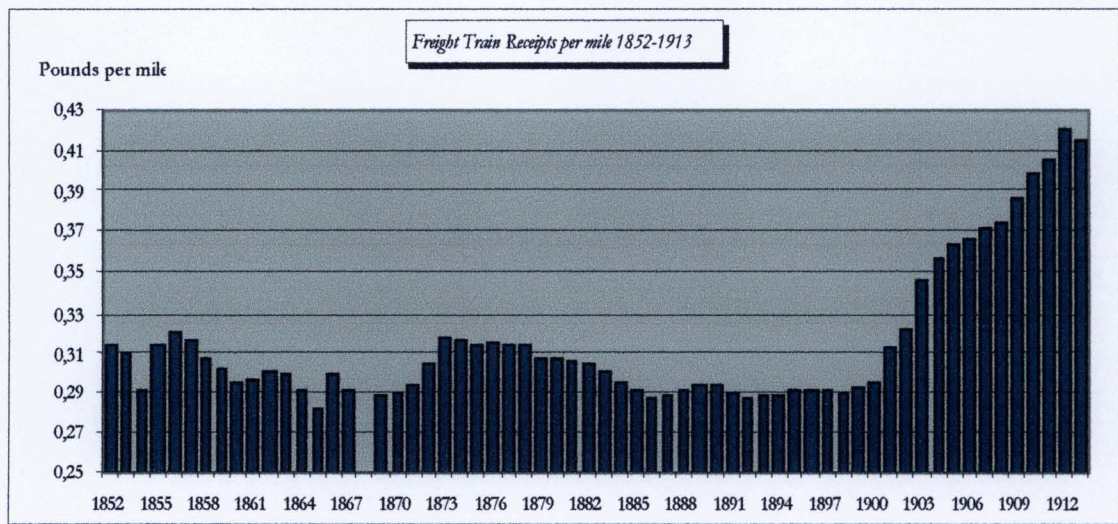


CHART 7

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

Note: Data for 1868 are unavailable



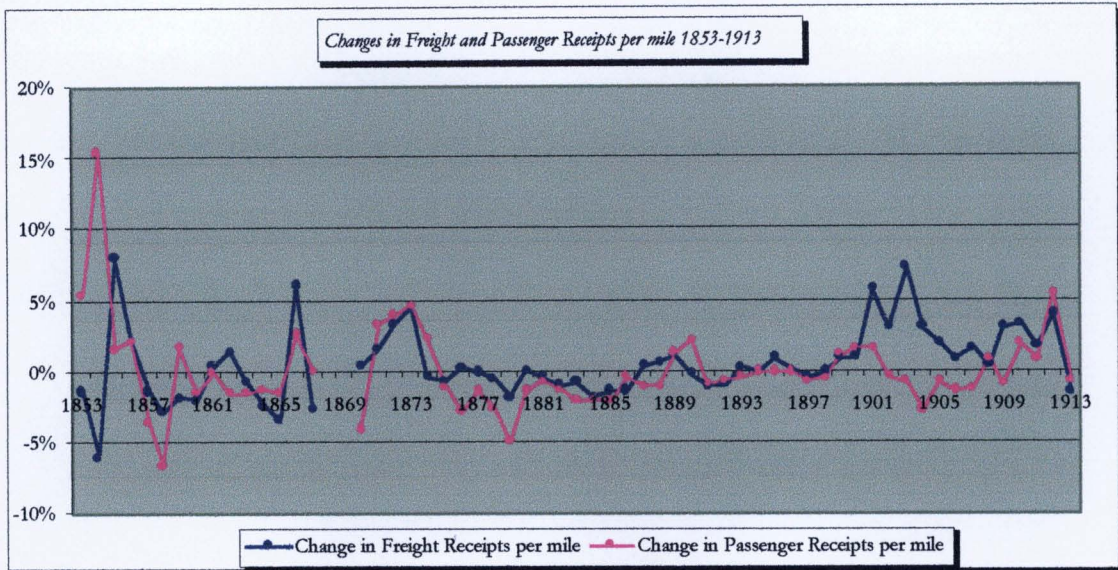


CHART 8

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

Note: Data for 1868 are unavailable

Image removed due to third party copyright

MAP 2: Map of England and Wales under the control of the Principal Railway Companies
Source: Cleveland-Stevens 1915), frontispiece

4. The World Wars, intermodal competition and nationalisation

World War I naturally affected the railways. During the war, the government took control of the railway companies' operations according to the Regulation of the Forces Act of 1871 that allowed Her Majesty's government to take possession of the railroads in an emergency.⁷¹ Thus, the *Railway Executive Committee* was established and was in charge of the actual operation. The Committee was made up of the general managers of the principal companies. The Act acknowledged the necessity to provide full compensation to the private railway companies. Consequently, it was agreed upon that the railways would receive their net revenue of 1913, amounting to £44.1 million.

Initially, the more uniform operation of the railways as a single network created considerable benefits for the system due to a reduction of duplicate services and facilities. However, the period of war time control produced severe long-term drawbacks. The railways suffered from a growing discrepancy between costs and revenues with heavy under-investment at the end of the war. Aldcroft points out that the annual average gross investment amounted to £16.1 million in the first decade of the twentieth century, and to about £9 million in 1910 to 1913. Therefore, the wartime annual average in the years 1915 to 1919 of £4.5 million in 1900 prices added up to a mere half of the pre-war level, falling just short of a quarter of the investment carried out in the first ten years of the century.⁷² Taking the figure immediately prior to the war as a basis for an extremely conservative estimate of the shortage of investment in the railways, at least another £22.5 million in 1900 prices were required to secure the railways' operation. However, the figure is likely to be a low estimate, as the pre-war figures are hardly representative for wartime maintenance efforts and future challenges. Intermodal competition slowly appeared on stage, indicating a massive need in investment to successfully match the challenge imposed upon the railways by motor traffic, trams and to a very limited amount early air travel, announcing the advent of a further competitor. Furthermore, the intensive use of the network during WWI contributed to a more than normal depreciation, in turn requiring for more than usual investments in repair, maintenance and replacements.

The necessary investments were, however, obstructed on account of different reasons. The high volume of traffic during the war left only a few time slots to carry out

⁷¹ Regulation of the Forces Act, 1871, 34 & 35 Vict., ch. 86. Aldcroft (1968) and Aldcroft (1970) present a detailed account of the railway history beginning with WWI on which the following discussion is based.

⁷² Aldcroft (1968), p. 35. The figures were supplied by Dr C.H. Feinstein.

repairs without interfering with railway traffic. Undoubtedly, the demand for labour in military industries and in the forces itself left the railways with a shortage of labour, with 30% of their former workforce joining the army. The same applied to industry production. Instead of producing new rolling stock, the priorities were naturally in military rather than railway equipment. Thus, repairs of the infrastructure were often postponed and became more pressing towards the end of the war. In 1918 the system had to operate with 80,000 fewer wagons than prior to the war.⁷³

The divergence between charges and operating costs in combination with the inflexibility of the rate structure in the late nineteenth century had already been discussed above. While there had been no major changes since the 1890s, the gap widened considerably during the era of wartime control. *“As with investment it is possible that costs and prices were falling out of line in the early twentieth century, but it was only really during the war that the problem was raised in an acute form...Under government control fares and charges were frozen at the pre-war level, the only concession being an increase of about 50 per cent in passenger fares in 1917. Wages and prices were much less rigidly controlled, and by the end of the war they were more than double the pre-war levels. During the course of the war, however, the railways were sheltered from the full effects of the cost increases by the fact that most of the wage awards were shouldered by the Government, whilst coal was sold to the railways at an artificially low price. Moreover with the heavy increase in traffic and government guarantee the companies had little cause to worry about their revenue. The partial removal of some of these measures of protection soon after the Armistice and the further subsequent rise in wages and prices left the railways in a very difficult position.”*⁷⁴ Chart 9 illustrates the increases over the pre-war levels in the railways’ input costs and in their income from rates and fares for the immediate post-war period 1919-1921 when the companies were still under government control. Whereas input costs in 1920 often exceeded pre-war levels by 200%, a revision of charges allowed for an adaptation to 75, respectively 100% above the basis of 1913 in the same year. The pressure eased in 1921 when input costs dropped slightly. However, the discrepancy between costs and prices resulted in the deterioration of the railways’ net revenue from £13.6 million in 1919 and £6.9 million in 1920 to a loss of £9.0 million in 1921, as demonstrated in chart 10. Correspondingly, the operating ratio rose to 104.1% in 1921 before it turned around in 1922 (chart 11). Accordingly, the railways’ receipts from passenger and freight traffic excluding miscellaneous receipts were not even covering short-term working expenditures in 1921, leaving long-term fixed costs

⁷³ Aldcroft (1968), p. 34

⁷⁴ Aldcroft (1968), p. 37

aside. Following the 1921 Railways Act the railways experienced a sudden recovery in net revenue to a post-WWI maximum of £44.5 million, only to decline steadily until WWII.

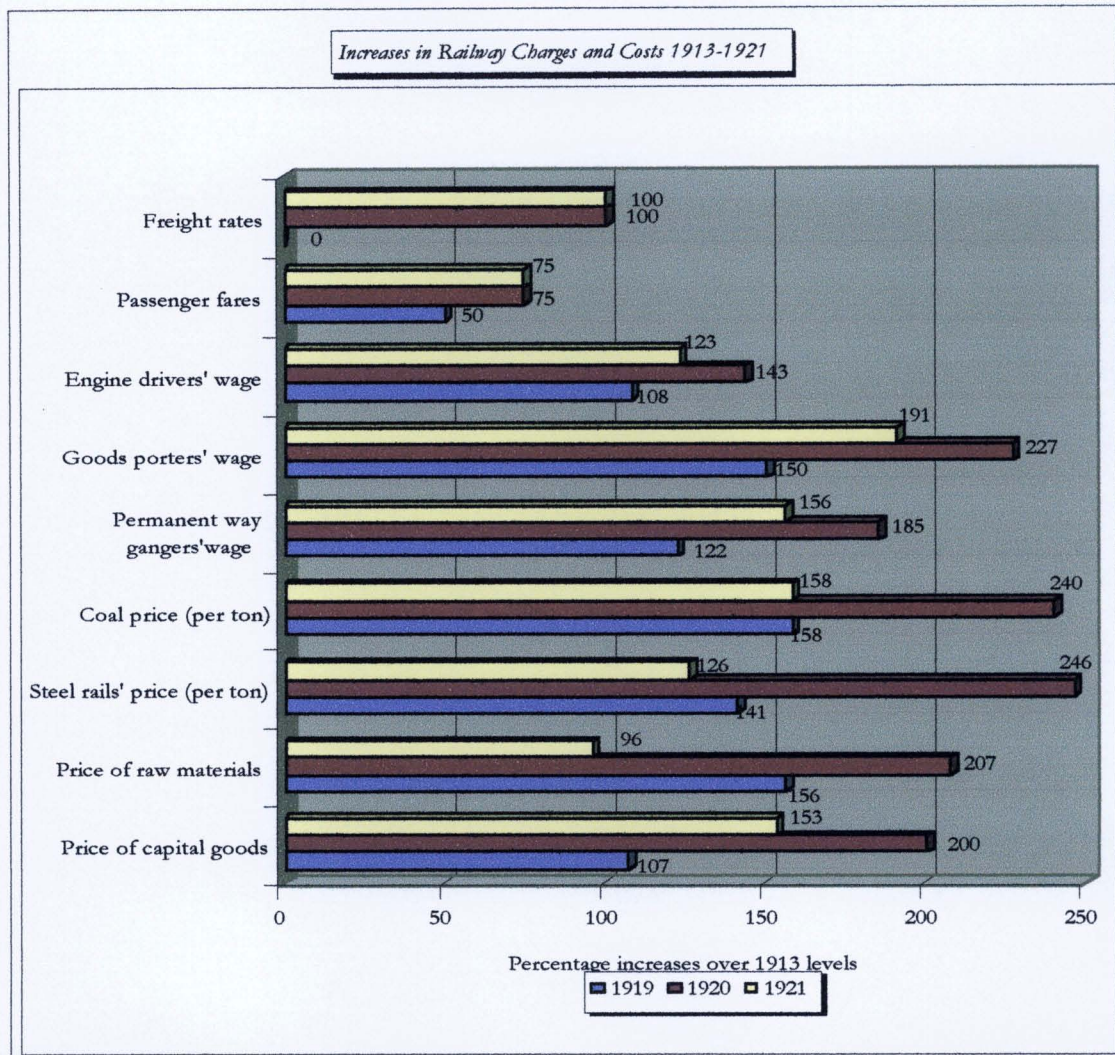


CHART 9

Notes: Steel prices are for July of each year, whilst the remaining figures are based on the annual average. Freight rates rose to 100% in September and passenger fares to 75% in August of 1920.

Source: Aldcroft (1968)

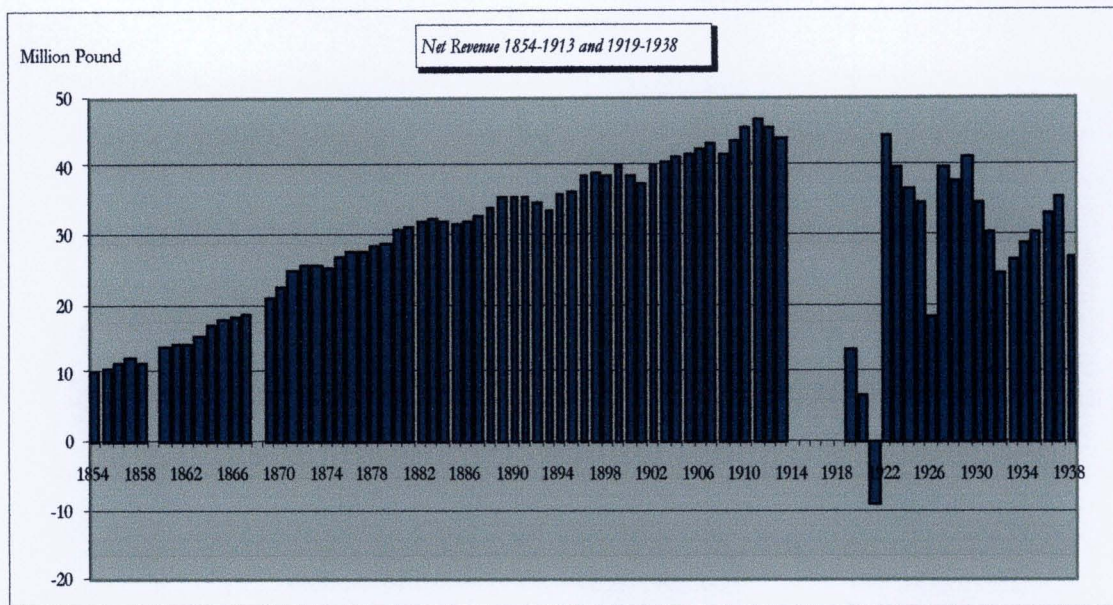


CHART 10

Source: Mitchell (1994): British Historical Statistics

Note: Data for 1859, 1868 and 1914-1918 are unavailable. Mitchell (1994): British Historical Statistics and PP (1921): Railway Returns for 1919 and 1920 cite the figures for 1913 and 1919.

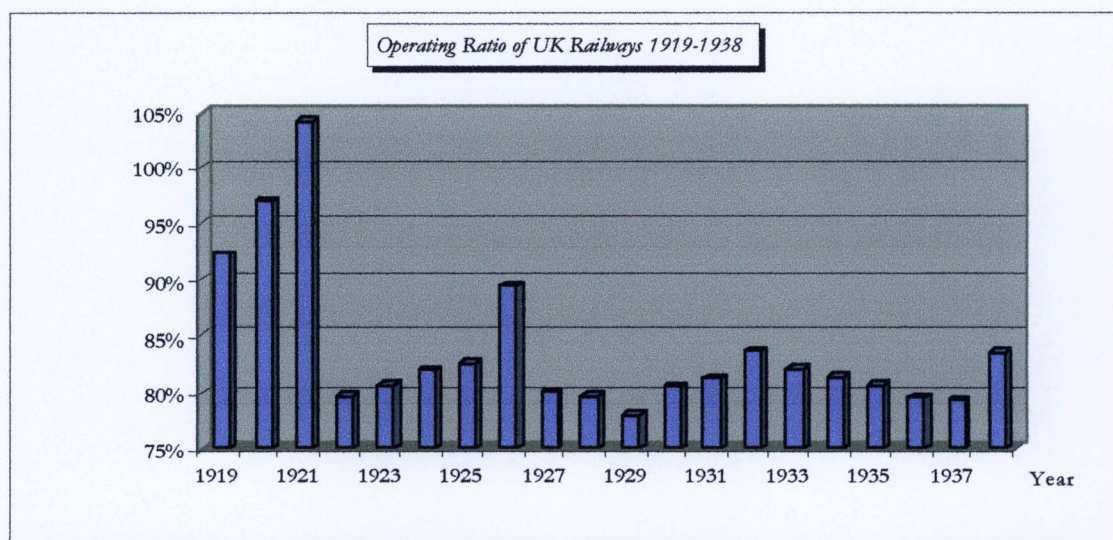


CHART 11

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

The aftermath of World War I put the railways' return from government control to private enterprise on the agenda.⁷⁵ Though the owners and the government mutually

⁷⁵ This was, however, only after a brief interlude of a nationalisation debate, as pointed out in Crompton (1995), pp. 116-117. According to Crompton, a bill was introduced in 1919 to create a new ministry with controlling powers over "virtually all forms of transport", though the political climate soon changed in favour of setting up private undertakings as "...regulated oligopolies, heavily constrained in both their pricing and wage fixing, and carrying strong obligations to act as 'public' utilities." With regard to the interventionist outcome of the 1921 Act, Crompton (1995), p. 117 reports the Railway Gazette denouncing the government's policy as a nationalisation without paying the bill, while he designated the 1921 Act as "...a half-way house to public ownership...", Crompton (1999a), p. 142.

agreed that the pre-war level of competition between the railway companies should be substituted with a more co-ordinated operation, there was no consensus concerning the actual implementation of reorganisation. The Railways Act of 1921 subsequently created four groups of companies according to the First Schedule of the Act, merging 120 companies.⁷⁶ The companies were divided into constituent and subsidiary companies, thereby drawing a dividing line between the larger and smaller ones. The larger constituent companies were required by the Railways Act to amalgamate, while the others were to be absorbed as provided by the Act. In effect, the Act created the *Southern Group*, consisting of 19 constituent and subsidiary railways and the *Western Group* with 33 companies, which then adopted the titles of *The Southern Railway* and *The Great Western Railway*. The *North Western, Midland and West Scottish Group* embraced another 35 railway companies and was titled *The London, Midland and Scottish Railway*. Finally, the *London and North Eastern Railway*, which came into being as the *North Eastern, Eastern and East Scottish Group* comprised the remaining 33 railroads. The main driving force for the Act was the belief that the grouping would lead to economies of scale and replace competition with co-operation between the railways, thereby reducing duplicate lines and other facilities.⁷⁷

The Act prohibited any further amalgamations or agreements between the four new companies without the government's consent and established the *Railway Rates Tribunal*. The Tribunal had jurisdiction to decide upon the reasonableness of charges, alterations of freight classifications as well as variations of tolls and rates. The constituent companies of the four groups were ordered to submit schedules of proposed standard charges for the amalgamated companies to the Rates Tribunal. The Railways Act required the settlement of any objections towards the schedule before they would subsequently come into operation on 1st January 1928. According to section 32, the amalgamated companies were obliged to charge the standard rates as fixed in the authorised schedule,

⁷⁶ The Railways Act, 1921, 10, 11 & 12 Geo. 5, ch. 55, pp. 417-506 contains the First Schedule (pp. 485-487), which allocates the railway companies to the four groups as displayed in appendix B.2. Fenelon (1932), pp. 101-117 discusses the 1921 Act, citing the titles the companies assumed. Though a total of 214 separate companies existed in 1921, the 94 companies which were excluded were either jointly owned or light and narrow gauge railways. Of the 120 companies, many had long been merged with other railways, but retained their legal independence. Cleveland-Stevens (1915), pp. 315-316 further noted that the amalgamations of the preceding sixty years led to a comprehensive railway system, which was dominated by eleven great companies prior to WWI, while 933 companies had been merged since 1849.

⁷⁷ Notwithstanding the anticipated savings, potential inefficiencies and costs of the amalgamations, such as different corporate cultures, organisational and management challenges, were rather neglected. Crompton (1995), p. 117 notes that it "...was less clearly appreciated that before financial advantages could be secured, there were major organisational problems to be overcome first."

ruling both upward and downward variations out, except by way of exceptional charges.⁷⁸ However, either the amalgamated companies or traders were “...entitled at any time to apply to the rates tribunal to modify the standard charges...and, if any such company or body of traders or person...prove to the satisfaction of the rates tribunal that the standard charges or conditions or any of them ought to be modified, the tribunal shall make such modifications as they think fit...”⁷⁹

The train operators’ only option to influence their own charges was by means of exceptional rates and fares that were provided for in sections 37 to 41. The exceptional charges that were still in operation on January 1st were cancelled unless they were in the region of 5% below the new standard rate. The new exceptional charges had to be reported to the Minister of Transport and exceptional freight rates which deviated more than 40 or less than 5% from the standard rate required the Rates Tribunal’s consent. When the Minister objected to exceptional rates because they were prejudiced towards users, the Rates Tribunal might modify or cancel the exceptional rates or revise the standard charges. In contrast to freight charges there were no restrictions on the passenger side to charge exceptional fares, as long as they were lower than the standard passenger fares and reported to the Minister of Transport, who again may refer the case to the Rates Tribunal if customers might be discriminated against in his opinion.

The legislation produced four railway combinations that had to face strong and steadily increasing intermodal competition from road traffic for passengers and freight. The government’s intention was to reorganise the railways to achieve a more *efficient and economical working*, as stated in section one.⁸⁰ Indeed the government established heavily regulated railway companies, stripped of their essential right to determine the most basic business policies, such as price and quality of the product they intended to sell. The entrepreneurial enthusiasm that created innovative and profitable enterprises had been left somewhere in the last century and was now substituted with dominant territorial enterprises. Notwithstanding the market power of the amalgamated railway firms, “...no one of the amalgamated companies can claim a complete monopoly of the railway traffic in its area. Branches from one amalgamated company extend into the area of another, and more important, the

⁷⁸ The amalgamated companies were loaded with burdens that contradict the allocation function of private markets. One of the most preposterous provisions of the 1921 Act was the provision that income should match 1913 figures.

⁷⁹ Railways Act, 1921, 11 & 12 Geo. 5, ch. 55, sec. 35. Fenelon (1932), pp. 105-110 provides an overview over the railway rates and the Tribunals’ power to determine.

⁸⁰ The potential paradox of achieving both an efficient and economical working has also been acknowledged by Crompton (1995), p. 119. Crompton (1985) devoted an entire article to the efficient and economical

*territorial boundaries of the companies are the routes of heaviest traffic.*⁸¹ Also restrained by legal requirements, the dominant railway operators were expected to serve the perceived public interest. Even though it was envisaged to achieve more efficient operation of the system, economic considerations were absent in the creation of the four groups. While the government suggested in their 1920 White Paper to establish seven amalgamated companies, opposition led to the compromise of the 1921 Railways Act.⁸² If the government were convinced of the supposed gains of economies of scale or scope to be overwhelmingly beneficial, it would have been a consistent line in their policy to take the merger a step further towards outright nationalisation or public control of a single instead of four private monopolies. And if the government's anticipated economies in the production of transportation were indeed based on proper economic arguments, they need not have worried. They could have delegated the actual amalgamations to the companies' self-interest of profit maximisation. The Act's provisions of imposed mergers, fixed standard rates and the Rate Tribunal's authority to modify charges as they thought fit left the regulations in the last decades of the nineteenth century appear rather harmless. Instead of enabling the railways to charge and amalgamate as *they think fit* to successfully meet the challenges arising through intermodal competition, they had to swallow the government's and Railway Tribunal's prescriptions. The same were ineffective in a dynamic, innovative and highly complex transport market. The railways were forced to administer their operations according to the government's plan with a maximum of inflexibility. In contrast to the chosen path of bureaucratisation, the 120 companies should have been forced by the emerging competitors to quickly respond to the innovative challenges in the transport market. Aldcroft briefly summarised the Act's defects: *"First, it drew too much from past experience and second, those responsible for its contents gave too little attention to economic considerations. The main innovation was the grouping of the companies, but even this was not done with any clear economic criteria in mind. Essentially the Act was a tidying-up measure which, since it drew so heavily on past experience, was unsuited to the rapidly changing conditions of the twentieth century."*⁸³

Most importantly, the challenge of road competition and the reorganisation's aim to provide for a more efficient and economical working required for a reform in pricing of freight and passenger services towards a pricing policy based on operating costs and on the

working of the railways in the inter-war years, whilst he emphasises on pp. 228-229 that effective competition was also secured by coastal shipping with very cheap rates due to post-war over-capacity.

⁸¹ Walker (1942), p. 19

⁸² Aldcroft (1968), pp. 41-46

⁸³ Aldcroft (1968), p. 47

price elasticity of demand, charging more for non-competitive traffic and less where competition curtailed the companies' pricing freedom. Adding to the legislative restrictions on pricing, cross-subsidies posed an immense burden to any reform towards more scientific charging principles. The problem of the construction of unprofitable branch lines through thinly populated areas aggravated with the 1921 mergers. The amalgamated companies incorporated lines which were dependent upon cross-subsidisation from profitable services. Instead of freeing the four groups from the responsibility to finance unsustainable services and provide for a sound basis to commence operations under the new group, the architects of the act were fooling themselves that the new creations would cope with these supposedly marginal difficulties – if they were realising the problem at all. In order to keep the uneconomic lines of the network up and running, the profitable railway services had to charge a mark-up from their customers, thereby reducing their competitiveness and putting the profitable lines at risk in the long-term. The railway operations were even more endangered, when the rapidly increasing competition of road traffic in freight and passenger transport skimmed the cream by focussing on the profitable transport operations of the railways, leaving the latter to serve the thinly populated areas and making it even harder to obtain the additional profit to redistribute it to the ailing parts of the network.

The necessary changes to pricing principles were not on the agenda of the inter-war period. Even worse, the situation turned out to be more confusing and arbitrary, lacking a sound strategy in charging for freight and passenger traffic. The railroads reacted to the challenge of road traffic by offering large numbers of exceptional charges, as variations in standard rates had to be approved by the Rates Tribunal before taking effect. The exceptional rates and fares were, however, not correlated to highly competitive connections but were available throughout the entire network, i.e. on both remunerative and unviable routes. Instead, the rate reductions should have been concentrated on profitable lines which were exposed to road competition. In the event, the proportion of revenue from special fares rose from 34.4 to 85% between 1924 and 1938 in passenger travel, whereas 70% of freight traffic receipts were derived from exceptional rates in 1935. The diversity of exceptional charges caused irritation and dissatisfaction among the customers with the result that passengers on a single train between the same locations were often travelling at various different fares.⁸⁴ Fenelon argues that the multiplicity of tickets available might have led customers on standard fares to believe they were victims

⁸⁴ Aldcroft (1968), p. 60 and Parliamentary Papers (1931), Vol. XVII, Cmd. 3751, paragraphs 123-125

of extortion, as virtually everyone around them travelled on another fare. He illustrates the great diversity in cheap tickets in the late 1920s, though the list was admittedly not exhaustive: “...season tickets; trader’s tickets; tourist tickets; period and special excursion tickets; weekend, day, afternoon, and market-day tickets; cheap tickets for ramblers, golfers, anglers, fishworkers, shipwrecked mariners, and members of sports clubs; 10,000 miles first-class tickets...; zone tickets...; and reduced fares for parties of eight. There are even cheap day and week-end tickets for dogs.”⁸⁵

The 1921 Railways Act sanctioned the traditional charging system by requiring for value classifications of merchandise and goods instead of addressing the long overdue issues of cross-subsidies and pricing reform properly. Statically, it had been assumed that the volume of traffic would continue to grow as it did during WWI. Thus, the railways could keep their poor lines running for the public benefit. Reality was not quite as pleasant. While the total number of passenger journeys declined from a peak of almost 2.2 billion in 1920 to just over 1.2 billion in 1938 (*chart 12*), the trend in the freight business was also downwards, from 318 million tons in 1920 to 266 million tons carried in the year before the outbreak of WWII (*chart 13*). The decline of neither freight nor passenger traffic could be compensated by higher earnings, as higher charges were impeded by both the regulatory constraints and intermodal competition from road haulage or coach companies. They were more cost-conscious than the railways and were not carrying the burden of cross-subsidisations and high fixed costs. After railway revenues reached a peak in 1920 with receipts of £109.4 million in passenger and £129.9 million in freight traffic, they lost more than a quarter until 1938 with receipts of £75.3 million and £87.8 million respectively.⁸⁶ Relating the railways’ earnings to the total mileage of goods and passenger trains confirms the continuous downward trend (*chart 14*), with a brief respite in 1926 and again in the mid-thirties (*chart 15*). In general, the data highlights an alarming decline of the railways between the wars, which was aggravated by the discrepancy between charges and costs. “*Though prices generally were falling in this period, labour costs, which formed a large part of total running expenses, remained fairly stable at more than double the pre-war level, while other costs did not fall pari passu with the fall in charges. Thus by 1938, the cost of many railway inputs was around double that of pre-war, whereas the average level of charges (freight and passenger) was only about 50 per cent greater.*”⁸⁷

⁸⁵ Fenelon (1932), p. 149

⁸⁶ Mitchell (1994), p. 548

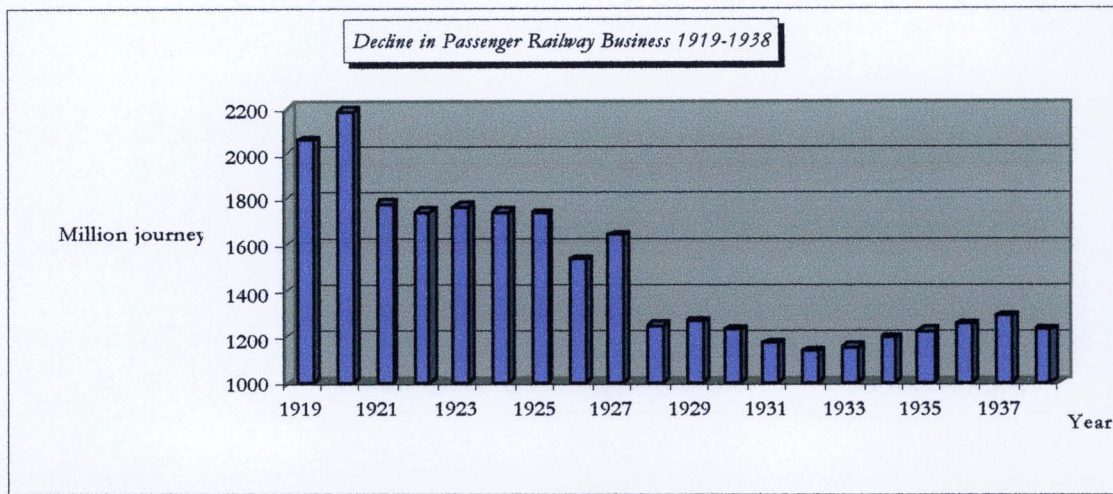


CHART 12

Source: Mitchell (1994): British Historical Statistics

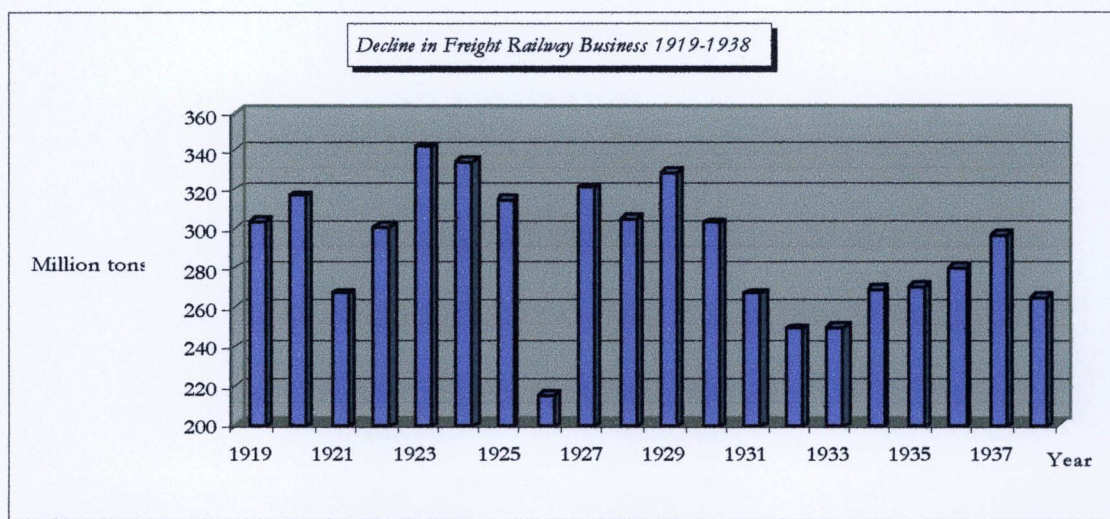


CHART 13

Source: Mitchell (1994): British Historical Statistics

⁸⁷ Aldcroft (1970), p. 220 (In the original Aldcroft emphasized 'pari passu' which was omitted in the quotation above.)

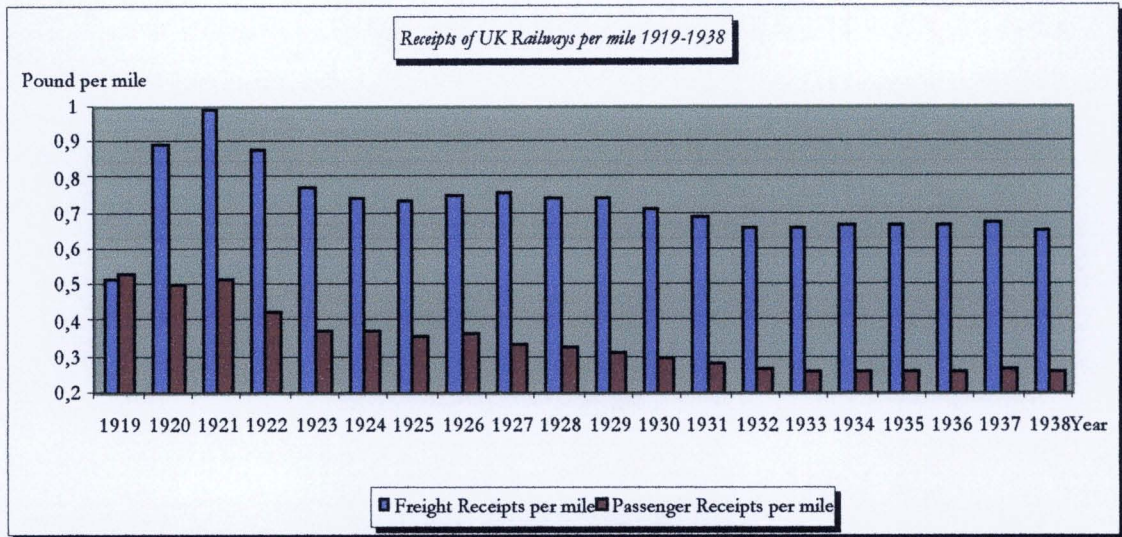


CHART 14

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

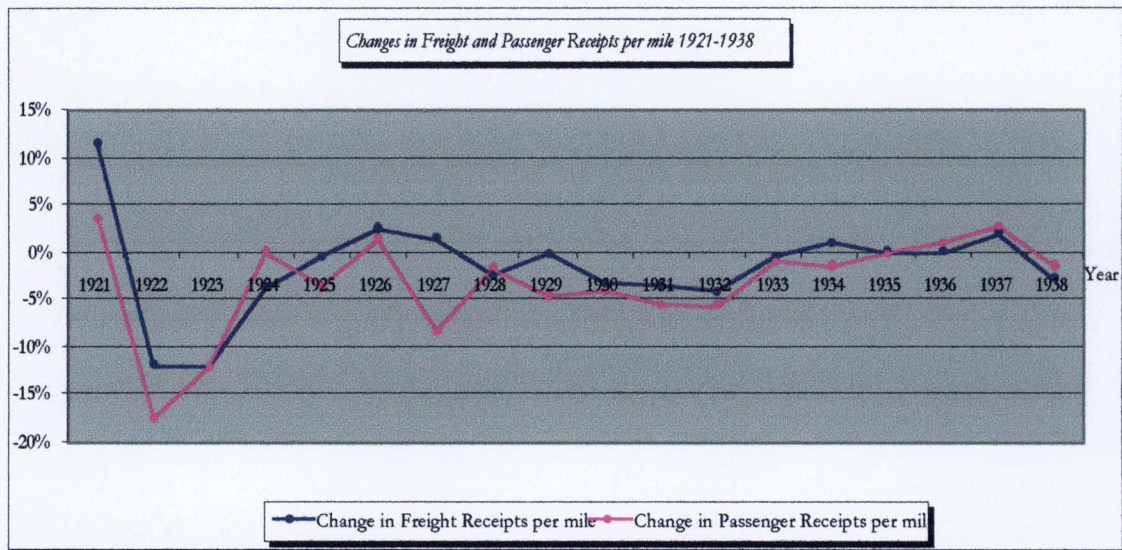


CHART 15

Source: Own calculations based upon Mitchell (1994): British Historical Statistics

Usually, competition from road transport is selected as the obvious scapegoat for the railways' descent.⁸⁸ Though intermodal competition did have a substantial impact on the railways' share of the transport market, the railroads themselves and the responsible regulators have to accept a fair amount of the blame. As a matter of fact the competitors' appearance on the transport stage was inevitable, whatever the reaction of the railways. However, the train operators were naturally in a position to influence the outcome of the

⁸⁸ Crompton (1985), pp. 230-231 emphasises the indirect impact of the 1926 general strike on the railways: "The general strike halted normal railway services for only a fortnight, but the spectacular character of the emergency drew attention to the unreliability of unionised labour and, conversely, emphasised the surprising effectiveness of motor vehicles."

game in the market of transportation. But it is likely that the companies were underestimating the role of their competitor, as less than 350,000 vehicles were running on Britain's roads at the end of WWI.⁸⁹ Still, they cannot have been entirely unaware of the forthcoming threat. It was fairly visible for everyone who ventured to look on the streets. By recalling their own experience with the canal operators in the nineteenth century, the railroads might have discovered that immediate investments in innovation and the removal of structural defects were urgently needed. During the course of the war, investments in maintenance, repairs and renewals were far lower than in peacetime, accelerating their decline. The restrictive regulation of charges meant that it was difficult to meet the rise in input prices after WWI, which is likely to have hampered any over-enthusiasm for new investment projects, whether in physical equipments or innovations. And the cross-subsidisation equalled an invitation to intermodal competitors to skim the cream off the profitable lines. The train operators were forced to charge a high mark-up on marginal costs, so long as they were committed to finance unprofitable services. Still, the defects were tackled neither in the 1921 Railways Act nor in the 1947 Transport Act. In fact, the problems of cross-subsidies aggravated with the railways under public ownership, as the new ownership approach rightly implied that benefits had to be generated for their collective owners and not a selected group of individuals, whether the public was living in an conurbation or a remote village.

The success of cars, buses and trucks was considerably pushed by manufacturing costs dropping a third between 1923 and 1929, accompanied by simultaneous reductions in operating costs. While the number of vehicles on the roads had increased to more than three million in 1939, they did not miss out on the unspoken invitation of the railways. Road haulage freight companies geared their charges to operating costs and were not required to make heavy capital investments in a fixed infrastructure network. Accordingly, market barriers to entry were low in road haulage business. The small element of fixed costs of road services provided for more flexibility compared to the railways, as unprofitable routes could be abandoned immediately. This also reduced the capital risk entailed. They could offer convenient door-to-door transport services as required by their customers, service distant villages if there was sufficient demand and carry small consignments. Though they partly complemented the railways and stimulated new demands for transportation, they often targeted profitable routes of the rail operators and did not commit themselves to the task of cross-subsidising uneconomic traffic.

⁸⁹ The data concerning the motor transport is taken from Aldcroft (1968), pp. 55-58

Nevertheless, road transport was mainly confined to short and medium distance merchandise and passenger travel until the late thirties. Aldcroft argues that the bulk of the journeys was non-competitive with rail travel.⁹⁰ Apparently, the railroads had their competitive advantage in long-distance passenger and freight business, as road transport was not geared to carry bulky and heavy loads, such as coals and minerals. Considering the arguments made on charging reforms, it was in those operations, where rail transport possessed a competitive advantage over road and had to raise prices according to the price elasticity of demand.

Therefore, the intermodal competition from road transport was indeed challenging, but not entirely devastating.⁹¹ Ideally, it should have released the railways' entrepreneurial potential. But there was another influential determinant in the railways' misfortune. After WWI, the railway companies still had a dominant position in the market for long-distance and heavy goods transportation. Quite unfortunately, it was exactly this highly profitable market, where the railways still possessed a competitive advantage over road haulage that experienced a decline in the volume of traffic in the inter-war years (*chart 16*). Thus, the assumption of further growth in rail traffic, implicitly underlying the 1921 Act, had been undermined, thereby further eroding the shaky vindication for supporting the unprofitable lines. The 1923 peak of 222.2 million tons of coal carried on the railways was never again reached with an annual average of 180 million tons conveyed in the period 1920-1938. This situation was mainly caused by an accompanying depression in heavy industries and coal exports being halved from 73.4 million tons in 1913 to 35.8 million tons in 1938. The fall in coal transport had a serious impact on the railways' earnings. The receipts from highly profitable coal freight amounted to 20% of revenues. To make it even worse, the railway network had been built to serve the demand of the same industries which were now on the decline, highlighting that adaptations and withdrawals from certain routes were inevitable.⁹²

⁹⁰ Aldcroft (1968), p. 58

⁹¹ Crompton (1999b), p. 137

⁹² Aldcroft (1968), p. 53

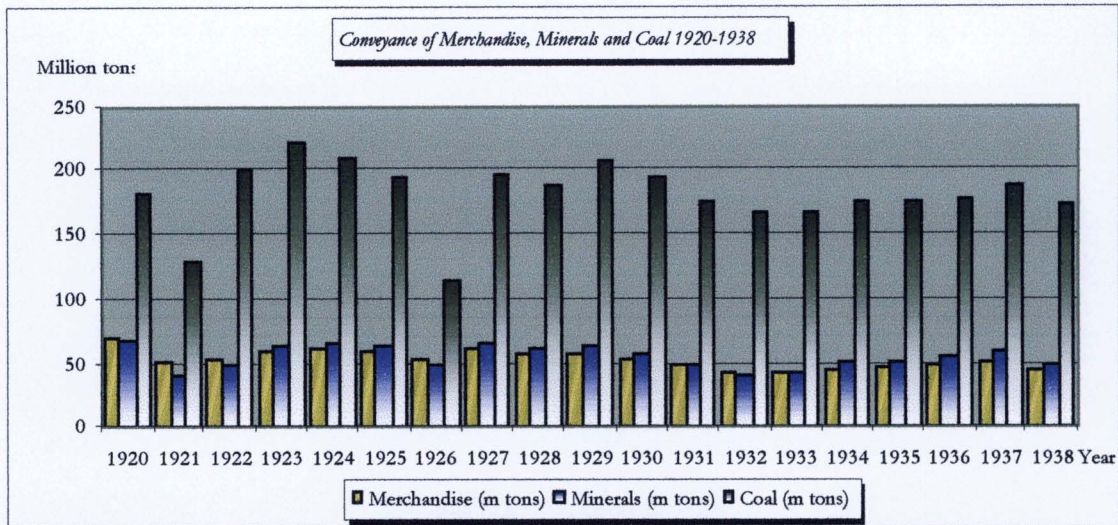


CHART 16

Source: Aldcroft (1968): *British Railways in Transition*, p. 50

Note: Mitchells data for 1921 account for an additional 50 million tons

The contraction in coal transport in the inter-war years and especially in 1926 had far-reaching consequences for the operating ratio that went up from 82.6% in 1925 to 89.6% in line with a drop in net revenue, which nearly halved from £34.7 to £17.9 million (*charts 10 & 11*). A comparison of the period between the wars to the years prior to WWI demonstrates that the operating ratio aggravated continuously from mid-nineteenth century, when it was at 45.6% in 1854 to the 1913 level of 63.2%, representing a constant increase in unit costs. Leaving aside the 1926 crisis and the excessive post-war years 1919-1921, when the working expenditure partly exceeded the gross revenue from charges in freight and passenger traffic, the operating ratio moved around a level of 80% until 1938, which necessarily reduced the profit margin in railway enterprises considerably.

It has already been argued that the road-based competitors cannot be held responsible for the entire decline in railroad transportation, as they were mainly competing over short and medium distances in the passenger and merchandise businesses. The observation that all the players in the game, from intermodal competitors via regulators to the railways themselves, had to accept responsibility for the railways' downhill run is underlined by the good performance of the Southern Group of amalgamated railway companies. The Southern had a different focus compared to the other three groups, being relatively independent from the heavy industrial traffic. Whereas 78% of its revenues stemmed from its passenger operations, the average receipts from passenger traffic in the entire railway industry were only 46%. Accordingly, the decline in heavy industries hit the

remaining groups particularly hard, as they were serving the industrial areas of south Wales, north-east England and south-west Scotland. Though the Southern was not that much affected by the industrial descent, the company had to face harsh intermodal competition in its passenger division in the metropolitan area of London. In addition to the threat the Southern had to face from bus and coach operators, its high volume of merchandise traffic was a potential victim of road-haulage companies. The Southern's operations must have been close to immediate withdrawal, if road competition was the prime challenge to the railways. However, the Southern Railway Company was indeed one of the most successful railway enterprises of post-war Britain. Therefore, road competition is clearly not accountable for the railroads' fate on its own, but the depression in heavy industry and the discrepancy between costs and prices are also partly responsible. Moreover, it remains to be emphasised that the structure of the railway network was by no means uniform over the entire system, but differed quite substantially between the Southern's focus on passenger and merchandise as against the other companies that had a more balanced mix.⁹³

When investigating the railways' reactions to the challenges posed by intermodal competition, deteriorating heavy industries and the discrepancy between prices and costs, the Southern leaps to mind again. Surely, one could assume, that the railroads would not wait until doomsday without taking action. As early as 1909 the *London Brighton and South Coast Railway Company*, one of the constituent predecessors of the Southern Railway, chose electrification as the only option to save its South London line between London Bridge and Victoria stations from closure. They were soon relieved of their disastrous records of falling passenger levels, which subsequently rose from three and a half million passengers during their crisis to 12 million travellers by 1920. Despite the high initial capital investments in the fixed infrastructure, electrification produced considerable advantages over steam-powered engines. Electric trains accelerate quicker than steam locomotives. Accordingly, electrification extended the network's capacity, allowing for a greater number of trains with an increased frequency and reduced costs of operation. Thus, especially over short-distance suburban routes with a large number of stops, the electric trains were faster than steam engines and were able to regain a position in passenger traffic with more efficient operations. *"It was only electrification and the reduced operating costs which allowed better services at cheaper fares. By those means rail transport was once more in a competitive*

⁹³ White (1982) gives the most comprehensive account about the Southern Railway Company in his study on the regional history of railways. The data on the Southern's electrification draws upon his discussion in White (1982), pp. 179-187 and Aldcroft (1968), pp. 54 & 71-77

position and new traffic was created."⁹⁴ White then quotes the example of the competition between London and Brighton, a distance too short for the railway to rely on their competitive advantage in speed over motorised vehicles. In the run-up to the electrification of the line, an increase in traffic of 6% was assumed to be sufficient to cover the costs resulting from the installation of the electric infrastructure. Eventually, the initial estimate was by far outnumbered with the traffic volume increasing by 29% in 1933, the first year of the new service to Brighton.

Surprisingly, only a marginal 5% of the UK's railways had installed electric traction by WWII, whilst the Southern Railway alone owned roughly 80% of the total, equalling 800 miles of electrified track.⁹⁵ The main reasoning for the popularity of electrification on the Southern is based on its structure, as its traffic pattern was particularly suited to electric trains due to its routes through densely populated areas. In contrast to steam trains, the electric trains did not have to sacrifice their main advantage of speed over road traffic, due to rapid acceleration on electric traction. Though diesel trains had proved to be a viable alternative at that time, the option was widely neglected until after the war, presumably because of the British abundance of coal. *"Whatever the reasons for the delay in adopting new forms of traction, it is clear that the railways stood to lose in the long run. Extensive application of diesel or electric traction would have made them more competitive with road transport, particularly on the passenger side, though it would not have eliminated competition. As it was, railway travel became relatively less attractive, especially over short distances where road transport showed to its best advantage, whilst the run-down in investment during the inter-war years left the railways in a particularly weak position to face the stringent conditions of the Second World War and its aftermath."*⁹⁶ Aldcroft estimated that the actual net investment, i.e. the annual gross investments reduced by the rate of depreciation in the railways' capital assets between the wars was indeed negative for each year and amounted to a total of at least £125 million in 1930 prices. While he agrees that figures alike are naturally rough estimations as they are

⁹⁴ White (1982), p. 186

⁹⁵ The Southern was committed to electrification in stark contrast to the general reluctance prevailing among the other railway companies in Britain. Crompton (1995), pp. 125-131 investigates the impact of the 1931 Weir report and other studies that were based on rather shaky assumptions. Increases in demand, advantages of accelerated services and the potential for reducing the number of locomotives due to electrification were mostly neglected. Also, the studies were often assuming a conversion of the entire railway network, although much *"...of this mileage would have been more appropriate for closure than conversion to electric traction"*, Crompton (1995), p. 127. In addition, concerns about further damaging effects upon the coal industry contributed to the reluctance in adopting innovations in locomotion technology, such as conversion to diesel units or electric traction.

⁹⁶ Aldcroft (1968), pp. 76-77

based on hypothetical assumptions about the assets' life cycles, they indicate the massive disinvestment in the railway business, which led to a deterioration of their capital stock.⁹⁷

Though innovations of diesel and electric trains were mainly confined to the Southern Railways, some efficiency gains were realised in the freight sector. The waste of resources in the inter-war years was curbed due to a more effective use of depot facilities and an improved utilisation of the capacity of wagons as well as the attempt to introduce larger carriers. Although the average capacity of 11.3 tons per wagon in 1930 against 10.4 tons in 1922 was an improvement, the capacity of freight wagons in Britain fell far short of the average size of wagons in Germany with 16 and the United States with 42.3 tons, indicating that there was massive room for savings. While the standard wagon size had a capacity of 12 tons, 20-ton trucks could have realised considerable gains in efficiency, when shunting and hauling the loads. An obstacle, however, was that nearly half of the wagon rolling-stock was privately owned and costly alterations in facilities to cater for the larger stock were often opposed. The legacy of the past had further established an insuperable burden to reform, as the traders took the conveyance of any size of consignments to a variety of locations for granted.⁹⁸ When employment figures dropped 20% from a total of 735,870 in 1921 to 588,517 employees in 1939 the railways were afforded another respite. Due to a decrease in earnings and the large proportion of labour costs to total receipts rising from 33.25% in 1913 to 55.42% in 1930, reductions in the workforce became a pure necessity for the survival of the railroads.⁹⁹

Nonetheless, the slight relief might have contributed to the railways' reluctance in pushing through more reforms and considerable investments in research and development in order to produce innovations to counter the competitive challenge.¹⁰⁰ Their difficulties were fairly obvious and solutions were at hand, including the use of electric or diesel engines, larger wagons and consignments, improvements in closer intra- and intermodal co-operation to provide better and wider services, the withdrawal from unprofitable lines to cut costs and cross-subsidies, thereby enabling the development of a cost- rather than a

⁹⁷ Aldcroft (1968), p. 71

⁹⁸ Fenelon (1932), p. 170-173 reports on the under-utilization of freight wagons and the trader's expectations.

⁹⁹ Aldcroft (1968), p. 78-83. Crompton (1989), however, notes that railway workers were not faring so well in the 1930s as in the 1920s. Whereas they enjoyed "...*greatly improved living standards and working conditions by comparison with the admittedly unsatisfactory pre-war situation*" throughout the 1920s, the serious decline in freight receipts in 1928 resulted in a 2% pay cut with cuts of nearly 5% to follow in mid-1931, Crompton (1989), pp. 68-71.

¹⁰⁰ Butterfield (1986), p. 32 noted that the "...*general attitude seems to have been fatalistic*" and competition from road services was given too little attention.

value-based pricing scheme. Instead of improving their competitive position by their own efforts, they resorted to lobbying the government for regulation of road transport. According to Aldcroft, the main outcome of the *1930 Road Traffic Act* and the *1933 Road and Rail Traffic Act* was a regulation of entry and conditions of service in the road transport industry, in effect checking their growth and competition. Though Aldcroft does not quite agree with the argument that the regulation made the railways less enterprising, as competition was still severe in the 1930s, he emphasises that the railroads' situation might have been much worse had it been left uncontrolled. However, he later admits that an increase of road competition might have forced the railways to withdraw from uneconomic operations, as the road transport companies would have concentrated on the dense traffic links.¹⁰¹

Therefore, the pressure on the railways would have been even bigger to abandon unprofitable lines, if the road operators were skimming off the cream of their competitors' main source of income. In order to stay in business at all, the four amalgamated railway companies would have been well advised to take immediate and radical steps to counter the competition on their profitable line of business, rather than leaning back and carry on in the way they did before, trusting that they were successful in the past and believe their past experience will help them overcome the challenges of the future. Instead of wasting resources on their unprofitable branches, the railways would have been forced to abandon them and concentrate their investments on improving their competitive position in their endangered core business. The legislative protection made the railways less enterprising. The same applies to former well-meant regulations aiming to protect rail transport. Though it helped to cushion against the immediate consequences of competition, it could not prevent them in the long term.¹⁰² Whereas the railroads should have grabbed the chance and make up for their delays in investments and innovations, they slowed down. Eventually they switched their strategy, either entering into alliances with bus or road freight operators or setting up their own road-based businesses after they secured the necessary parliamentary approval in 1928. In 1931 they were already associated with nearly half the bus companies, whilst it was far more difficult to settle in the road haulage industry. In 1929 the railroads obtained powers to diversify into air travel, but it was not

¹⁰¹ Aldcroft (1968), p. 84-8 (esp. footnote, p. 85) and Aldcroft (1970), p. 221. The *Road Traffic Act, 1930*, ch. 43 regulated the traffic of motor vehicles and the *Road and Rail Traffic Act, 1933*, ch. 53 was focussed on "...regulating the carriage of goods on roads by motor vehicles on certain roads...".

¹⁰² Accordingly, J y (1973), p. 138 underlines the absurdity and the adverse effects of the *Road Traffic Act*: "After 35 years of economic regulation of road haulage, it was difficult to identify any beneficiaries of the system, with the key exception of some established hauliers. It had certainly not protected the railways."

until the mid-thirties, that they were actively involved, either establishing new companies or acquiring stakes in existing enterprises.¹⁰³

The check on road transport is remarkable when observed in the light of the findings of the Royal Commission on Transport, published in their final report in 1931. The Commission discovered that the depression in heavy industries was more important than road competition in causing the difficulties of the railways. Still, the report acknowledged that the railways were naturally affected by the emerging competition, as road transport was highly advantageous to both commerce and the general public. Still, the railways were supposed to be partly responsible for their debacle. *"It has been suggested to us that when road competition first began to be serious from a railway point of view – that is, immediately after the War – the railways were caught napping and failed to take sufficient steps to meet the new situation....it cannot be denied that in the days of their monopoly the railways had in some ways insufficiently studied the needs of the public, and that their policy had become unduly conservative."*¹⁰⁴ The report then states the railways' efforts to convince the Commission to regulate road transport. Whereas the railway companies were right to highlight the government's damaging discrimination in favour of the road hauliers, regulation was only one option. The railway users had to bear the full costs of rail transport, while the corresponding bill in road transport was shared between the users by means of licenses and the taxpayers.¹⁰⁵ Instead of the regulation of the 1933 Road and Rail Traffic Act, legislation might have pursued the path suggested by the railway companies themselves in the same report, namely an equal treatment of road and rail transport concerning maintenance costs and new investments in order to put an end to legislative discrimination.¹⁰⁶

¹⁰³ Bonavia (1981), pp. 94-117 briefly examines the railroads' involvement in road and air transportation, serving as a comprehensive literature study.

¹⁰⁴ Parliamentary Papers (1931), Vol. XVII, Cmd. 3751, paragraphs 128-139

¹⁰⁵ Parliamentary Papers (1931), Vol. XVII, Cmd. 3751, paragraph 97: "As regards what may be described as economic disabilities, the railway companies took the view that although the economic costs of rail transport are entirely borne by rail users, in the case of road transport the user bear a part only of the corresponding costs. The grounds on which this contention was based were that (i) railway revenue must remunerate the capital approximately £900,000,000 expended in purchasing lands for and constructing the permanent way, stations, etc., and must also meet the annual cost (approximately £23,000,000) required for the maintenance of permanent way, signalling, equipment and the wages of signalmen; and (ii) the total annual expenditure on highways is approximately £60,000,000, of which only about £20,000,000 is provided by the Road Fund (i.e., licence duties) and £40,000,000 is provided by the ratepayer. The railways asserted that no account is taken of this £40,000,000 in the charges made by road hauliers for conveyance."

¹⁰⁶ Parliamentary Papers (1931), Vol. XVII, Cmd. 3751, paragraphs 99-102. The discrimination in favour of road transport remained.

The events during the Second World War very much resembled the WWI period. From 1st September 1939 the government regained control over the railways and left the responsibility for the daily operations to the Railways Executive Committee of the railway managers. As before, the companies experienced a decrease in investments and frozen charges after the initial financial arrangements had been revised in September 1941. The initial wartime agreements between the railway owners and the government established a pool for the entire receipts and expenses of the railways. Government guaranteed payments of £39.44 million, the guaranteed net revenues. They were then paid to the five controlled undertakings out of the pool. Whereas any remaining balance in the pool up to a further £3.5 million was distributed between the four amalgamated railway companies and the London Passenger Transport Board in proportion to their respective guaranteed net revenues, any earnings exceeding the sum payable up to a limit of £56 million were split half between the Exchequer and the five companies in proportion to their guaranteed net revenues with the remainder going directly into the government's account.¹⁰⁷

Following strong opposition to the financial arrangements due to the belief that they were favouring the railways at the cost of the transport consumers, alterations were undertaken in 1941. The outcome was guaranteed net revenue of £43 million payable to the railway companies, while any surpluses in net revenue over the agreed guarantee would contribute to the government's purse.¹⁰⁸ In the short term, the revision turned out to be a welcome blessing for the government, which received a total of £195.1 million between 1941 and 1945.¹⁰⁹ In the long term it added to the costly railway bill for neglected and overdue investments. Also, the controlled undertakings had no incentive to provide efficient transport services and to invest in maintenance and innovations, as they would not get a share of any profits exceeding the guaranteed net revenue. Though the railroads successfully managed the wartime demands, they were worn out in its aftermath. *“One of the biggest problems was the poor physical condition of railway assets. This can be attributed mainly to the effects of war damage, the neglect of investment and maintenance, and the intensive use of rolling stock which accelerated the rate of depreciation. Moreover these adverse factors affected the railways when they were least able to stand the strain, since prior to 1939 investment and renewals had been neglected, and on balance the railway companies had been disinvesting since 1914. The war served*

¹⁰⁷ Parliamentary Papers (1940), Vol. X, Cmd. 6168. The proportions of the guaranteed net revenues are given in the Command Paper as follows: London Midland & Scottish Railway: 34% ; London & North Eastern Railway: 23% ; Great Western Railway: 16% ; Southern Railway: 16% ; London Passenger Transport Board: 11% . Also see Gourvish (1986), p. 12

¹⁰⁸ Parliamentary Papers (1941), Vol. VIII, Cmd. 6314

¹⁰⁹ Aldcroft (1968), pp. 89-94

to accentuate the problem considerably.”¹¹⁰ In 1947, 16.6% of the total stock or roughly 203,000 railway wagons were in line for repair with many more being obsolete, reflecting the neglect of investments during the wartime years. Mirroring the post-WWI period input costs of the railways rose in the aftermath of WWII, whilst there was no corresponding adjustment in charges. Despite an increase in 1947, charges reached only 55% of the pre-war level. Wages and other input prices had more than doubled by 1948.¹¹¹

After the Labour Party’s sweeping victory in the 1945 election, the railways were set on the final path to nationalisation. Labour assumed that public ownership was necessary to undertake a general overhaul of the railway network and that a government controlled unified transport system was the most efficient organisation to run the service.¹¹² However, the nationalisation received cross-party political support, though the Tories’ standpoint was rather ambiguous, drawn between the party’s inter-war étatiste tradition and economic liberalism, ending up in a compromise.¹¹³ Eventually, the 1947 *Transport Act* established the *British Transport Commission (BTC)*, which was granted the powers to run passenger and freight transport by rail, road and inland waterway. As the government awarded a legislative monopoly in transport to the Commission, the BTC was supposed to break even, neither making any profits, nor losses. *“The Commission shall charge to revenue in every year all charges which are proper to be made to revenue, including, in particular, proper allocations to general reserve, proper provision for depreciation or renewal of assets and proper provision for redemption of capital, and all payments (including the payments which are by the relevant provisions of this Act, or by any other relevant statutory provision, to be deemed to be capital payments) which fall to be made, in lieu of any other form of compensation, to any local authority in that year in respect of any undertaking transferred to the Commission, and references in this Act to charges properly chargeable to revenue shall be construed accordingly.”*¹¹⁴ Finally, the regulation of private enterprise reached its climax in the Transport Act, following a century of government interference in railway transport. The British Transport Commissioners now had to prove

¹¹⁰ Aldcroft (1968), p. 100. Savage (1957), p. 638 portrays a similar picture of the railways after the war.

¹¹¹ Aldcroft (1968), p. 104

¹¹² Alternatively, Bonavia (1946), p. 6 suggested an early version of institutional separation in a memorandum of the London and North Eastern Railway as the government should purchase “...the fixed assets required for the operation of railway traffic” There is some resemblance to the Swedish approach to deregulation, as outlined further below.

¹¹³ Crompton (1999a), pp. 146-147. The Conservatives quickly adopted the advocacy of decentralisation, but it “...was unclear, how much autonomy the railways would enjoy, whether they would compete with each other or where managerial control would be located. In its comprehensive vagueness, advocacy of decentralisation among post-war critics of nationalisation roughly paralleled the earlier vogue for co-ordination among the enthusiasts.”, Crompton (1999a), p. 147.

¹¹⁴ Transport Act, 1947, section 93

that they would run the transport system to the public benefit, maximising the welfare of the public.

Image removed due to third party copyright

MAP 3: Survey Map of the German Railways in 1911

Source: Klee (1982)

B. The Kingdom of Prussia and the German Reich

1. The early railway promotion and the 1820 National Debt Law

In the early years of railway construction, Germany still resembled a patchwork rather than a unified nation state. What became known as the German Reich were 39 sovereign states, finally tied together in 1871 as a direct result of the Franco-Prussian war. Thus it is no big surprise that there was no unified German railway policy before the empire's foundation. The other German states were worried that Prussia would take on a dominant role in railway transport, meaning in turn that Prussia could influence the individual states' economic and trade policy to an extent. The states, being aware of a potential threat to their sovereignty, were reluctant in promoting a German railway network. German particularism and its inherent complexity was one of the biggest burdens the railway advocates had to face. The construction of a line from Berlin to Hamburg required successful negotiations with four different states, one of them being subject to the Danish government. Having managed the initial construction phase of railway lines across several borders, new burdens were waiting, as the states often had differing local or regional time zones, currencies and units of measurement, resulting in several calculations. However, at least the gauges were of a standard width, as the German states were importing their locomotives mainly from England in the early stages of railway development.¹¹⁵

It is characteristic for Germany that the entire range between the extremes of a private enterprise railway network and one operated and built by the state can be found. While the systems in Bavaria and Saxony were partly state-owned, the states of Baden, Braunschweig, Oldenburg and Württemberg were following the public ownership approach.¹¹⁶ Prussia left most of the construction and operation of the network to private entrepreneurs, offering only limited financial assistance to projects being in the national interest. The following discussion is limited to the Prussian case.

¹¹⁵ According to Fremdling (1983), p. 126, 48 locomotives out of a total of 51 purchased for Prussian railway companies between 1838 and 1841 were made in Great Britain, two in Belgium and a single one in Germany. Seidenfus (1983), pp. 233-234 explains the consequences of the German state's particularism on railway promotion in greater detail.

¹¹⁶ Fremdling (1983), p. 122, Klee (1982), pp. 165-166 and Stolper (1967), p. 40. Von Mayer (1891) presents a detailed railway history of every single German state.

The new mode of transport already had its promoters in the 1820s, with both entrepreneurs and some of Prussia's civil servants favouring the construction of a railway network. Their main line of thought was simply a logical consequence of taking Prussia's economic geography and its central European location into account.¹¹⁷

Even though Prussia had its natural resources hidden away in the most remote corners of the country, it still lacked an efficient transport system, such as the canal networks that were prevailing for bulky and heavy goods traffic in Britain and the Netherlands. Coal being the most essential ingredient for the country's industrialisation, the major coal mines were disadvantageously located at its borders, in the Ruhr and Saar regions in the west and in Silesia in the east. In order to exploit its natural resources and distribute them to the cities and factories of industrialising Prussia, railways could provide an efficient and time saving link between the centres of commerce and inland waterways, thus being beneficial to the economy on a large scale. As if to support Prussia's early railway promoters, the Dutch were placing a heavy burden on German commerce in levying duties on all goods carried from the Rhine to the North Sea, although the 1815 Treaty of Vienna provided for free shipping on the Rhine. In order to circumvent the levies and exercise pressure on the Dutch, a rail project between the Rhine and the river Weser was suggested, promoting trade between the southern parts of Germany up to the North Sea via the port of the Free Hanseatic Town of Bremen. This plan was first rejected by the Prussian king Friedrich Wilhelm III in 1828 and again by the government in 1832. The Prussian state invested in a road network in the aftermath of the Napoleonic wars and thus, the government was concerned about the role of competing railways, diverting traffic from toll roads without providing compensation for its loss in revenue.

In 1833 the German economist Friedrich List gave the railway promoters strong backing with his visionary publication on the advantages of a German railway network, which would contribute substantially to the welfare of the German states. Still, the Prussian government failed to recognise the potential benefits for the entire economy. In July 1835 it commissioned its minister Christian von Rother to analyse the alternative options for the government's railway policy. In his final report he advised King Friedrich Wilhelm III against any government commitment to the railways, whether it be financial assistance or even outright construction of lines. He believed that the promoters of the railways were exaggerating the gains when contrasted with both the high initial capital

¹¹⁷ For the early efforts of Prussian railway advocates see Henderson (1958), pp. 155-160, Klee (1982), pp.

investment of putting the infrastructure into place and the associated commercial risk of the innovation. The Prussian roads would be sufficient for existing transportation needs. The government failed to envisage that the railways might create new demands for communication, stimulating economic growth and the demand for transportation facilities.¹¹⁸ Finally the military gained interest and the government had to acknowledge the railway's advantages, reconsidering its options.

Adding to the economic arguments, the railway advocates further highlighted strategic defence issues. Prussia's central European location left it in the position of an island. In contrast to Britain, however, it was not surrounded with water, but with more or less friendly nations, posing a potential threat to the country. Thus, from a military point of view the railways could provide immediate supplies for endangered posts along the frontier. If Prussia should decide to opt out or postpone the development of a railway network, it would have a strategic disadvantage, when attacked by countries that invested in this modern means of transport.

But even though their lobbying of the government went back to the early 1820s, the Prussian railway advocates did not succeed with their plans until November 1838, when the first Prussian railway service had finally been introduced, connecting the cities of Berlin and Potsdam. The very first locomotive-drawn German railway went into service three years earlier, on 7th December 1835 in Bavaria, linking the neighbouring towns of Nürnberg and Fürth, followed by the 1837 opening of the first section between Dresden and Leipzig in Saxony.

The promoters had to circumvent a number of problems and vested interests. They met strong opposition by the Prussian élité, the Junkers. Those aristocrats owned huge estates in the East Elbian provinces and were strongly involved in Prussian governmental and military bureaucracy. Further opposition against the advanced methods of transportation came from competitors, such as road and water transport companies, but as well from the head of the Prussian postal service, von Nagler. The latter anticipated falling revenues due to the competition of railway companies, as the railways would skim the cream by choosing profitable lines and leaving the remainder to the post. The common cross-subsidies from profitable passenger services could no longer subsidise the

97-101 and Seidenfus (1983), pp. 236-237

¹¹⁸ Fremdling (1983), pp. 123-140 discusses the railways' significance for the economy as well as both forward and backward linkage effects with other industries.

unremunerative lines of the post's passenger coach traffic in order to maintain the universal service even to the most remote village. He demanded appropriate compensation for the post's loss in revenues and secured his interests in the Prussian Railway Law of 1838. Incumbent competitors in the transport market and other interest groups lobbying the government in order to set up strategic market barriers slowed the progress of Prussian railway innovation.¹¹⁹

Legal requirements were a further check on the railway promoters' progress, adding to the market barriers. The 1820 National Debt Law considerably limited the leeway of the Prussian government. The law "...fixed a 'legal' ceiling on the debt, the Crown promising neither to add to it nor to introduce any new direct taxes without consulting that quasi-parliamentary body, the United Diet...It did not promise to be a very radical political instrument, but the Prussian monarchy felt that steps in its direction were concessions toward 'democracy' to be avoided at all costs. This stand, one should remember, was strongly influenced and supported by Prussia's conservative Austrian and Russian allies (the Holy Alliance)...Thus, general antipathy on the part of Prussia's ruling class to industrial development was reinforced in the area of fiscal policy by politico-legal arrangements which made public spending patterns dependent upon change in revenue sources."¹²⁰ The National Debt Law left the government hardly a choice, as borrowing was ruled out and the Crown would have to divert resources from other uses. Withdrawing resources from other public institutions would have provoked strong opposition of civil servants and other beneficiaries affected.

The National Debt Law was the prevailing force which prevented the realisation of a state-owned railway from a legal point of view. Though Friedrich Wilhelm III's successor Friedrich Wilhelm IV decided to call the *Vereinigten ständischen Ausschüsse der preußischen Provinziallandtage* in 1842 and the *Vereiniger Landtag* in 1847 that were both in favour of the government's involvement in railway construction, they declined the Prussian government's proposal of approving a loan for the construction of the Eastern Railway between Berlin and Königsberg, as they did not regard their assembly as a parliament in accordance with the requirements of the 1820 National Debt Law. Whereas the *Vereinigten ständischen Ausschüsse* were made up of representatives of the provincial assemblies, the *Vereiniger Landtag* was the sum of the representatives of the eight provincial assemblies. The 1820 National Debt Law, however, required a national

¹¹⁹ Klee (1982), pp. 98-102 and Seidenfus (1983), p. 237 on the opposition of the government and Tilly (1966), pp. 486-487 for the powerful position of the Junker aristocracy in Prussian government.

¹²⁰ Tilly (1966), p. 488

representation, the *United Diet*. The Diet was envisaged to be a genuine national parliament, representatives being directly chosen by the electorate in national elections.

The king's admittance of a national parliament would have been equivalent to a self-restriction of his power and the introduction of a constitutional monarchy. Regardless of whether Friedrich Wilhelm IV was in favour of giving way to more democratic control, he had to consider further vested interests. His Austrian and Russian allies as well as the crown prince were unanimously opposed to modern democratic tendencies. Although the Prussian railway policy had been the focus of the assemblies in 1842 and 1847, the debate on public versus private ownership of the railways was only superficial, hiding the highly delicate issue of constitutional reform based on the king's promise in the 1820 National Debt Law. The majority of the advocates of either assembly arguing for state railways were likely to be by far more concerned about the establishment of a constitution and a genuine national parliament.

The 1847 *Vereinigter Landtag* ended up as an embarrassing catastrophe for the government and the King of Prussia, leaving them stranded without the requested bond for the Eastern Railway. During the debate, August von der Heydt and David Hansemann, both prominent champions of a state-run railway system and later ministers in the Prussian cabinet, were openly arguing that they could not approve of any state bond, as long as the use of the taxpayers' money was entirely taken out of their control. Hansemann went even further and attacked the failed railway policy of the last decade. Following the assembly's refusal, the government dismissed 8,000 workers who were already occupied in the construction of the Eastern Railway, thus increasing the massive unemployment in pre-revolutionary Prussia. Eventually, the revolution of 1848 made further considerations of the National Debt Law pointless, as the national parliament became reality, in turn agreeing upon the required bonds, resulting in the government's active involvement in the construction and management of the railways.¹²¹

Whether or not the successive Prussian governments preceding the 1848 revolution had been convinced by the arguments of the promoters of a state-run system, they did have less choice than someone being trapped in a cul-de-sac. There was no way of return to the era without railways – the only path led forward with the creation of a

¹²¹ Henderson (1958), p. 163 and Blankart (1987), pp. 79-80. Blankart highlights the role of the National Debt Law as the single most prominent issue determining the Prussian government's railway policy. Klee

system somewhere between the poles of a purely private and a state railway operation. The final option, however, was legally restrained due to the National Debt Law, leaving the government very limited scope. In the 1830s Prussia had to face the reality of lacking public funds and seized its limited chance with the subsequent 1838 Railway Law. While construction and operation were left to individual entrepreneurs, the state regulated their endeavour.

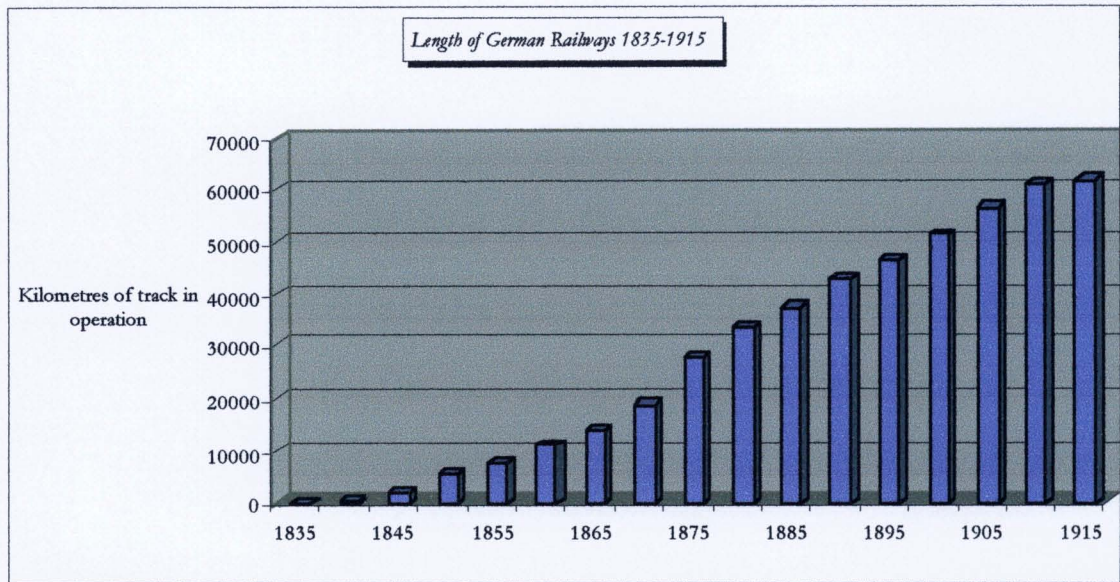


CHART 17

Source: Mitchell (1998): International Historical Statistics: Europe

(1982), pp. 107-113 very vividly displays the embarrassment of the Prussian king in the assemblies of 1842 and 1847.

2. Government interference and the 1838 Prussian Railway Law

In his classic economics book on business cycles, Schumpeter analysed the early development of the railways in Prussia. He stressed the role of private enterprise and the revolutionary impact upon the economy as a whole. The Prussian government “...acted upon what later became the fashion to call – with some derogatory implication – Smithian principles. The creation of the German railroad system was, hence, substantially the work of private entrepreneurs...”¹²² Schumpeter’s assumption of a Prussian free-market trend might appear remarkable in a country which would soon take the lead as the forerunner of increasing state control of the economy. But the Smithian principles can be explained by exogenous factors, being beyond government’s control. Notwithstanding the Prussian government’s stance concerning the above principles, the restraints on borrowing limited its possible involvement in the railways and were responsible for the relatively unhampered entrepreneurial freedom. Still, the Prussian system was far away from becoming a network being created and operated by unrestrained entrepreneurship. The Smithian principles were put in a straitjacket from the very beginning with the 1838 Railway Law.¹²³ “The Prussian government had to face the fact that most of the capital for railway construction would have to be raised by private companies. But the State was determined to exercise as much influence as possible over the building and operation of railways. The Prussian Railway Law of 1838 gave the State wide powers over railway companies. Moreover every railway company had to obtain a concession from the government and this gave the authorities an opportunity to acquire the right of purchasing the line at some future date.”¹²⁴

The lack of public funds and the government’s determination to exercise its regulatory power in railway construction and operation resulted in the *1838 Prussian Railway Law* and its predecessor, the *Allgemeinen Bedingungen* of 1836. The latter defined the general rules to obtain concessions from the Ministry of Commerce for the construction and operation of private railway companies. The act of 1838 provided for the combination of private enterprise with public supervision, exclusively directed towards private railway companies.¹²⁵ §26 of the Railway Law dealt with the urgent need to attract private investment by granting every railway company monopoly power on its own line for three years from start of service. During these years, the company was free to set

¹²² Schumpeter (1939), p. 346

¹²³ The Royal Prussian Railway Law is attached in the appendix, section VI.B.3.

¹²⁴ Henderson (1958), p. 163

¹²⁵ Seidenfus (1983), p. 237 takes the viewpoint that the law was a preliminary decision whether the system should be run by public or private companies, as it was restricted to private enterprises.

prices according to their discretion. In addition, §44 of the law was concerned with the high risk of the initial investment, as the government was not allowed to give any concessions for parallel lines within the 30 years.

But the monopoly of the incumbent railway company was potentially restricted. Competition on the track was permitted after the initial period of three years had passed, thereby lowering the entry barriers of the railway market. According to §27 of the Railway Law potential entrants had to pay an access charge, the *Bahngeld*, to the track owner. Additionally, they had to obtain a licence from the Ministry of Commerce. Already in 1838, the law specified the formula for calculating the access prices to the incumbent's infrastructure and limited the profits a company was allowed to receive to a maximum of 10% of the investment capital (§§29-30).

Due to the Prussian postal services' complaints and demands for appropriate compensation, the law included certain privileges, such as the transportation of all postal goods free of charge (§36, 2). In addition, every railway company was obliged by law to bring its transport service into line with the postal administration's requirements (§36, 1). If the regular service should be interrupted due to the railway company's responsibility, thus temporarily forcing the post to find other means of transportation, the private business would have to compensate the postal administration. Though the law allowed for a general railway tax (§38), its revenues were limited to compensating the government's budget for lost revenues due to the railway's competition (§39). Most importantly, the law codified the state's right to acquire the property of the railway companies 30 years after opening the line for traffic (§42, 1), even including the basic rules for calculating the purchasing price (§42, 4). The state's discretionary powers were considerably widened with the final paragraph of the law (§49), providing leeway for future amendments or alterations of the legal requirements of the 1838 Railway Law and railway concessions.

The law immediately provoked strong opposition from contemporary entrepreneurs and shareholders of railway companies who were opposed to granting the government both omnipotent and arbitrary powers, as they were expressed in §49 of the law.¹²⁶ Even one of the prime advocates of state owned railways, David Hansemann, strongly criticised the law on entrepreneurial grounds. Ironically, he admitted his lack of

¹²⁶ Klee (1982), pp. 103-104 and Seidenfus (1983), p. 238. Klee argued that the government designed the Railway Law to make the capitalists pay for the railways, while it left the power of disposal with the government.

comprehension of the rules on calculating the access prices laid down in §30. The requirements were complicated, ambiguous and allowed different interpretations. Notwithstanding the Prussian civil servants' astuteness and knowledge, the criticised rules would prove their incapability of judging decision making in business. Hansemann condemned the profit ceiling of 10% as being unreasonable and unfair. The law, he claimed, would scare off foreign capitalists, hamper innovation in railway transport and curb any possible reduction in tariffs due to an increase in frequency of services.¹²⁷ Already in 1837 he argued against the government's intention to place a commissioner in every railway company in order to exercise the government's supervisory powers, as was envisaged for the law and actually implemented in §46. Hansemann deemed the constant supervision of individual business decisions harmful. The private companies would lose their essential advantage compared to state-run enterprises, if their entrepreneurial freedom was restricted. He concluded that the government would have to choose either a purely private or state-run system of railways, as the advantages of both systems were incompatible.¹²⁸

Hansemann was convinced that state-run railways were the first-best option for Prussia, as only the government would build lines into areas with a low population density. Though beneficial to the economy as a whole, the lines would not attract private enterprises. However, he realised the impossibility of a public railway network due to the government's financial restraints and resorted to a system of unrestrained entrepreneurial freedom as the next best choice. Instead of regulation he demanded promotion and the removal of all barriers for the construction and operation of railways. The law, he argued, was an adequate means to wreck a railway company.¹²⁹ Indeed, the railway market had suffered from the interference and did not recover in the following years. The demand for railway shares and consequently their share prices went down, as the law ruined any expectations for a high return on investment. The railway companies were left with the vague hope that the government would refrain from applying the extensive regulatory potential of the Railway Law.¹³⁰

Recognising the imperceptible progress of railway building, the Prussian government created the Railway Fund in 1843 in an effort to provide limited support for

¹²⁷ Hansemann (1841), pp. 80-81

¹²⁸ Hansemann (1837), pp. 102-103

¹²⁹ Hansemann (1837), pp. 26-27 and Klee (1982), p. 103

¹³⁰ Klee (1982), pp. 103-106 reports on the protests of the railway companies, the economic downturn and the intention of the government, not to make full use of the law.

railway projects. The combination of privately owned railways and companies built with the fund's assistance resulted in Prussia's mixed approach to railway policy. The fund's resources were available whenever the construction of a line was considered to be essential for Prussia's economic welfare or for military reasons, but the risk associated with the investment kept private entrepreneurs away from the project. In order to attract investors, the state accepted part of the risk of some railway projects to make them commercially viable. Though the Railway Fund served to promote railway construction, it was in its essence a device for cross-subsidisation from profitable to less profitable lines were considered to be in the national interest.¹³¹

The Railway Fund's revenues were drawn from diverse sources. In the years following the introduction of the fund, it was financed through government money and superdividends of private railway companies, as the government creamed off one-third of the profits which were exceeding 5% of the entire capital held in shares. In addition, a progressive tax between 2.5 and 10 cent of net profits on railway companies was levied following the *1853 Railway Law*, activating the tax already provided for in §§38-39 of the 1838 Railway Law.

Financial assistance through the Railway Fund was given by two means. Either the government acquired some shares of a private railway company or by guaranteeing interest on shares through the fund. If the government agreed to support the construction of a new line, it bought one in seven of the company's shares and guaranteed 3.5% interest on the other six-seventh owned by the public.¹³² Although it might already benefit by owning one-seventh of the shares and in political terms by an increase in the nation's welfare with the new transport facilities, it demanded the right for taking over the administration of the company in question if certain circumstances would require so in exchange for its financial commitment. If assistance through the fund were granted, the government would impose its terms upon the company in the concession agreement, therefore considerably restricting the company's leeway.¹³³

¹³¹ Fremdling and Kneeps (1993 , p. 132 discuss the problem of the cross-subsidies. The policy of cross-subsidisation within a company was all too common in British Rail and Deutsche Bundesbahn in the 20th century, which was partly responsible for the decline of the entire networks.

¹³² Henderson (1958), pp. 165-166 and Seidenfus (1983), pp. 239-243

¹³³ Seidenfus (1983 , p. 240 for an excerpt of a concession agreement.

3. National versus private railways

The 1848 revolution presented a turning point in Prussia's railway history with the new government now openly favouring public railways. The struggle for political participation was over and the way for public borrowing open to the government. David Hansemann was appointed Minister of Finance in spring and carried on to promote his vision of state-run railways. In consequence, the Prussian government planned to nationalise its entire railway network for the sum of fifty million Thalers. The plan did not materialise for another three decades, because that very government had to leave office in the same year. Nevertheless, the nationalisation efforts were stimulated in December 1848, when one of the most prominent advocates of a network of state railways, August von der Heydt, was appointed Minister of Commerce. In contrast to Hansemann's unsuccessful attempt, he adopted a piecemeal approach to nationalisation and exercised a greater influence wherever possible, either by constructing new state lines or buying private railway businesses. Heydt interfered with their internal business decisions, as he was convinced the trains should be run in the national instead of the shareholder's interest. During the 1848 depression many railway companies were facing financial difficulties due to a decline in freight transport as a direct result of the economic depression. When they turned to the government to request assistance, Heydt was only too ready to bail them out. But the government's support was conditional upon the Prussian state taking over the administration of the company in question.

His policy of partial nationalisation and extension of influence was so far quite successful. It was furthermore highlighted in December 1849, when the Prussian Landtag authorised a loan that was required for the state railway projects Heydt was advocating. Still, the opposition towards the politics of nationalisation grew. He met fierce resistance from the directors of the *Lower Silesian Railway*, when he suggested that its poor performance in the late 1840s would justify the government's take-over of the company's administration. The company's directors did not quite share his view. They argued that the minister himself was responsible to some degree, because he had imposed upon the company an expensive night train service.¹³⁴

Even though the 1838 Railway Law did not authorise Heydt to order private railway companies to run night trains, he made use of the law in accordance with his idea

¹³⁴ Henderson (1958), pp. 174-178 and Klee (1982), pp. 121-122

of maximising the country's welfare and meeting the national interest. The minister referred to §36 of the law, stating that the companies were obliged to adjust their timetables to the postal service. When confronted with the Lower Silesian's demand for compensation due to the expected increase in costs, he replied that it would be odd for the government to pay anyone to comply with the law. Thus, he forced the Lower Silesian Railway Company to run a night train on the route between Berlin and Breslau in 1849. Complying with the government's regulations, the company's directors were offering the service and supplemented it with a surprise: *"At a meeting of the shareholders it was decided to defy the Minister of Commerce by having the night trains drawn by horses instead of by locomotives. Von der Heydt threatened the directors with legal penalties if the locomotives were withdrawn from the night trains and the company gave way."*¹³⁵

The board of directors of the Lower Silesian Railway Company was hardly entirely responsible for their railway's poor performance. Neither did they decide to run expensive night trains, nor was the economic depression and the consequent reduction in commerce their fault. The debate went on and included Karl von Bodelschwingh, the then Minister of Finance. He rejected Heydt's plans of nationalising the Lower Silesian Railway Company. However, Friedrich Wilhelm IV overruled Bodelschwingh, pointing to the economic and military importance of the line. The railway was transferred into public ownership in 1852.¹³⁶

Subsequently, the railway tax of 1853 as well as the dividends on the government owned shares were used to increase the total amount of railway shares held by the state. Apparently, the government's path between 1848 and the late 1850s was essentially a policy aiming at a nationalised rail network, reversing the former market led development. Though the government's policy of letting the railway companies pay for their own nationalisation was remarkably ingenious, it is more than doubtful, whether the mixed system between the poles of private and state railway companies maximised the welfare of Prussia after all. The Prussian influence over railways grew at such a rate, that by the year 1857 about half of the Prussian railway network was either controlled or owned by the state.¹³⁷

¹³⁵ Henderson (1958), p. 181

¹³⁶ Blankart (1987), p. 80 argues that excessive regulations led to deficits, resulting in the government's legal justification to take control. See also Henderson (1958), p. 178 and Klee (1982), p. 122. The nationalisation order for the Lower Silesian Railway is attached in appendix 4.

¹³⁷ Henderson (1958), p. 183 and Seidenfus (1983), pp. 242-243 concerning von der Heydt's nationalisation efforts.

The trend towards steadily growing government involvement came to a temporary halt with the election of a Prussian Landtag in 1858. Liberal politicians dominated the newly elected parliament. They favoured a notion of entrepreneurial freedom and put an end to Heydt's nationalisation concept financed by the private railway companies. The proceeds from the dividends of the shares the government held in railway companies were now no longer used for acquiring new shares, but were to contribute to the entire public budget. Despite the change in politics Heydt remained in the Prussian government until 1862, when he resigned due to Bismarck taking the post of Minister President. He returned to the cabinet as Minister for Finance in 1866 for three years. Ironically, Heydt was forced to sell shares, which the state held in some of the private railway companies, in order to raise money for the Austrian-Prussian war in 1866. However, the Prussian annexation of German territories immediately after the war with Austria enlarged the Prussian State Railway's lines by 1069 kilometres in total length, thus creating something close to a true railway network for the first time.¹³⁸

In December 1862 Heinrich von Itzenplitz was appointed Minister of Commerce and was henceforth responsible for the government's policy towards the railways until 1873. *"Von der Heydt's railway policy was now reversed. Public opinion followed the lead given by the influential Congress of Economists in favouring private rather than public railways. Itzenplitz declared that it did not matter who built railways so long as someone built them."*¹³⁹ Again, the lack of public funds available for railways was a further driving force behind the support for private railways. The government's priority was rather military spending than investments in the railways. The Minister of Commerce's source of public money, the Railway Fund, was discontinued in 1863, leaving even less leeway for public construction of railway infrastructure. As a result of the shortage of both public and private funds in Prussia, English capital was increasingly attracted in the 1860s, an era dominated by a trend towards laissez faire in Prussia. The massive increase in privately built and operated tracks culminated in a railway mania in the early 1870s after the Franco-German war, with 25 new railway companies emerging between 1871 and 1873, leading to a boost in network expansion (*chart 18*). This period is characterised by increasing competition in the railway industry, with companies building parallel lines, e.g. along the Rhine river and on other routes in the Rhein-Ruhr industrial region. Though the competitive pressure was

¹³⁸ Blankart (1987), p. 81 and Klee (1982), p. 134 report on the take-over of the railways of the states of Hanover, Kurhessen, Nassau and Frankfurt/Main as well as Schleswig-Holstein by the Prussian State Railways.

effectively curbing monopolistic pricing behaviour and increasing the density of the network, it created overcapacity that led to collusive behaviour between the different operators.¹⁴⁰

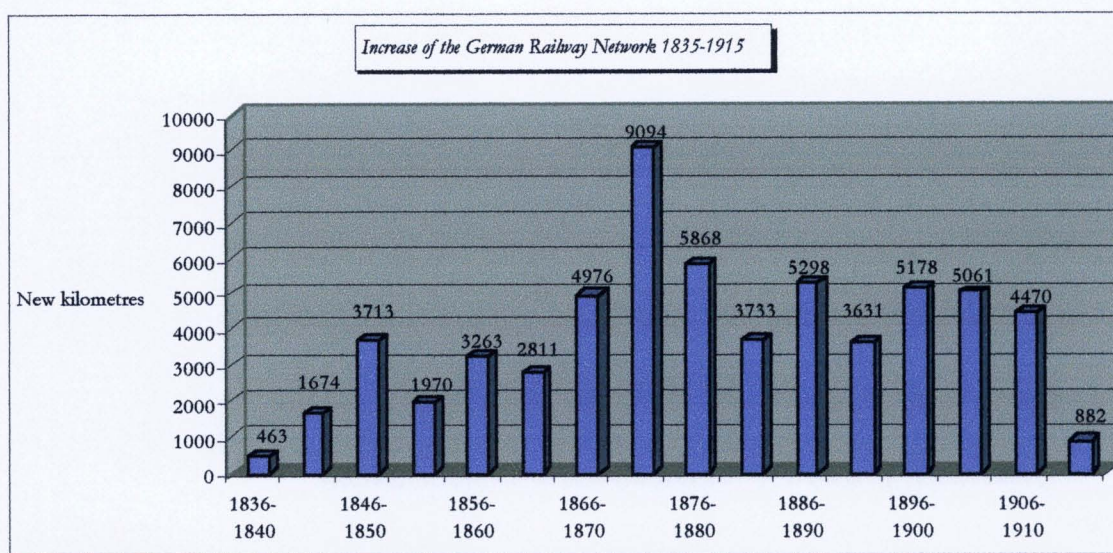


CHART 18

Source: Own calculations based upon Mitchell (1998): *International Historical Statistics: Europe*

The speculative boom after the war with France resulted in a deep depression from 1873. The average share price for the entire stock market was halved between 1872 and 1876 with many companies facing bankruptcy. Several shareholders were deprived of their savings, which they had invested in railway companies and other industries. The economic consequences of the inevitable depression were structural adaptations, mergers and rationalisations. The political consequence, however, was a return to protectionist tendencies. From now on liberal free trade policies became the welcome scapegoat for economic difficulties. Due to excess production abroad, foreign products were imported at low prices and increased the competitive pressure in Germany. In order to support German industries, protective duties were implemented.¹⁴¹

The resignation of the liberal minister Delbrück, a principal champion of free trade, marks the final turning point from a government with a positive view on private enterprise towards a government openly favouring public enterprise in 1876. The Reich elections in 1878 and the subsequent elections to the Prussian Landtag in the following year both resulted in the liberals losing seats to the conservatives.¹⁴² When Bismarck's

¹³⁹ Henderson (1958), pp. 186-187; see Klee (1982), p. 133

¹⁴⁰ Fremdling and Knieps (1993), pp. 133-139, Henderson (1958), p. 187 and Klee (1982), pp. 141-162

¹⁴¹ Blankart (1987), pp. 81-83 and Klee (1982), pp. 158-159

¹⁴² Blankart (1987), p. 82 provides an overview, showing the number of seats of each party in the Reichstag and the Preußisches Abgeordnetenhaus (the Landtag).

efforts for the nationalisation of the entire German network failed due to the opposition of individual states of the Reich, he decided to pursue his course in Prussia. After the Landtag elections a majority of representatives approved of his nationalisation programme commencing in December 1879. By 1884, the Prussian government had acquired the major share of about 8,500 kilometres of lines. *“Construction was thenceforth done by the state, which unified rates, rationalised administration, and achieved what was in the whole world looked upon as the standard example of successful public enterprise. The compliment, while very well deserved, must not be overdone. The main work was accomplished by 1875...private industry continued to offer to, in fact almost to force upon, the state-managed railroads a stream of improvements – particularly improved types of locomotives, cars, brakes, safety devices – so that the merit...is reduced to not resisting and to displaying an intelligent demand; and conditions, both technological and commercial, were quite exceptionally favourable in a thickly populated, predominantly flat country.”*¹⁴³

At last, Bismarck got his way to pursue the path of nationalisation of the railways. While nearly 60% of the Prussian railway network of 16,142 kilometres was still in private ownership in 1875, it was only a marginal 6% of the 37,973 kilometres on the eve of the first world war, as shown below (*chart 19*).¹⁴⁴ Nevertheless, the chancellor's vision of having the railways nationalised under ownership of the Reich was partly wrecked by the several differing interests of the individual states within the Reich. It was not until 1920 that the operation of the railway network was transferred to the *Deutsche Reichsbahn*. In the meantime, eight state railways were co-existing next to each other and the *“...relationship among the eight public railroad systems was about what it would have been among private systems under loose state supervision.”*¹⁴⁵

¹⁴³ Schumpeter (1939), pp. 346-347

¹⁴⁴ Stolper (1967), p. 41 presents the corresponding figures for the Reich. The entire German railway system in 1875 was consisting of 27956 kilometres, of which 12641 kilometres were private, 12062 were state railways and the remaining 3253 were operated by the state, though owned by private companies. The year 1912 presents a somewhat different picture, with a total network of 60521 kilometres, of which a marginal 3631 kilometres were owned and operated by private companies with the remainder being under control of the German states.

¹⁴⁵ Stolper (1967), p. 42

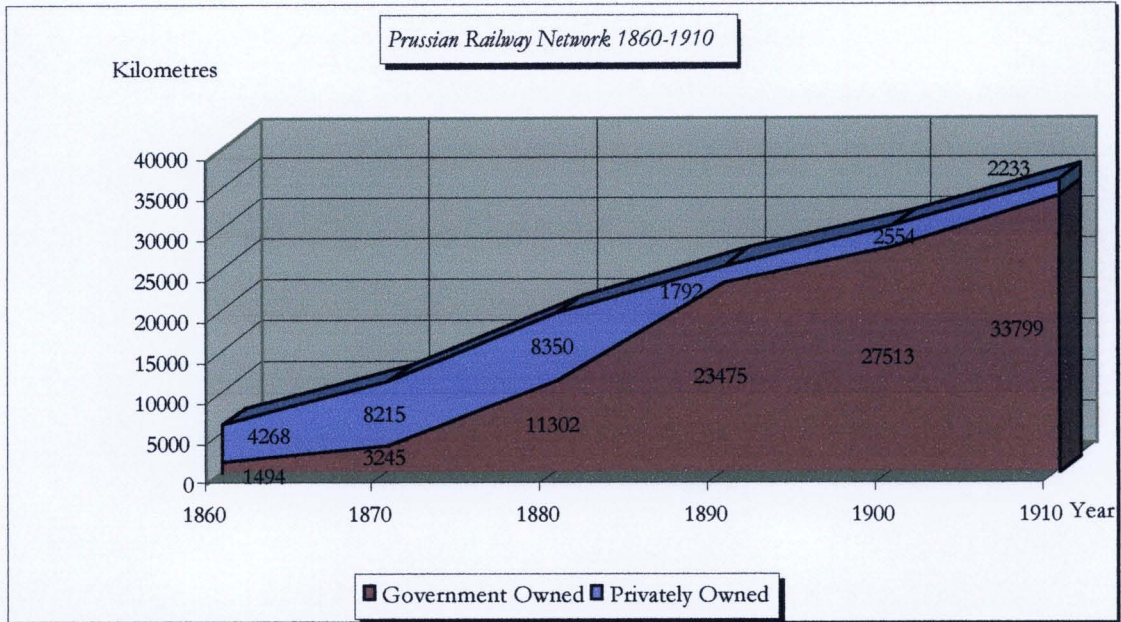


CHART 19
Source: Blankart (1987)

4. The motivations for nationalisation

The development of the Prussian railways may be separated into three broad stages. In the first stage of railway construction until the 1848 revolution, relatively unrestrained entrepreneurial activities emerged as a bare necessity due to the scarcity of funds in the government's purse. Though the 1838 Railway Law provided the government with a powerful regulatory apparatus, it refrained from its use. Active government involvement characterises the second stage. In 1858 it came to an end with the liberals winning the absolute majority in the election to the Prussian Landtag. During the 1850s August von der Heydt's policy of gradual nationalisation led to a system in which public and private railroads were increasingly co-existing and competing with each other. The state had purchased private railways, taken over their administration and operation or built own lines. In spite of the government's successful efforts to get more involved in the decade from 1848, the *laissez-faire* doctrine captured ever more ground and came close to being accepted as mainstream politics in the 1860s. Again, the government was confronted with a shortage of funds for railway projects. The budget was focussed on military spending due to the wars with Austria and France. However, there was an essential difference compared with the 1840s, as the political climate was now strongly favouring a market economy. Thus, a kind of *golden age* for the private railway companies marks the third stage before the nationalisation process gained full pace in 1879.

Though the cartelisation of the railways in the aftermath of the Franco-German war created growing demands for reform, it is rather doubtful whether the nationalisation was the appropriate reply. Even in the unlikely case that the government had suddenly lost its entire confidence in a liberal economy, it could have applied the powerful measures of the 1838 Railway Law.¹⁴⁶ The promotion of competition on the track according to §27 of the law was a considered option, allowing other operators than the owner of the track access to the railway infrastructure, provided that the operator had obtained a concession from the Minister of Commerce and paid the *Bahngeld* to the owner. The competition between lines, which produced the overcapacity in the early 1870s, would have been eased, thus avoiding future waste of resources by duplicate lines. Nevertheless, the instrument had only been applied on a single occasion as a potential threat against the *Upper Silesian Railway Company*, when Berlin's growing demand for coal was to a large extent supplied by England. In order to promote the higher priced Silesian coal, Heydt

¹⁴⁶ Fremdling and Knieps (1993), pp. 144-154 study possible options prior to nationalisation.

required both the Lower and Upper Silesian Railways to introduce the special *Einpennigtarif*. The companies soon abolished the low tariff on account of anticipated losses. In the course of events, the minister took over the Lower Silesian's administration and announced that he would grant the Lower Silesian Railway a licence according to §27 of the Prussian Railway Law to run their coal trains for the *Einpennigtarif* on the Upper Silesian's tracks. Unsurprisingly, the law assisted the Upper Silesian Railway's directors to change their mind in 1852.¹⁴⁷ In retrospect, the new tariff was a profitable business for both the Silesian mining industry and the railways, as the coal carried to Berlin rose from 5,300 tons in 1850 to 191,700 tons in 1860.¹⁴⁸

Though market failures are a common justification for public ownership of industries, the Prussian government could have remedied assumed failures with a regulatory approach, e.g. applying §27 of the 1838 Railway Law. Heydt's arguments for public ownership or control were often based on mismanagement or losses. Comparable arguments were not viable in supporting the case of nationalising several profitable railways in 1879. Also the argument of providing cheaper transportation facilities after nationalisation was unjustified to support a state purchase. Contrasting the reductions of the private companies, average rates nearly remained on the same level after nationalisation, as illustrated in chart 20. Accordingly, the government's motivation for nationalisation had different origins.

First, a single centralised state-run railway was preferable from a military point of view, as it was subject to military control and easier to administer than a diversity of relatively small, independent companies. Second, the railways were not at all at the margin of bankruptcy, but in an excellent condition. Therefore, they were a welcome source of hidden taxation. Fremdling and Knieps highlight that the "*...major reason for nationalisation was that railway revenues served as a substitute for proper taxes in order to finance Prussia's budget.*"¹⁴⁹ Third, the nationalisation was a logical reflection of Prussia's trend towards protectionism. Bismarck claimed that protective duties would only be effective if the railway companies could not undermine the duties by means of their pricing policy, as it

¹⁴⁷ Fremdling (1999), p. 79

¹⁴⁸ Fremdling and Knieps (1993), p. 145, Henderson (1958, pp. 182-183 and Klee (1982), pp. 126-129 discuss the *Einpennigtarif* which meant that the freight tariff for 100 kilogramme of coal was fixed at one Pfennig per German mile. Appendix B.4. contains the King's nationalisation order of the Lower Silesian Railway Company as published in Klee (1982), pp. 123-124.

¹⁴⁹ Fremdling and Knieps (1993), p. 153

was nearly impossible to control every single rebate or even secret tariffs granted to foreign companies.¹⁵⁰

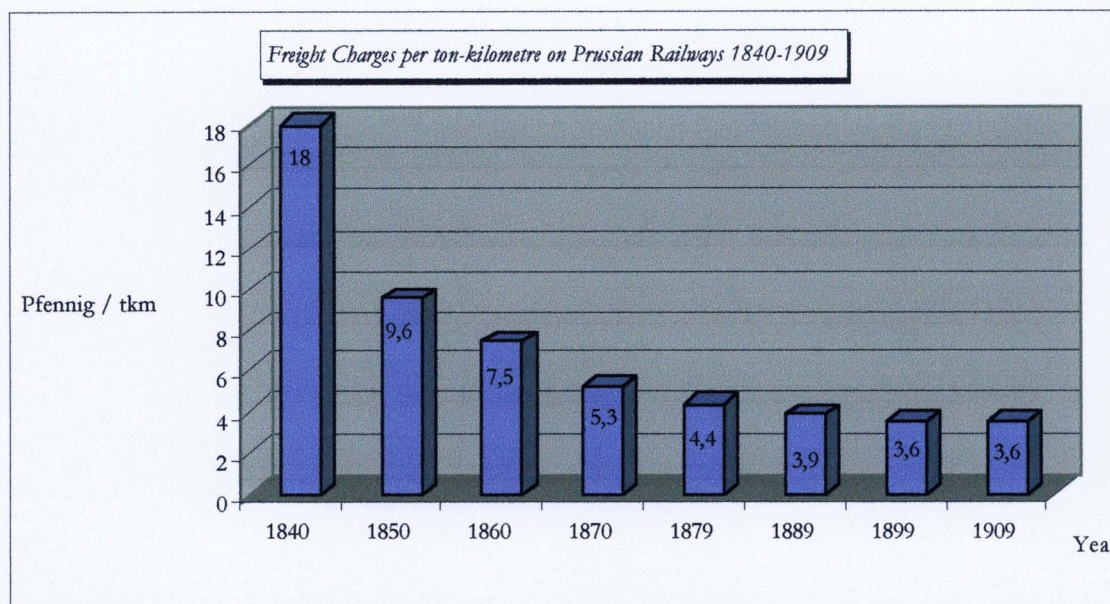


CHART 20

Source: Blankart (1987)

German railway policy in the 19th century was difficult to anticipate. At least it was by no means monotonous, switching from periods of relative independence to state interference, returning to entrepreneurial self-rule only to be nationalised in 1879. Though a more strategic approach would have been preferable to foster the railways, political considerations of one kind or the other constantly influenced the railway industry's fortunes. It can be concluded that *"...railway construction by states or public support of private companies did not compensate for the obstacles placed by governments on private initiatives. And the breakthrough into a railway network must be attributed mainly to the efforts of private enterprise. The fact that railways were in general lucrative investments from the beginning suggests that their construction followed an existing demand for their services. The earliest railways paid for themselves even in the short run. It could be argued that without interference from governments concerned with particularistic aims, and with private companies allowed to determine the shape of their respective networks, a comparable, and probably superior, railway system would have emerged. State financial support might never have been necessary, and railway construction would have taken off somewhat*

¹⁵⁰ While Blankart (1987), pp. 77-84 and Klee (1982), pp. 158-162 consider the role of protective duties, Stolper (1967), p. 41 emphasises military considerations as the main determinant.

*earlier and proceeded more rapidly than it actually did under a regime of bureaucratic interference and delay.*¹⁵¹

¹⁵¹ Fremdling (1983), p. 122. Klee (1982), p. 113 and Seidenfus (1983), p. 238 share Fremdling's view, that the Prussian railway policy rather hampered than promoted its further progress.

C. Conclusion

Studies of railway history of the United Kingdom and Prussia illustrate that the early railway systems had some parallels. Both the United Kingdom and Prussia were densely populated and relatively small countries. They were benefiting from an improved transportation service, whereas the railways in the United States were opening up large undeveloped lands to the settlers.¹⁵² Prior to the railways' advent, the countries were largely depending on a transport system of inland waterways, turnpikes and other roads with the system of canals being most elaborate in the United Kingdom. Road and canal operators, as well as landowners were often naturally opposed to the railway innovation threatening their market or country estates, respectively.

Following a period of relative government absence from railway affairs for the different reasons described above, state involvement steadily increased across the UK and Prussia. The advocates of a public railway network were most vigorous in Prussia. In the aftermath of the depression of the late 1840s, the Prussian state became actively involved in rail traffic, running a widely praised public railway in competition with private railway companies. Prussia's piecemeal approach to nationalising the railways was quite successful and by 1857 roughly half of its entire railway network was owned or controlled by the government. While the action towards regulation and nationalisation in Prussia was largely due to politicians' initiatives, shifts in public opinion were responsible for the trend towards increasing government involvement in transport in the United Kingdom and also in the United States.

After a speculative investment boom in the early 1860s, the 1866 crisis marks a turning point for Great Britain. During the ensuing depression, the railways were discovered as a welcome scapegoat in the competitive struggle of tradesmen against foreign products. Dreadful accidents led to public concerns about the railways' neglect of safety and it was suggested that the passengers' personal safety was sacrificed for higher profits, ironically resembling the claims in today's Britain. Amalgamations in the industry were supporting the advocates' arguments for more regulation, as the railway companies appeared to accumulate ever more market power.

¹⁵² The railway development in the United States is discussed in section VI.A.

In consequence, the last quarter of the 19th century was dominated by government legislation in order to control the power of the railways in the United Kingdom and United States, while Prussia had already nationalised the railways in 1879. Prussia's and Germany's politicians were pushing towards nationalisation, above all the chancellor of the German Reich, Bismarck. But the railways were in an excellent condition and more importantly very profitable. Thus, the nationalisation served as a substitute for proper taxes and furthermore supported Bismarck's protectionist economic policy. The railways in the United Kingdom were suffering from severe underinvestment both before and during WWII and had failed to meet the challenge of intermodal competition, when the newly elected Labour government nationalised the railways with the 1947 Transport Act in order to get the ailing railways back on track. The industry's problems were, however, largely caused by the government's legislative discrimination against the railways. The railways' flexibility in pricing and other business decisions was constantly curtailed, making it more difficult to react to the challenges imposed upon the railways from other modes of transport.

Although the early railway development in the UK and Prussia has often been cited as an example of entrepreneurial freedom, considerable state interference prevailed. The argument was even highlighted by outright supporters of a state-run railway system like David Hansemann in Prussia, when he attacked the regulations of the 1838 Railway Law, because he deemed them adequate to wreck a railway company. It has been shown that the existing laws already contained a solution concerning the major problem of a potential waste of resources in railway networks due to duplication of infrastructure. Both the British Acts of Incorporation and Prussia's 1838 Railway Law provided for competition on the track, which came back into public debate in the course of privatisations in the 1990s in Britain and in Germany. The next section investigates the common justifications for nationalisation of railway transport.

Section II

Regulation and Nationalisation

Throughout Europe, rail has generally been seen as a natural monopoly, requiring both regulation and subsidy. Monopoly power was deemed to require regulation of prices charged for rail services, and 'common carrier' obligations to carry whatever traffic was offered at that price. Withdrawal of passenger services required government approval, which was frequently withheld, requiring cross-subsidy of loss making services by profitable ones. Competition was also regulated, with protection of rail traffic being a major factor in the regulation of the bus and road haulage industries. Nevertheless, railways throughout the Community fell into deficit during the course of the 1960's and 1970's.

Nash and Preston, 1997¹⁵²

A. The market imperfections doctrine and interventionism

Nash and Preston illustrate the environment in which the railways were operating under private and public ownership. The extremes of relatively unhampered railway competition and excessive government regulation were prevailing in the United Kingdom and the German Reich until the train companies were nationalised. The reasoning behind the governments' interference may be separated into economic and political motives. However, politically motivated regulations are often claimed to arise due to economic imperfections, though they are indeed politically motivated. This chapter focusses on the economic considerations for regulation of the railway market due to perceived market imperfections, before considering the remaining scope for public policy in chapter A.4.¹⁵³ Chapter B concludes section II with a statement and definitions on deregulation and privatisation.

The political motives for regulation and nationalisation are extensive. The motives in Britain and Prussia mainly comprised the pursuit of:

- integrationist transport policies;
- social policy considerations;
- redistribution of income;
- centralised political control and guidance;
- protection of other modes from railway competition;
- protection of the railways from intermodal competition;

¹⁵² Nash and Preston (1997), p. 20

¹⁵³ Ewers and Rodi (1995), pp. 21-23 and Stackelberg (1990), pp. 176-189. Blankart (1994), pp. 54-76 for a comprehensive analysis of market imperfections and the potentially resultant role for the state.

- protectionist government policies;
- militaristic advantages;
- substitutes for proper taxes;
- increases in overall welfare.

Most of the political motives, however, are centred at a dissatisfaction of politicians or the public with the outcomes of the market. Thus, it shall be assumed with Kirzner “...that government regulation of the market economy is generated by dissatisfaction with market outcomes. Legislators or other government officials (perhaps in response to public outcry, or in anticipation thereof) are disturbed either by the high price that certain would-be purchasers are asked to pay in the market or by the low price (for example, the wages of labor) received by certain sellers in the market; or they are disturbed by the quality of goods or services being offered for sale (for example, because of the absence of safety devices) or by the unavailability in the market of goods or services that they believe to be important. They are disturbed by the conditions under which workers are expected to work, or they are disturbed by the pattern of income distribution generated by the market, by unemployment, or by ‘profiteering’, or by the side effects (such as environmental pollution...) generated by uncontrolled market activity.”¹⁵⁴ Though Kirzner did not focus on railway policy, the reader will recognise the similarities to the periods of railway regulation in section I.¹⁵⁵

Dissatisfaction with market outcomes may then induce the government to intervene and correct the perceived market imperfections by means of state ownership or public regulation. Accordingly, it was suggested that an unhampered free market leads to inefficient outcomes. First, public regulation of the railways was assumed to be essential to curb their monopolistic market power. Second, the marketplace may be the wrong place to co-ordinate transactions between producers and consumers of railway transport. Thus, it may be a public instead of a private good, and should consequently be paid for by the taxpayers. Third, market imperfections are supposed to arise due to external effects in railway transport. In the following, the main arguments for market failures shall be validated. If the discussion shows that there are none of the above assumed market imperfections present in railway transportation, there is no reason to impede the

¹⁵⁴ Kirzner (1985), p. 134. Baum (1983), p. 14 follows a related line of thought, arguing that regulations were “...considered necessary because – or so the policy-makers believe – these individual, sectoral and general economic goals would not be achieved, or not to the desired extent, through free competition.” He then concludes that regulation of the market economy was being justified on account of structural market failure, external effects and public interest.

¹⁵⁵ See also the appendix in section VI.A on American railway developments and regulation.

unhampered working of a free railway market.¹⁵⁶ Also, the past railway regulations and nationalisations would be called into question from an economic point of view. Political considerations must then hold the sole responsibility for regulation of railway services.

¹⁵⁶ Ewers and Rodi (1995), p. 23 and Brenck (1993), p. 101

1. Monopoly

The charge that railways were exercising dominant or even monopolistic market power raises questions about the term monopoly. Varian noted that the word monopoly originally implied the right of exclusive sale, but the term “...has come to be used to describe any situation in which some firm or small group of firms has the exclusive control of a product in a given market. The difficulty with this definition comes in defining what one means by a ‘given market’. There are many firms in the soft-drink market, but only a few firms in the cola market.”¹⁵⁷ While the state-owned railways generally enjoyed exclusive rights of selling the product passenger rail services on their railway networks, they faced competition in the wider transport market. Accordingly, competition theory uses the concept of the *relevant market* to delineate the market under investigation.¹⁵⁸

The relevant market describes a market that is clearly distinguishable from a material, spatial and temporal point of view. Thus, competitive conditions in the relevant market are not or only marginally affected by outside supply and demand variations. Disregarding a railway company’s position in the railway market, it could be subject to intermodal competition in the transport or communication markets, disciplining its behaviour in the correlated railway market. Furthermore, it is important to define the scope of the market, whether it is regional, international or strictly confined to national borders. Also, markets are dynamic and change over time, requiring for flexible adjustments. While European countries were highly protectionist in the 1870, the borderless European Union extending from the Atlantic Ocean to Russia or even further is at the doorstep. National frontiers will not for long be safeguards protecting national economies against global competition. Thus, even when a monopolistic charge was applicable a century or decade ago to an industry, an innovative leap may have replaced the industry or created a wider market. While canal traffic had a prominent role in the transport market in the early 19th century, the railway innovation left the canals behind. Though the telephone, video conferences and the Internet are not direct competitors in the transport market, the wider communication market may exercise a long-term influence

¹⁵⁷ Varian 1992), p. 233

¹⁵⁸ Schmidt 1993), pp. 44-49

on the transport market and could eventually replace some activities in the transport market.¹⁵⁹

The railways face substantial intermodal competition in the transport market. They have lost market shares in passenger and freight services during recent decades, mostly to road transport.¹⁶⁰ Though many state railway operators enjoyed exclusive rights on their national rail networks, it did not assist them very much to protect their business. The railways' power to exploit consumers had been eroded to such an extent that one proclaimed reason for nationalisation was the protection of railways.¹⁶¹ Notwithstanding rail protectionism, public subsidies, regulation of competitors and legally granted national railway monopolies, the situation on European railways steadily deteriorated.

Schumpeter noted the essential role of monopoly rents as rewards for innovative entrepreneurs. Though genuine long-run monopoly positions are difficult to defend in a competitive, dynamic market, he asserted that short-term monopoly situations are much more common. Indeed, they are necessary as incentives for innovation in the process of creative destruction.¹⁶² Firms that succeeded in innovating "*...are upsetting existing industrial structure and, as it sometimes seems, heading toward monopoly, are in general precisely those which have set up new production functions and which are struggling to conquer their market.*"¹⁶³ According to Schumpeter, firms that are unable to keep up with the pace in innovating die a natural death. "*No firm which is merely run on established lines, however conscientious the management of its routine business may be, remains in capitalist society a source of profit, and the day comes for each when it ceases to pay interest and even depreciation.*"¹⁶⁴ State-owned undertakings are exempt from these essential characteristics of the market economy. Rather than being disciplined by market forces, state railways were subject to political wisdom, interest group politics and governments' budgetary constraints.¹⁶⁵ They were not compelled to innovate and

¹⁵⁹ In their game theoretical approach to business strategy, Nalebuff and Brandenburger (1996) emphasise the complexity of the marketplace and recommend looking beyond current borders for both competitive threats and opportunities.

¹⁶⁰ See charts 21-24 and 39-42 in section III for Europe, Germany and the UK. Section IV.B.3 discusses intermodal and other forms of competition.

¹⁶¹ Schmitz (1997), p. 38 claims that the British railways were nationalised due to road competition. Though this was one important suggestion, it was certainly not exclusive.

¹⁶² Schumpeter 1943, pp. 102-105

¹⁶³ Schumpeter 1939, p. 91

¹⁶⁴ Schumpeter (1939), p. 95. Porter (1997) and Kim and Mauborgne (1997) support Schumpeter's arguments, emphasising the necessity to build a consistent strategy and to leap-frog competitor's innovations.

¹⁶⁵ Crompton (1999a), p. 145 suggested that fear of politicisation of the railways existed in the inter-war years and was "*...applicable to any type of public ownership. It was supposed that all manner of improper pressures – for*

operate profitably in the transport market, as the national governments protected and backed the railway undertakings.

In 1942, Walker highlighted the benefits of competition over imposed co-ordination and sketched the further political and economic developments. *“Competition between road and rail has been more successful in two decades than control by public authorities over a century in winning the solicitude of transport undertakings for the wants of traders. ...A ‘co-ordinated’ transport service can be established by an industry which remains competitive just as readily as by monopoly. In the one case, co-ordination is brought about by the competition of individuals in pursuit of their own gain, the method described and recommended by most economists, and most notably by Adam Smith; in the other, by fiat of those who control the monopoly. The latter...is more in keeping with the plans and planning currently fashionable as the method of economic statesmanship.”*¹⁶⁶ Though the four British rail companies were intended as territorial monopolies in railway transport, they neither had an exclusive control, nor an exclusive right to undertake passenger and freight traffic in the national transport market.¹⁶⁷ In stark contrast, the British Transport Commission was legally awarded exclusive rights in the transport industry. While the British transport market was essentially closed down to newcomers, the previous private railway system did not possess similar powerful mechanisms to deter entrants and stifle competition. Schumpeter highlighted the public perception with private monopolies or dominant firms. *“Economists, government agents, journalists and politicians in this country obviously love the word because it has come to be a term of opprobrium which is sure to rouse the public’s hostility against any interest so labelled. In the Anglo-American world monopoly has been cursed and associated with functionless exploitation ever since...”*¹⁶⁸ This only applied to private monopolies. Five years after Schumpeter’s statement the British Transport Commission was established, enjoying incontestable privileges in transportation, whilst the market forces had been disabled in favour of centralized co-ordination of inland transport.

more jobs, higher pay, lower fares, better services – from self e king groups might be impossible to contain. Particular anxiety was caused by the railway unions, which were strongly organised, affiliated to the Labour Party and active supporters of nationalisation.”

¹⁶⁶ Walker 1942), pp. 180-181

¹⁶⁷ Butterfield (1986), pp. 22-23 points out that the grouping actually preserved competition on major cross-country routes and lines to London between the railway companies. Walker 1942) has already been quoted earlier, noting that *“...no one of the amalgamated companies can claim a complete monopoly of the railway traffic in its area. Branch from one amalgamated company extend into the area of another, and more important, the territorial boundaries of the companies are the routes of heaviest traffic.”*

¹⁶⁸ Schumpeter (1943), p. 100

In the following it is assumed that a railway firm possesses monopoly power if it temporarily obtained exclusive control of a product in the *market of transportation services*.¹⁶⁹ Though superior competitors might replace such private monopolies, the advocates of the market imperfections doctrine suggest that natural monopolies are exempt from according rules of the market.

¹⁶⁹ Brenck (1993), p. 102 also defines the relevant market as the market for transport, not solely the railway market.

1.1 Natural Monopoly

According to the market imperfections doctrine, the existence of natural monopoly characteristics hampers the efficient working of the market economy. Natural monopoly exists if it is less costly for a single firm than for multiple firms to produce the output to serve the market demand. In essence a natural monopoly is a one-firm industry by nature of the industry's cost structure. In this case, a firm's cost function is subadditive due to economies of scale, scope or density.¹⁷⁰ Thus, only a single firm can achieve productive efficiency under subadditivity. Also, the monopolist is believed to deviate from the social optimum of allocative efficiency.¹⁷¹ The monopolist may determine price and output at monopoly level, pursuing the maximisation of profits instead of the provision of the welfare maximising price-output combination. Traditionally, regulating or nationalising the natural monopolist was expected to solve the dilemma between allocative and productive efficiency in markets that were deemed to exhibit natural monopolistic tendencies.¹⁷² The regulator may then lower the profit-maximising monopoly price to the welfare-optimal marginal cost price-output combination. It was assumed that state ownership or regulation would result in productive and allocative efficiency.

Though theoretically feasible, the regulator or planner's aim is very ambitious. Neither a regulator nor the central planners in a state-run natural monopoly can obtain the massive amount of information to determine the welfare-optimal price-output combination. Regulations might eliminate the cost advantages of a natural monopoly, while the incentive structure inherent to profit-maximising companies is eradicated. Also, political aims other than the maximisation of the public welfare and interest group politics may obstruct their supposedly welfare enhancing operations.

¹⁷⁰ Baumol, Panzar and Willig (1982), pp. 169-186, Berg and Tschurhart (1988), pp. 22-24, Stackelberg (1990), p. 177-182 and Schmalensee (1979), pp. 3-7. Economies of scale, scope and density are defined and discussed in section IV.C with special regard to railway systems.

¹⁷¹ The terms are used according to Ellig (2001), pp. 3-4, who reflected on the U.S. regulations: "*Railroad regulation hampered both allocative and dynamic efficiency. Allocative efficiency occurs when prices reflect marginal costs, and these price signals lead to optimal use of resource, given cost and demand conditions. Dynamic efficiency occurs when firms find ways to lower their costs (shift the production function), improve quality (shift the demand curve), or offer new products or services (create a new demand curve). The concept of dynamic efficiency thus captures a variety of diverse phenomena that scholars have described...*" such as productive efficiency, creative destruction and entrepreneurship.

¹⁷² Geddes (2000), p. 1165 notes that state ownership was more frequently used than regulation of utilities in Europe.

Demsetz challenged the conventional view on natural monopoly. He maintained that the theory is exclusively founded on the belief that the price-output combination is at monopoly levels if a single firm produces a good due to scale economies. *“The natural monopoly theory provides no logical basis for monopoly prices. The theory is illogical... To the extent that utility regulation is based on the fear of monopoly price, merely because one firm will serve each market, it is not based on any deducible economic theorem.”*¹⁷³ Demsetz has reservations about the assumption inherent to natural monopoly theory that market concentration and monopoly price bear any necessary relationship. Rather, he claims that the natural monopolist’s pricing power to charge consumers a monopolistic mark-up over marginal cost prices depends upon the presence of high sunk costs as market barriers. Sunk costs are irreversible investment costs and serve as credible barriers to market entry and exit. Sunk costs exist when the factors of production are tailored to suit the production of a specific product and cannot be used for any other means of production. Once these industry-specific investments have been committed, they are sunk as a specific input and cannot be recovered from their current usage, not even by total cessation of production. If there are no significant sunk costs in production, the market of the natural monopolist is contestable and potential entry undermines monopoly pricing, assuming absence of other market barriers.¹⁷⁴ Though only a single firm will actively serve an efficient natural monopoly market, many inactive firms exist. Currently, those potential competitors may produce complementary, related or different goods, but they would be able to enter the natural monopoly market without notice if the natural monopolist should neglect efficiency savings or preferences of consumers.¹⁷⁵

Sunk costs constitute an entry and exit barrier against potential competitors. Imagine the case of potential competitors in railway transport. Because a locomotive and the carriages may be used on many different railway tracks in Europe and elsewhere, investments in rolling stock are not sunk, but fixed. Investing in the construction of an entirely new railway track, however, is a market-specific investment that cannot be recovered by simply ripping the infrastructure off the ground and shipping it to another market.

¹⁷³ Demsetz (1968), p. 59 (without original emphasis)

¹⁷⁴ Moorhouse 1995), p. 422

¹⁷⁵ Sharkey (1982), p. 145

Investments in the infrastructure and the operation of railways are of a different nature. Due to the sunk cost element in the infrastructure, competition between the incumbent infrastructure operator and competitors may seem impossible, whereas the market for transportation services on the track network does not exhibit characteristics of sunk costs or a natural monopoly.¹⁷⁶ The different nature of infrastructure and train operations requires that both layers of a railway system be investigated in separation from each other. Distinguishing the layers reveals that sunk costs are solely involved in the construction of an infrastructure network, while the fixed costs in train operations are not sunk. Therefore, potential entrants to the railway market are confronted with a very substantial entry barrier if they enter train and infrastructure operation in conjunction. The construction of a competing network is not only time, but also capital intensive. And the infrastructure investment will not be recoverable in case of failure, notwithstanding the waste of economic resources due to the duplication of the network.

The market power of a natural monopolist is tied to the contestability of his market. Entry and exit barriers being absent, the market of the natural monopolist is contestable and leaves no leeway for monopolistic behaviour. Monopolistic mark-up's on prices attract potential competitors that may skim off the cream and force prices down to the competitive level. The contestability of natural monopoly markets is an important determinant in whether or not and to what extent an industry must be regulated.

¹⁷⁶ See section IV.C regarding the potential of competition and the need for regulation in the horizontal layers of railway systems.

1.2 Contestability

Contestability theory looks at formal outsiders of a natural monopoly industry as de facto incumbents.¹⁷⁷ The definitions on entry barriers hardly reflect consensus. Bain started the debate on market entry and defined the conditions of entry as “...the advantages of established sellers in an industry over potential entrant sellers, these advantages being reflected in the extent to which established sellers can persistently raise their prices above a competitive level without attracting new firms to enter the industry.”¹⁷⁸ Stigler defines barriers in a cost-based approach “...as a cost of producing (at some or every rate of output) which must be borne by a firm which seeks to enter an industry but is not borne by firms already in the industry.”¹⁷⁹ Whereas Bain considers economies of scale in production and product differentiation as barriers to entry, Stigler’s terminology contradicts with Bain’s barriers, as long as there are no cost differentials between the established firms and newcomers.⁸⁰

Market barriers are an impediment to the mobility of firms as they impose an extra cost burden on the firms that wish to enter a market, whereas the costs are not borne by the incumbent firms. Baumol, Panzar and Willig defined a perfectly contestable market as a market that is open to potential entrants, “...as one that is accessible to potential entrants and has the following two properties: First, the potential entrants can, without restriction, serve the same market demands and use the same productive techniques as those available to incumbent firms. Thus, there are no entry barriers in the sense of the term used by Stigler. Second, the potential entrants evaluate their profitability of entry at the incumbent firms’ pre-entry prices. That is, although the potential entrants recognize that an expansion of industry outputs leads to lower prices...the entrants nevertheless assume that if they undercut incumbents’ prices they can sell as much of the corresponding good as the quantity demanded by the market at their own prices.”¹⁸¹ In essence a contestable market shall be defined as a market that potential entrants irrespective of scale or scope

¹⁷⁷ Demsetz (1989), p. 87. The contestability theory was developed by Baumol, Panzar and Willig (1982).

¹⁷⁸ Bain (1956), p. 3

¹⁷⁹ Stigler (1968), p. 67

¹⁸⁰ Stigler (1968), pp. 67-70. Schwalbach (1986) and Schmidt 1993, pp. 62-65 amend Bain’s structural entry barriers with strategic barriers to entry, such as limit-price and over-capacity strategies. They explicitly acknowledge the role of exit barriers as entry barriers. If potential competitors anticipate high exit barriers (like sunk costs in railway infrastructure) prior to entering the market, the anticipated exit barrier may deter them from actually competing with the incumbent.

¹⁸¹ Baumol, Panzar and Willig (1982), p. 5

economies may enter and exit freely, without being obstructed by entry and exit barriers.¹⁸²

*“The key requirement of contestability in markets in which the set of techniques dictates that the size of incumbent firms be large relative to market demand is that the entry process be entirely, or almost entirely, reversible without cost. With reversible entry - that is, with costless exit - unsustainable prices will afford incentives for rational entrepreneurs to enter in fact. Such entrants need not fear changes in prices by the incumbent firms for, if and when such reactions do occur, even if they preclude all further profit to the entrant, that firm need only exit.”*¹⁸³ Looking at natural monopolistic industry structures due to subadditivity from the angle of costless reversibility of entry, sunk costs are back in focus. If a potential competitor has virtually nothing to lose from challenging a natural monopolist there is nothing that could possibly keep him from accepting the challenge. Naturally, the incumbent will not give way without defending his position by threatening the potential newcomer. However, market barriers, such as sunk costs or new legal requirements that the incumbent does not have to comply with being absent, the threat of the incumbent is not credible. Entry is likely to take place only if the anticipated profits of successful entry are greater than the unrecoverable costs in case of failure.¹⁸⁴

If, indeed, the potential newcomer would meet high sunk investment costs before entering the market, the incumbent has a major advantage. The entrant faces higher decision-making costs than the incumbent who has already committed large sunk investments. Once the sunk costs are committed to their specific use, they cannot, by definition, be recovered – in contrast to fixed costs, which can be eliminated by total cessation of production. The difference between sunk and fixed costs leads Baumol, Panzar and Willig to the conclusion, *“...that sunk costs, unlike fixed costs, can constitute a barrier to entry. In particular, we argue now that fixed costs need not have any detrimental welfare consequences, unless they also happen to be sunk. In an industry whose firms use only capital on wheels (or wings), some or all of that capital may be fixed, but it is not sunk. This means that in the absence of other entry barriers, natural or artificial, an incumbent, even if he can threaten retaliation after entry, dare not offer profit-making opportunities to potential entrants because an entering firm can hit and run, gathering in the available profits and departing when the going gets rough. Such a situation*

¹⁸² Geddes (2000 , p. 1167, also Tram (1991), p. 303

¹⁸³ Baumol, Panzar and Willig (1982), p. 6

¹⁸⁴ Baumol, Panzar and Willig (1982), pp. 290-291

fits our definition of a contestable market, that is, a market vulnerable to costless by reversible entry, even when it is currently occupied by an oligopoly or a monopoly. The contestable market is a generalization of the case of pure competition, and it offers many of the same benefits... The availability of sustainable prices does permit the incumbent to preclude entry. But he can do so only by offering the public the very same benefits that actual competition would otherwise have brought with it. With entry barriers, supernormal profits, inefficiencies, cross subsidies, and nonoptimal prices all become possible. But in a contestable market, which is perfectly consistent with the presence of fixed costs that are not sunk, matters change drastically, and government intervention can contribute far less, if anything, to general welfare.”¹⁸⁵

Apparently, the common argument that the railway market is a typical candidate for a natural monopoly and must be regulated is slightly over-enthusiastic. ¹⁸⁶ Observing the product *train operations*, sunk costs are absent. However, the supply of the product obviously depends upon the supply of the product *infrastructure access* that is characterised by the existence of sunk costs. Sunk costs may indeed deter potential entrants. Section IV will account for the special characteristics of the railway industry, offering a subtly differentiated and flexible approach to the layers of railway systems.

¹⁸⁵ Baumol, Panzar and Willig (1982), pp. 292-293 (emphasis in original)

¹⁸⁶ Rahmeyer (1996 , p. 5

2. Public goods

The market imperfections doctrine also comprises the theory of public goods.¹⁸⁷ If railway transportation is indeed a public and not a private good, market provision of the good leads to misallocations and inefficiencies. The economic meaning of public goods must not be confused with *public services*, representing an ideological conviction that certain goods and services should be provided by state production. Services that were labelled as public services represent a service in the same way as car manufacturing and baking cakes. Eventually, these services have in common that they are provided for private consumption.¹⁸⁸ Private goods are both excludable and rival. Considering the consumption of a sandwich, it is fairly obvious that one person eating the sandwich excludes everyone else from the joy of consuming it. More generally, the owner of the sandwich shop excludes would-be consumers from consuming the sandwich, if they are unwilling to transfer ownership of the sandwich for the payment demanded. If someone has purchased the last sandwich, it is apparent that it is a rival good, because his consumption rivals the one of others who were queuing up behind him for the last delicious sandwich.

Public goods are defined by the absence of the two characteristics of private goods. Public goods are *non-rival* and *non-excludable* goods regardless of the individual contribution to the production of the public good. A tall monument on the town square is visible for everyone who passes by, whether other visitors like it or not. Furthermore, the consumption of the monument is non-rival, i.e. the consumption of the good by one person does not diminish the utility that someone else might obtain from the consumption. The monument remains the same even after many people have looked at it.

*“Exchange cannot occur without property rights, and property rights require exclusion. Given such exclusion, the market can function as an auction system. The consumer must bid for the product, thereby revealing preferences to the producer, and the producer, under the pressures of competition, is guided by such signals to produce what consumers want. At least, such is the outcome with a well-functioning market.”*¹⁸⁹ While property rights are enforceable in railway services, the

¹⁸⁷ Blankart (1994), pp. 55-64 and Stackelberg (1990), pp. 184-186

¹⁸⁸ Seldon (1998), p. 17 notes that goods are misleadingly labelled *public services* and embrace *public utilities* from transport and power production to prison administration.

¹⁸⁹ Musgrave and Musgrave (1989), p. 42

externalities below highlight the issues connected with non-defined property rights in the environment. Now, comparing the sandwich-monument phenomenon to railway transport results in a clear assignment of rail travel into the sandwich category. Obviously, train passengers are excludable from the journey, as a valid ticket will prove to be an essential prerequisite for rail travel. Railway transportation is also a rival good. The seats on the train limit the tickets the rail company may sell, assuming that customers are unlikely to sit on each other's lap. Both conditions of private goods are evidently met by railways, resulting in the conclusion that railway transport is a private good that can be allocated by means of market exchange instead of public planning. Though market imperfections might be present in railway transport, the public goods argument does not offer support towards the creation of a public railway undertaking.

3. External effects

Though not qualifying for public good characteristics, railway traffic may expose considerable public benefits, such as a reduction in environmental pollution and relieving congestion on the roads, waterways and in the air. Accordingly, the production of railway transportation produces external effects. Externalities are harmful or beneficial effects on a third party resulting from production or consumption activities by other individuals, who ignored the externality when deciding upon their action.¹⁹⁰ External effects are based on deficient property rights, as the property rights of externalities are not defined. Owing to the lack of property rights, markets cannot internalise externalities.¹⁹¹ Ewers notes that rational utility maximisers are induced to produce too many negative and too few positive externalities.¹⁹²

The most commonly known external effect is environmental pollution. The smoke of a factory or a steam locomotive polluting the environment constitutes a negative external effect upon the environment and the consumers of the good clean air. The neighbour who plants flowers in his garden produces a positive external effect insofar as every passer-by can enjoy the colourful variety of flowers and their fragrances. The issue is slightly more complex, if the neighbour plants a big tree instead of flowers. If his neighbours value the shadow they gain during the hot summer sun and the view of the green tree which is blocking the view of decaying blocks of flats, the externality is of a positive kind. However, if the tree blocks the view of the sea and prevents the inhabitants of the neighbouring gardens, who usually indulge in sunbathing, from their summer habits, the planting of the tree produces a negative effect on the neighbours.¹⁹³ To obtain confirmation on the validity of the negative externalities between neighbours disregarding costs imposed on each other, a quick check through German court registers could be revealing.¹⁹⁴

¹⁹⁰ Blankart (1994), pp. 22-23, Stackelberg (1990), p 184, Varian (1995), pp. 531-551

¹⁹¹ Demsetz (1988), pp. 104-115 on the role of property rights in solving problems caused by externalities.

¹⁹² Ewers (1995), pp. 118-121 exemplifies his example with environmental damage and basic research. See also Ewers and Rodi (1995), p. 22

¹⁹³ Coase (1960), p. 8 reports on such incidents in Florida where a building cast a shadow on a neighbouring hotel pool, and a building in England that ruined a windmill's production, as it obstructed currents of air.

¹⁹⁴ A recent dispute between neighbours about a wire-netting fence in Saxony made it through the German TV channels and ended up as a famous pop song.

Even though the era of steam engines has long passed, railway transport produces negative external effects. Both diesel and electric locomotives pollute the environment without bearing the full costs, while the land use for new routes cutting through farmland, villages and towns also creates externalities.¹⁹⁵ The population in areas that are affected by the route, but not served by a station will have to bear negative externalities, the inhabitants of connected town centres may benefit from positive externalities in the form of network benefits.¹⁹⁶ However, in general positive externalities in railway transport are assumed due to network benefits, regional development effects and a reduction of road congestion with increasing train traffic.¹⁹⁷

Every production involves positive or negative externalities of some kind. None of the cases, though, necessarily requires government regulation other than a definition of property rights. *“It is clear that the government has powers which might enable it to get some things done at a lower cost than could a private organisation... But the governmental administrative machine is not itself costless. It can, in fact, on occasion be extremely costly. Furthermore, there is no reason to suppose that the...regulations, made by a fallible administration subject to political pressures and operating without any competitive check, will necessarily always be those which increase the efficiency with which the economic system operates.”*¹⁹⁸ Coase draws the conclusion that the market might find results superior to government regulation, while state involvement could be beneficial if large numbers are involved.¹⁹⁹ With regard to transport, Ewers suggested internalising external costs via imposing the cost on producers of negative externalities and subsidising the construction of lines, if the affected region would benefit over-proportionately. Harmful regulation would then be redundant.²⁰⁰ The market approach to internalising externalities is based on Coase’s findings and involves the government to establish and

¹⁹⁵ Ewers (1995), pp. 118-121

¹⁹⁶ Consider the construction of high-speed routes as well as the proposal and local opposition to build a magnetic high-speed line between Hamburg and Berlin.

¹⁹⁷ The impact of the railroads on regional progress may be observed in the settlement and industrialisation of the American Midwest. See Appendix, section VI.A.

¹⁹⁸ Coase (1960), p. 18

¹⁹⁹ Though the main results of Coase’ 1960 article are generally referred to as the Coase theorem, the repeated criticism that Coase neglected transaction costs is wrong. Instead, he dedicated a whole chapter of his article to transaction costs in Coase 1960 , pp. 15-19. Explicitly, the theoretical argument of the Coase theorem is made under the theoretical assumption of transaction costs being absent. Mueller 1989 , p. 28 formulated the theorem: *“ In the absence of transactions and bargaining costs, affected parties to an externality will agree on an allocation of resources that is both Pareto optimal and independent of any prior assignment of property rights.”*

²⁰⁰ Ewers and Meyer (1993 , pp. 6-7 and Ewers (1995), p. 121

enforce property rights. In environmental pollution this approach suggests an institution of emission trading to determine prices for scarce natural resources.²⁰¹

Regarding public regulation or nationalisation of railway transport, the market imperfections doctrine finds no justification in externalities. Problems of environmental pollution, regional development and social policies must be dealt with in the responsible government departments and may not be passed on to the railways, even though the passing of the buck was very convenient to politicians in the past. When reforming the railways in Europe, governments chose approaches similar to Ewers' suggestion with regard to non-commercial regional infrastructure investment and train operations. Nonetheless, a comprehensive environmental policy that establishes a level playing field in transport is still absent.²⁰²

²⁰¹ Anderson and Leal (2001), pp. 167-169 analyse the potential of the market to solve environmental problems. *“Free market environmentalism accepts that individuals are unlikely to set aside self-interest and asks how in titution can harness this survival trait to solve problems. It recognizes that information about the environment is so diffuse that a group of experts cannot manage the planet as an ecosystem.”* The literature on external effects and their solution in environmental affairs is extensive. The following selection offers detailed comparisons of mechanisms, such as emission trading, Pigouvian taxes and non-market instruments used in environmental policy with special emphasis on the uncertainty involved in planning ecosystems: Endres (1994), pp. 102-117, Kemper (1989), pp. 121-141, Roberts & Spence (1976), pp. 193-208, Stavins (1996), pp. 218-232 and Wetzman (1974), pp. 477-491.

²⁰² However, the German government implemented a highly re-distributive and discriminating environmental policy. The environmental tax that had been levied on fuels since January 2000 granted exemptions to notorious polluters like concrete producers, while the tax revenue subsidises the crumbling German state pension system and investments in Eastern Germany to obscure the true costs of reforms in the areas affected.

4. Public policy

The market imperfections doctrine proved to be invalid as a credible justification for extensive government regulation, let alone past nationalisation of railways.²⁰³ The actions taken across European nations did not relieve the railways of their deteriorating situation, but may have conserved it. Section III focuses more closely on European railway reforms and the trend after WWII in Germany and Britain.

Recapitulating Kirzner's assumption that dissatisfaction with market outcomes stimulated government regulation, political considerations must hold the sole responsibility for railway regulation.²⁰⁴ This is not to say that there is no remaining scope for public policy with regard to the railways.²⁰⁵ But whatever demands politics impose upon the railway industry, government must be prepared to bear the full costs of the actions. Most likely areas for governments are regional development policies, as well as social and environmental considerations. However, government interference imposes considerable distortions and resultant externalities on third parties that are affected by the government's actions. As Braeutigam noted, "...perhaps the most significant feature of regulation is that it redistributes income, creating winners and losers, thereby shaping interest groups and coalitions."²⁰⁶ While the government creates positive externalities for the winners, the external costs have to be borne by the losers. Public choice theory shows that some interest groups are highly effective in working to become winners, whilst taxpayers are often losing out in the game of rent seeking.²⁰⁷ Tullock defined rent seeking as "...the use of resources for the purpose of obtaining rents for people where the rents themselves come from some activity which has negative social value."²⁰⁸

²⁰³ Stackelberg (1990), pp. 186-187

²⁰⁴ These are essentially the political motivations listed at the beginning of this chapter which are similar to the nebulous concept of the so-called public interest in Baum (1983), p. 17. Rightly, Baum claims that the pursuit of this essentially arbitrary concept results in a substantial deviation from the optimal allocation process through competition. "Priority is given to incomes distribution policy goals, regional and land-use policy, promotion of small and medium firms, protection of railways, improvement of road safety, fiscal relief of the national budget, maintenance of jobs and sectoral action against inflation."

²⁰⁵ However, Beesley (1997), p. 32 insisted that procedures for non-commercial obligations be clearly specified in the privatisation acts to prevent governments from eventually subsidising profitable operations.

²⁰⁶ Braeutigam (1989), p. 1299

²⁰⁷ Public choice applies economic theory to political processes. The founding fathers of public choice theory present an overview in their classic analysis, Buchanan and Tullock (1999). See also Mueller (1989). In his short criticism of public choice economics, Grantham (1998), pp. 30-31 outlines the objectives and advantages of the theory of political economy.

²⁰⁸ Tullock (2000), p. 45. Though Tullock was one of the developers of the concept, he emphasises that he personally does not like the term, as every investor would logically be seeking a rent.

This concept clearly applies to regulatory issues, if resources are employed to influence the outcome and direction of the regulation. Thus, if incumbents in the market for passenger rail services lobby for the restriction of competition, they will gain at the cost of potential entrants and their customers, as they could expect lower prices or better quality of services. Rent seeking is about obtaining special privileges. Indeed, Tullock maintains that private monopolies and direct income redistributions by the government are the results of rent seeking activities.²⁰⁹ Socially wasteful rent seeking expenditure may arise from three main categories, namely the lobbying establishment itself, distortions imposed upon a third-party as a consequence of the rent seeking efforts and finally, the costs incurred by the bureaucrats and politicians involved.²¹⁰ Regarding the bureaucrats, Tullock reminds that *"...there is also the steady growth of the total scope of bureaucratic control. This benefits the bureaucrats and not anyone else. That the bureaucrats do not become vastly wealthy is no doubt an indication of their probity, but the costs to the community or rent seeking may still be gigantic."*²¹¹

Public policy must have a limited role with regard to the railways. The government may provide a rule-based framework for the industry as for every other industry, respecting and protecting the property rights of each firm, but economic theory does not provide any justification for a more extensive role of public policy concerning the railways.²¹² Section III analyses the European reforms before section IV develops an alternative model for the railway sector with minimal guidance.

²⁰⁹ Tullock (2000), p. 45

²¹⁰ Mueller (1989), pp. 230, 247. Foster (1992), pp. 92-93 finds the attack of public choice economists on the incentive structure in public enterprises as the fundamental determinant in the inefficiency of state-owned undertakings.

²¹¹ Tullock (2000), p. 53

²¹² The author emphasised the necessity of a rule-based, constitutional approach to government in Knipping (1997), drawing upon findings in Mueller (1996). Lal (1984) pictured the state as a predator possessing a natural monopoly over the use of violence within its territory. Thus, he saw constitutionalism as the most effective force to restrain the dangers of the state. Vanberg (1998) highlighted the ongoing debate upon the extent of the state in liberal theory.

B. Conclusion: Deregulation and privatisation

Railway regulation, nationalisation and protectionism dominated the 20th century. Realising the deteriorating situation of the railways, politicians proclaimed they would resort to deregulation and privatisation policies in the last decade. Whether they adhered to their goals shall be revealed in the next section. Now, for the remaining discussion it is useful to define the terms associated with liberalisation of the railway industry:

- Liberalisation embodies all policies that help to extend the scope of individual freedom and reduce coercive arrangements.
- Interventionism characterises policies that aim to actively shape processes and impose external costs to be borne by third parties. The central planning wisdom dominates interventionist policies.²¹³
- Laissez-faire leaves the railway industry to its own fate. Laissez-faire is incompatible with well-intentioned subsidies, railway promotions or protectionism. While there is no scope for central planning, the state may provide a basic framework for the economy, applying the same rules to all actors. The power to shape the railway market remains exclusively with the individual actors in the industry.
- Deregulation implies the *“...withdrawal of the state’s legal powers to direct the economic conduct of non-governmental bodies. While this can occur in a variety of ways, most typically in utilities it refers to the relaxation of price, entry and / or exit controls.”*²¹⁴
- Privatisation involves the transfer of property rights to the private sector. The capital market acquires the control previously exercised by the government over a specific economic activity. The transfer of controlling powers excludes the general framework and checks that are applied to the entire economy.²¹⁵

Economic aims of privatisation and deregulation policies focus on an increase in economic efficiency. This results from a reduction of the internal inefficiency of public companies and distortions, such as subsidised prices and inflated costs due to the absence of competitive pressures. Government objectives typically comprise revenue from the sale and a reduction of subsidies and deficits.²¹⁶ Also, government objectives with regard to

²¹³ Mises (1977), pp. 35-37, 57-60

²¹⁴ Geddes (2000), p. 1168, based on Stigler and Winston. See also Ewers and Meyer (1993), p. 4

²¹⁵ Ewers (1995), pp. 114-115, Ewers and Meyer (1993), p. 4 and Rahmeyer (1996), p. 16

²¹⁶ Ewers and Meyer (1993), p. 5 and Kirzner (1985), p. 142

liberalisation policies may embrace the creation of an efficient transport system and resultant environmental improvements.

This policy change emerged after decades of government guidance due to personal motives of politicians and dissatisfaction with market outcomes, while market imperfections were unjustly blamed for these often well intentioned, but harmful policies. The consequence was a monopolised transport industry subject to rent seekers, as noted by Demsetz. *"The key to monopoly power is the ability of an industry to restrict or retard the expansion and utilization of productive capacity. Government can offer to industry much greater powers of coercion to accomplish this end than can be supplied by the industry itself."*²¹⁷ Such rent seeking opportunities may be curbed with privatisation and deregulation policies in open markets.²¹⁸ The liberalisation efforts must target the opening up of railway markets.

The opening up of markets with consequent deregulation and privatisation policies promotes actual and potential competition in railway markets. The market is the alternative to the conventional rationale of central planning and the entailed protectionism, policies that are fashionable until the present day. The main advantage of the dynamic market mechanism over central planning is the innovative potential involved, the process of creative destruction.²¹⁹ Regulation blocks spontaneous discovery and search for new solutions as well as the replacement of inefficient organisational structures or firms.²²⁰ In the framework of the conventional rationale, the planner or regulator allocates the resources to the production and allocation processes. The criticism of the rationale was one of Hayek's major achievements, as he asserted that knowledge is disseminated across the individuals and no high-ranking expert panel could outperform the functioning of the market when search is involved.²²¹ The spontaneous discovery of information previously unknown to the spontaneous learners is not based on deliberate search, but evolves from an unplanned discovery process.²²²

²¹⁷ Demsetz (1989), p. 108. Friedman (1962), p. 28 and Greenspan (196), pp. 64-65 strongly support the view that governments are the main creators of non-contestable monopolies. Even worse, these monopolies are legally granted and protected.

²¹⁸ Veljanovski (1989), p. 36 observed that privatisation takes politics out of daily operations, though politics is not removed from the process of privatisation and from regulated industries.

²¹⁹ Schumpeter (1943), p. 83

²²⁰ Kirzner (1985), pp. 141-143

²²¹ Hayek (1996), p. 14. Burrows (1977), p. 91 for a more optimistic view of government decisions and government's access to expert evaluations.

These insights were ignored in the past and led to the deterioration of the railway industry and the supposedly social market economy.²²³ The railway liberalisations in Europe need to account for the dangers entailed with occasionally even well-intended state guidance as "*...it is quite plausible to believe that government intervention constitutes the main threat to a competitive economy. It is important that this threat be recognized, because our belief on this score governs how we deploy resources to ensure that competition will flourish. What is called for is a redirection of our efforts. Government intervention that has created and sustained monopoly should be our primary target.*"²²⁴

²²² Kirzner (1979 , p. 151

²²³ Littlechild (1978) and Hayek (1946) for a critique of the mixed economy.

²²⁴ Demsetz (1989 , p. 109

Section III

Case Studies

A. Railway reforms across Europe

1. The liberating impact of the European Union

The market share of rail transport has been in constant decline since the end of WWII. The railways' share of both passenger and freight transport markets went down steadily across the 15 member states of the European Union, whilst private road and air travel gained a considerable share of the transport market as displayed in the charts below. The European Commission claims that the decline "*...is due to several factors both inherent and external to the sector, as well as to the administered regime where railway activities have taken place.*"²²⁴ Governments were usually reluctant in liberalising the railway market, whereas they granted exclusive rights or at least dominant market power to national railway undertakings. In addition, governments were neither prepared to leave the public undertakings alone nor guarantee their managerial independence from national politics. Instead, railways were burdened with public service obligations as an instrument of social policy, while they were often – though notably differing between countries – not receiving full compensation for the substantial costs imposed on them. Rather, the undertakings were expected to continue running several loss-making lines by cross-subsidies from profitable operations.²²⁵

The Commission also claimed that the railway industry suffered from unfair competition in freight transport, as road freight did not pay for its true costs, whilst the railways "*...have been confronted with the full costs of their activities.*"²²⁶ The only appropriate wording is indeed, that the railways have been *confronted* with the full costs – naturally they did not bear the full costs as they were heavily subsidised, state owned national monopolies, though their dependency on public funding varied substantially across the 15 EU member states.²²⁷ In contrast, road haulage operators were generally not directly subsidised, though the state is in charge of infrastructure investments. Road users contribute to the total costs of road use via differing instruments across the EU, ranging from fuel duties and vehicle taxes to tolls, whereas congestion charging and road pricing

²²⁴ European Commission (1998a), paragraph 1. See also European Commission (1996), paragraph 10

²²⁵ Nash and Preston (1994), p. 20

²²⁶ European Commission (1998a), paragraph 2. See also European Commission (1996), paragraphs 16-20 and Gerondeau (1997), p. 140

²²⁷ According to the European Commission (1996), Annex I/2, railway debt as a share of GDP varied from 0.2% in Finland to 4.9% in Italy in 1994, after the first railway reforms had been undertaken or were under way. The annual state subsidies to the railways also varied considerably across the 15 member countries.

schemes are still in an experimental phase.²²⁸ The current financing of road use across the European Union differs markedly: "Only one Member State levies registration taxes on heavy goods vehicles. Five Member States levy road tolls, six others use the Eurovignette scheme for heavy commercial vehicles, one other applies a different form of user charge and three others do not charge for road use at all. All Member States levy annual vehicle taxes, but these vary by up to 3000 ECU, and diesel fuel excise duties vary by as much as 330 ECU per 1000 litres. The result of such variations is that road hauliers from different Member States can face vastly different costs and unfair competition."²²⁹ Though charging of external costs would be likely to boost the railways' competitiveness, the European transport sector is still profoundly distorted and non-transparent.

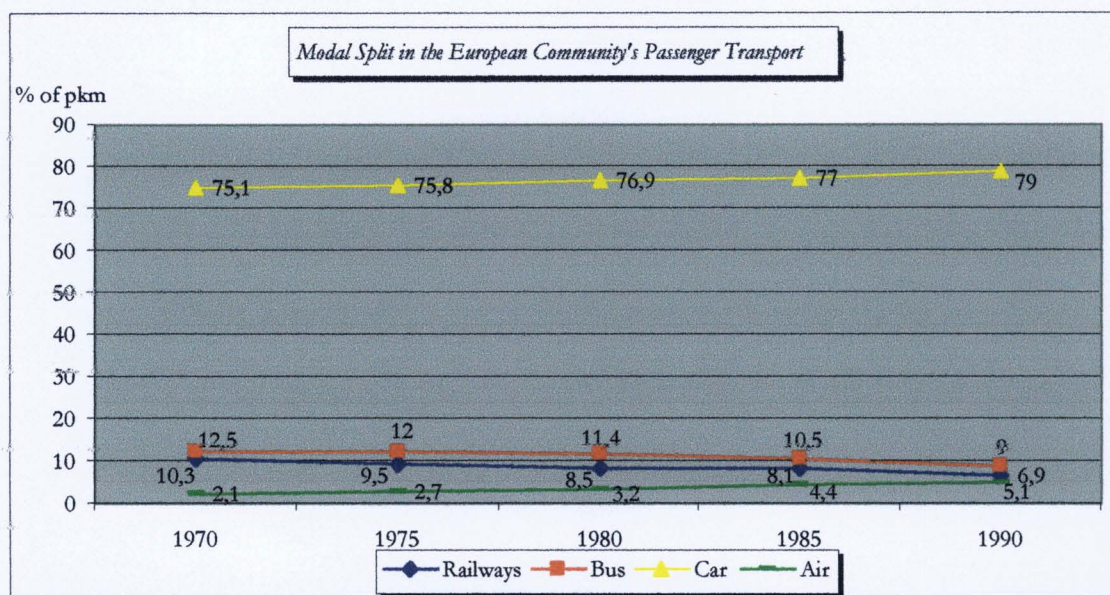


CHART 21

Source: European Commission (1996), Annex I/4

²²⁸ However, in 1995 the United States' first variable-priced and fully automated highway was opened to the public in California with charges ranging from US\$ 0.6 to US\$ 2.95, depending on the time of day, see Harbaugh (1997), p. 19. In 1999 German motorists paid DM 1.03 per litre for gas, while taxes for diesel fuel amounted to DM 0.67 per litre. Tax revenue from fuel duties totalled DM 75 billion, whereas vehicle taxes totalled roughly DM 14 billion, BMVBW (2000), p. 274.

²²⁹ European Commission (1998b), p. 3

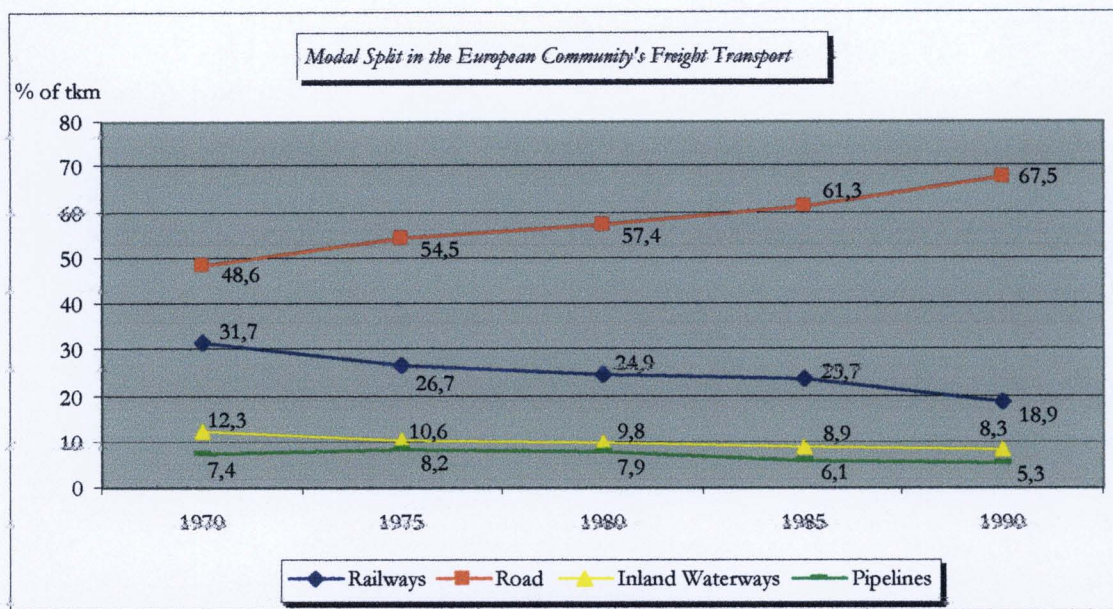


CHART 22

Source: European Commission (1996), Annex I/3

The 1990s have seen various differing railway reform programmes across the member states of the European Union. This chapter sheds light on the European Union's involvement in the process with a brief outline on the speed of reform efforts in France, the Netherlands and Sweden, while the next chapters target the comprehensive and far-reaching privatisations in Germany and the UK in greater detail.

Probably the single most important piece of legislation with regard to railway market liberalisation was the 1991 European Council Directive 91/440 EEC. The directive was fairly moderate, sometimes described as a *tiger without teeth*, as its legal requirements pose hardly any challenge to national railway policies.²³⁰ Still, it might be exactly this moderate tone, which made the legislation acceptable to a broad spectrum of member states, thereby promoting the entire liberalisation process. Quite often, railway services in the member states were not seen as purely economic, but rather public services, which had to be maintained for political reasons.²³¹ Thus, any compliance approach of the European Commission would raise strong resistance in a number of member states. Due to the political sensitivity of railway policy, any radical approach to liberalising the railway market

²³⁰ Knill and Lehmkuhl (1998), p. 2. Kiriazidis (1994), p. 31 notes that the European Community adopted a series of regulations prior to the Directive 91/440/EEC "...to eliminate the distortions of competition which arose from the traditional state intervention in this sector." Additionally, the Treaty of Rome included a chapter on transport policy aiming at a harmonisation of national rules and regulations, however restricted by 86 and 87 on public undertakings and state aid.

²³¹ Knill and Lehmkuhl (1998), p. 3

would result in political hara-kiri of the national politicians involved.²³² Therefore, the Commission dropped earlier proposals based on a compliance approach in favour of a liberalisation tactic strongly relying on its non-compulsory nature and the subsidiarity principle, thereby allowing diversity in the implementation of the directive.²³³ Thus, the directive was limited to modest requirements and did not cover urban and suburban railway networks, while encouraging member states to go ahead with more drastic reforms.²³⁴

The Directive 91/440/EEC states the promotion of the single market of the European Economic Community and an increased efficiency of Europe's railways as prime objectives. The means to achieve those aims are first, a *managerial independence* of railway undertakings from the state and second, a *compulsory separation of accounts* with an optional institutional separation of railway infrastructure from transport operations. The accounting separation was the most demanding condition the directive was enforcing upon the member states. Additional measures were suggested to improve the railways' *financial structure* and to grant *access rights* to the infrastructure networks of other member states for international railway groupings. Explicitly, the legislation does not discriminate between public or private ownership of railway undertakings.²³⁵ The directive recognises the subsidiarity principle of the Community, emphasising in Article 8 that the individual member states are responsible for the specific rules for determining the access charges. As mentioned above, the directive remains vague, not to jeopardise individual states, but suggesting voluntary compliance with its demands.

The Commission realised that the access rights had to be specified and went ahead with two further steps in June 1995 with the Directives 95/18/EC and 95/19/EC, complementing Directive 91/440/EEC. Their prime objective was to ensure an effective

²³² Hibbs (2000), p. 47 highlighted the political sensitivity of railway policy, as cited in the introduction: "Politicians and the public alike appear to possess certain fixed ideas about railways that are by no means related to reality. A certain sentimental attraction may be their association with childhood train-sets." Again, the tragic railway accidents at Ladbroke Grove and Hatfield in 1999 and 2000 underline the sensitivity of railway policy. In its wake, politicians were acting hysterical rather than providing a calm lead for the public, guided by reason. The accidents and their consequences are discussed in the UK Case Study below.

²³³ The subsidiarity principle demands that the decision-making competence must reside with authorities, resp. individuals at the lowest possible level. Relating to transport market liberalisation, it suggests that the Commission provides a general framework to promote the single market in transportation, while the detailed rules for implementing a system of, e.g. licenses, are to be left with the member states. See Krüpping (1997).

²³⁴ The directive 91/440 EEC was indeed an exception in the European regulatory framework. Webb (1989), pp. 18-19 pointed out that European laws and regulations dominate over national legislation.

²³⁵ European Economic Community (1991): Directive 91/440/EEC, Articles 1-3 for the general objectives, while sections II to V deal with the four means mentioned. See also European Commission (1998a) for an overview.

enforcement of access rights to the railway infrastructure. Thus, they generated conditions with regard to the licensing of railway undertakings and the allocation of railway infrastructure capacity, including access prices. The prices should be related to the nature and time of service, the market situation as well as the wear and tear of the infrastructure.²³⁶ Due to the subsidiarity principle, the licenses are issued by the individual member states, though they are valid throughout the entire territory of the Community. The member states have some leeway regarding the four main requirements for issuing licenses, which are broadly good repute of the railway undertaking, financial fitness, professional competence and cover for public liability. The requirements are further defined in the Directive 95/18/EC.

Supplementing the directives, the European Commission issued a White Paper in 1996, outlining a strategy to revitalise Europe's railways, which was generally in line with the Directive 91/440/EEC, but did not present any radically new insights or changes.²³⁷ Again, the White Paper acknowledged that railways have been insulated from the effects of market forces, while governments did not fully compensate the national railway undertakings for public obligations imposed. Thus, the Commission's approach was predominantly twofold. First, the Commission suggested government support to relieve the railways of their debts. Second, open access provision to the railway infrastructure must be extended to benefit from the expertise of market entrants and their positive effects on railway services. The Commission identified a network of Trans-European Rail Freeways for Freight as priority action and envisaged a single European railway market and a new kind of railway to overcome the weaknesses of the past and to exploit the future opportunities. According to the Commission, the future railway *"...should be first and foremost a business. It should have the independence and resources to compete. It should be free of the burdens of the past. Market forces should be further introduced in an appropriate way. The division of responsibilities between the State and the railways should be clarified, particularly for public services."*²³⁸

Eventually, the much more detailed Directive 2001/14/EC superseded and repealed Directive 95/19/EC on infrastructure access, also recognising the subsidiarity principle. Accordingly, the member states are expected to establish charging rules, subject to the management independence laid down in Directive 91/440/EEC, while the

²³⁶ Holder (1999), p. 112 and European Community (1995a): Directive 95/18/EC and European Community (1995b): 95/19/EC, both directives issued on 19 June 1995

²³⁷ European Commission (1996)

²³⁸ European Commission (1996), paragraph 21

*“...determination of the charge for the use of infrastructure and the collection of this charge shall be performed by the infrastructure manager...Infrastructure managers shall ensure that the application of the charging scheme results in equivalent and non-discriminatory charges for different railway undertakings that perform services of equivalent nature in a similar part of the market...”*²³⁹ The directive further requires at least a balance of infrastructure expenditure on the one hand and revenues from access prices, surpluses from other commercial activities and state funding on the other hand. While the new directive very much resembled the replaced directive of 1995, Articles 7 and 8 of Directive 2001/14/EC inject essential new principles of charging.

Though the access charges shall reflect the costs directly incurred as a result of the train operations, the *“...infrastructure charge may include a charge which reflects the scarcity of capacity of the identifiable segment of the infrastructure during periods of congestion.”*²⁴⁰ And the following paragraph makes provision for environmental charges to take external effects caused by train operations into account. Thus, the new directive realises the potential for price discrimination to allocate scarce infrastructure capacity more efficiently, while the charges are still non-discriminatory between different railway companies. The maximum duration of individual train slots or paths granted to applicant railway firms must not exceed one working timetable period, in order to promote constant competition for the slots.

Apparently, the latest directive was strongly inspired by the 1998 White Paper of the European Commission on infrastructure access pricing. The White Paper's goal was *“to improve the overall efficiency of the provision and use of European transport infrastructure, promote fair competition, safeguard the single market and enhance the sustainability of the transport system.”*²⁴¹ Due to the non-transparent variety of national charging regimes, the Commission suggested a harmonised Community approach to transport charging in order to establish a level playing field, to be applied to all commercial modes of transport.²⁴² In order to achieve the Commission's goal, the infrastructure charges *“...should be directly related to the costs that users impose on the infrastructure and on others, including the environmental and other external impacts caused by the users. Charges should only differ when there are real differences in costs and service quality and should not discriminate between users...”*²⁴³

²³⁹ European Community (2001): Directive 2001/14/EC, Article 4, paragraphs 1 and 5

²⁴⁰ European Community (2001): Directive 2001/14 EC, Article 7, paragraph 4

²⁴¹ European Commission (1998b), p. 5

²⁴² European Commission (1998b), p. 6

²⁴³ European Commission (1998b), p. 6

Eventually, the Commission's 1998 White Paper recommended the implementation of a policy of marginal social cost charging at the EU level, estimating that it would lead to welfare benefits of 30 to 80 billion ECU per year.²⁴⁴ The Paper explicitly identified a number of cost components which may be included in the marginal cost calculation, namely *operating costs*, such as energy, labour and some maintenance costs, *infrastructure damage costs*, such as maintenance and wear and tear of the infrastructure system, *congestion and scarcity costs*, including delays to other users as well as *environmental costs* and *accident costs*.²⁴⁵ As marginal costs reflect only the costs of an additional transport unit using the infrastructure network, there is no relation to fixed capital costs of the system, as they are independent of the intensity of transport usage. Though the cost recovery would vary across the European networks, the Commission estimated that a charging principle based on marginal costs "...would generate sufficient revenues to fund the transport system's infrastructure capital costs and pay for further investments."²⁴⁶ Aberle argues that a marginal cost pricing approach leaves a massive gap between infrastructure revenues and charges, which would require a large amount of public subsidies, establishing a renewed dependence from political decision making, contradicting the initial goal of Directive 91/440/EEC.²⁴⁷ Price discrimination in line with scarcity on the network, however, offers potential for full cost recovery without falling back into state dependency. The Directive 2001/14/EC established the basic conditions for such a pricing regime, while the British and German pricing systems also offer two ways to fully recover the costs of the infrastructure, contrasting the three examples below. Whereas the British approach involves negotiations between the infrastructure operator Railtrack, the public Rail Regulator and the individual train companies with different charges for franchised and open access operators, the German method favoured a non-discriminatory access pricing regime every single train operator has to face.²⁴⁸

The competition policy section of the Treaty of Amsterdam had an overriding impact with regard to the transport market liberalisation and the relevant directives mentioned. The enforcement of the corresponding articles of the treaty is vital in the initial phase of liberalisation.²⁴⁹ Article 81 EC declares as void "...practices which may affect trade

²⁴⁴ European Commission (1998b), pp. 8-12.

²⁴⁵ European Commission (1998b), p. 8

²⁴⁶ European Commission (1998b), p. 9

²⁴⁷ Aberle (1998), pp. 474-475

²⁴⁸ Schwalbach (1998), pp. 476-479. The German pricing regime was altered in 1998 and again in 2001, as small train operators were complaining that the regime was discriminating in favour of the former state monopolist Deutsche Bahn AG. The German access pricing system is discussed extensively below.

²⁴⁹ European Union (1997), most importantly Articles 81, 82, 86, 87 and 295

between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the common market..." whereas Article 82 EC prohibits any "...abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it..." if the abuse affects trade *between* member states. The Commission recognised that national railway undertakings were still enjoying monopoly power for the provision of traction, either statutorily or de facto. Thus, "...they enjoy a dominant position within the meaning of Article 82 EC and must therefore be prevented from putting into place abusive practices such as discrimination or refusal to supply traction."²⁵⁰ In consequence the Commission acknowledged the existence of an obvious conflict of interest in a railway undertaking operating its own transport services, whilst being expected to allow fair and non-discriminatory access to its infrastructure for all transport operators: "An undertaking cannot be at the same time both a competitor and a judge determining access to any relevant market."²⁵¹

Clearly, one of the outstanding principles of the European Union is the promotion of free trade and competition between the individual member states.²⁵² But Articles 86 and 87 set limits to the Treaty in governing public companies. Article 86 EC is explicitly concerned with public undertakings and undertakings with exclusive rights granted by the member states. Those undertakings may not uphold any measures contrary with the Treaty, also with special regard to the above articles. Though the interpretation of the articles leaves a loophole for interpretation, Article 86 EC explicitly emphasises that the development of trade "...must not be affected to such an extent as would be contrary to the interests of the Community." Similar scope of interpretation remains with other articles, such as Article 87 EC, which declares state aid incompatible with the common market if it affects trade between member states and "...distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods...". However, should the aid have a "...social character, granted to individual consumers..." or "...promote the economic development of areas where the standard of living is abnormally low..." it may be compatible with the common market. Notwithstanding, the Treaty's rules regarding competition, the Treaty is indifferent towards public or private ownership, according to Article 295 EC: "This Treaty shall in no way prejudice the rules in Member States governing the system of property ownership." Thus, the Treaty makes a strong case against practices restricting trade or competition between the member states,

²⁵⁰ European Commission (1998a), section on Article 86 EC: the author replaced the original "Article 86 EC" with "Article 82 EC", as the ratification of the Treaty of Amsterdam also resulted in some changes in numbering of articles.

²⁵¹ European Commission (1998a), section on Article 86 EC

²⁵² Thus, similar legislation was passed in electricity and telecommunication industries with directives 90/388 EEC and 90/377/EEC of 28th, respectively 29th June 1990. The liberalisation of the latter markets was finally established with two directives issued in 1996 that is directives 96/19/EC, respectively 96/92/EC.

notwithstanding whether private or public undertakings are concerned. Nonetheless, it limits its applicability to interfere with national policies and public undertakings.

However, a variety of approaches towards railway liberalisation had been applied across the European Union from member states such as Britain or Germany going far beyond the measures imposed by the legislation to countries strictly keeping in line with the minimum requirements or even strongly opposing a more open rail network, such as France.²⁵³ Thus, the reforms differ in various ways, such as public or private ownership, managerial independence from the government, regulatory oversight, open access to the railway track infrastructure, and also the extent of vertical separation between the infrastructure and operation of train services. The main goal behind the separation issue is the guarantee of non-discriminatory access to the tracks for every train operator, in order to promote competition in the railway market. The objective of non-discriminatory access rights, however, depends upon the impartiality of the infrastructure operator. Whilst Sweden and Britain organised the infrastructure provider as an institutionally separate entity, most countries complied with the Directive 91/440 by placing the infrastructure in a separate division of the national railway company.²⁵⁴ Notwithstanding the great diversity of reform models, they share at least one common characteristic in their liaison between the railway firms and the national or regional authorities. In general, their bonds are dominated by contractual arrangements in the form of competitive tenders, franchises or negotiations. The different approaches to railway reforms are investigated below.

Considering the liberalisation of the European passenger rail network, the European Union's transport commissioner "...highlighted the political sensitivity of the issue, saying that it was hard enough to get member states to agree to open up the international rail freight network."²⁵⁵ Whereas the liberalisation in freight rail markets will take effect from 2003, the passenger rail market gained a respite until 2008. In the following, the approaches towards liberalisation shall be dwelled upon briefly in France, the Netherlands and Sweden before analysing the complexity of the reforms pursued in Germany and the UK.

²⁵³ Financial Times (2000g), p. 12 and Frankfurter Allgemeine Zeitung (2001e), p. 17

²⁵⁴ Nash (1998), p. 2

²⁵⁵ Financial Times (2000g), p. 12. However, the first result of freight liberalisation was registered on 29 June 2001 with IKEA Rail AB, the newly founded subsidiary of the furniture company IKEA, www.bahn.de (2001) and www.banverket.se (2001), press notices. IKEA Rail signed track access agreements with the German, Danish and Swedish track operators to run daily freight trains each weekday between Sweden and Germany.

2. France

The French attitude towards liberalisation and the Directive 91/440 EEC may at best be described as rather unresponsive to the European move. France limited her compliance efforts to the minimum requirements of the directive and was "...probably the most reluctant country to implement the 1996 EC White Paper and the proposal for freeways it contained."²⁵⁶ Nevertheless, the situation for the French state monopoly *Société Nationale des Chemins de Fer (SNCF)* was as bleak as for other railway companies across the continent in the early 1990s. The debt of SNCF was close to 200 billion francs in 1993 and could only be accumulated due to state guarantees. While revenues from passenger and freight traffic amounted to 40 billion francs, expenditure was exceeding the revenues by nearly 50 billion francs in the same year. Accordingly, the state had to grant further guarantees to extend SNCF's debt, whilst it covered the remaining sum out of the budget.²⁵⁷

In 1997 SNCF was split into the small *Réseau Ferré de France (RFF)*, the owner of the infrastructure with about 250 employees and the large residual SNCF for all train operations. Thus, there is no competition in the operation of train services, as the trains are either run by SNCF, joint ventures or under agreements between SNCF and foreign railway undertakings.²⁵⁸ In theory, France has complied with the requirements of the 1995 directives and provides access rights to the railway infrastructure, but the access conditions are rather restrictive. Currently, track access is granted to SNCF and international groupings, though exclusively for international operations.²⁵⁹

As the owner of the infrastructure, RFF is responsible for its construction, maintenance and for the allocation of train paths after consultation by SNCF. Paradoxically, RFF was separated from SNCF when it was established to manage the infrastructure, though SNCF is undertaking the actual maintenance work and operates the infrastructure on behalf of RFF under the new arrangements. Thus, the whole structure looks just like an artificial construct to please the legislators of the Directive 91/440/EEC and the complementary legislation. While RFF receives track access revenue from SNCF, RFF commissions SNCF to undertake maintenance and repairs.

²⁵⁶ Henry and Quinet (1999), p. 120, see also Domergue and Quinet (2001), p. 5, Schwalbach (1998), p. 478

²⁵⁷ Gerondeau (1997), p. 156

²⁵⁸ Henry and Quinet (1999), p. 120, see also Knill and Lehmkuhl (1998), p. 11

²⁵⁹ Monami (2000a), p. 98

Regulation of passenger railway services is shared by the state with six regional authorities.²⁶⁰ As before this most minuscule reform, both SNCF and RFF are property of the state. Regardless of the ownership question RFF is dependent on state financial aid, as its revenues from access charges amounted to 6 billion francs in 1998, while its expenses on infrastructure investment added up to 30 billion francs, leaving the lion's share of 24 billion francs to the taxpayers. The state is responsible for the charging framework after advice given by RFF. This is hardly managerial independence as envisaged in the European directives. Notwithstanding the creation of RFF, vertical integration is very strong in the French railway system, as SNCF is still responsible for timetabling, controls and the actual operations of the railways.

France's reluctance to reform and change may be based on the strong concept of public service that is deeply rooted in French society and attitudes.²⁶¹ Trade unions are especially powerful in the control and management of public firms and would lose considerable influence in a highly competitive sector or in a privatised SNCF and RFF.²⁶² In addition, the high speed services on the French network account for almost 60 per cent of the entire passenger traffic and represent a distinction of French quality of railway services, marketable abroad as French high-tech engineering.

²⁶⁰ Monami (2000b), p. 179

²⁶¹ Henry and Quinet (1999), p. 121. Gerondeau (1997), pp. 153-159 also attributes the French aversion to reform to historical experiences in WWI and WWII.

²⁶² In December 1995, France experienced a month long strike, after the government announced a bill to reduce SNCF's debt and public service pensions, as well as to re-examine the special retirement status of railway employees, which allowed train crews to retire at the age of 50 and at 55 for others in the sector. As a result, the government agreed that SNCF would remain a unified company and a public service. Six years later, the industrial relations climate had not changed. A suggested pay raise of 2.41 per cent in the rail sector led to two day long national strikes in spring 2001. The strike however also reflected the French railway workers' rejection of further restructuring of SNCF as a consequence of freight and passenger rail liberalisation in the European Union.

3. The Netherlands

Contrasting the French attitude towards railway reform, the Dutch approach went beyond the requirements of the Directive 91/440/EEC, though it did not take the radical path of break-up pursued in the UK as outlined below. Prior to the reform of the railways initiated in 1995, the state-owned *Nederlandse Spoorwegen (NS)* operated train services, which “...were subject to a high degree of government intervention at every level.”²⁶³ Whereas the passenger division relied heavily on public subsidies, freight transport was run as a by-product on a commercial basis.²⁶⁴ However, the structure was challenged in the 1980s, when it emerged that NS would need steadily increasing subsidies to improve passenger rail services or even to maintain the status quo of rail operations. Also, it had been observed that road freight faced worsening problems of congestion and bottlenecks while freight volumes were growing, thus creating a far-reaching problem for the competitiveness of the Dutch economy. A report in 1989 “...made a gloomy forecast concerning the competitive position of the Port of Rotterdam and the development of the railways in the future. The lack of a high quality railway system to provide an alternative to road transport would be ‘disastrous’ and a ‘serious handicap for the Netherlands as a gateway to Europe’.”²⁶⁵

The Wijffels select committee submitted a report in 1992 and recommended a horizontal and vertical separation of the railway industry, incorporating the European legislation of 1991. The report advocated “...substantial deregulation, giving NS the freedom to determine its investment, finance, service supply, fares, and personnel policies. The reform was implemented by a transitional contract for 1996-2000.”²⁶⁶ Consequently, the Netherlands Railways were re-structured into a *market sector* and three *task organisations*. The market sector embraces *NS Reizigers*, operating passenger services, *NS Stations*, in charge of train stations and *NS Vastgoed* to manage the holding’s property and real estate. While these three businesses are at the core of the market sector, which is supposed to act along commercial lines, NS is also associated with *Telfort*, a joint venture with British Telecom and *Railion*, a joint product of its predecessor NS Cargo, the Deutsche Bahn Cargo and other European rail freight operators. The non-commercial task organisations of NS are *NS Verkeersleiding*, the traffic control agency, *NS Railinfrabeheer*, overseeing construction, maintenance and the management of the infrastructure, and *Railned*. Railned’s functions embrace traffic safety,

²⁶³ Nash and Toner (1998), section on Dutch railways

²⁶⁴ Knill and Lehmkuhl (1998), p. 6

²⁶⁵ Knill and Lehmkuhl (1998), p. 7

²⁶⁶ van de Velde (2000), p. 10, see also Nash and Toner (1998)

capacity management for freight and passenger operators, licensing of train operators and advice to the Department of Transport related to capacity constraints, investments and innovation. Though the task organisations are subsidiaries of Nederlandse Spoorwegen, they are accountable to the Department, which also covers their costs.²⁶⁷

At the outset of the reform, access prices to the Dutch railway network were set to zero up to the year 2000. Since then operators face total charges of up to 400 million Dutch Guilders, about 250 million to be returned from the main line, 100 million from local networks and 50 million from freight services, in line with the European directives requiring access charges. Reflecting the zero access prices, subsidies for train services were also reduced down to zero by 2000. Passenger operations are now required to cover their expenses, excluding infrastructure costs. Socially desirable though commercially unviable services are contracted by the Department of Transport, totalling around 180 million Dutch Guilders a year, roughly half of the subsidy required prior to the reform. The new organisation of NS provided more transparent data on the viability of services, also allowing NS to focus on profitable railway lines. As a result, government support may be directed right to infrastructure investments and the contracted services.²⁶⁸

Even though the Dutch liberalisation provided open access to the railway network at zero prices, competition on the track was limited in passenger traffic, whereas Railion has to face competition from a few private freight companies, operating on a national and international scale. The government granted complete commercial freedom to NS Cargo and its successor Railion, also including the discretion to set freight rates as it pleases, thereby ending the pricing regime which discriminated in favour of road haulage. However, a politically motivated temporary zero pricing policy for infrastructure access turns the discrimination issue upside down and introduces new distortions between rail and road freight. On the passenger side, the first private passenger rail company in the Netherlands, *Lovers Rail*, originating from the Amsterdam sightseeing boat business was granted permission by the Department of Transport to run passenger trains on the Amsterdam – Haarlem – IJmuiden line in 1996. Competitors to NS Reizigers had to surmount the burden to obtain rolling stock equipped to the standards of the Dutch network, while drivers had to be authorised to drive engines on a specific section of the rail network. Lovers Rail

²⁶⁷ Schaafsma (1997), p. 59 and van de Velde (2000), p. 10

²⁶⁸ van de Velde (2000), pp. 10 and 14

solved that problem by hiring locomotives from NS Cargo, spare coaches from the Belgian railways and former NS drivers, who had retired early.²⁶⁹

In 1997 Lovers Rail was acquired by a French subsidiary of the Vivendi Group and refurbished Belgian coaches were operating the trains from Amsterdam to the North Sea without subsidies. *“Compared to NS Reizigers, Lovers Rail provided a number of interesting and surprising innovations for such short-distance services. The trains provided reserved seats and rental bicycles for seasonal pass holders as well as a number of unusual on-board services, including local TV news, bicycle racks, shoeshine machines, beer and coffee bars with standing area rather than the usual 1st and 2nd class, penalty-free onboard ticket sales and through ticketing with the Amsterdam municipal transport company.”*²⁷⁰ However, NS Reizigers was not prepared to co-operate with Lovers Rail in ticketing. Thus, passengers had to choose between two Lovers trains and six NS trains per hour and many passengers between Haarlem and Amsterdam were holders of NS discount cards, benefiting the NS Reizigers service to Lovers’ disadvantage. Finally, Lovers withdrew its operations in 1999 and the new incoming coalition government banned competition on the tracks.²⁷¹ Complementing competition *on* the track, the Dutch model of liberalisation also allowed for competition *for* the tracks. While competing operators such as *ConneXXion*, the Netherland’s main state owned bus operator, were successful in tendering for local railway lines, NS Reizigers entered a variety of joint ventures with the British *Arriva*, a French SNCF subsidiary and *ConneXXion* to tender for regional integrated rail-bus networks, such as *NoordNed* and *Syntus*.

The former liberal government envisaged franchises for the operations of the national rail network as in the UK and the final privatisation of NS. However, those plans are on hold as the new Labour Minister of Transport favoured a ten-year contract granting NS Reizigers the right to operate the national main line network until 2010. The contract specifies performance regimes, minimum service requirements, fare increases and other conditions. Relating to the regional train lines, the new government is implementing a policy of *“...gradual transition from negotiated contracts to competitive tendering by provincial governments, with subsidies based on the same principles as applied to local bus services.”*²⁷² Van de Velde further emphasises the importance of clever and competent transport authorities. He has some praise for the British Office of Passenger Rail Franchising, in sharp contrast to the rather discouraging example of the provincial call for tender in Groningen, as the

²⁶⁹ Schaafsma (1997), p. 64

²⁷⁰ van de Velde (2000), p. 11

²⁷¹ van de Velde (2000), p. 11

²⁷² van de Velde (2000), p. 14

relevant authority specified almost everything, including the timetable. Thus, he realises
*"...the risk of a paralysing effect through over-specification of contracts by risk-averse authorities."*²⁷³

²⁷³ van de Velde (2000), p. 16

4. Sweden

The original purpose of the state owned Swedish railway company *Statens Järnvägar* (SJ) was the provision of a link between private railway networks in the regions. In addition, SJ acquired failing private operators and gradually built an extensive national and regional network, pushing private operators below five per cent of the route kilometres by 1965.²⁷⁴ Since ever increasing car ownership was eating into the market share of the passenger traffic, railway finances deteriorated. The situation in passenger and freight traffic was further aggravated due to intermodal competition from air traffic and road haulage resulting in Statens Järnvägar diving into deficit in 1976. As the population density between the more industrial South and Sweden's northern counties differed markedly, several unviable lines in the North were either facing closure or lasting dependency upon state subsidies. This uninspiring choice led to the passing of the Transport Policy Act in 1979. The legislation divided the Swedish railway system into a commercial network, the *Stomjärnvägar*, and a subsidised non-commercial network. Services in the *Stomjärnvägar* were required to cover their costs.²⁷⁵

The act established *County Public Transport Authorities (CPTAs)* in Sweden's 24 counties, in charge of overall planning for public bus or rail services in the corresponding county. The decentralisation of responsibility to the CPTAs circumvented the politically disaster-prone issue of centrally executed line closures and undermined local opposition. Now, it was the responsibility and choice of the regional CPTA to discontinue non-commercial SJ services in favour of bus links, in which case the new authorities would be eligible for national subsidies for five years. In the event, most of the non-commercial county lines were replaced with bus services and where railway links remained in service, the CPTA negotiated with SJ to run the lines at the agreed level of subsidy.²⁷⁶

Still, the steady decline in market share and investment as well as rising deficits were not halted, leading to the 1985 Railway Act as a renewed effort to turn the situation around. While the legislation demanded the implementation of separate accounting for infrastructure and operation of trains, the passenger and freight divisions of SJ were obliged to pay internal access prices to the infrastructure division. The national government, however, would cover all infrastructure investments and accepted a greater

²⁷⁴ Nash and Toner (1998), section on Swedish railways

²⁷⁵ Allemeyer (1991), pp. 147-149 and Schmitz (1997), p. 74

²⁷⁶ Alexandersson (2000), p. 4

commercial freedom of SJ from the state relating to personnel policies and its internal organisation. The further deterioration of Statens Järnvägar's finances and the need for more subsidies amounting to one billion Swedish Kronor led to the 1988 Transport Policy Act with the aim "...to provide the citizens and the firms in all parts of the country with satisfactory, safe, and environmental friendly transport services at the lowest possible cost to society as a whole. A strive for making the preconditions for the railways more similar with the ones for road transportation was of major importance for the design of the reform."²⁷⁷

The Act created the basic conditions to liberalise the Swedish railway market. It ended Statens Järnvägar's monopoly position in passenger and freight rail services by institutionally separating the railway operations of Statens Järnvägar from the infrastructure. *Banverket (BV)* was established, essentially a government authority responsible for infrastructure maintenance and investment, except terminals which would remain the property of SJ. Banverket is funded through large state subsidies and access prices, equalling the pricing regime employed by the road authority.²⁷⁸ Accordingly, the 1988 Act was a deliberate attempt to create the same competitive positions for road and rail traffic and abolish intermodal distortions. The charge is composed of a fixed element relating to vehicle axles and a variable element that is set to cover social marginal costs, reflecting the amount of wear and tear caused by the train plus a contribution to the external costs.

Though SJ would retain its legal monopoly for the entire freight network and passenger connections on the trunk routes, the CPTAs might choose contractors other than SJ for county lines. For a transitional period of ten years, the CPTAs were granted state subsidies to commission train or bus operators to run public transport services in the affected regions at specified service levels. The rolling stock formerly used by SJ on the county lines was transferred to the CPTAs to contract the public railway services by means of negotiating with interested parties or competitive tendering. Alexandersson points towards the rise of BK Buss, a small bus company in the county of Jönköping. *"At a meeting with the CPTA in 1989, one official suggested that BK Buss should place a bid in the upcoming tender for the regional train services. The idea materialised into an actual bid during the following months from what came to be called BK Tag, resulting in BK Tag's sensational victory against SJ and one other bidder. In*

²⁷⁷ Alexandersson 2000), p. 5

²⁷⁸ Rothengatter 1991), p. 188 and Nash and Toner (1998), section on Swedish railways. Schwalbach (1998), p. 477 estimates that the access charges in Scandinavia reflect roughly ten per cent of the total costs of the infrastructure.

May 1990, BK Tåg entered the Swedish railway market, breaking SJ's monopoly and becoming the first new private train operator for 40 years. Of great importance was the fact that BK Tåg's bid implied a large reduction (25%) of the CPTA's costs for upholding the services.²⁷⁹ Despite the advantages of incumbents, such as learning economies, reputation, marketing and supply channels, BK Tåg combated those entry barriers by challenging the former inflexible practices, reducing costs and integrating their road and rail businesses. Thus, BK Tåg operated their service with a crew of 43 instead of SJ's crew of 250 for the same service.²⁸⁰ Notwithstanding BK Tåg's success in the initial tender, SJ won the second tender in 1993, though an investigation by the Swedish Competition Authority found that SJ had abused its dominant position and placed its bid lower than its actual costs to drive BK Tåg out of the market. Eventually, Statens Järnvägar was sentenced to an 8 million Swedish Kronor fine in 1998.²⁸¹ Nevertheless, the competitive pressures introduced with the railway liberalisation led to a radical exchange of SJ's executive directors with experienced private sector managers, while the SJ's staff nearly halved between 1988 and 1994 from 29,000 to 15,000. The reduction in the workforce was due to structural changes, such as the establishment of BV with 6000 employees, the sale of SJ's own chain of travel agencies and efforts to slim the railway operator.²⁸²

In 1991 a Conservative government came to power, aiming to induce further competitive elements to the railways. Resisting SJ's pressure, the government backed Banverket's decision to allow the mining firm LKAB to run own freight trains, implying immediate cost reductions to the mining business. The government pushed a massive infrastructure programme ahead to upgrade the network for tilting trains, amounting to 32 billion Kronor. In order to introduce competition into interregional traffic, the state implemented the use of competitive tenders instead of negotiations with SJ to allocate unprofitable interregional services from 1992. Notwithstanding fierce opposition from the Social Democrats, a left wing party and the railway unions, the Conservative government passed the 1994 Deregulation Act, opening up the entire railway market to newcomers. The Act would have ended the CPTAs and SJ's dominance in rail traffic, also establishing a rail regulator in charge of traffic control and capacity management. Open access would be provided to any entrant with sound finances, whilst the entrants could draw upon

²⁷⁹ Alexandersson (2000), p. 7

²⁸⁰ Nash and Toner (1998), section on Swedish railways

²⁸¹ Alexandersson (2000), p. 9

²⁸² Gerondeau (1997), pp. 150-151

redundant rolling stock of SJ on a lease or purchase basis. However, the deregulation effort was immediately postponed after the Social Democrats regained power in the same year.²⁸³

The new Social Democratic government decided to allow the CPTAs to run their services also on the main lines within their county's borders, with the potential to reach out into other counties. Despite expressed concerns of SJ against open access in freight transport, the government went ahead liberalising rail freight from July 1996, though paying tribute to SJ's efforts by introducing a grandfather's clause favouring incumbent operators in the allocation of slots. In the run up to the 1998 Transport Policy Bill, a report supported by the Competition Authority proposed to drop SJ's monopoly by subjecting both profitable and non-profitable interregional services to competitive tendering. Not surprisingly, Statens Järnvägar was strongly opposed to those plans and succeeded to secure exclusive rights for profitable interregional lines, while *Rikestrafiken* was established in 1999, an authority to oversee the tendering of unprofitable interregional traffic.

Still, further intermodal competition was on the doorstep, as the Social Democratic government deregulated the long distance bus market. In effect, the growing competition from coaches was assumed to affect the already loss-making passenger train connection between Malmö and Göteborg. However, in spite of the continued losses of the line, Statens Järnvägar did not file the Malmö – Göteborg line for competitive tendering, as it used to do with unprofitable businesses. Due to the potential danger of growing losses as a consequence of the intermodal competition by coaches, parliament decided to tender the line for one year from January 2000. *“For the very first time, another operator than SJ had placed the best bid for this type of traffic. Moreover, the winning consortium, Sydvästen, a joint venture between BK Tag and the French company Via GTI and British Go Ahead Group, did not demand any subsidies whatsoever from the state to carry out the traffic, claiming that the revenues from ticket fares would be enough. Shortly after the result of the tender was made public, SJ withdrew a report demanding tendering of another two lines that had turned unprofitable.”*²⁸⁴ However, three days after Sydvästen had commenced operation, the government announced that Statens Järnvägar would take the line over after the contract expired in January 2001. Though the contract was limited to a year from the very beginning, the joint venture expected an extension or a renewed tender procedure after termination. *“In mid April Sydvästen declared openly that it was losing money on its operations and that it was meaningless to try to break this negative development when it would nevertheless*

²⁸³ Alexandersson (2000), p. 8-9

²⁸⁴ Alexandersson (2000), p. 11

*lose its contract in January 2001...On April 20, Sydvästen released a statement that the company had cancelled all payments to its debtors and that all trains would stop within one week. The action was said to be a consequence of the Government's 'wavering position on whether the line should be open for tendering or not'. On April 28, Sydvästen filed bankruptcy, after having reached a deal with Rikstrafiken, implying that SJ would take over operations on May 11.*²⁸⁵

²⁸⁵ Alexandersson (2000), p. 13

5. Conclusion: A market based integration of Europe's railway network

In 1994, Nijkamp suggested "...that the network that is missing most in the rail transport domain until this moment is a reorganised structure of the railway market with companies which are independent from national states and are operating competitively on a European network (common carriage)."²⁸⁶ He emphasised the rather nationalistic character of transport policy making up to the early 1990s, as governments were implementing policies in a segmented way, disregarding mutual benefits of cross-border co-operation.²⁸⁷ This was also one of Knieps' main concerns. He already envisaged track and traffic control agencies, separate from train services and track maintenance, somehow similar to Railned in the Dutch model or to air traffic control agencies, such as Eurocontrol. While he expected corresponding agencies to arise on a national or interregional level, they might end up as a single European agency. Thus, they would offer massive network benefits and the nationalistic notion of the traditional state-owned railway undertakings would simply vanish.²⁸⁸ The issues regarding a strict vertical separation will be dealt with in great detail in section IV below. According to Nijkamp, the railways' problems and loss of market share originated in their specific structure as large organisations, exempt from competitive pressures. *"Planning and running railways in Europe has always been a task of national governments. This explains the large, bureaucratic, non-market oriented railway organisations in most countries. It also explains to a large extent the lack of private sector involvement in the financing, management and operation of railways. The picture of road transportation is very different. This explains the dominant use of road vehicles in both freight and passenger transportation."*²⁸⁹

However, ten years after the liberalisation on the European level took off the ground following the Directive 91/440 EEC, the situation of previous decades was altered to a greater or lesser extent across the European Union. Already, the above examples represent three different interpretations behind the term of railway market liberalisation. They furthermore underline the scope of self-determination the European legislation offered to the member states. Whereas the French way certainly stands at one end of the range of options, the British pole characterises a highly debated opposing example. The

²⁸⁶ Nijkamp (1994), p. 54

²⁸⁷ Nijkamp (1994), pp. 26. Later, Nijkamp exemplifies his claims that transport policies show various signs of nationalism with the high-speed rail network in Europe (pp. 89-97).

²⁸⁸ Knieps (1996b), pp. 11-13, 26-27. Monami (2000a), p. 101 raises a similar, though more limited idea. He suggested a "...European arbitration or track allocation body, which could be based on the model provided by Eurocontrol in air transport." Though Monami's proposal contains a European dimension, Knieps' idea of an agency goes beyond, as it should also be in control of traffic safety.

²⁸⁹ Nijkamp (1994), pp. 89

following chapter shall turn to the German model and the most radical approach towards liberalisation in the European Union, namely the British reform. Still, what was the impact of the European legislation on the three approaches described above, what triggered their national models?

Turning to the French model, Knill and Lehmkuhl suggest that the European legislation may have supplied some support to the limited liberalisation in France, as it provided the government with legitimisation and conceptual back up.²⁹⁰ Nevertheless, they indicate that the notion of a strong French state is weakened by voluntarily complying with European efforts, which may finally result in increased competitive pressures on the French railways, potentially even from abroad, therefore jeopardising French jobs. The moderate, mostly non-compulsory nature of the Directive 91/440/EEC permitted a particular French approach to the French railways, while stimulating other countries to run ahead their own way. Quite likely, a more draconian directive would have created more opposition against an imposed liberalisation from Brussels, putting the whole legislative effort at risk.

As in France the directive provided legitimacy to the Dutch government to endorse railway market liberalisation, while it served as a valuable concept to solve domestic problems the government would have to tackle anyhow. Thus, the government could draw strength from the European legislation. It allowed policy makers to deal with specific problems sequentially as *"...the provisions enshrined in the legislation left sufficient room for the government to incorporate its own policy views whilst transforming the provisions into national legislation."*²⁹¹ The reform of Nederlandse Spoorwegen was quite unique in Europe with regard to the creation of Railned as a task organisation in charge of traffic safety and capacity management in distinction from NS Railinfrabeheer's management of the infrastructure. Commonly, those functions are combined in organisations such as Railtrack in the UK or Banverket in Sweden. However, a further distinction in railway systems as pursued in the Netherlands to a certain extent is a main feature of a traffic safety and control agency as suggested in section IV and could lead to a previously unparalleled market integration of European railway enterprises, similar to the hopes expressed by Nijkamp and Knieps.

²⁹⁰ Knill and Lehmkuhl 1998, p. 11

²⁹¹ Knill and Lehmkuhl (1998, p. 7. Van de Velde (2000), p. 10 supports the view that the Directive 91/440 EEC triggered the Dutch reforms.

Though the Netherlands have been a playground for more radical measures than simply competition for the track and have seen innovative transportation services, the moderate experiments have been put on hold for the time being, due to a new government moving in. While this illustrates the political power and interdependence between governments and railways, the Lovers Rail experiment between Haarlem and Amsterdam indicates that competition on the track could work, if the government provides a basic straitjacket for the state-owned dominant railway operator so that competition may flourish. Van de Velde suggests the reform of NS would have benefited from adopting some of the British ideas, though he admits that it would have required legislative changes in the Netherlands, which were impossible at the time. *“A number of regulatory measures, such as compulsory integrated ticketing and some form of integrated information, would have facilitated competition. In this respect, the Ministry of Transport could have benefited from adopting the British regulatory framework where ticket and information integration are intrinsic parts of both connecting franchises and competing franchises using the same or parallel routes.”*²⁹²

While the European legislation was certainly helpful in getting the French and Dutch reforms off the ground, it was rather the other way around in Sweden. First, Sweden was not yet a member of the European Community and second, Sweden implemented her reforms two years before the Directive 91/440/EEC and was looked upon from all over Europe. Today, Statens Järnvägar still keeps its grip on its legal monopoly relating to profitable interregional train services *by its own* assessment, as long as SJ does not decide to file a line for competitive tendering to Rikstrafiken. Freight transport is open to competing operators, limited by a grandfather's clause due to SJ's intervention with the government, while competitive tendering procedures are employed for county lines and unprofitable interregional services, reminding of the Dutch example of competition for the track or the British franchising model. Over the years, market-led reforms have been injected into Sweden's railway system in a step-by-step approach.

The French and Dutch examples have already highlighted the strong relationship between railway transport and the government. Whereas the French were reluctant to let 'Europe' have too much of a say in national affairs, such as railway policy, the Dutch were far more progressive and open to quite comprehensive changes, though a change in government put a question mark behind the policy previously executed. Sweden's experience parallels the Dutch in this respect. Substantial deregulation was envisaged,

²⁹² van de Velde (2000), p. 13

legislation subsequently passed parliament and was postponed right after a new government took office in 1994. Nevertheless, the market liberalisation was well under way and generally embraced by the new Swedish government. In the late 1990s Statens Järnvägar was taken by total surprise with the zero-subsidy bid of Sydvästen, which *"...turned out to be the most serious threat so far against what is left of SJ's legal monopoly. However, SJ managed to get rid of this threat, by seeking new alliances (NSB) and lobbying the Government. The Government was able to meet SJ's demands just by sticking to the formal 1-year-only-contract..."*²⁹³

Similar experiences of compromised or watered-down reforms including continued political interference were made in Germany and the UK. The German reform was restricted to a far-reaching overhaul of the railway system, including non-discriminatory access rights for newcomers without actually selling the railway undertaking to the private sector. The Conservative government in Britain sold the infrastructure operator and the rolling stock of British Rail completely, while franchising passenger services by competitive tender. But the process was substantially flawed. The franchisees barely owned any assets, though they carried a substantial risk due to leasing contracts with rolling stock operators and static access arrangements with the track owner. Open access was severely constrained until 2002 and the envisaged sale of the franchises was postponed to some unknown day in the future. The reforms are still far from a full privatisation. The next two chapters look at the German and British reforms up to the current day.

²⁹³ Alexandersson (2000), p. 15. The NSB are the Norwegian State Railways *Norges Statsbaner*.

B. Railway reform in Germany

1. The nationalised German railway system on the path to reform

Whereas Bismarck's plan of a single German national railway was not accomplished until 1920 with the creation of the *Deutsche Reichsbahn*, he nevertheless succeeded in setting up a Prussian state railway company by nationalising the lion's share of the Prussian railway network in 1879. In WWII and in the years preceding the war, the Nazis used the Deutsche Reichsbahn to serve their political demands and the war machine. When Germany was divided after WWII, the German constitution for the western sectors of the allied forces from Britain, the United States and France subordinated the administration of the railway system to the federal government as the *Deutsche Bundesbahn*. In the years to come the Bundesbahn was exploited as an instrument of social, regional and structural policy, instead of dealing with these issues adequately in the corresponding state departments of social affairs and economic policy. Though the German government had originally been concerned about the dominance of the railway system in the market for transport services, these concerns were soon turned upside down. In the early 1950s it were no longer other modes of transportation that required protection from the dominant Deutsche Bundesbahn, but rather the railway. The DB had to react to strong intermodal competition, especially from road hauliers.²⁹⁴

The Deutsche Bundesbahn went into deficit as early as 1952. By 1965 the situation of the Bundesbahn had deteriorated immensely. The annual deficit exceeded DM 1 billion, while federal subsidies in the following decades rose to a peak of DM 13 billion after the reunification in 1990, not accounting for the deficit of the Reichsbahn of the ceased German Democratic Republic. Since the 1950s the market share of the railway in the market for transportation of both goods and passengers was on a steady decline, notwithstanding the German government's protectionist railway policy.²⁹⁵ This aggravating trend is illustrated in charts 23 and 24. Chart 23 underlines the decline of public road and rail traffic compared to private transport.

²⁹⁴ Lenke, p. 35 on the sudden shift from a protection against the dominant railway to a protectionist railway policy.

²⁹⁵ Schröder (1994), p. 3

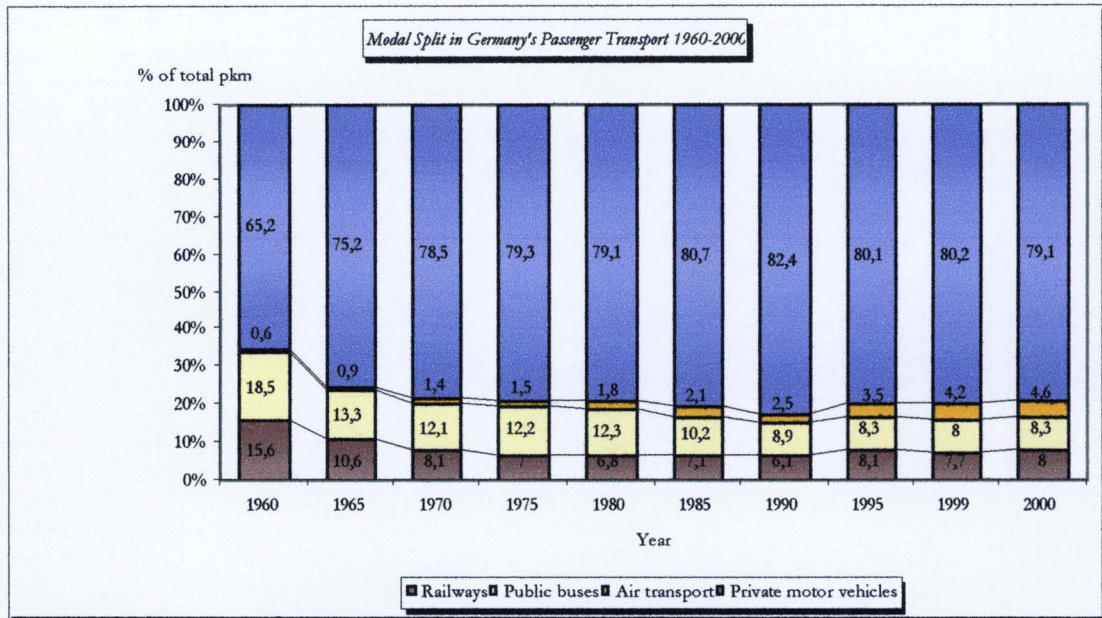


CHART 23

BMVBW (2000): Verkehr in Zahlen 2000, pp. 218-219

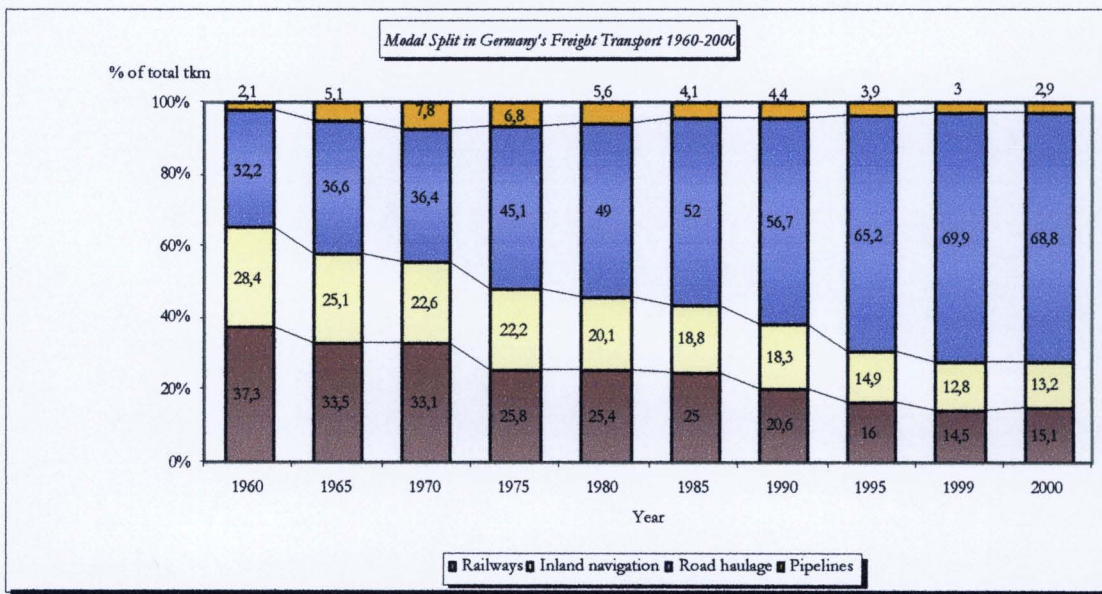


CHART 24

Source: BMVBW (2000): Verkehr in Zahlen 2000, pp. 234-235

Note: Air cargo, sea transport, internal railway traffic and road haulage smaller than 3.5 tons are excluded

While the situation in passenger transportation was not at all cheerful for the Deutsche Bundesbahn, the freight business was not more enchanting. The modal split in the freight industry in the decades following WWII until today is illustrated in chart 24. The chart underlines the decline from the 1960 level for the railways and waterway traffic, while transportation via long-distance pipelines went into the same downward direction from the 1970s. Nevertheless road hauliers seemed more than happy to capture their share of the freight traffic, expanding their market share from 32.2% in 1960 to

69.9% in 1999, thereby more than halving the market shares of railway and waterway freight traffic. The transport market is characterised by a structural change with the beneficiary of the railways' reduction in demand proportionate to total demand for transportation services being road transport.²⁹⁶

Having addressed the statistical data of the structural change and the steady deterioration of railways in German transport, the contemporary observer might wonder about the reasons for the structural change. And if the crisis of railway traffic was that apparent, it is startling that substantial structural reforms were carried out with a time lag of several decades.

²⁹⁶ Stackelberg (1993), pp. 247-250

1.1 Reasons for the structural change in the transport market

Whereas it has often been claimed that the railway system's assumed inefficiency was to a large extent a consequence of its organisation as a government-protected public monopoly, both the demands of travellers and of freight customers changed over the years and contributed to the railway's plight.²⁹⁷ The German *Wirtschaftswunder*, the period of high economic growth in the aftermath of WWII, laid the foundations for more individual wealth, which was then partly spent on automobiles, whether as a status symbol or in order to become more flexible and independent. Growing car ownership, however, increased private transport to the loss of public transport and created the demand for more roads, which in turn provided a better road infrastructure and created network benefits for car owners. Turning from passenger to freight transportation, the demand for the freight the railways were typically carrying, such as coal, steel, raw materials and alike was on a steady decline, whereas the road hauliers were concentrating on high-value products.²⁹⁸ Also, cables and pipelines could easily carry substitutes to coal, e.g. electricity, gas or oil, further cutting into the freight market of the railways. With the energy market switching from coal to substitutes in individual households, an extensive network of coal stocks in cities became unnecessary. Now, it was sufficient to deliver the coal to a few energy-producing plants around the country.

True, economic growth and individual wealth might well induce customers to substitute public by private transport in either passenger or freight traffic. But an inefficient railway service considerably supports customers' decisions to switch from public to private transport, especially when the latter is more flexible with regard to the preferences of customers. Whereas other modes of transport offered logistic packages and complementary services, the railways did not match their services. This is not to say that the railways were unable to meet those demands. The challenge of losing market share requires immediate rethinking of the Deutsche Bundesbahn's strategy if it did not want to miss the boat. However, according to the figures discussed earlier, the Deutsche Bundesbahn lost out to other transport modes to a massive degree. Chart 25 reflects the railway system's lack of competitiveness with other modes. The chart illustrates the overall growth in the transport market between 1960 and 1990, divided in passenger and freight transportation. While the passenger market went up by 185%, the corresponding

²⁹⁷ Ewers and Meyer (1993)

²⁹⁸ Ewers and Meyer (1993), pp. 2-4 and Rahmeyer (1996), pp. 2-3 discuss the impact of the structural change on the market for transportation.

growth of passenger services on the railway was only close to 9%. In the freight industry, the Bundesbahn's business increased by 20%, compared to an overall increase of 110%.

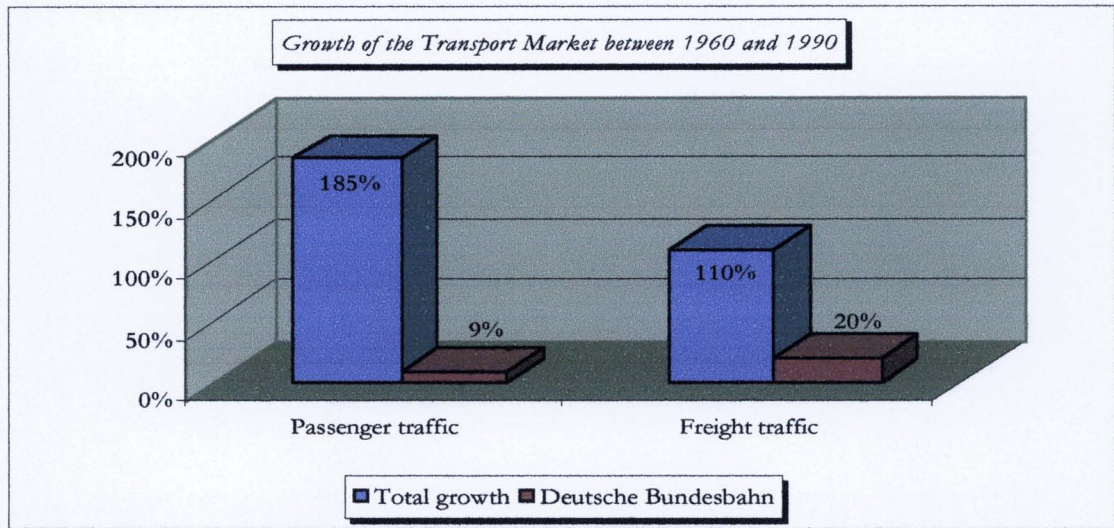


CHART 25

Source: Ewers and Meyer (1993), p. 2

Reasons for the structural change were exogenous to the railways due to changing demands of customers. However, the loss of market share was also endogenous on account the DB's organisation of a legally protected public monopoly. The system enjoyed full governmental financial backing against any deficits and was not in urgent need to react to the intermodal challenges and the customers' demands properly. One could even argue that the emerging crisis was of the Deutsche Bundesbahn's own making. Exactly because the DB did not match its customers' demands, they were simply walking away, as soon as a superior means of transport from a price or quality point of view was on offer. If intramodal competition were permitted in addition to the strong intermodal competition, another railway company might have served the preferences of the customers who wandered away to another mode of transportation.

The government's response to the unfolding crisis of the railways had a long tradition in Germany. Instead of looking for new solutions, the government resorted to protectionist policies of the past. Accordingly, the entire transport market was subject to strict government regulation. In the freight industry this meant that road hauliers had to operate within tight constraints due to licensing arrangements. However, in addition to guaranteeing some freight business for the Deutsche Bundesbahn, the policy of restraining road freight operators protected the incumbent road hauliers against competition from potential entrants. Thus, the policy led to further distortions and erected artificial market

barriers due to government regulation.²⁹⁹ It is startling that the Bundesbahn, which already had a government guarantee on monopolised railway transportation and subsidies, needed further protection from road hauliers by licence arrangements.³⁰⁰ Apparently, the DB was so inefficient that it required even more protection via regulation of the remaining competitors – despite its monopoly position in the market for railway transport and a dominant position in the transport market, with 36.4% in passenger and 62.3% in freight traffic in 1950. Considering that politicians resorted to massive regulation plus financial transfers in order to cover the railway's deficit, the Deutsche Bundesbahn's value to the German economy and society must have been overwhelming. Still, it is hard to believe that the Bundesbahn could not have done better than it actually did under the protective shelter.

And if the DB was indeed essential to the German society and economy, why did nobody acknowledge that very fact, why did customers switch to other modes of transport? Obviously, other services were somehow superior, whether in price, quality or both.³⁰¹ Though a fundamental reform of the Bundesbahn might have averted the crisis of the system and established the railway system as the superior product it could well have been, the government cemented the status quo and resorted to plain protectionism.³⁰²

It is not the intention of this analysis to accept the often-proclaimed perception that the railway system as a whole was doomed to be a failure if it was not protected from various competitive threats. Indeed, the DB could have done far better than it was condemned to do under regulation, which limited the entrepreneurial potential inherent to a competitive and innovative railway system. Before turning to the delay in reforming the system, the endogenous characteristics of the Deutsche Bundesbahn that led to its decline will be discussed.

The Bundesbahn held a monopoly on public railway transport, guaranteed by federal legislation and the German constitution.³⁰³ The only competition it had to face stemmed from other modes of transport that were, however, heavily constrained in freight and passenger transport in order to protect the railway's business. As a public company,

²⁹⁹ Lenke, p. 35

³⁰⁰ Hamm (1988), pp. 4-5

³⁰¹ It must be clarified that the quality of a service includes a variety of parameters such as flexibility, punctuality, kindness, speed, convenience, safety, complementary services etc.

³⁰² This situation was familiar on the British Isles.

the Bundesbahn was subject to political decisions; it had to face state intervention in order to fulfil politicians' and pressure groups' demands. As a legally protected public service, the Bundesbahn was obliged to serve the public by working towards social goals, though it was supposed to operate profitably at the same time. Major management decisions of the Bundesbahn, such as investment or fares had to gain approval from the civil servants and the politicians of the federal transport ministry, or in the *Verwaltungsrat*, an administrative council consisting of representatives from trade, industry, agricultural, manufacturing, and transport associations, the unions and the *Bundesrat*, Germany's upper house of parliament.³⁰⁴ Now, briefly recalling the often-opposing interests of trade unions and industry associations, throwing in local concerns about infrastructure improvements in their own *Länder*, potential conflicts are eye-catching. The decisions of either the *Verwaltungsrat* or the federal ministry necessarily neglect the objective of profitable operations in order to reach a compromise that offered benefits to each interest group. Thus, management decisions in the Deutsche Bundesbahn were indifferent to economic rationale but were subject to political compromise. One may wonder whether the DB's decisions served interest groups, a blurred social goal, business interests of a healthy railway company in a regulated marketplace or none of them. As it seems, the German government had simply resorted to a railway policy of *muddling through*, which did not follow any consistent strategy for the railway system and transport policy as a whole.

The variety of contradicting claims towards the Bundesbahn was a major burden for the train system. Social service obligations forced the railway to maintain unprofitable traffic to remote areas, charging passengers and products equally across the country, even on unprofitable lines. In turn, social service obligations had considerable consequences for the Bundesbahn as the DB's competitors were free of similar obligations. Other transport modes had obtained an invaluable competitive advantage due to the Bundesbahn's obligation to charge universal prices across the railway system. The Bundesbahn had to cross-subsidise the unprofitable lines via transfers from profitable traffic, further undermining the competitive position of profitable lines towards other modes. In addition, the government discriminated against *and* in favour of the road haulage industry via licences – limiting their traffic volume and protecting their limited market against potential entrants into the road haulage industry at the same time.

³⁰³ This is excluding local tram or underground railways. They were generally run by the municipality, whereas the Bundesbahn operated the S-Bahnen, a kind of urban commuter trains.

Due to the public service obligations and its costly operation, the federal government had to accept responsibility for the survival of the railway system. Accordingly, deficits of the Deutsche Bundesbahn were covered by the federal budget, taking any risk away from the railways. As a result, the Bundesbahn was not subject to the constraints of the marketplace when running into deficits, because the government was in charge of the railway company. This practice further discriminated against other modes and distorted the working of the market. The Bundesbahn obtained around DM 14 billion annually as compensation payments for the public service provision. Nonetheless, Ewers asserted that the Deutsche Bundesbahn would have had to be liquidated immediately due to excessive debts, if judged on normal business criteria.³⁰⁵

The railway system had to cope with another absurdity, as the leeway of its management was further limited. The employees of the Bundesbahn were either civil servants or even *Bundesbeamte*, i.e. privileged civil servants who were appointed for sovereign jobs on a permanent basis by the federal state. But it is hard to see why employees of the railways had to be granted special privileges supposedly reserved for sovereign affairs of the government. In effect, civil service regulations caused the already inconsistent set of social and business goals to be supplemented with administrators and bureaucrats rather than professional railway executives. By law, civil servants were rather concerned about the legitimacy of their actions than the successful operation of a profitable railway industry. The law regulating their privileged status made it nearly impossible to dismiss them and offered no performance-related incentives to get promotions or a raise in salary.³⁰⁶

In summary, competition from other modes of transport gradually grew fierce, notwithstanding the fact that the market was heavily regulated in order to protect the Deutsche Bundesbahn. In addition, the risk of liquidation was simply non-existent. Deficits were generally transferred from the DB to the federal budget, eliminating a major driving force of entrepreneurial activity. The Bundesbahn lacked not only external, but similarly internal incentives due to its bureaucratic organisation as a civil service administration.³⁰⁷ Eventually, the chosen policy of railway protectionism resulted in the

³⁰⁴ The Bundesrat is the representation of the Länder governments. Ewers and Meyer (1993), p. 3 briefly describe the dependence of the Deutsche Bundesbahn from political decision-making.

³⁰⁵ Ewers and Meyer (1993), p. 2 and Regierungskommission Bundesbahn (1991), p. 10

³⁰⁶ Ewers and Meyer (1993), p. 3

³⁰⁷ The former chairman of the Bundesbahn, Dürr (1993), pp. 4-5, 9, selected the DB's bureaucratic corporate culture as the main challenge to the railways: *"This status of a public authority, derived from its definition*

absence of a permanent pressure to innovate and exceed competitors in the market for transportation. Laaser concludes that the regulation of the entire German transport system was nearly perfect. Market entry and exit as well as pricing decisions were subject to strict government regulation. Due to a comprehensive net of regulation, suppliers in the transport markets were united as a single cartel with competitive elements being the rare exception.³⁰⁸

as a state-owned railway which is subject to public service law and budget law, is an insurmountable barrier to flexible company development. This is a decisive difference, and one of its greatest advantages compared to its competitors which are organised on a private enterprise basis."

³⁰⁸ Laaser (1991), p. 19 and Rahmeyer (1996), p. 15

1.2 Railway reforms postponed

Accordingly, the Deutsche Bundesbahn was in a straitjacket of internal and external disincentives and constraints, hampering its successful operation as an innovative and competitive transport business. The growing criticism of the rising deficits and falling market shares as well as the over-regulation of the railway system led to the *Brand-Gutachten* in 1960, the first systematic analysis of the weaknesses of the Deutsche Bundesbahn.³⁰⁹ In effect, the report was partly considered in the transport legislation of the following year, the *Verkehrsänderungsgesetze*, designed to promote intermodal competition as an important mechanism to co-ordinate the modes of transportation. However, Ewers concludes that the minor reform of the *Verkehrsänderungsgesetze* did not initiate a U-turn in German transport policy. The legislation failed to meet the main aim of the reform, to improve the Bundesbahn's economic position, and neither curtailed the Ministry of Transport's intensive regulatory instruments, nor the social objectives of the Bundesbahn.

Notwithstanding the attempt to reform in 1961, it did not take the government long to contradict the former legislation with the *Leber-Plan* in 1967, the official government guideline in transport policy for the 1968 to 1972 parliamentary session. The *Leber-Plan* aimed at putting the Bundesbahn back on track by dirigiste measures against its intermodal competitors. Road haulage contractors were prohibited from carrying specific freight on the roads, whilst the quantity of road haulage licenses was limited and special taxes levied. The opposition of industry associations, however, left the *Leber-Plan* stripped of the quantity requirements and further regulations, thereby reducing its defective consequences.³¹⁰

The late 1970s saw two main reform proposals to save and reinvigorate the German railway system. In 1976, the board of the Deutsche Bundesbahn suggested the *betriebswirtschaftlich optimales Netz*. The concept envisaged a concentration upon an optimal network from a business perspective of 14,500 kilometres in total length, compared to the existing network of 29,000 kilometres. The Bundesbahn's optimal network would then be complemented with a socially optimal network. Whereas the government had to decide

³⁰⁹ Laaser (1988), pp. 8-9. The following remarks are largely based on the work of Laaser (1988), pp. 8-19, Ewers and Meyer (1993), pp. 11-15 and Schröder (1994), pp. 4-13.

³¹⁰ Ewers and Meyer (1993), p. 12 note that the *Deutscher Industrie- und Handelstag (DIHT)* and the *Bundesverband der Deutschen Industrie (BDI)*, two lobbying organisations which are biased in favour of more competition in the German economy were at the forefront of the opposing industry associations.

upon the scope of the socially optimal network, it was furthermore required to pay for the social service the Bundesbahn was obliged to deliver. Thus, for the first time it was proposed to tackle one of the main structural misconceptions of the railways, the perception that train companies would have to deliver a social service to the nation, while operating profitably at the same time. Still, the reform did not succeed on account of opposing Länder and community authorities as many regions benefited from the non-profitable train traffic and were afraid of losing their heavily subsidised transport infrastructure. In addition, the federal government was not in favour of the proposal. The massive annual re-distributions of taxpayers' money to certain regions from the federal budget as *explicit* railway transfers would have been exposed to criticism from well-off regions that were already financing states with less revenue.³¹¹ Nonetheless, the board's proposal was a landmark on the way to a fully-fledged reform.

The 1978 proposal, however, focussed on another main pillar of reforming the railways, the vertical separation of train and infrastructure operations.³¹² The government analysed four different models of vertical separation with regard to their structural, economic and social consequences. Whereas three of the four models simply implied a direct transfer of the infrastructure costs from the Bundesbahn to the federal minister of transport, one proposal suggested an actual separation of the track management and the operation of train services. Accordingly, the track network was supposed to remain in government ownership with the operation of one or more independent private train operators on the network. Eventually, constitutional constraints of article 87e *Grundgesetz* (GG) prevented the reform's realisation.

The publication of social balances in the DB's 1978 annual report was short-lived and discontinued in the following year. While the social balances were soon forgotten, the company published three separate accounts in their annual reports after 1980 in order to produce clear responsibilities. According to the division, the government was in charge of the track network and the social service obligations relating to the local and regional traffic. The Deutsche Bundesbahn assumed responsibility of the freight and long-distance

³¹¹ The federal organisation of Germany consists of three administrative layers: the federal government (*Bund*), the regional state governments (*Länder*) and the communities (*Gemeinden*). Due to the *Länderfinanzausgleich*, an arrangement of the federal organisation of the republic, the tax income of the different layers is redistributed in order to support *disadvantaged* regions. For a comprehensive critical analysis of the *Länderfinanzausgleich* see Blankart (1994), pp. 522-545

³¹² This policy proposal was, indeed, not new to the railway industry. Already in 1864 Gladstone suggested a vertically separate organisation of railway operations and the track management, when he advocated nationalisation of tracks to avoid more "*unco-ordinated building*"; Jenkins (1995), p. 249.

passenger traffic. Though the division of responsibilities between the state and the railway created more transparency, it had not much in common with an actual separation of infrastructure and train services. Overwhelmingly, the accounting division rather served the Bundesbahn well in justifying its rising deficits, as did the social balance in 1978.

However, the development of the deficits and of the Bundesbahn's debts was alarming to the federal government and the financially struggling state-owned undertaking. This led the recently appointed board to the implementation of the strategy DB'90 in 1983, to counter the aggravating trend. Complementing ambitious internal targets to boost efficiency by means of reducing staff expenses by 30%, increasing productivity by 40% and lowering total expenses by 25% until 1990, the board expected external support from the government, more exactly debt relief and investments in new track infrastructure. Regarding the set of targets, the strategy was successful. But though the transfer of debts from the Bundesbahn to the federal budget in 1991 reduced the debt of the Bundesbahn to DM 34 billion, they were roughly comparable to the 1983 level. This sum still exceeded the annual revenues of the Bundesbahn of DM 20.2 billion in 1990, not offering a real prospect of economic viability to the railway system. In case of failure to reform the railways thoroughly, massive debts were anticipated until the end of the millennium.

The previous considerations have shown that the post-war railway system was steadily running downhill. The DB gained a brief respite with the debt transfer from the Bundesbahn to taxpayers and the efficiency gains of the late 1980s. If the problems were apparent from the outset, one may wonder why the various reforms were half-hearted approaches until the more comprehensive report of the government commission on railways in December 1991, the *Regierungskommission Bundesbahn*. In a public choice analysis, Ewers and Meyer reveal that massive lobby interests were responsible for the postponed or watered-down reforms.³¹³ Transport economists and policy advisers after WWII were mostly in favour of social service provisions. They cut off transport policy from the economics discipline and discredited economists' criticism of regulated transport markets by inventing the so-called *Besonderheitentheorie*, i.e. instruments of economic theory would not apply to transport economics.

Road hauliers were rather satisfied with the status quo. Neither did they consider the inflexible and heavily regulated Deutsche Bundesbahn as a dangerous competitor, nor

did they welcome a reduction in the barriers to entry of the road freight market, as inventive and challenging entrants might intrude upon their market. Suppliers and complementors to road hauliers, such as oil companies and truck as well as car manufacturers, were naturally tied to road transport. They were unlikely to challenge the regulated railway system. The regulations of the road haulage industry protected both the Bundesbahn and the road freight operators from new competition.

Advocates of railway reform had to face further opposition from the railway unions. Naturally, they were defending their members – public employees and civil servants of the Bundesbahn who were afraid of losing their jobs in a privatised railway undertaking. The same applied to executives of the Bundesbahn, as the management did not expect to be an exception to the rule. They would have been equally affected by job losses, potentially even with a higher proportion, assuming that the course of the Bundesbahn and the management style had to be turned in the opposite direction. The prime concern of environmental groups is generally a reduction of road transport. They were afraid that a privatisation of the railways would result in more road and less railway traffic. Environmental groups were mostly opposed to a deregulated DB, disregarding the benefits of an efficient and competitive railway system.

The electorate is often subject to ideological influences, such as the commonly held view that the railway system needs protection and subsidies to exist due to its ecological and social benefits to society. Though the short-term advantages of regulation, such as social service obligations, are apparent to the electorate, long-term costs of public services like the Bundesbahn debt on the general tax bill and an inefficient service were hidden and more difficult to understand. Though politicians and the government are subject to a re-election constraint, railway policy in Germany does not have more than a partial influence on actual voting behaviour, as railway policy is one issue of a political election agenda. However, railway policy often served as a comfortable substitute for direct social or regional policy, such as the promotion of disadvantaged regions by infrastructure investments or the support of disadvantaged groups in society by special tariffs with the costs not being covered by the government budget, but by cross-subsidies or the annual railway deficit. For the same reasons, regional and local governments and communities were generally in favour of a public railway system. Otherwise, regional public transport provision and finance could place a burden to the Länder.

³¹³ Ewers and Meyer (1993), pp. 15-26 and Ewers (1995), pp. 115-118 discuss the following issues in

2. The report of the *Regierungskommission Bundesbahn*

The partly successful strategy DB'90 highlighted the necessity for full-scale reform of the Deutsche Bundesbahn. The rather unattractive alternative to the German government was the railways' continued dependence from public funds. Though budgetary pressures forced the government to counter the worsening railway situation, the German conservative-liberal coalition government was in favour of a comprehensive railway reform which is reflected in the government's selection of commission members. The *Regierungskommission Bundesbahn*, a government panel on the Deutsche Bundesbahn's future prospects, was commissioned in 1989 and submitted its report in December 1991.³¹⁴ Though the commission was initially expected to publish a report on the reform of the Deutsche Bundesbahn, it was overtaken by German reunification. Eventually, the *Regierungskommission* decided to take both the Deutsche Bundesbahn and the Deutsche Reichbahn in the former German Democratic Republic into account.

Two reports immediately preceded the report of the *Regierungskommission*, mapping out further developments. The reports of the monopoly and deregulation commissions in 1989 and 1990 unanimously agreed that restrictions on competition were detrimental to transport services and redundant. Though protectionism originally intended to favour the Bundesbahn, it contributed to the railway system's decline. The reports recommended curbing the regulations to prevent a further deterioration. The criticism focussed on the entrepreneurial environment surrounding the Bundesbahn. The undertaking did not face any entrepreneurial risks and was allowed to transfer its deficits to the government budget. It was subject to civil service regulations and exploited to ease labour market constraints in periods of high unemployment. This was on top of social policy objectives that were imposed on the Deutsche Bundesbahn. Also, the commissions rejected to consider regulation on grounds of perceived ecological benefits. Lenke concludes that protectionism promoted the shift of market share in the transport market from the railway to road traffic. Both reports recommended a vertical separation of the railway system and open access to the track infrastructure.³¹⁵

The *Regierungskommission Bundesbahn* published their report in December 1991 in line with the monopoly and deregulations commissions. The report advocated a fully-

greater detail.

³¹⁴ *Regierungskommission Bundesbahn* (1991)

³¹⁵ Lenke, p. 36

fledged structural reform of the German railway network. The Deutsche Bundesbahn and the Deutsche Reichsbahn should merge into the holding company *Deutsche Eisenbahn AG (DEAG)* and the federal government would remain the sole owner of the new company. The commission proposed a vertically separated structure between the track network and the operations as well as a horizontal separation of train services into passenger and freight traffic divisions in profit centres.³¹⁶ After a transitional stage of 5 to 8 years, the passenger and freight traffic divisions should move to full privatisation.

The commission proposed to transfer the debt to an external institution, as the massive liabilities would strangle the new DEAG and its three subsidiaries. Another burden to the new holding company was the massive number of civil servants and Bundesbeamte, amounting to a total workforce of 390,000. Again, the commission suggested an external institution to embrace the staff from the Bundesbahn. This arrangement allowed the DEAG to renegotiate the job contracts with the employees individually, as their former contracts would officially run with the external institution. The staff was to be hired by the DEAG from the institution in exchange for the payment of market wages at market conditions instead of civil servants' salaries and privileges.³¹⁷

Privatisation of the Bundes- and Reichsbahn did not mean that unprofitable lines must cease to exist, if they are socially beneficial. The Regierungskommission recommended that the regional Länder governments might order services from the Deutsche Eisenbahn AG if the services could not cover costs. The Länder would have to pay for the services, the alternative being cross-subsidies from profitable traffic, leading into a vicious circle of intermodal incompetiveness. Payments to cover unprofitable services had so far been undertaken by the federal German government. First, the funds would be transferred to the Länder. Second, the Länder could then auction their public transport operations to the Deutsche Eisenbahn AG or a competitive train operator.³¹⁸ This policy of *regionalisation* of social service responsibilities from the federal to the Länder governments was one of the most important steps in the process of structural reforms. Eventually, it ended the railway's *social* obligation to cross-subsidise unremunerative and expensive lines from the revenue of profitable services. Prior to the railway reform, the profitable traffic had been condemned to charge customers a mark-up on the competitive price, simultaneously undermining the Bundesbahn's intermodal competitiveness.

³¹⁶ Regierungskommission Bundesbahn (1991), p. 30

³¹⁷ Regierungskommission Bundesbahn (1991), pp. 20-21

³¹⁸ Regierungskommission Bundesbahn (1991), pp. 22-23

However, the regionalisation from 1996 guaranteed the continuation of socially beneficial services.³¹⁹

The Regierungskommission urged the government in the report to undertake a general overhaul of the transport system, emphasising the necessity to provide equal opportunities for all modes of transport, especially with regard to public infrastructure investments. Though the DEAG would oversee the construction and maintenance of the entire track network in its own responsibility, the federal government should finance the investments in the infrastructure, receiving in exchange the annual depreciation from the DEAG.³²⁰ The sole financial responsibility for investments in passenger and freight traffic would be in the authority of the Deutsche Eisenbahn AG. Non-discriminatory open access for third parties must be granted to the track network by the DEAG to promote competition on the track. The Regierungskommission strongly advised against a public authority in charge of the infrastructure, as an authority lacks the incentives to market train slots and is highly sensitive to political interventions.³²¹

³¹⁹ The regionalisation was based upon the 1993 regionalisation law, article 4 ENeuOG.

³²⁰ Wittenbrink (1993), p. 224

³²¹ Regierungskommission (1991), pp. 24-27

3. The Deutsche Bahn AG

3.1 The first stage of the reform

Parliament passed the necessary legislation to restructure and privatise the German railway system in December 1993, based upon the Regierungskommission's findings in the *Gesetz zur Neuordnung des Eisenbahnwesens (ENeuOG)*.³²² The first stage of the long awaited structural reform commenced on January 1st, 1994. Accordingly, the Bundesbahn and Reichsbahn were merged into the *special federal railway assets*, the *Sondervermögen Bundeseisenbahnen* (*chart 26, large blue box*). The Sondervermögen comprised commercial and public functions, which were allocated to the bodies as shown in chart 26.³²³ The new joint stock company *Deutsche Bahn AG (DBAG)* was established for the commercial side of the Sondervermögen, with the federal government as the sole owner of 100% shares of the DBAG.³²⁴ The DBAG was restructured as an integrated company with the separate subsidiaries *Personenfernverkehr* and *Personennahverkehr*, the long- and short-distance passenger traffic, *Güterverkehr*, the freight traffic division, *Personenbahnhöfe*, the subsidiary for the railway stations and the *Fahrweg*, comprising the entire track network (*chart 26, upper green box*).³²⁵ Non-discriminatory open access to the track system was provided, whilst cross-subsidies between infrastructure and train operations were prohibited.³²⁶ Thus, Germany's reform of the railway system encompassed the European Community's directive 91/440/EEC and restructured the DBAG into the above subsidiaries.³²⁷

³²² Bundesgesetzblatt I 1993, No. 73. The ENeuOG comprises the following five articles:

Article 1: Gesetz zur Zusammenführung und Neugliederung der Bundeseisenbahnen – law to merge and restructure the federal railways

Article 2: Gesetz über die Gründung einer Deutsche Bahn Aktiengesellschaft – law on the creation of a joint stock company Deutsche Bahn

Article 3: Gesetz über die Eisenbahnverkehrsverwaltung des Bundes – law on the federal state's railway administration

Article 4: Gesetz zur Regionalisierung des öffentlichen Personennahverkehrs – law on the regionalisation of short-distance traffic

Article 5: Allgemeines Eisenbahngesetz – general railway law

³²³ Article 1, §§1-3 ENeuOG

³²⁴ Article 2, §1 ENeuOG

³²⁵ The separation was laid down in article 2, §25 ENeuOG. The law envisaged at least four separate divisions, namely the above, except Personenbahnhöfe, the station operations.

³²⁶ Article 5, §§9,14

³²⁷ Articles 2, 5 ENeuOG converted the EC directive into national law.

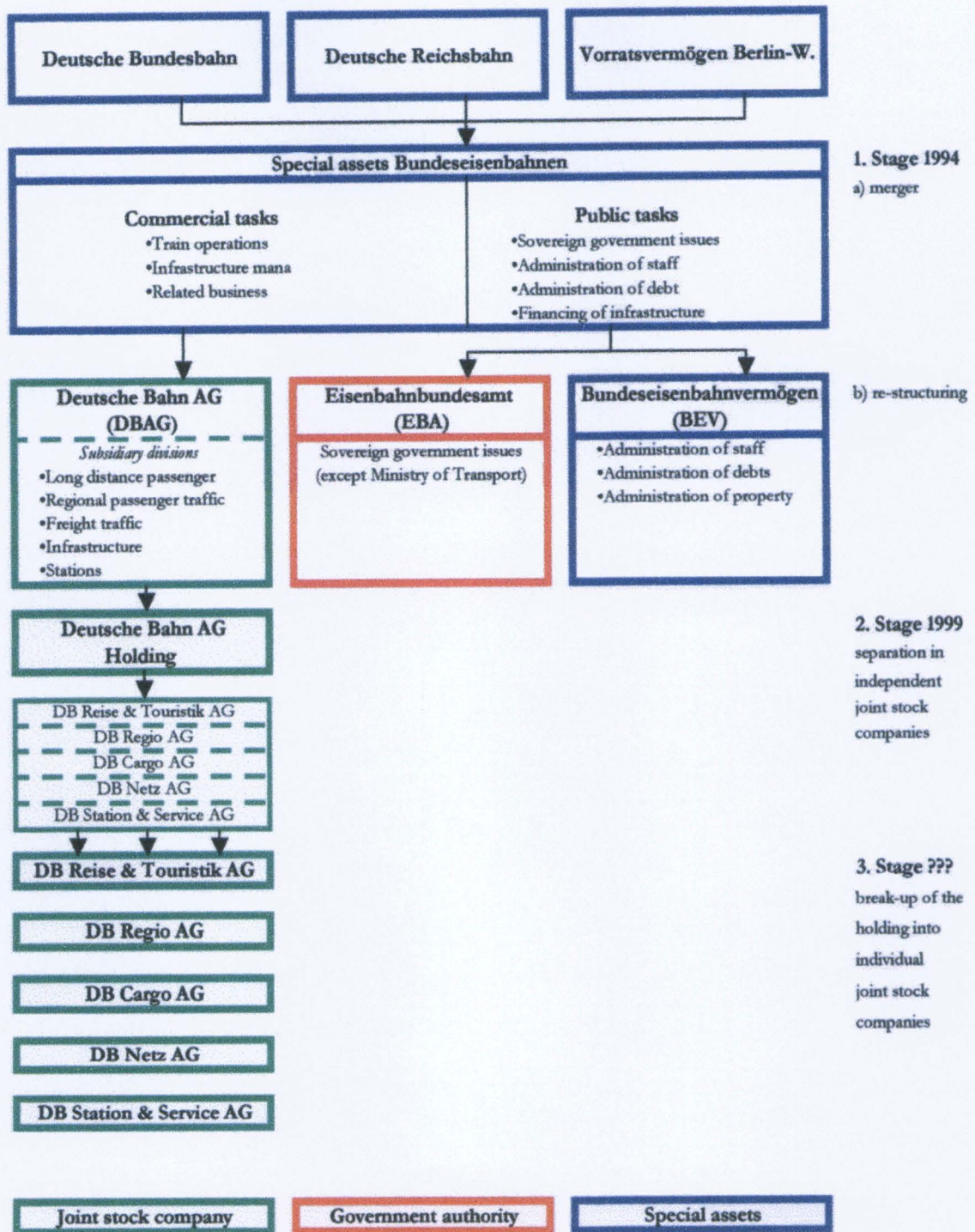


CHART 26: German Railway Reform

Source: Aberle and Brenner (1996), p. 7 and www.bmvbw.de with alterations

The remaining non-commercial functions of the special asset Bundeseisenbahnen were allocated to the *Eisenbahnbundesamt (EBA)* and the *Bundeseisenbahnvermögen (BEV)* as illustrated in the red and lower blue boxes. The EBA was subjected to the Ministry of Transport and is the supreme authority in supervising the traffic flows and planning of

investments into the infrastructure.³²⁸ In addition, new train firms have to obtain operating licences from the EBA. Generally, licences are granted if the applicant is reliable, financially sound and competent with regard to the operation of a railway company.³²⁹ The German government pushed to upgrade the EBA's functions to create a proper railway regulator during 2001. Accordingly, the EBA would obtain powers to ban discriminatory action itself, a power that is explicitly in the domain of the German competition authority, the *Bundeskartellamt*.³³⁰ Due to strong opposition to a special railway regulator from the competition watchdog's president and opposition politicians, the passing of the law is not anymore expected for 2001. The Kartellamt's president advocated a strict separation of infrastructure from train operations rather than an overlapping industry regulator that would obscure competencies.³³¹

The BEV incorporated the main burdens to privatisation. The massive debt of DM 67 billion, accumulated by the Bundesbahn and Reichsbahn, the staff of the former companies and the property of the state railways that was not directly required for railway operations were transferred to the BEV.³³² Thus, the 1994 *Bahnreform* removed the DBAG's long-term debt and to some extent relieved the railway system of the burdens of the past. This was a considerable privilege to the DBAG as other modes of transport had no way to get rid of their accumulated long-term debt. The debt transfer to the public purse discriminates against other modes of transportation and distorts competition. Though extremely beneficial to the railway system, the *Bahnreform* did not produce a level playing field in the transport market. Aberle and Brenner emphasise that this positive railway discrimination highlighted the continuation of the past's railway protectionism.³³³

The Deutsche Bahn AG hired Bundesbeamte for an initial period of three years. Following the transitional stage, the DBAG exclusively hired the Bundesbeamte who were required in the company from the BEV. The BEV served as a *job pool* to the DBAG according to its demand for personnel. The privileged civil servants were then hired at the same rates and conditions, which were agreed upon with new employees or former civil

³²⁸ Article 3, §3 ENcuOG

³²⁹ Article 5, §6 ENcuOG

³³⁰ The *Gesetz gegen Wettbewerbsbeschränkungen (GWB)* offers extensive scope for the Kartellamt to intervene with companies that are exploiting their market power or discriminate against competitors (§§19,20 GWB), e.g. see Bechthold (1999) or Wolf (1996) with regard to the competition watchdog's role in liberalised transport markets.

³³¹ *Frankfurter Allgemeine Zeitung* (2001c) and *Frankfurter Allgemeine Zeitung* (2001d)

³³² Kwasniewski (1993), p. 610 and Article 1, §16 ENcuOG: Expenditure of the BEV that is not covered by revenues shall be borne by the federal budget.

³³³ Aberle and Brenner (1996), pp. 15-16

servants who signed individual contracts with the new company, thus terminating their privileges within the new company.³³⁴ The BEV expected railway staff related expenses of DM 87 billion in the period from 1995 to 1999, whereas anticipated revenues totalled DM 29 billion from the Deutsche Bahn AG. Therefore, the accumulated net burden to the BEV job pool would amount to DM 58 billion. Even though the BEV expected revenue from property sales, they would not exceed DM 5.7 billion until 1999. The federal budget accepted responsibility for the BEV's expenses, which are not covered from revenue according to Article 1, §16 ENeuOG. Thus, the high deficits of the BEV led to severe strains in the federal budget.

In 1993 about 110,000 job losses had been anticipated up to the year 2000. The workforce of the infrastructure division amounted to 119,655 and was cut to around 100,000 by 1995. Assuming an average gross income of DM 70,000 per staff, total staff expenses would reach DM 7 billion in the infrastructure division alone. In relation to the total network size of about 40,000 kilometres, an average 2.5 workers looked after each kilometre in 1995. Comparing the number to an average one or two staff per kilometre on small private railway networks, Aberle and Brenner suggested that the infrastructure division had a considerable potential to increase productivity, especially when taking more automated networks into account.³³⁵ Necessarily, antiquated production methods would have to be replaced with innovative production technology to increase productivity and reduce the high costs of the track management. The large workforce and the lack of investment in technological progress inflated the costs of the Deutsche Bundesbahn and Reichsbahn. Over the next years, considerable gains were achieved. At the end of the year 2000, the workforce of the infrastructure division was down to 53,554 for a total network size of 36,588 kilometres, amounting to an average 1.5 staff per kilometre. Since privatisation in 1994, the total workforce of the DBAG holding was reduced by more than 125,000 staff, as illustrated below.³³⁶

³³⁴ Article 2, §§12,21 ENeuOG

³³⁵ Aberle and Brenner (1996), pp. 32-37

³³⁶ Deutsche Bahn AG (2000a) and Deutsche Bahn AG (2000b)

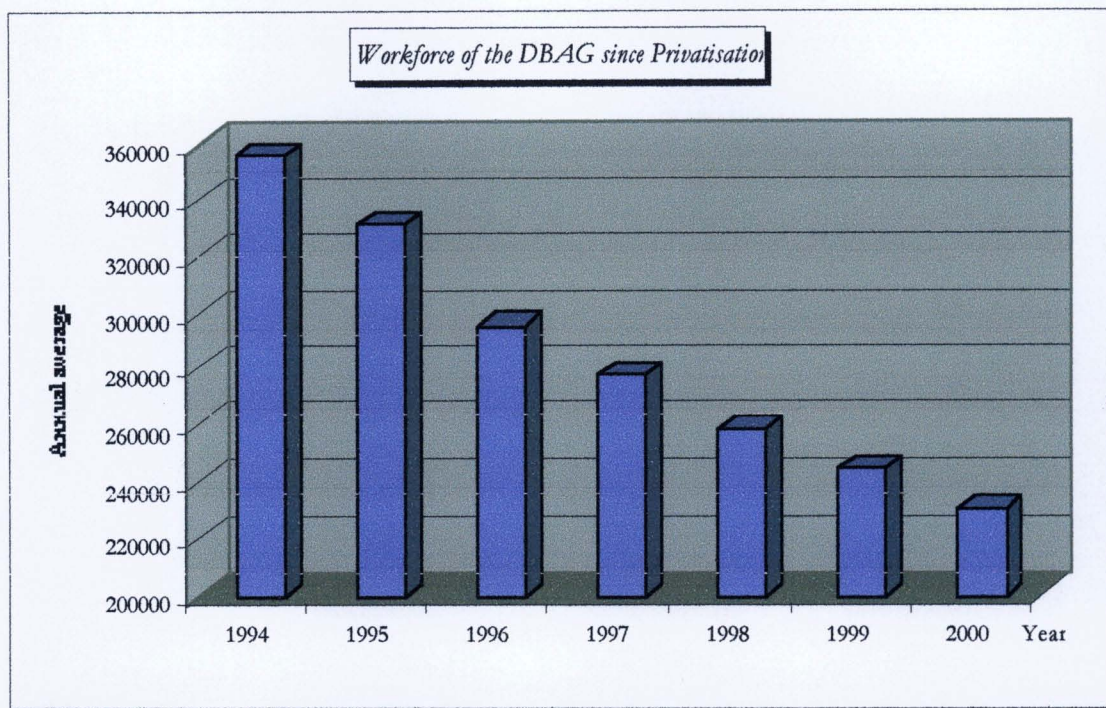


CHART 27

Source: Deutsche Bahn AG (2000a), pp. 10-11

Naturally, the network costs are correlated with the access prices to the railway network and the prices of the final product *railway transport*. But artificially inflated prices hamper the DBAG's successful intermodal competition. Railway protectionism, such as regulations, licensing arrangements or penal taxes for other modes of transport were the traditional way to ease competitive strains of the railways. This policy, however, produced exactly the crisis the railways were facing at the outset of the German reform. The railway protectionism of the past led to an antiquated railway system in urgent need of a general overhaul. The complex regulations and policies of the 20th and 19th centuries pressed the railway system into a straitjacket, crippling its potential to reply to intermodal challenges. An innovative and flexible railway system is an integral part of an efficient transport system and a competitive economy. The railway reform suggested by the Regierungskommission Bundesbahn aimed to achieve this goal.

3.2 The second stage of the reform

Following a transitional period of three to five years, the subsidiary divisions (*chart 26, upper green box*) were to become joint stock companies in the second stage of the Bahnreform. In an envisaged third stage, the Deutsche Bahn AG holding was to be resolved into entirely separate joint stock companies at some future date (*chart 26, lower green boxes*). The purpose of the DBAG holding in stage two was the strategic co-ordination between its subsidiaries. Obviously, this arrangement could result in collisions of interest, if third parties apply for traffic slots of the holding's infrastructure subsidiary in competition with the transport operations of the Bahn AG.³³⁷ Similarly to Britain, the initial proposals of the reform were watered down in the further political process and an actual privatisation drifted away into the distant future.

The DBAG entered the second stage in 1999 in accordance with article 2, §2(1) ENeuOG. However, it is currently at least unlikely that the DBAG holding will ever resolve into its subsidiaries in a third stage. Whereas the original bill in parliament fixed stage two for 1997 and stage three for 1999, the latter date was dropped due to opposition from the German Länder. As a consequence of the complicated parliamentary negotiations in the *Bundesrat*, the chamber representing the German Länder, the date for stage two was scheduled to start *between* 1997 and 1999. An outright sale of the share capital of all independent companies of the then resolved holding DBAG was only visualised for the final stage. This would, however, exclude the infrastructure provider, the *DB Netz AG* that was to remain federal property with a majority of shares. Today, 100% of the DBAG's share capital is still owned by the federal government. Apparently, the reform stopped halfway through. The Bahnreform was merely a formal instead of a fully-fledged material privatisation. As a result of the difficult negotiations between the federal and Länder governments, the introduction of the final stage of the reform with a break-up of the holding requires federal legislation and consent of the *Bundesrat*.³³⁸

The second stage commenced in 1999 and saw the foundation of five quasi-independent joint stock companies under the umbrella of the holding Deutsche Bahn AG. The *DB Reise & Touristik AG* is now responsible for the long-distance market, corresponding to the short-distance operator *DB Regio AG*. The *DB Station & Service AG* was created to maintain the station and service facilities, while the *DB Cargo AG* operates

³³⁷ Aberle (1998), pp. 472-473

freight services and the *DB Netz AG* provides the railway infrastructure (*chart 26, green boxes*). The *DB Netz*' functions comprise the construction and maintenance of railway tracks, the traffic management and the operation of safety control systems.³³⁹

The federal government assumed final responsibility for infrastructure investments other than commercially viable ventures of the *DBAG*. However, the government also supports infrastructure investments that are of commercial interest to *DB Netz AG* by means of *interest free loans*. This major shift of final responsibility to the federal government substantially decreased the *DBAG*'s burden of the former social service obligations. The move was essentially justified to correct past distortions in financing basic transportation infrastructure, though it created new distortions of competitive conditions between all modes of transportation. Again, the government discriminates in favour of the railway industry, while the tax burden of road transport is rising, not least due to the new environmental tax from which the *Deutsche Bahn* is currently exempt.³⁴⁰ The government's generosity is indeed startling for a supposedly profit-making private company operating in a wider transport market. As a result, government policy distorts market prices, induces investments that are considered beneficial to the general public and revives the old times of railway protectionism and positive discrimination, when train services were predominantly expected to be socially beneficial instead of profitable.³⁴¹ Also, the interest-free loans distort investment decisions of the *DB Netz AG* by encouraging investments and construction of lines that would not have been considered under undistorted conditions.

Under the current arrangements, the *DBAG* is expected to maximise the profits of the entire holding, whilst being required to allow competitors non-discriminatory access to its railway network.³⁴² Notwithstanding the legal prohibition of cross-subsidies, compliance with non-discriminatory rules cannot be guaranteed, if the five subsidiaries are subordinated to a single management holding. Only a full institutional separation between the track management and the transport operations can assure a non-discriminatory open access to the network for various train operators.³⁴³

³³⁸ Aberle and Brenner (1996), p. 6, Ewers (1995), p. 122-126 and Rahmeyer (1996), p. 17

³³⁹ §2 AEG

³⁴⁰ Böhmer and Delhaes (2000), p. 92

³⁴¹ Ewers (1995), p. 123 and Aberle (1998), p. 472

³⁴² §14 AEG

³⁴³ Schwenn (2001c)

3.3 The access price system of the DBAG and DB Netz

During the first stage of the Bahnreform access to the railway network was theoretically possible by paying an access charge to the predecessor of the DB Netz AG, the Fahrweg division of the DBAG. However, the initial access prices were exposed to constant criticism from transport economists. Summarising the critics' viewpoints, Knieps suggested the Deutsche Bahn charged internal, partly arbitrary prices between the DBAG's different divisions and signalled that the entry of other parties would not quite be welcomed.³⁴⁴ Indeed, as one would expect the Deutsche Bahn's charging mechanism rather discouraged than encouraged potential competition by disincentives, such as quantity discounts to firms using the whole Fahrweg network. Apparently, the only operators using the whole network were the DBAG's transport divisions. Regional market entry could have been promoted by a differentiation of the Fahrweg in regional networks or routes, but apparently the Fahrweg's business goals were subordinated to the goals of the holding DBAG. The access price discounts were clearly designed for the Bahn's own passenger and freight operations, as they were the only operators who could benefit from the most rewarding discounts. Thus, it was virtually impossible for small operators and potential market entrants to come even close to the most attractive discounts. The incumbent DBAG's Fahrweg division erected market barriers against outsiders in order to give the DBAG a competitive advantage over potential entrants.

Though the pricing differentiated between different categories of trains, such as InterCityExpress (ICE), InterCity (IC) and InterRegio (IR), the categories were designed according to the Deutsche Bahn AG's own train categories and requirements. Though the standards were possibly a natural occurrence based on the DBAG's past railway experiences, they impeded innovations of new models by potential competitors, as they had to comply with DBAG's standards. Nonetheless, the inflexibility of the pricing scheme did not only apply to the train categories, but also to the capacity of the network. The Deutsche Bahn simply neglected traffic externalities, though congestion pricing could have alleviated congestion on the network. Instead of rewarding flexible train operators for switching from peak to off-peak operations and charging mark-ups for the use of capacity bottlenecks in the railway system, the Deutsche Bahn AG lacked a rational incentive price mechanism. In the 1997 railway infrastructure directive, the *Eisenbahninfrastruktur-Benutzungsverordnung (EIBV)*, the Ministry of Transport provided

criteria for access prices, also comprising components for congestion and pollution costs.³⁴⁵ Above others as a reaction to the mounting criticism, the DBAG relaxed its pricing regime in time for the start of the second stage of the railway reform in 1999.

The 1998 access price system, the *Trassenpreissystem (TPS'98)* was essentially designed to attract more traffic to the railway system and to recover the full costs of the infrastructure, setting a stark contrast to most access price systems in the European Union. The majority of European railway track managers solely recover a small margin of the entire infrastructure costs through their revenues from access charges, while government subsidies make up for the resulting shortfall in revenues. Due to the technical characteristics of railway infrastructure, the proportion of short term fixed costs usually adds up to 90% or more of the total network costs. In turn, marginal cost pricing cannot recover the full costs of the network, requiring either additional government subsidies or other second best pricing regimes, such as the TPS'98 two-tier system set up by the DB Netz AG. Knieps argued that a split into a fixed and variable price component is beneficial to society, whenever high fixed costs are present. In such a scenario, the variable price component promotes an increase in the total volume of traffic as a result of the degressive cost structure of a two-tier system. The average access costs of train operators decrease the more kilometres they operate their train services. Thus, a two-tier system could recover the full costs of the infrastructure with minor deviations from the economic optimal allocation principle of marginal cost pricing.³⁴⁶

The TPS'98 provided for open access to all national and international existing or potential train companies. The pricing structure accommodated both operators with only occasional traffic and operators with regular operations or a high quantity of services that require a great amount of slots on the network, such as the DBAG train operators. While occasional customers were likely to pay the so-called *VarioPreis*, a special two-tier pricing system had been created for the high volume customers to attract more traffic to the railway infrastructure supposedly without discriminating quantity discounts as in the initial access pricing mechanism. In the two-tier system, the access price had been composed of a fixed and a variable price component. The fixed component of the access price was purchased with an *InfraCard*, whereas the price of the *InfraCard* was independent of the final volume of traffic. The card entitled the customer to use the

³⁴⁴ Knieps (1996), p. 65; also see Aberle and Brenner (1996), pp. 41-57 for a detailed criticism of the initial access price system.

³⁴⁵ §6 EIBV

network in exchange for the payment of an additional variable price component. However, the variable component was considerably smaller than the VarioPreis access charge, because the VarioPreis already contained a fixed plus a variable price element, whereas the fixed element had already been covered with the purchase of the InfraCard in the two-tier system.³⁴⁷

The pricing of the InfraCard was based on the long run network related costs, such as capital costs in the form of depreciation, interest payments and basic maintenance costs. Thus, the cost components of the InfraCard did not vary in the short term with the number of train journeys. The final purchase price of the InfraCard for an individual train operator depended upon three parameters, those being (f1) the contract length, (f2) the scope of the chosen railway network and finally, (f3) the quality of the network.

The duration of the InfraCard subscription (f1), which embraced a period of one to ten years, reduced the InfraCard's price by a maximum of 10% for a ten-year contract. As customers with long-term contracts shared the DB Netz AG's investment risks and thereby promoted new infrastructure investments, they were rewarded with a reduction in the InfraCard's price. An additional discount was tied to the scope and the quality of the chosen network for which the InfraCard was valid. The bigger the network (f2) that individual train operators selected from the entire track infrastructure of nearly 40,000 kilometres owned by DB Netz AG, the more expensive was the InfraCard. In order to address the network character of the railway system, the DB Netz required its customers to select lines that were linked together as small, quasi-autarchic networks of a minimum 100 kilometres for low-distance, 1,000 kilometres for long-distance passenger traffic or 500 kilometres for freight services. The cost of the InfraCard finally reflected the quality of the selected network (f3). The DB Netz AG divided the entire network into six track categories that represented various speed limits, ranging from category K1 with a speed allowance between 200 and 300 kilometres per hour to category K6 with a speed limit of 80 km/h.

The prices of the InfraCard reflected specific requirements for the operation of long- and short-distance passenger, as well as freight traffic on a mixed-use infrastructure, such as differences in equipment and quality of tracks. Thus, the access prices for

³⁴⁶ Aberle (1998), p. 472, Knieps (1998), pp. 466-470 and Schwalbach (1998), pp. 476-479

³⁴⁷ The information on the TPS'98 is taken from the official brochure of the Deutsche Bahn AG (1998), which describes the new system and from Haase (1998), pp. 460-465

passenger traffic were generally higher than for freight traffic due to the comparatively simple standards required for freight services. Long-distance passenger traffic needs more expensive infrastructure equipment on high-speed lines, while short-distance regional trains call for extensive and highly expensive interface facilities, such as tracks along platforms and special signalling for trains pulling out of or into stations. Whereas the DBAG owns a total of 6,500 railway stations and stops, the regional traffic exclusively uses about 60% of the stations, obviously increasing the fixed quality-price component of the InfraCard. The InfraCard also considered the relevant market structure, such as intermodal competition with other transport operators along the chosen network.

Every train operator who had purchased the InfraCard was charged an additional variable price component per train kilometre. The variable component depended upon three further parameters, those being ($\nu 1$) the capacity of the line, ($\nu 2$) the timetabling flexibility of the service and ($\nu 3$) possible premiums or discounts.

Contrasting the initial access price mechanism's inflexibility in peak pricing ($\nu 1$), the TPS'98 designated three capacity classifications (BI – BIII), with highly frequented capacity bottlenecks being more expensive than the remaining categories, thereby acknowledging the criticism that the former charging principles neglected congestion costs. The Deutsche Bahn assumed the TPS'98 would encourage a more balanced use of the whole system and increase the overall performance and capacity of the network.

Also, the variable cost element was correlated with the timetable flexibility of the train companies applying for slots ($\nu 2$). As co-ordinated train operations put rigid demands on arrival and departure times of different services as well as train connections, the expenses of the DB Netz AG are higher the tighter the restraints, such as connecting services. Correspondingly, more flexible train operators received price reductions. Still, the cheapest option was the purchase of specially offered slots from DB Netz, the so-called *Angebotstrassen* or slots on offer, as they require the highest flexibility from train companies rather than the track operator. The DB Netz constructed the *Angebotstrassen* between major junctions and specified the required speed for the offered train paths. However, priority was given to the *Regeltrassen*, the regular slots for which the companies applied and were charged according to the standards they require. The cheaper *Angebotstrassen* were by far more restricted, as they were offered according to the requirements of DB Netz whenever slots were not purchased in the process of allocating the *Regeltrassen*.

Train companies wishing to offer services at particular times on a particular line usually applied for *Regeltrassen*.

Potential discounts or premium payments (*uß*) were linked to the variable costs of the access price, adding to the capacity and flexibility elements. The DB Netz had some room for manoeuvre in determining the final variable access price with regard to special arrangements or conditions that had not been covered by the individual pricing elements. Thus, innovative train systems, environmentally friendly or noise-subdued trains might be eligible for discounts and vice versa for premium payments.

In addition to the *InfraCard* system, the *VarioPreis* offered an alternative to customers who did not meet the basic requirements of the *InfraCard*, such as the minimum scope of an individual railway network or who generated only occasional traffic. The *VarioPreis* was explicitly tied to the total distance of train kilometres covered. The price depended mainly on the three capacity classifications (BI-BIII) and six different categories of line (K1-K6) that were defined according to the technical equipment of the chosen track and its performance and speed potential. While the combination K1/BI led to the most expensive, the track category K6/BIII offered the cheapest basic price. The DB Netz guaranteed a non-discrimination of the *VarioPreis* customer regarding to price alterations due to discounts, his flexibility in respect to the timetable and the use of *Angebotstrassen*.

If more than one operator applied for the same slot, the DB Netz AG had to follow the regulations of the EIBV. The directive regulates the access price system and potentially arising conflicts between different players. According to §4(5) EIBV, the slot must in such circumstances be granted to the operator who is willing to pay the highest mark-up on top of the access price of the TPS'98. Even the initial stage of separating railway tracks and transport systems in different subsidiaries created an emerging market for train slots.

In summary, the TPS'98 had two main objectives under the official condition to provide non-discriminatory access to the network. First, the pricing system was designed to recover the full costs of maintaining the railway infrastructure. Second, it targeted an increase in total traffic volume and productivity by managing more train slots through an incentive price mechanism. The variable price component represented an incentive to run

more services, because the average access price decreases in proportion to the train kilometres operated.

Overall, the reformed access price system eliminated many of the initial access pricing system's disincentives that discouraged small or regional operators, innovative train systems and flexibility of operators. The TPS'98 abolished bulk discounts that exclusively benefited the DBAG's transport subsidiaries. Furthermore, it revoked the former system's orientation to the DBAG's own train categories in favour of a more open system. Most importantly, the TPS'98 actively encouraged the flexibility of train companies regarding congestion on the track system. This provided for a more efficient allocation of slots and increased the railway system's productivity due to fewer capacity bottlenecks and a higher network capacity. While the VarioPreis set an incentive for small or regional operators, the InfraCard access price structure provided incentives for operators to use the network more intensely. Accordingly, their final average access price decreased in proportion with rising traffic. Thus, the TPS'98 made a step towards the twofold aim of recovering the costs of maintaining the infrastructure while at the same time attracting more traffic to the railway system.

Notwithstanding the achievements of TPS'98 compared to the former system, non-discriminatory open access was not guaranteed. As a result, the German competition authority considered an investigation into the access price system. Disregarding the potential arising from an institutional integration in the DBAG holding, possibilities remained to discriminate against open access operators. Bulk discounts for operators using the whole network were abolished, but the TPS'98 still offered quantity discounts according to the network size. Indeed, cost differentials of DB Netz partly justified the InfraCard's price components of contract length and scope of the network. However, the fixed costs of the InfraCard hold a potential to deter newcomers from entering the rail market. The capacity of the network did not allow for immediate large-scale market entry, even if a newcomer would be able to find sufficient resources.³⁴⁸ The discounts of the fixed cost component and the separation in a the VarioPreis and InfraCard regime favoured the Deutsche Bahn AG to the detriment of smaller competitors, as they could hardly get hold of the most favourable discounts.

³⁴⁸ After the DBAG announced to cease all InterRegio services, Connex suggested to acquire the entire InterRegio rolling stock of the DBAG to replace the services with new *InterConnex* trains. Naturally, the DBAG was rarely enthusiastically in favour of the proposals. Connex argued that public funds part-financed the purchase of the InterRegio's and Connex would be unable to order new trains on such a large scale in the short-term, *Frankfurter Allgemeine Zeitung* (2001)

Under the influence of the Kartellamt's investigation, the DB Netz revised the TPS'98 and implemented new access prices in April 2001. The competition watchdog ceased its investigation, because the new system abolished the competitive distortions of TPS'98. Quantity discounts of any kind are now absent – the access price is the same for each track kilometre, independent of the total amount of kilometres travelled with an average price of DM 6.40 per track kilometre as before. As an inevitable side effect of the abolition of a two-tier system of fixed and variable costs, the incentive price mechanism to run additional trains ceased, which was subsequently criticised by environmental groups.³⁴⁹

The new arrangement consists of three modules, the *basic price*, the *product specifications* and *special specifications*.³⁵⁰

1. The basic price accounts for different track categories and capacity of the track. The module is subdivided into nine categories, ranging in price between DM 2.9 per track kilometre for S-Bahn tracks to DM 6.6 per track kilometre for operations with minimum speeds of 200 km/h. The capacity charge of a uniform mark-up of 20% applies to highly frequented train paths.³⁵¹
2. This price component is added to the basic price and differentiates three price categories for both passenger and freight traffic. In passenger operations, prices range between DM 1 per track kilometre for an economy train path, DM 1.65 for at least three regular services each day to DM 1.8 for express paths with highest priority. Prices in freight traffic range between DM 0.5 and DM 1.65 per kilometre for feeder, standard and express freight operations.
3. Finally, discounts or premiums may be added on top of both elements. Thus, tilting trains have to pay an additional charge of DM 1 per kilometre and freight trains exceeding 1,200 tons are charged an extra DM 1 to DM 2.6 depending upon the weight due to higher wear and tear costs imposed on the network. Innovative train technologies may obtain discounts.

³⁴⁹ Frankfurter Allgemeine Zeitung (2001b), p. 17

³⁵⁰ DB Netz AG (2001), pp. 4-9

³⁵¹ There are six long-distance paths F1-F6, two feeder paths Z1 & Z2 and one category for S-Bahn traffic S1 with the following speed restrictions: F1 > 200 km/h, F2 161-200 km/h, F3 101-160 km/h for mixed traffic use, F4 101-160 km/h for fast interregional traffic, F5 101-120 km/h for slow interregional traffic, F6 101-160 km/h, though generally used by regional traffic, Z1 < 100 km/h, Z2 < 50 km/h and S1 exclusively for S-Bahn trains.

Though the revised pricing regime abolished the incentives for additional train services inherent under the former system, it eliminated the discriminations arising from quantity discounts that were in favour of the DBAG's subsidiaries. Still, there are more subtle ways of discriminating against competitors other than price discrimination.³⁵² The DBAG could simply refuse to do business with its competitors or to co-operate in the provision of train connections and timetabling. The DBAG might block supply channels and long-term DB loyalists might use their lobbying connections in the EBA, which is run by former Bundesbahn employees.³⁵³ Also, DB Netz and the other DBAG subsidiaries have a variety of informal links between each other. There are various ways of discrimination against unwelcome competitors in a vertically integrated DBAG. If the government indeed intends to curb the discriminatory potential inherent in the DBAG holding, an institutional separation of the Deutsche Bahn AG offers the only credible alternative.³⁵⁴

And eventually, in March 2001 the German minister for transport announced that the DB Netz AG would be separated from the holding, but immediately compromised his announcement due to strong opposition from the chairman of the DBAG.³⁵⁵ The ministry commissioned a task force to investigate options for the DB Netz AG to guarantee the independence of the track network.³⁵⁶ The task force suggested stronger independence of the Netz AG, though intertwined connections of the board members of each subsidiary are still allowed. In addition to greater autonomy in the holding, the task force recommended to establish a track agency at the EBA to supervise the non-discriminatory open access to the network.³⁵⁷

³⁵² Basedow (1996), p. 27

³⁵³ Aberle and Brenner (1996), p. 9

³⁵⁴ Vertical and horizontal separations are discussed in section IV below.

³⁵⁵ Frankfurter Allgemeine Zeitung (2001a), p. 17 and Schwenn (2001a), p. 1

³⁵⁶ BMVBW (2001), www.bmvbw.de

³⁵⁷ Wirtschaftswoche (2001), www.wwo.de and Frankfurter Allgemeine Zeitung (2001g), p. 13

3.4 Regionalisation of social service responsibilities

One of the most fundamental prerequisites of the structural reform of the railway system was to free the newly created Deutsche Bahn AG from the Bundesbahn's pressing burden to meet the contradictory goals of social service provision and commercial viability. Though accepting the basic propositions of a supposedly social market economy, post-war politicians had burdened the Bundesbahn with social service obligations instead of solving the issues with a proper social policy. Eventually, the structural reform of the Deutsche Bundesbahn dealt with the problems that originated from a concept of dual objectives. The Bahnreform relieved the railway system of its social service obligations that kept unprofitable traffic going for political reasons, despite the devastating effect of cross-subsidises on the intermodal competitiveness of the railway system as a whole.

The regionalisation commenced in January 1996 and was essentially a decentralisation concept for social service responsibilities from the federal down to the German Länder level. The Deutsche Bundesbahn and Reichsbahn, respectively the DBAG received direct federal compensation payments for social service provisions until 1995. Though the Regierungskommission Bundesbahn recommended implementation of the regionalisation concept right from the beginning in 1994, the Länder authorities claimed they were inexperienced and unable to take over planning, management and financial responsibilities from the national government to tender regional train services to the DBAG or other public transport operators.³⁵⁸ Since the regionalisation has been implemented in 1996, the federal government compensates the Länder for their additional financial burden in contracting regional train services.³⁵⁹ The financial transfers from the national budget to the regional Länder governments amounted to DM 8.7 billion in 1996 and DM 12 billion annually from 1997 with variations depending on value added tax revenues.³⁶⁰ No changes to the adjustments were envisaged prior to 2002 and would have been subject to the approval of the Länder representatives in the Bundesrat. The total annual amount is allocated to the states of the federal republic in relation to an *allocation key* according to article 4, §8 ENeuOG.

³⁵⁸ Aberle and Brenner (1996, pp. 17-22 present a detailed account of the regionalisation and its consequences; see also Girmau (1995, p. 19

³⁵⁹ While the direct transfers from the Bund to the DBAG have been replaced, the compensation funds are allocated via the Länderfinanzausgleich arrangement between the Bund and the Länder since 1996. Regarding the Länderfinanzausgleich see footnote in chapter 1.2 above.

³⁶⁰ Article 4, §5 ENeuOG committed the funds provided from federal fuel taxes.

Thus, the Deutsche Bahn AG was no longer responsible for social service obligations. However, the regional states may commission the DBAG to provide local passenger train services. In that case, the Deutsche Bahn is acting on behalf of the Länder governments and cannot blame possible deficits on unprofitable local or regional connections, a blame-culture-tactic that was very fashionable with the old Bundesbahn. The regionalisation did not oblige the Länder to use the funds to commission public rail or other specified public services, though article 4, §7 ENeuOG suggested that the public funds should preferably support regional rail services. Still, the Länder may order local and regional passenger services from either the Deutsche Bahn AG's DB Regio subsidiary, from any other train operator or public bus provider. Notwithstanding potential competitors, the DB Regio is still the dominant regional operator of train services and was the monopolistic supplier until the regionalisation in 1996. Aberle and Brenner argued that the Deutsche Bahn AG's market dominance, especially prior to 1996, might have induced the company to declare higher than actual costs in order to skim off the cream of short-distance train traffic, as the costs were reimbursed by the regional states from the federal transfers. The Länder did not have any benchmarks in costs of the services until the regionalisation ended the monopolistic role of the Deutsche Bahn AG. Apparently, a declaration of inflated costs equals an obscured subsidy from the taxpayers to the then monopolistic supplier of regional passenger rail services. Nonetheless, there is no further evidence of a potential declaration of higher costs, owing to the lack of transparency in short-distance operations and an unclear dividing line between short and long distance traffic. However, Aberle and Brenner suggest that the former champion in loss making, the short-distance traffic division of the Deutsche Bundesbahn, had received a sudden promotion to an outstanding subsidiary of the Deutsche Bahn AG.³⁶¹

Since the liberalisation of regional passenger traffic took effect with the regionalisation, other modes of transportation may be offered the opportunity to provide subsidised public service traffic subject to the Länder governments' consideration. However, the legislation, which instituted the regionalisation highlighted that the funds provided by the federal government to the regional states should focus on railway traffic. As the DB Regio is still the major player in the market for regional railway traffic, potential competitors could be deterred from entry. This potential danger is further aggravated due to DB Regio's backing from the powerful Deutsche Bahn AG holding. The deterrent effect can lead to a further strengthening of DB Regio's market power, whilst

³⁶¹ Aberle and Brenner (1996), p. 21

artificially cementing inefficient and unprofitable railway services. Länder authorities might then ignore more rewarding options from a social and economic point of view.³⁶²

The Länder could either directly commission a train company to operate regional train services or invite competitive tenders for subsidised public services.³⁶³ Since the regionalisation took effect in 1996, all German states with the exception of the city states of Berlin, Bremen and Hamburg made use of the competitive element offered by the regionalisation and initiated a bidding process. The invitations for bids are usually published in either an official journal of the EU, the German federal government or in major German newspapers. The Länder have a further possibility to pre-select a few train companies and ask them to provide their bids, thus excluding outside bidders.³⁶⁴ In order to cope with the regionalisation, the 16 German Länder founded 32 regional authorities that are responsible for the planning and operation of the subsidised regional services. Of those, only 20 chose the competitive approach until the end of the year 2000, equalling 45.9 million or 7.9% of the total train kilometres in the regional rail passenger market, whilst most of the remaining services are operated by the DBAG.³⁶⁵

The service contracts of the competitive process average 8.7 years, though the range is very wide, from one to fifteen year contracts. Schnell claims that the lack of competition in regional rail transport was caused by several reasons. First, the regional authorities lack experience and have high co-ordinating efforts, which delayed the introduction of competitive tendering. Second, resources were not readily available for small competitors of the dominant DB Regio, as supply channels were blocked by large orders of the DBAG, such as train staff and rolling stock.³⁶⁶ Third, short-term selection processes for a regional service naturally favour the DB Regio, as newcomers are often unable to commit the required resources within that period as they generally do not own a large stock of rolling stock which they can flexibly adjust to demand. Fourth, the DB Netz, DBAG's subsidiary infrastructure operator was behind schedule in upgrading tracks for new service, resulting in further delays. Furthermore, a horizontal and vertical

³⁶² Aberle and Brenner (1996), pp. 21-22

³⁶³ Article 5, §15(2) ENeuOG stated that the Länder *may* place tenders without further specification.

³⁶⁴ Schnell (2001), p. 3

³⁶⁵ Schnell (2001) studied the extent of competition emerging in the German passenger market for regional transport since the regionalisation took effect in 1996. His comprehensive study is drawn upon in the following.

³⁶⁶ Blocking of supply channel is usually seen as a *strategic* market barrier, consciously erected by incumbents – in contrast to the *structural* market barrier. Gabel (1994) traces the emergence of AT&T's monopoly in telecommunication in 1894-1910 to AT&T's ability to lock off competitors' access to capital markets and other strategic means to discourage entry.

integration in one company offers the possibility of hidden cross-subsidies to deter competitors and win the bid. Fifth, the Länder apply a counterproductive policy of direct subsidies for rolling stock, which again favoured the DBAG considerably in the past. This might impair the Länder's willingness to introduce competitive tendering for regional services, as their invested rolling stock capital might then move to different parts of the country with the train operator.

Though the competition in regional transport is still slow, Schnell quotes cost reductions amounting up to 20% in European wide bids, up to 15% for bids published on a national scale and up to 10% for pre-selected tenders. In effect, 107 mostly small public or private companies were offering passenger train services on the German network at the beginning of the year 2000 and the demand on some lines increased to such an extent that additional rolling stock had to be ordered. Due to the growing competition from smaller operators, the DB entered into industry associations with some smaller competitors to win bids co-operatively. However, the Kartellamt asserted that joint operations were incompatible with German competition law, if either of the associated firms could run the business alone. As this clearly applied to DB Regio, the competition watchdog assumed that the DB Regio intended to stifle potential competition and prevented the DB Regio's participation in the bidding associations.³⁶⁷

³⁶⁷ Frankfurter Allgemeine Zeitung (2001d) and Schwenn (2001b), p. 13

3.5 Performance

Charts 28-30 illustrate the Deutsche Bahn AG's developments in freight and passenger traffic, abstracting from the traffic of competing open access providers. While the DBAG's freight traffic measured in ton kilometres increased by 14% over the level immediately after the reform in 1994, passenger traffic measured in passenger kilometres went up by 29% in regional and 4% in long-distance traffic. Overall, the long distance figures seem rather stable, whereas regional growth was impressive over the entire period. And the growth in freight was simply due to a statistical alteration, as the DBAG's Belgian freight joint venture contributed to the freight data in 2000. Excluding the 2000 figures results in a mere 1.3% growth of DB Cargo's operations over the 1994 rail freight figures. Considering chart 30, DB Cargo's situation does not look very encouraging. Total freight carried even declined from 307 million tons to 279 million tons in 1999, before Railion's influence changed DB Cargo's trend. However, the positive news are that the length of freight services increased since the creation of DBAG, which led to the rather stable figures in chart 29 until 1999 compared to the downturn in chart 30. Longer freight journeys and productivity gains following job cuts at DB Cargo indicate a more forward oriented trend.³⁶⁸ However, charts 23 and 24 above show that the railway industry's decline was not halted by the privatisation attempt, as both charts highlight the further expansion of other modes to the detriment of the railways' share of the transport market.

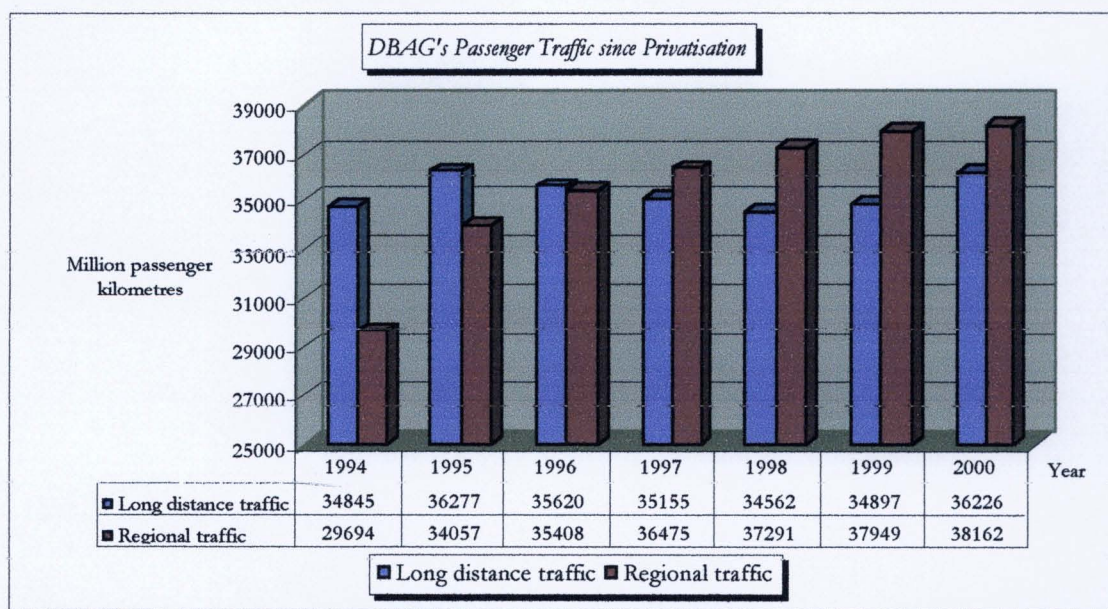


CHART 28

Source: Deutsche Bahn AG (2000a), pp. 4-5

³⁶⁸ Böhmer and Delhaes (2000), p. 90 and DBAG (2000a), p. 19. The workforce at DB Cargo was cut to 38,555 in 2000 from 40,995 in 1999.

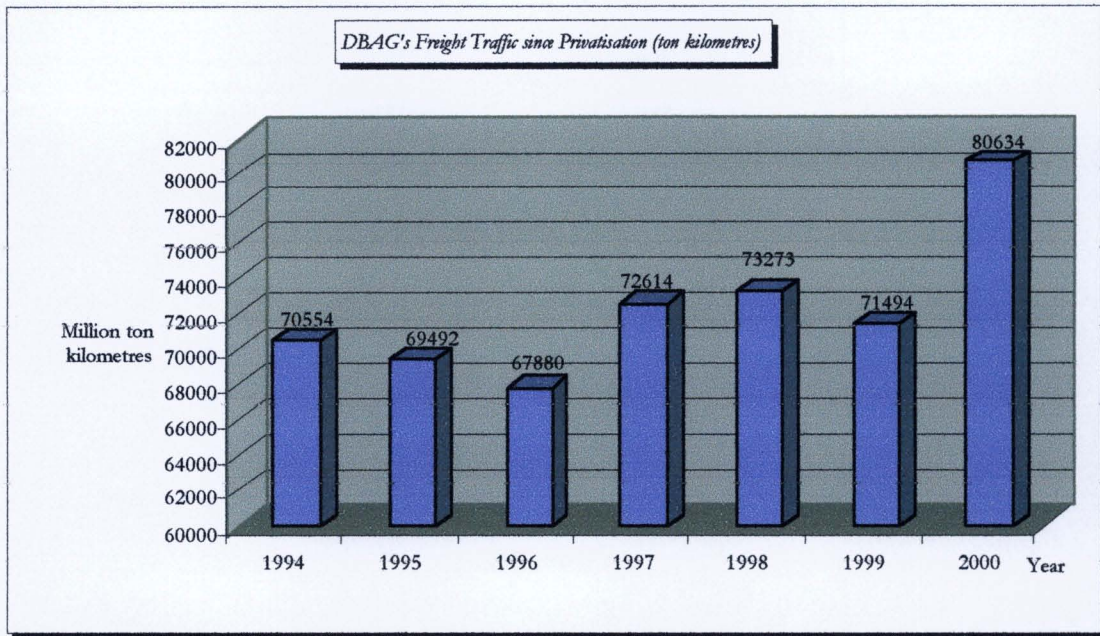


CHART 29

Source: Deutsche Bahn AG (2000a), pp. 4-5

Note: Inclusive of parcel freight until 1997; figures include the joint venture Railion since 2000

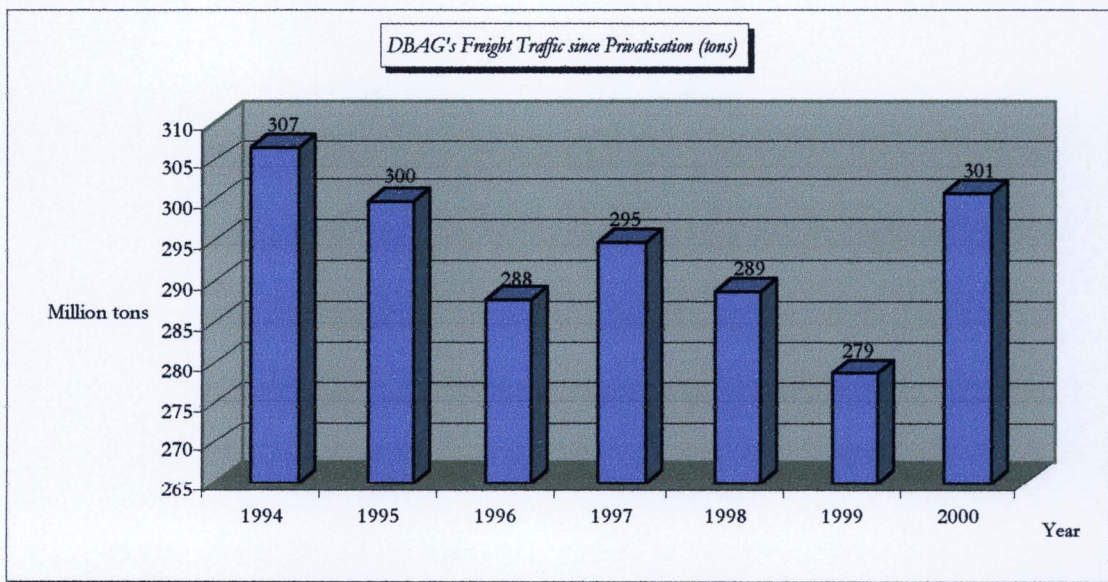


CHART 30

Source: Deutsche Bahn AG (2000a), pp. 4-5

Note: Inclusive of parcel freight until 1997; figures include the joint venture Railion since 2000

The investment figures in chart 31 illustrate investment in the track infrastructure and also in terminal buildings. Station investment peaked right in the first year of privatisation, rising again towards the turn of the millennium. The data mostly reflects investment in upgrading and modernising stations, especially the prestige projects of the

Stuttgart and Leipzig railway terminal buildings. The infrastructure investment in the tracks peaked in 1995 and experienced a 63% increase in 1999 due to prestige infrastructure projects in building new railway lines for InterCityExpress trains that consist of various tunnels and required expensive drilling through mountain areas to allow for straight high-speed operations.

Chart 32 proves that the organisational reform to a state-owned joint stock company resulted in considerable cost burdens to German taxpayers, excluding any additional allowance individual Länder provide in state aid to the railways. The figures comprise total federal government expenditure to the Deutsche Bundesbahn and Reichsbahn until 1993 and their successors DBAG and BEV from 1994-2000. This includes the federal government's direct compensation payments to the DB and DR for the provision of local and regional traffic until 1994 and to the DBAG for the years 1994-1995. In addition, the data covers the costs of interest-free loans to the DBAG, non-commercially viable infrastructure investments and the annual deficit of the BEV. As the DB's and DR's debt was transferred from the BEV to the federal debt administration, the BEV deficit excludes corresponding interest payments from 1999. Also, the federal funds committed to regional railway operations since the regionalisation in 1996 are excluded from the data. These amounted to DM 12 billion in 1997 and roughly DM 16 billion in 2001, substantially increasing the total subsidy bill to the taxpayers. The exclusion of the regionalisation fund and the interest on the Bundesbahn debt from 1996, respectively 1999 accounts for the deceiving fall in expenditure levels in chart 32. Apparently, the reform was an expensive but inevitable undertaking for the German government, but stopped half-way through. The reform required the government's commitment to relieve the Deutsche Bahn of the burdens of the past, such as the massive railway debt, an inflated workforce to relieve the German job market and the Bundesbeamte who amounted to 65,001 in 1999 and still 55,850 in 2000. The BEV and thus the taxpayers covered the wage differentials and the costs of Bundesbeamte who were not anymore required by the DBAG.³⁶⁹

³⁶⁹ DBAG (2000a), p. 13

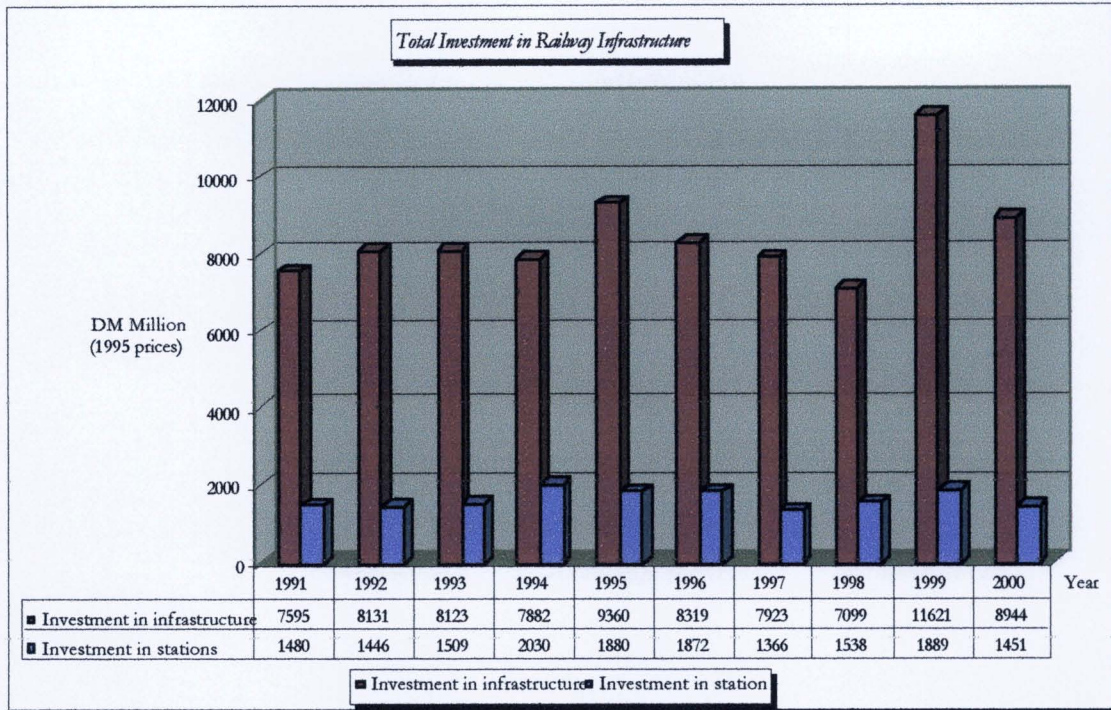


CHART 31

Source: BMVBW (2000): Verkehr in Zahlen (2000), p. 33

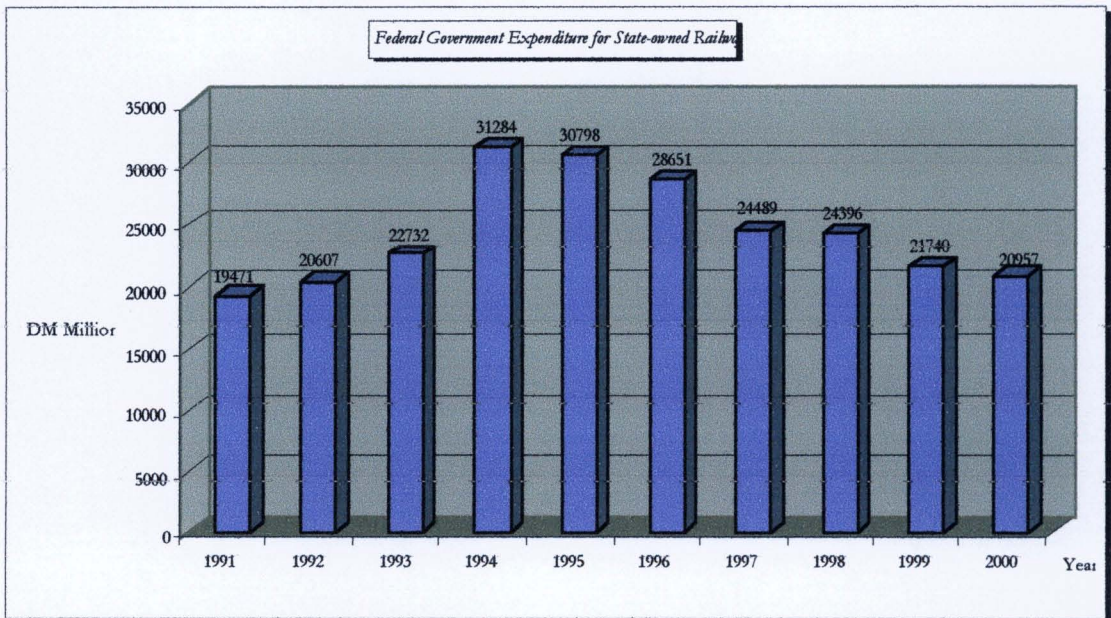


CHART 32

Source: BMVBW (2000): Verkehr in Zahlen (2000), p.126

Note: The data includes total federal expenditure on the Deutsche Bundesbahn and Deutsche Reichsbahn for the years 1991-1993. The figures after 1994 are transfers from the federal government to the DBAG and the BEV. The figures comprise compensation payments for regional traffic until 1995, interest-free loans to the DBAG, non-commercially viable infrastructure investments and the annual deficit of the BEV. As the BEV transferred the Bundesbahn's and Reichsbahn's debt to the federal debt administration in 1999, the BEV deficit included the corresponding interest payments exclusively until 1998. The additional information to the BMVBW (2000) statistics was provided by Mr D. Lanzendörfer of the BMVBW.

4. Conclusion

The organisational reform of the Deutsche Bundesbahn to the state-owned Deutsche Bahn AG did not lead to the expected turning point in the transport market, so far. The railways lost market in passenger and freight rail traffic since privatisation, though it might have been worse without the changes. Notwithstanding the efforts of the past years, several elements of a fully-fledged reform were either ignored or repeatedly postponed. The full privatisation and the separation of the Deutsche Bahn holding were at the very heart of the Regierungskommission's proposal for a structural reform. Nevertheless, the DBAG's chairman is opposed to the transport minister's advocacy of a separation of his holding company and succeeded, whereas the government does not appear to be excited about a sale of its share capital of the Deutsche Bahn AG. Though the formal privatisation of the Deutsche Bundesbahn and Deutsche Reichsbahn resulted in a merged company with re-organised structures, the federal German government is still the sole shareholder of the joint stock company Deutsche Bahn AG and carries the entailed entrepreneurial risks. Despite the transfer of the Deutsche Bundesbahn's debt to the federal government's account, the German government remains responsible for potential deficits of the DBAG, as long as it owns the company and transfers considerable subsidies to the railway system. What is more, the government has not yet committed itself to a final sale, thereby stopping midway in the process of privatising the Bundesbahn and shifting control to private investors.

The government has not taken the decision to concede its controlling powers over the railway system to the capital market, in effect crippling the railway systems' potential and holding one of the most effective checks at distance. Even if the full privatisation materialises at some future day, an emergency brake for the government is already in place, as less than 50% of the DB Netz AG would be sold to private individuals or companies.³⁷⁰ Ewers had strong reservations about a potential sale of the shares of the DB Netz, as long as the government remains the majority owner, as it casts doubts on the proposition that the DB Netz will operate profitably. Rather, it paves the way for a DB Netz as a self-service shop for political pressure groups, similar to the situation of the Deutsche Bundesbahn in the post-war period until the 1994 reform.³⁷¹ Under such arrangements it is highly unlikely that a sale of shares from DB Netz will attract the investors needed for an efficient and modern infrastructure.

³⁷⁰ Article 2, §2 3) ENeuOG and also article 87e of the German constitution.

Indeed, the government has reserved a controlling stake to interfere with the DBAG's internal business decisions. It impedes the potential the railway system could have had acquired if organised as an independent industry, subject solely to its own decisions. Until today the reform was at best half-hearted and has shown that the attitude of post-war railway protectionism still prevails instead of relieving the railways of its past burden into an industry run like every other industry. The transport ministry's plan to establish the EBA as a new regulatory body, somehow in competition to the Kartellamt, indicates a trend to more interference, even though the Kartellamt has proved its ability to oversee the railway market on a number of recent occasions. It induced the DBAG to revise its discriminating TPS'98 and prevented that associations of bidders for regional competitive tenders were dominated by the DB Regio's participation in corresponding associations.³⁷² Also, the new regulatory body would be directly accountable to the ministry of transport, raising questions about the EBA's independence from the political process, comparing unfavourably to the Kartellamt's independence from the ministry of transport.

The institutional integration of the passenger and freight subsidiaries along with the DB Netz AG under the holding company Deutsche Bahn AG poses a threat to exploiting the full potential of the structural reform. The current virtual separation of the train operations and the infrastructure manager does not guarantee the absence of price or non-price discrimination against competitors of DBAG's subsidiaries. Ewers argued consistently that the DBAG's board was stuck in a dilemma. On the one hand, the company must not discriminate, but competitors may in effect compete with the Bahn's own subsidiaries and capture profitable business. On the other hand, the board of the company has to maximise the entire holding company's profit as a vertically integrated industry.³⁷³ Notwithstanding the latest revision of the access price system, the DBAG holds the capability to deter competitors or to discriminate against other train operating companies by means of price discrimination of the DB Netz in the limited terms of the access pricing regime and by more subtle ways of discrimination. Therefore, a vertical separation of the DBAG is the only assurance to promote greater independence and focus the DB Netz' objectives on the track system and *all* train operators, instead of vested interests of the DBAG holding.

³⁷¹ Ewers (1995), p. 122-123

³⁷² Schwenn (2001b), p. 13

³⁷³ Ewers (1995), p. 122

The regionalisation in 1996 was of paramount importance to the reform project. It separated the issues that had been muddled over in the Deutsche Bundesbahn for decades, as the government required the public company to run both a profitable business and work as a socially oriented caretaker. The structural reform resolved the conflicting goals of the railway system and transferred responsibility for social service provisions to the regional Länder. However, one flaw of the regionalisation still remains, due to the dominance of the DB Regio AG and thus again, the DBAG. The DB Regio's market power may deter potential entrants from competing for regional train services, though its market dominance is increasingly undermined. Also, the instant decision of some Länder governments to spend federal transfers for regionalisation explicitly for train services ruled intermodal competition, possible efficiency and environmental gains out from the very beginning. If DB Regio were forced to react to intermodal and intra-modal competition from the outset of the reform, the competitive pressure for innovations and superior transportation quality would have been stronger. Accordingly, the Länder governments should be encouraged to invite tenders for public transport provisions from a choice as wide as possible to get the best value from taxpayers' funds.

Initially, government subsidies were required to free the railways of the burdens of the past. But the transfer of the entire railway debt of DM 67 billion to the government distorted the transport market, privileging the DBAG. Article 2, §22(2) ENeuOG provided for a further transfer of public funds amounting to DM 33 billion between 1994 and 2002 to invest and modernise the DBAG's assets. The Deutsche Bahn receives additional generousities of DM 26.4 billion between 2001 and 2003 for the track network and spent roughly DM 16 billion in compensation to the Länder in 2001, up from the 1997 level of DM 12 million. In addition, the government finances new infrastructure projects directly or subsidises commercially viable projects with interest free loans. The provision of interest free loans for commercially viable investments is paradoxical if the government wanted to create a self-sustaining, profitable train operator. The massive subsidies considerably distort the investment decisions of the Deutsche Bahn, because the DBAG carries less risk for their decisions, encouraging too much investment, e.g. in prestige projects such as expensive terminal modernisations and route extensions for high-speed services. The discrimination in favour of the railways prevents a level playing field in the transport market. However, the German railway system has potential for growth, especially with congestion on the roads increasing and also due to Germany's central role

for East-West transit freight traffic. Germany has embraced the European Community's conditions in an early stage and exceeded the directive 91/440/EEC's requirements. The European legislation provided the German legislators with a justification to go ahead with the structural reform, as the government required agreement in the parliament from the opposition Social Democrats and also consensus in the Bundesrat.³⁷⁴

³⁷⁴ Knill and Lehmkuhl (1998), p. 9

An Act to provide for the establishment of a British Transport Commission concerned with transport and certain other related matters, to specify their powers and duties, to provide for the transfer to them of undertakings, parts of undertakings, property, rights, obligations and liabilities, to amend the law relating to transport, inland waterways, harbours and port facilities, to make certain consequential provision as to income tax, to make provision as to pensions and gratuities in the case of certain persons who become officers of the Minister of Transport, and for purposes connected with the matters aforesaid.

Transport Act, 6th August 1947³⁷⁵

An Act to provide for the appointment and functions of a Rail Regulator and a Director of Passenger Rail Franchising and of users' consultative committees for the railway industry and for certain ferry services; to make new provision with respect to the provision of railway services and the persons by whom they are to be provided or who are to secure their provision; to make provision for and in connection with the grant and acquisition of rights over, and the disposal or other transfer and vesting of, any property, rights or liabilities by means of which railway services are, or are to be, provided, to amend the functions of the British Railways Board; to make provision with respect to the safety of railways and the protection of railway employees and members of the public from personal injury and other risks arising from the construction or operation of railways; to make further provision with respect to transport police; to make provision with respect to certain railway pension schemes; to make provision for and in connection with the payment of grants and subsidies in connection with railways and in connection with the provision of facilities for freight haulage by inland waterway; to make provision in relation to tramways and other guided transport systems; and for connected purposes.

Railways Act, 5th November 1993³⁷⁶

³⁷⁵ Public General Acts (1947): Transport Act

³⁷⁶ Public General Acts (1993): Railways Act

C. Railway reform in the United Kingdom

1. The nationalised British railway system on the path to reform

Both the 1947 Act to nationalise Britain's inland transport system and the 1993 Act for the privatisation of the railway system represent the markedly opposing ideologies of their political masters. Prior to analysing the privatisation in the 1990s, it is necessary to provide a brief overview of the events in the preceding decades, which resulted in the government's duty to present radical reform proposals in order to rescue the deteriorating public railway system.

The 1947 Transport Act had established the British Transport Commission and its subsidiary Executives as the agencies to control and run a centralised and unified national transport system. The new Labour government, which was elected in 1945 with a majority of 146 seats in the House of Commons, claimed that only a single public agency could co-ordinate the country's transport system efficiently. Labour's party manifesto for the general election strongly advocated in favour of a unified system: "*Co-ordination of transport services by rail, road, air and canal cannot be achieved without unification. And unification without public ownership means a steady struggle with sectional interests or the enthronement of a private monopoly, which would be a menace to the rest of industry.*"³⁷⁷ Accordingly, the overriding aims of the Act to nationalise Britain's transport system may be summarised with the terms of *integration* and *centralized co-ordination* of transport services, which would soon again become fashionable in the 1968 Transport Act and towards the close of the millennium under New Labour's run-up to the 1997 general election and beyond. However, the apparent consequences of the centralized co-ordination and the costs of a nationalised transport serviced had been overlooked by the advocates of nationalisation in Britain and elsewhere: "*But for there to be gainers from transport co-ordination there must also be losers. Co-ordination can only mean the restriction of choice to reduce costs; 'public service' implies the widest possible choice.*"³⁷⁸

Throughout the 19th, but especially the 20th century it is interesting to note that the railway system in Britain was always a highly delicate matter of affairs. The various Labour governments were consistently preoccupied to pass legislation either to nationalise or heavily regulate both the private and later the nationalised railways. The results of their

³⁷⁷ Bonavia (1987), p. 3

³⁷⁸ Joy (1973), p. 144

legislative efforts are highly visible with the 1947, 1968 and 2000 Transport Acts. Whenever Conservative governments were elected, they took countermeasures, aiming to destroy Labour's integrationist efforts of regulation. Immediately after nationalisation, the Conservatives passed the 1953 and 1962 Transport Acts, separating the modes of transport and cutting the railway network's size. In 1985 followed a further Transport Act, which was chiefly concerned with the privatisation of the public National Bus Company, already hinting at the 1993 Railways Act to privatise railway services. At first glance, it is therefore obvious that the railways in Britain and the transport sector as a whole were muddling through a zigzagging route without the option to consider a clear strategy, as its determinants might change after the next general election. British Rail "*...has become a political football with the number of post-war Transport Acts now in double figures. The British Rail management has had to take into account political constraints as much as market constraints in the running of its business.*"³⁷⁹ The British railway system provides a nearly perfect example for everyone interested in the side effects of political interferences with private or public companies serving a somehow mystically defined *public interest*. A first recommendation to political decision-makers must therefore be to guarantee the – private or public – companies complete independence from day-to-day political decisions, in order to avoid the companies' exploitation for short-term political desires and power games. However, it is admittedly doubtful whether politicians will readily agree to restrict their own leeway.

The British Transport Commission was granted a legislative public monopoly with nationalisation of transport, in order "*...to carry goods and passengers by rail, road and inland waterway, within Great Britain...*"³⁸⁰ in addition to ancillary services, such as hotels, hostels, places for refreshment and services "*...as it may appear to them requisite or expedient to provide...*"³⁸¹ Apparently, the Act afforded the BTC extensive autonomous powers to develop various kinds of business under public ownership, which would necessarily result in crowding out of private business activities in the same fields. In addition the Commission was granted a limited degree of political power in §9 of the 1947 Transport Act, as the "*...Commission may, with the consent of the Minister, promote Bills in Parliament and may oppose any Bill in Parliament.*"³⁸² Again it may be assumed that the Commission naturally favoured its rising influence, but the entire structure of the relationship between the government and the British Transport Commission implied the potential danger that

³⁷⁹ Irvine (1987), p. 32

³⁸⁰ Public General Acts (1947), §2

³⁸¹ *ibid.*

³⁸² Public General Acts (1947), §9

political implications of the BTC's operations would prevail over elementary business decisions. The implications of British Railways' dependence from politics have just been outlined above as a zigzagging route, which may hardly be described as beneficial to the British rail system. Strategic planning was rendered impossible by pressing and constantly changing political demands.

Labour's initial announcement to nationalise the railways hampered investment and the long-term planning of the train companies in the immediate aftermath of the war, when the train system was in urgent need to compensate for the wartime backlogs in maintenance, repairs and new investment. When the train companies' managers had diverted their resources to an anti-nationalisation campaign, they had to realise the one-way route the railways were driving. From their point of view the remaining period preceding the eventual nationalisation was purely transitional in character and rationally, their overriding aim was therefore to negotiate the best deals of compensation for their shareholders rather than concentrate on strategic planning and long-term investment decisions.³⁸³

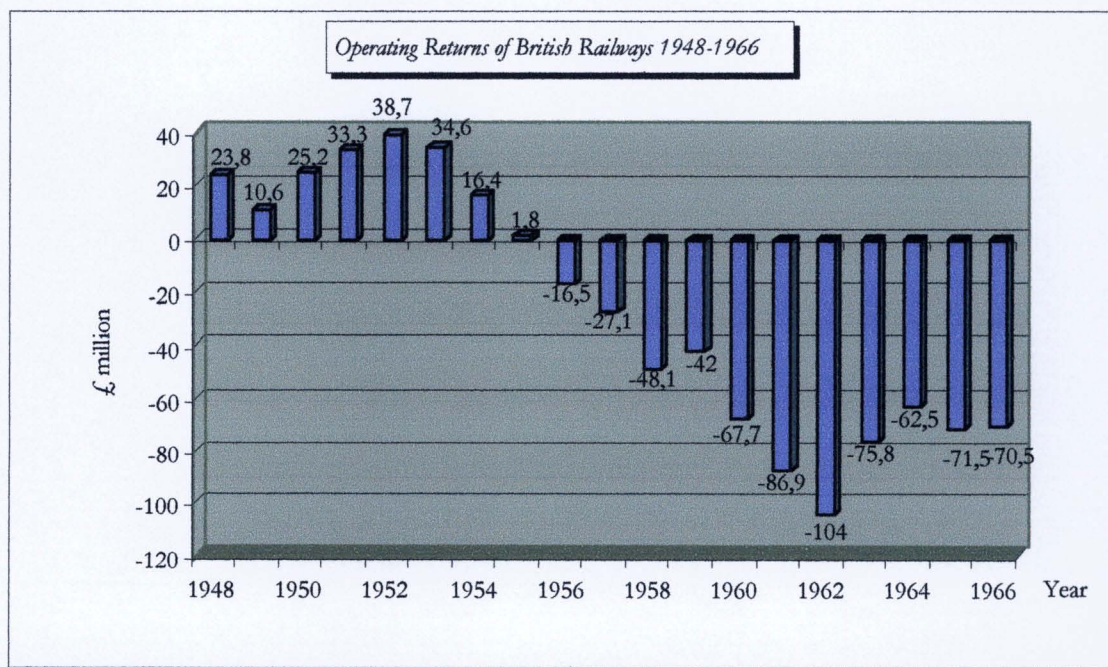


CHART 33

Source: Aldcroft (1968), pp. 120 and 209, based upon Annual Reports and Accounts of the B.T.C. and the B.R.B.

Note: The operating return excludes interest on capital and any central charges allocated to the railways, such as administration and redemption costs, which were in the range of £31.9 to £52.1 million in Aldcroft's compilations

³⁸³ Gourvish (1986), pp. 6, 20-24. See also Aldridge (1998) for a brief overview on Sir John Elliot's role in the anti-nationalisation campaign. The terms of compensation to the private transport undertakings are specified in the Fourth Schedule of the 1947 Transport Act and in §§16-18.

British Railways first went into an operating deficit in 1956 with £16.5 million and no recovery in sight. The situation was rather aggravated within the following years as displayed in chart 33. The figures, however, do not include any central charges from the British Transport Commission, such as interest on capital, administration and redemption costs, which were in a range of £31.9 to £52.1 million per year in the period 1948 to 1962 as suggested by Aldcroft. Taking the central charges into account, the overall deficit would have looked quite bleak with £156.1 million in 1962 and only a single year of a minor profit of £3.6 million in 1952.³⁸⁴ Still, he concludes that the real problem was the rapid deterioration of the operating account, as the central charges were fairly stable after 1955.

Charts 34-37 offer some insight behind the operating returns. Chart 34 clearly points to 1956 as the year in which the total working expenses of the railways exceeded their revenue from passenger, freight and miscellaneous receipts with the gap markedly widening over the next few years as reflected in the operating returns. Whereas passenger receipts were slowly increasing in absolute terms between 1948 and 1962, freight receipts experienced a turning point in 1957 and went into a decline, which explains the growing relative importance of passenger in relation to freight receipts as portrayed in chart 35 from the mid-1950s. The ton-mileage of British Railways' freight business was already on the downturn after 1956, whereas the estimated passenger miles increased from 20,308 to 22,591 million between 1955 and 1957 (*chart 36*). Chart 37 illustrates the post-war situation in the freight market, where coal and mineral reached their post-war peak in 1953 and merchandise traffic in 1951 before entering the path of decline in the freight business. Due to the general decline of the rail freight business in the 1950s the mineral traffic gained relative importance as it increased proportionately to the total volume of railway freight.

³⁸⁴ Aldcroft (1968), pp. 120

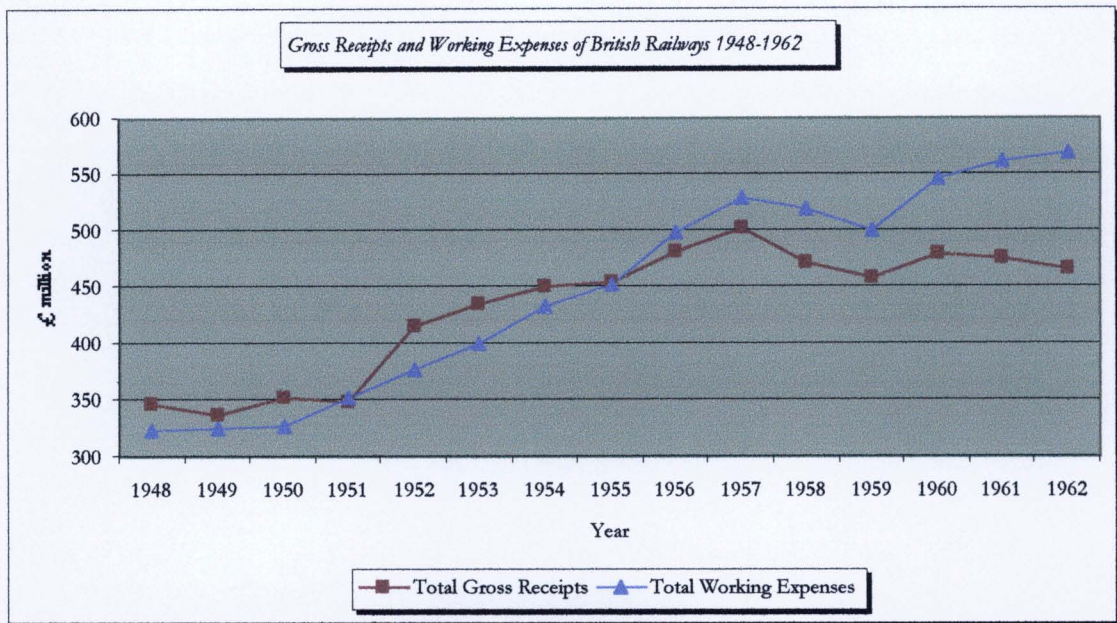


CHART 34

Source: Aldcroft (1968), p. 120, based upon Annual Reports and Accounts of the B.T.C.

Note: Gross receipts include passenger, freight and miscellaneous receipts

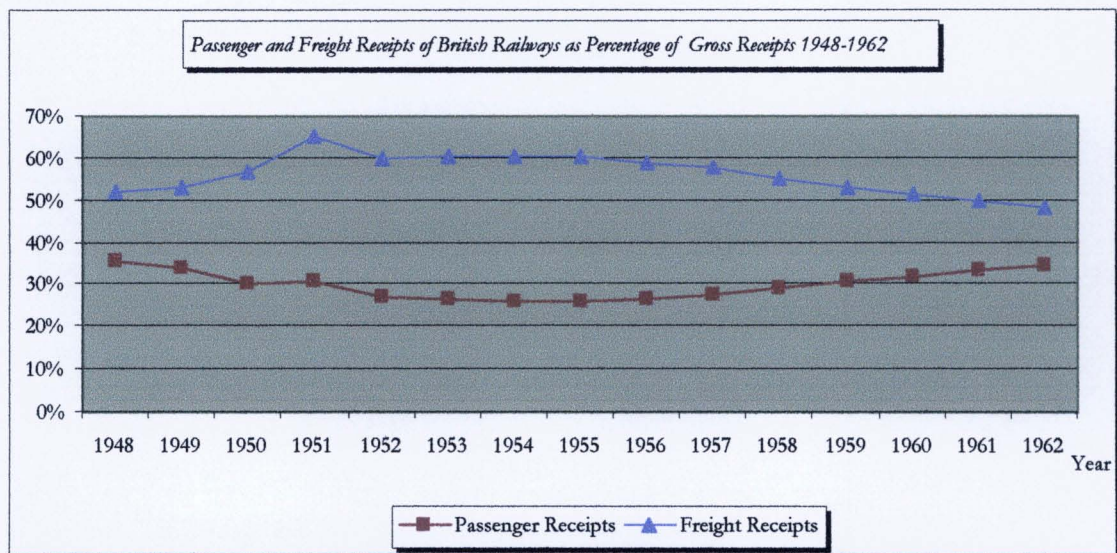


CHART 35

Source: Own calculations based on the compilations of Aldcroft (1968), p. 120, from Annual Reports and Accounts of the B.T.C.

Note: Gross receipts include miscellaneous receipts

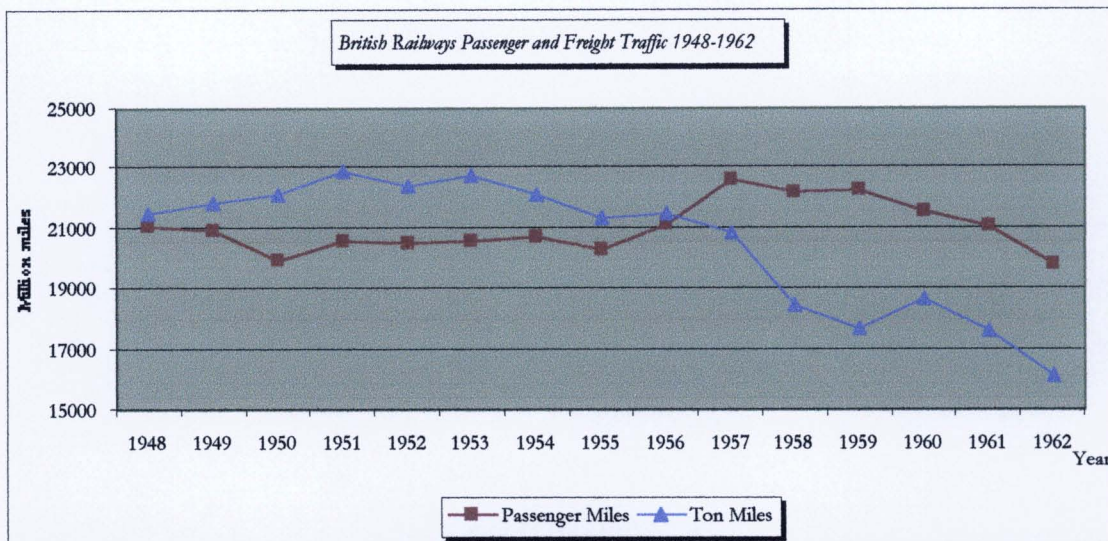


CHART 36

Source: Aldcroft (1968), p. 122, based upon Annual Reports and Accounts of the B.T.C.

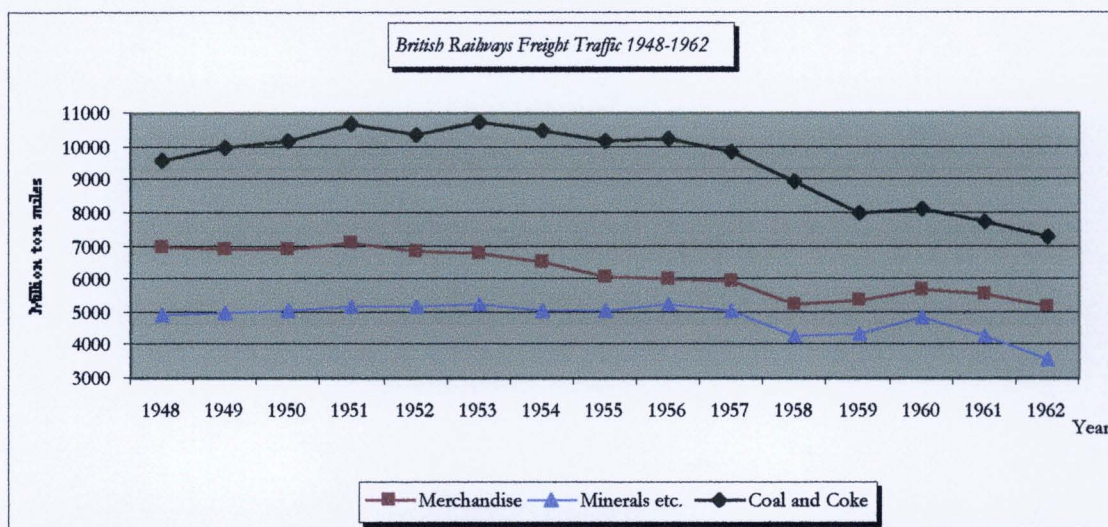


CHART 37

Source: Aldcroft (1968), p. 122, based upon Annual Reports and Accounts of the B.T.C.

The statistical data for British Railways reveals an overall decline both in actual traffic volumes of freight and passenger services and in the operating accounts from the mid-1950s. Having a closer look at the passenger transport side, chart 38 illustrates the division in inland public and private passenger transport on the road and railways. The chart indicates a clear trend towards a higher usage of road transport as a share of the inland transport market in the decade from 1950 to 1960. While public transport was the prevailing means of transportation in 1950 with a share of 72 per cent of the inland transport market of road and rail transport, private road transport hold the remaining share of 28 per cent. Within a single decade the market had been turned upside down. Buses, coaches, London Transport and British Railways were down to 47.9 per cent and had been overtaken by private road transport of cars, taxis and motor cycles, amounting to 52.1 per

cent of inland transportation in 1960. Again taking the entire market for rail and road transport as the basis, a closer look into public transport of buses, coaches, London Transport and British Railways shows that British Railways was only on a rather slow downward trend from 19.4 to 15.0 per cent, as displayed in chart 39. Compared to the market share of public road transport in the market for inland transportation, which went down from 48.8 to 30.6 per cent, the railways look almost glamorous. In absolute terms, however, public road traffic declined from 50,200 to 43,900 million passenger miles, while British Railways total passenger miles even increased marginally, up from 20,000 to 21,500 million passenger miles. Accordingly, public transport's declining share in inland transportation was the result of an immense growth of the only remaining player, i.e. private road transport. The data available for private road transport underlines the assumption. It grew 2.6 times from 28,800 to 74,800 passenger miles in the decade up to 1960, as depicted in chart 40. While the three public modes of transport display only marginal changes, private road transport experienced massive growth. Private road transport was responsible for most of the growth in the inland transport market, while British Railways and other modes of public transport could not gain a bigger share of the market (*chart 43*). In fact, their share remained fairly constant in absolute terms, but they lost out in relative importance in inland transport due to their inability to capture traffic from the overall growth in traffic volumes.

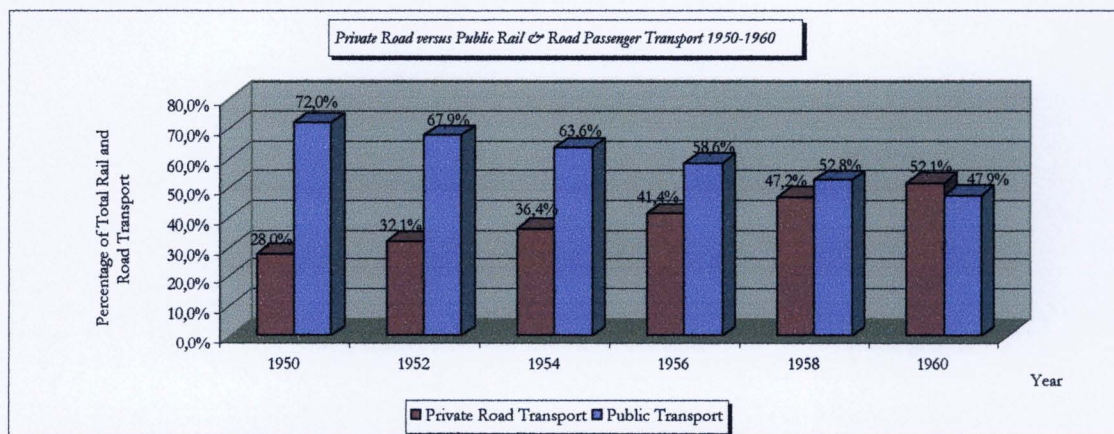


CHART 38

Source: Own calculations based upon compilations of Aldcroft (1968), p. 125, from R. Stone, D.A. Rowe and Ministry of Transport

Note: Private Road Transport embraces cars, taxis and motor cycles, whereas Public Rail and Road Transport includes British Railways, London Transport and buses, coaches etc

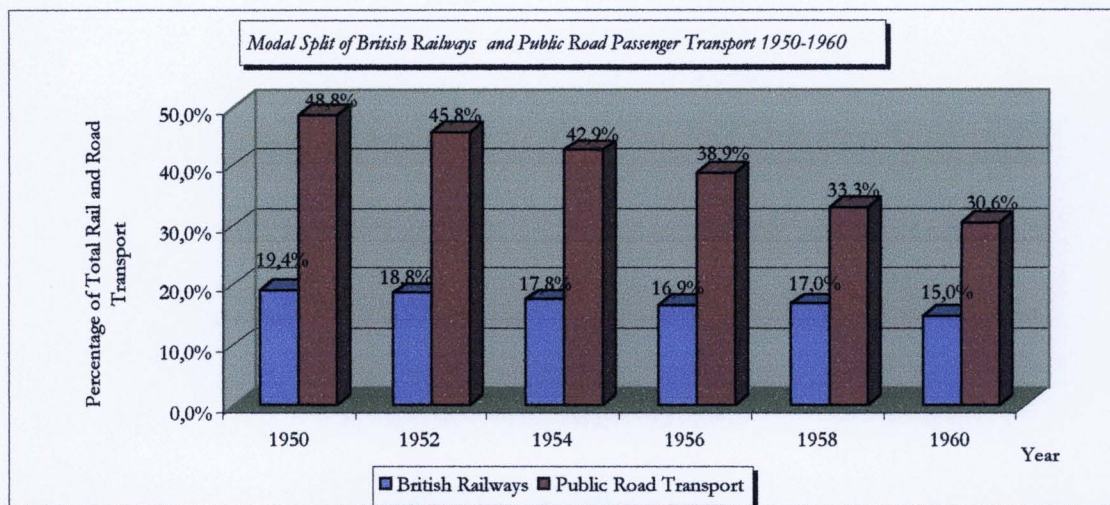


CHART 39

Source: Own calculations based upon compilations of Aldcroft (1968), p. 125, from R. Stone, D.A. Rowe and Ministry of Transport

Note: Public Road Transport includes buses, coaches etc. Total Rail and Road Transport embraces British Railways traffic, London Transport, as well as Private and Public Road Transport

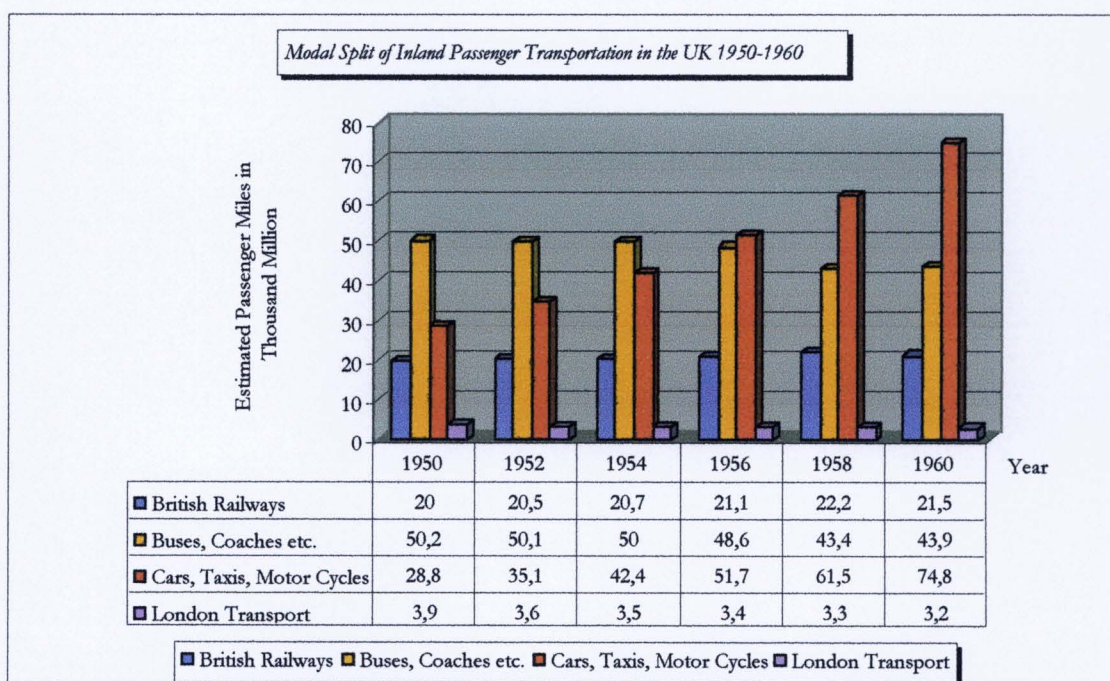


CHART 40

Source: Aldcroft (1968), p. 125, from R. Stone, D.A. Rowe and Ministry of Transport

On the freight side, the situation deteriorated in both absolute and relative terms, with the railways being unable even to defend their status quo. Between 1952 and 1962, freight carried by rail went down from 22,400 to 16,100 million ton-miles as illustrated in chart 41. At the same time, road haulage freight almost doubled from 18,300 to 33,600 million ton-miles. Measured as a share of the inland freight market of rail and road

transportation, the railways lost 22.6 per cent market share from their 1952 level of 55 per cent, whereas road haulage was growing accordingly, reaching 67.6 per cent of the inland freight market share in 1962 (*chart 42*).

While British Railways passenger operations remained more or less stable in the 1950s, the freight business declined in absolute terms, losing more than a quarter of their traffic. However, in relative terms the situation looks even more alarming, as the inland freight market expanded by 22 per cent. Therefore, British Railways proved not only to be incapable of capturing a share of a growing market. Worse than that, they could not even retain their level from the beginning of the decade, as they did in passenger traffic (*chart 40*). British Railways demonstrated a remarkable inability to benefit from a growing passenger transport market. The railways had been deprived of their dominant role in the inland transport market. The modal split shifted in favour of private road traffic, to the detriment of public road and rail transport. The advocates of railway regulation shifted their arguments correspondingly from a protection *from* the railways' market power to a protection *of* the railways from road competition.

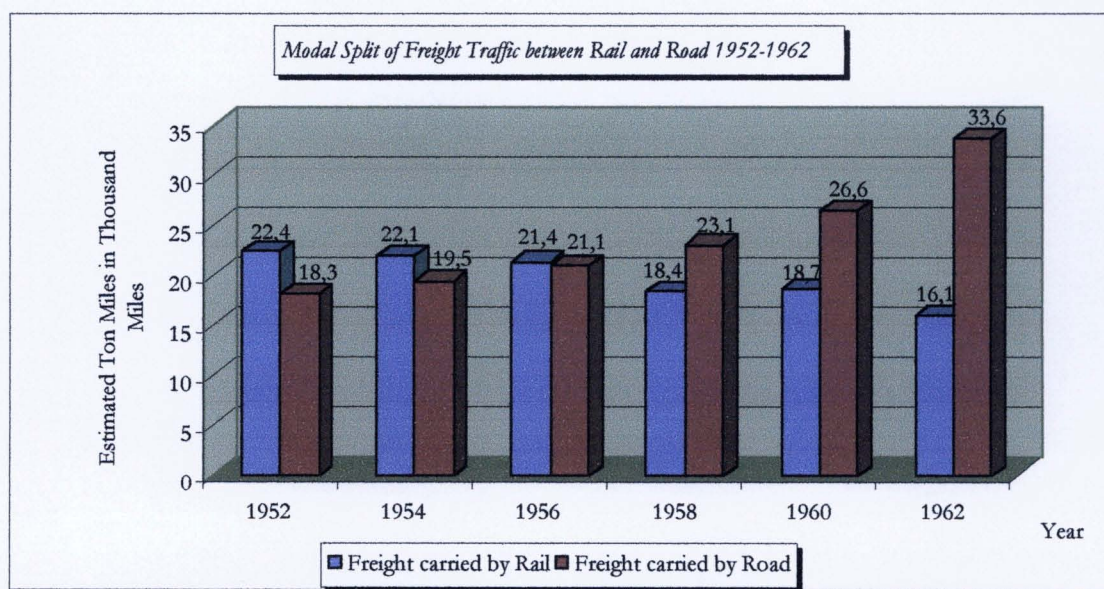


CHART 41

Source: Aldcroft (1968), p. 125, from Ministry of Transport and Basic Road Statistics

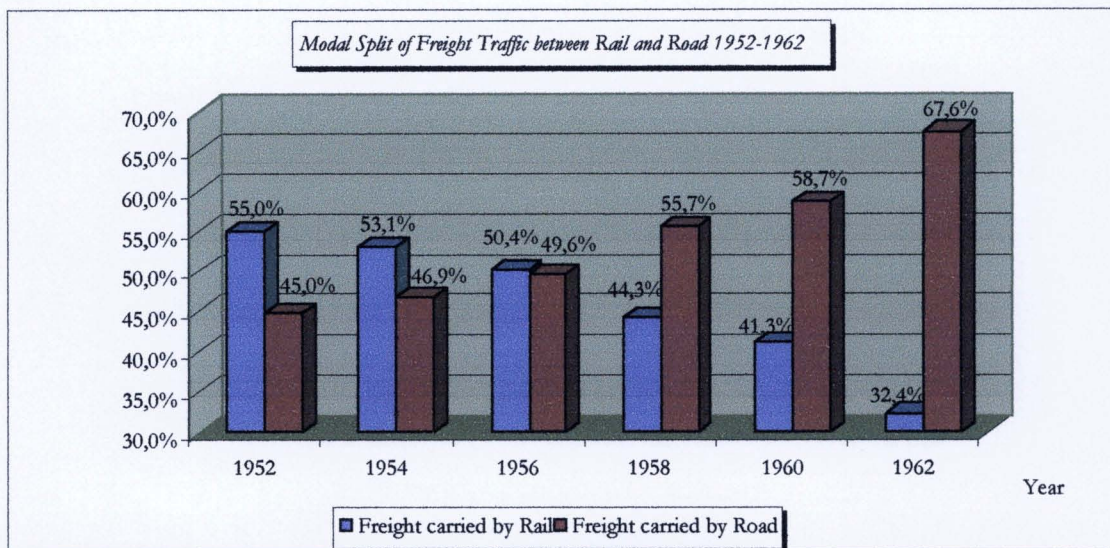


CHART 42

Source: Own calculations based upon compilations of Aldcroft (1968), p. 125, from Ministry of Transport and Basic Road Statistics

1.1 Reasons for the structural change in the transport market

The situation in the British transport market resembled the German case. The reasons for the structural change were both endogenous and exogenous to the railways.³⁸⁵ British Railways were organised as a public monopoly in the non-existent *market* for railway transport. Throughout its nationalised history, government backing and debt-relief cushioned competitive and financial pressures. The supply of railway services was limited to the quality and quantity British Railways had to offer under the reign of the BTC at politically regulated prices. The British Transport Commission was supposed to coordinate and integrate the different modes of transportation until its abolition with the 1962 Transport Act. Under the BTC competition was restricted to a marginal degree to achieve the goals of an integrated system of public inland transportation. In the 1947 Transport Act, §3 obliges the Commission “...to exercise their powers under this Act as to provide, or secure or promote the provision of, an efficient, adequate, economical and properly integrated system of public inland transport and port facilities within Great Britain for passengers and goods...”³⁸⁶

The steady deterioration of the financial situation of British Railways with increasing deficits after 1955 and the government's financial priorities for other policies had a negative impact on British Railways' investment policy. Investment proved to be a major problem to the railways in the aftermath of WWII. This naturally hampered innovation that was urgently needed to respond to challenges posed by intermodal competition. While the physical assets were still suffering from wartime under-investment, the shortage of resources in addition to claims of other nationalized industries led to an aggravation of the problem. “Restrictions on the allocations of investment to nationalized industries, in which the railways were accorded a low priority, severe shortages of labour and materials, especially of steel and timber, and steadily rising prices, meant that the railways could do little more than try to catch up with their arrears of maintenance. Given these severe conditions it was practically impossible to embark upon any major new technical developments.”³⁸⁷

However, adding to the lack of capital, the BTC realised very late that transportation innovations, such as diesel trains would result in considerable savings, especially in suburban services. Neither did the Commission discontinue the mass production of steam locomotives after WWII, nor did it start substituting steam by diesel

³⁸⁵ Nash and Preston (1994), pp. 19-20

³⁸⁶ Public General Acts (1947): Transport Act

³⁸⁷ Aldcroft (1968), p. 151

power within their common replacements early in the post-war period. Finally, the Commission acknowledged these shortcomings in paragraph 34 of their 1956 *Proposals for the Railways*, as technical developments of twenty years would have to be gathered in.³⁸⁸ Thus, even if the financial constraint upon the Commission's investment policy would have been relaxed, it is at least doubtful, whether the Commission would have invested in modernisation of the system. Alternatively, additional resources might even have induced the BTC to further resist market pressures, as they would have cushioned the BTC's desperate situation.

Lack of investment and the handling of the BTC contributed to the structural change. Due to lack of capital it was difficult to get the best and innovative products. Still, the management was neither inclined to opt for diesel trains as replacements for steam locomotives, nor did the BTC cut unprofitable lines and the consequent cross-subsidies or charge discriminating prices to reflect the cost differentials of operation. As a result, British Railways' competitiveness with other modes of transport declined in relative terms, partly due to the British Transport Commission's and the British government's own fault or reluctance.

Though the passenger miles actually travelled between 1950 and 1960 did not change markedly in railway transport, they went up 2.6 times in private motor transport during the same period of time (*chart 40*). Chart 43 shows a similar picture for the inland transport market, divided between private and public transport. Whereas private traffic occupied no more than a tiny fraction of the inland transport market in 1950, it outperformed public transport handsomely by the end of the decade. Apparently, the overall demand for transportation grew rapidly, but the railways proved unable to benefit from the massive growth. Instead, the increased demand favoured private means, such as cars, taxis and motorcycles. Previously, it has been argued that endogenous factors contributed to this trend by slowing down innovation and change, but the developments were partly out of the control of the Transport Commission.

³⁸⁸ Parliamentary Papers (1956)

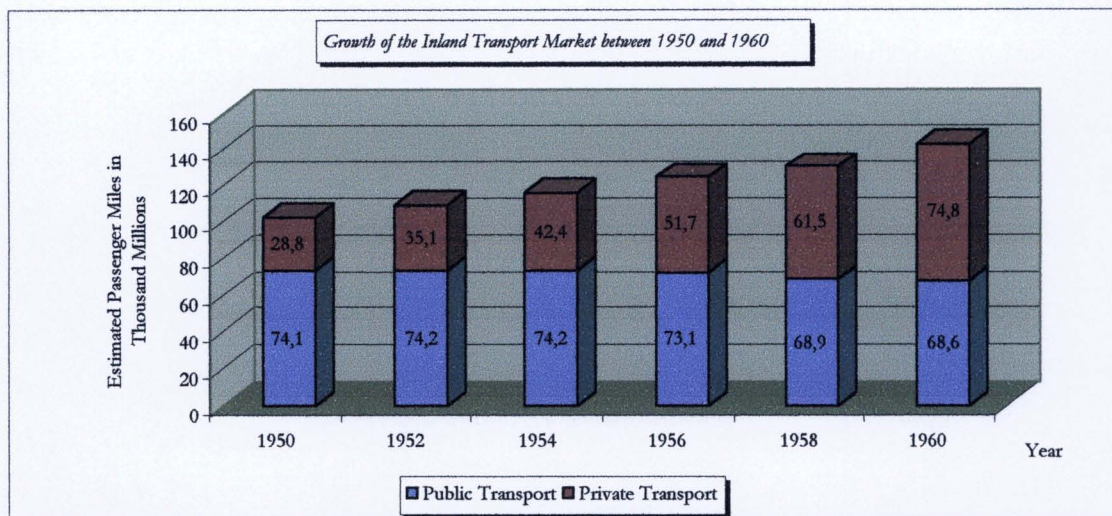


CHART 43

Source: Aldcroft (1968), p. 125, from R. Stone, D.A. Rowe and Ministry of Transport

Note: Public transport includes British Railways, London Transport, buses and coaches. Private transport embraces cars, taxis and motor cycles, while total inland transport is the accumulation of both.

In the 19th century the railways managed to marginalize canal traffic in a changing and dynamic transport market. In the 20th century the railways were affected by intermodal competition from private means of transport, such as cars, trucks and to a lesser extent in the early years from airways.³⁸⁹ Whilst the railways created new demand for a new mode, motor traffic created new demand in the same way. Due to the BTC's charging principles based on social ideals rather than on costs, viable railway lines had to charge a mark-up for cross-subsidising of unremunerative lines, resulting in excessive prices on otherwise competitive services. Though it might be considered very praiseworthy of the Transport Commission to serve the public welfare by retaining remote and uneconomic services, it is simply impossible to recover the costs of the system with this objective. But the incompatibility of objectives mostly rests with the 1947 Transport Act and its idealistic but damaging ideas. Disregarding the pricing policy of the Commission, private motor traffic was more flexible and for many customers simply more convenient than train connections, especially in remote areas with low frequency in train services. The changing preferences of individual customers in a dynamic market left the railways behind in gaining new customers. However, it is hard to see the incentives of a government-backed public company to capture more customers of the growing market or to come up with innovative ideas how to keep them. *"It would be difficult...to argue that the railways' difficulties were primarily due to unfair competition from the road. Road transport had few marked economic advantages over rail,*

³⁸⁹ While airlines were mostly targeting a high-value, high-speed segment of the transport market in its early years, their role is clearly changing. Nigel Dennis points out that the so-called low-cost airline operations, which have recently entered the European market, started in 1971 in the United States with Southwest Airlines intra-state Texan services prior to deregulation, see Dennis (1999), p. 1-8

and in any case convenience rather than price was the determining factor in road competition during this period. The really momentous growth in motor traffic occurred in the private sector whilst the public sector tended to decline, especially the passenger side. Moreover though the railways' share of inland transport declined, they were in the 1960s still carrying a similar volume of traffic to the pre-war period. Thus it cannot be argued that the railways lost much traffic to the road in absolute terms, though it is possible that they could have done more to capture some of the new traffic created in the 1950s by motor transport.³⁹⁰

³⁹⁰ Aldcroft (1968), p. 173

1.2 Early railway reforms

Following a Conservative election victory in 1951 the emphasis in transport policy shifted from integration to competition with the 1953 Transport Act. Whereas §3 of the 1947 Transport Act called upon the Commission to provide an integrated public inland transport system, the new legislation restricted the Commission's power mainly to the provision of rail transport in Britain and to passenger services in London. In addition, the Act fundamentally relaxed the railway's charging system to grant the railways the possibility to react to the increasing competition. Concerning the organisational structure, the Railway Executive was replaced with six Area Boards to decentralise the management of the railways.³⁹¹ In effect, the restrictive charging principles prior to the 1953 Act meant that the railways were unable to price its services along with operating costs. Similar to the German train system, train operations were subject to public service obligations, resulting in the railways' duty to maintain a number of uneconomic services without a considerable degree of price discrimination between low- and high-density traffic. Therefore, cross-subsidies from profitable to unprofitable lines were essential to keep the unviable operations. In the consequence, low-density, high-cost services to remote places were priced too low, whereas the high-density, low-cost services were priced excessively to cross-subsidise the former. As the road haulage business was not affected by restrictive charging principles, they could effectively reduce their prices down to marginal costs, attracting business from the more expensive railways, thereby easily undermining the profitable railway traffic and the complex system of cross-subsidies in the railway network. However, Aldcroft suggests that the Transport Commission was too conscious about the social service obligations to use its charging freedom granted by the 1953 Act to price discriminate across the network, which would have led to a more rapid closure of uneconomic lines.³⁹² In the long run, closures were the only way to eliminate cross-subsidies across the network in order to regain the competitiveness compared to other modes of transport. But instead, the programme of massive closures was delayed until the Beeching Report and in the meantime the financial situation of the railway system deteriorated with the trains losing market share to private modes of transport.

It was not before 1955 that the British Transport Commission realised the necessity for an overhaul of the railway system, when they published their *Modernisation Plan*,

³⁹¹ Public General Acts (1953): Transport Act

³⁹² Aldcroft (1968), pp. 129-130

outlining the BTC's rather general suggestions to modernise tracks and locomotives. Implicitly, the Commission acknowledged its former neglect of investments in diesel and electric traction. The Commission and Railways Executive were still too preoccupied with steam traction, which accounted for up to 97 per cent of track miles operated in 1955.³⁹³ However, due to large anticipated government commitments to the Modernisation Plan, the government demanded a further investigation in the railways' needs and published a more detailed analysis in 1956 with the *Proposals for the Railways*.³⁹⁴ In paragraph 34 the report noted a possible outcome of the modernisation measures: *"The financial results of all these measures in connection with passenger traffic will be decisive. The investment in diesel multiple unit trains for stopping services is expected to result in immediate and very great savings. Economies will also be made on the suburban services, and the profitability of the long distance services will be enhanced. All in all, a total improvement of some £30m. a year may be predicted with confidence as the eventual outcome. This is hardly surprising when it is remembered that there are the technical developments of twenty years to gather in."*

Notably, the report was rather vague. Paragraph 75 underlines the Commission's uncertainty about the report's final outcome, as *"...the changes in charging arrangements will have to start at a time when road competition is keener and greater than ever before and when the service afforded by the railways is below the efficiency and reliability needed. Also, it will take some time to effect the complete re-orientation of selling policy and selling methods, which is required. Though the benefits will emerge slowly, in the end they will be substantial. How substantial, will depend in large degree on the price policy to be pursued by the Commission in the near future."*³⁹⁵

After the BTC re-examined its modernisation plans, it presented the British government with its *Re-appraisal of the Plan for the Modernisation and Re-equipment of British Railways* in 1959 and estimated that its suggestions would produce a substantial working surplus between £50 and £100 million by 1963.³⁹⁶ Contemporary critics might argue that the British Transport Commission was steadily losing contact with reality, as the accelerating deterioration of the financial and market position of British Railways was even more evident in 1959 than four years earlier (*e.g. see charts 34, 38, 39, 42*). There was at best a scarcity of economic arguments supporting the Commission's unrealistic assumption that gross receipts would more than cover working expenses by 1963. By the publication of the 1959 Re-appraisal, the gap between gross receipts and working expenses had widened to an

³⁹³ British Transport Commission (1955)

³⁹⁴ Parliamentary Papers (1956)

³⁹⁵ Parliamentary Papers (1956), paragraph 75

³⁹⁶ Parliamentary Papers (1959), paragraph 111

impressive £42 million from the first year of deficit in 1956. Despite the Commission's insistence that everything was under control, the government was no longer prepared to accept the Commission's propositions. *"No one would deny that in 1955 the railways were badly in need of modernization and investment. But the plan was really a last-minute rescue operation, hastily conceived and ill-thought out, and it was accepted by the Ministry and the Government largely on the grounds that anything was better than nothing. Later, in evidence to the Select Committee, the Treasury expressed the view that it was 'merely a hotch-potch of the things that the Commission was saying it was desirable to try to achieve by 1970, ill-qualified and not really explainable'."*³⁹⁷

Foster finds three possible explanations to *"the obscurities and deficiencies"* of the Modernisation Plan and its successor documents in 1956 and 1959: *"First, the Commission may have had something to hide. Second, it genuinely did not know how to set out its calculations unambiguously and correctly. Third, it was so puzzled by the lack of data on which to support its calculations that it fell into well-intentioned confusion. The third of these is the most plausible."*³⁹⁸ Apparently, the Commission was over-optimistic, in stark contrast to the government, which was not quite inclined to believe the Transport Commission's over-enthusiastic conclusions and arbitrary estimates, as the Commission had not undertaken a detailed analysis so far. And indeed, it is surprising that the Transport Commission was actually founding its estimated predictions in their 1956 and 1959 proposals on nothing but guesswork, which is rarely adequate to produce reliable data for urgent strategic decisions upon investments and reorganisations. In addition, the Commission missed out to cut uneconomic and cross-subsidised parts of the network in order to enhance the overall long-term viability of the railway system and partly justify its rather enthusiastic predictions. Aldcroft concludes that the Commission *"...simply assumed that traffic would increase when diesel multiple units were introduced and that immediate savings would be very great."*³⁹⁹

³⁹⁷ Aldcroft (1968), pp. 155-156. He quotes from the Report from the Select Committee on nationalised Industries-British Railways, H.C. 254 (1960), paragraph 164

³⁹⁸ Foster (1975), p. 103. Foster (1975), pp. 97-111 provides a detailed account of the Modernisation Plan and its immediate successor documents and analyses their severe shortcomings. Comparing the 1959 *Re-appraisal* with the 1955 and 1956 Plans, Foster (1975), p. 102 noted that it *"...went further than the other two in confusing the profitability of investment in modernisation with the profitability of the railways as a whole."*

³⁹⁹ Aldcroft (1968), pp. 157-158

1.3 The Reshaping of British Railways

Notwithstanding the optimistic predictions of the British Transport Commission, the optimism was, however, incapable of averting disastrous figures for the railways. The government appointed Richard Beeching as new chairman of the British Transport Commission in June 1961, prior to his successive appointment as the first chairman of the British Railways Board, which came into being in early 1963 after the 1962 Transport Act. *'In almost all but de-nationalization the intentions of 1947 were now finally reversed. Transport co-ordination, a dead-letter, was officially buried, and above all the railways were no longer to be a utility. Commercial viability, not service, was now their prime duty. To this end they were given almost complete freedom to vary rates and also passenger fares outside the London Transport Area. At the same time they were relieved of common-carrier liability.'*⁴⁰⁰

The Reshaping of British Railways, popularly known as the *Beeching Plan*, was published in 1963 and constituted the first detailed analysis into the shortcomings of the British railway system, thereby contrasting the rather unfounded and vague modernisation proposals of the 1950s. The underlying assumption of the Report was to make the railways *pay their way*. As a result, the *"...proposals are directed towards developing to the full those parts of the system and those services which can be made to meet traffic requirements more efficiently and satisfactorily than any available alternative form of transport, and towards eliminating only those services which, by their very nature, railways are ill-suited to provide."*⁴⁰¹ The Report emphasises its *conservative* proposals with regard to closures of railway services and lines, as assessments of future developments usually involve risks of destroying valuable assets.

⁴⁰⁰ White (1982), p. 205

⁴⁰¹ British Railways Board (1963), p. 2

Image removed due to third party copyright

MAP 4: Density of Passenger Traffic

Source: British Railways Board 1963), Aldcroft (1968)

Image removed due to third party copyright

MAP 5: Density of Freight Traffic

Source: British Railways Board (1963), Aldcroft (1968)

The conclusions of the Reshaping Report are based on traffic surveys that were conducted in the week ending 23rd April 1961.⁴⁰² The size of British Railways' network consisted of a total 17,830 route miles and a track mileage of 34,150 for both, passenger and freight services. The results of the survey concerning traffic densities are displayed in maps 4 and 5 above. The fixed costs for maintaining the network including the signalling system, but excluding interest on capital, stations, depots and marshalling yards amounted to £110 million per year, which was about a quarter of the railways' total revenue. This share of fixed costs highlights the necessity to achieve high traffic densities in order to recover not only the variable, but as well the fixed costs. Contrasting this essential condition, about one third of the route miles carried only one per cent of the total

⁴⁰² The following data are taken from British Railways Board (1963), pp. 9-11

passenger and freight traffic, measured in passenger, respectively ton-miles. Whereas these traffics produced approximate revenues of £4.5 million, the corresponding costs for the provision of the route was in the range of £20 million. The situation is not much more encouraging when considering an entire half of the route mileage. Whilst it carried four per cent of the passenger miles and five per cent of freight ton-miles, the corresponding revenue was only half of the £40 million costs for providing these tracks. Accordingly, the railway traffic on one half of the system was by no account able to recover its costs of providing the tracks and signalling, irrespective of movement and other costs. However, the earnings of the other half of the system covered their own route costs more than six times. The revenue-cost ratio of British Railways' 7,000 stations in 1961 was similarly disastrous. Whereas one third accounted for less than one percent of passenger receipts, one half of the stations produced no more than two percent. However, less than one per cent of the total 7,000, namely 34 stations, produced 26 per cent of total passenger receipts. Again, the discrepancy on the freight side was similar, with one third producing less than one and half of the freight terminals producing no more than three per cent. Therefore, it was concluded that station and line closures would result in massive savings, even if it would involve a loss of traffic.

Image removed due to third party copyright

TABLE 1: Revenue and Assessed Costs for British Railways, 1961

Source: British Railways Board (1963)

The results of the Report's analysis of revenues and costs of British Railways' services in 1961 are displayed in table 1 above. The Report admits that the method to allocate indirect costs may be disputable, but it was necessary to allocate the costs, which

were not identifiably associated with particular traffics in the most appropriate manner in order to produce results as a sound basis for general conclusions.⁴⁰³ Accordingly, the league-table of the most unprofitable services was headed by stopping-trains with an overall loss of £55.9 million in 1961 after indirect costs were allocated to the business. However, stopping services were not even able to cover their direct costs by their own revenues, with a gap of £26.1 million waiting to be catered for by cross-subsidies. Though suburban trains covered its direct costs by a marginal surplus of £0.5 million, they were nevertheless unable to pay their full share of system costs by £25 million. Only the fast and semi-fast passenger services, provided by through trains on routes with a comparatively high traffic density easily covered their direct costs by £18.5 million, but still ended up with a substantial deficit of £21.8 million due to indirect costs of the system. On the freight side, only coal traffic and freight by coaching trains, meaning mostly parcel and mail freight, were still profitable after indirect costs had been allocated. While mineral freight produced a comparatively small deficit of £3.7 million, wagon load and sundries traffic generated deficits of £53.8 and £21.3 million respectively and proved unable to cover their direct costs by a massive degree.

The problem of the railways was found to be a legacy of the past. When the horse and cart served as feeders to the railway network in the 19th century, an extensive network of branch lines including a multiplicity of stations and depots had been developed to minimise journeys on the poor road network. Thus, the railways were engaged in a complex nationwide system of collection and delivery, often in single wagon consignments. With the extension of the national rail network, the wagon rather than the train was established as the unit of movement. While fast through freight services were mostly suppressed, the wagons moved extremely slowly from one to the other marshalling yard, involving often unpredictable overall journey times and delays. *‘Thus, in order to provide for a large measure of rail participation in countryside collection and delivery of small consignments, which the railways were never particularly well suited to do, and which they only did because the horse-drawn cart was worse, the railways threw away their main advantages. They saddled themselves with the costly movement of wagons in small numbers over a multiplicity of branch lines, where there were too few wagons moving to make good trains. At the same time, they sacrificed the speed, reliability, and low cost of through-train operations even on the main arteries.’*⁴⁰⁴

⁴⁰³ British Railways Board 1963), p. 7

⁴⁰⁴ British Railways Board (1963), p. 25. For the full details of the *Reshaping* report on freight services see pp. 24-48. The following data concerning the passenger services is taken from pp. 12-23 of the report.

The fast and semi-fast passenger services generally provided inter-city services. Predominantly, they can be located on map 4 as full lines, carrying a high proportion of the total passenger numbers. Owing to the past competitive structure of railway services, duplicate facilities and tracks had been constructed between some of the main cities. The Report targeted a concentration on selected routes and stations to achieve substantial savings for British Railways. Peak traffic for summer and public holiday seasons on those routes further inflated the costs of the fast and semi-fast lines due to under-utilization of rolling stock. Less than a third of the total 18,500 gangwayed coaches allocated for fast and semi-fast services were used for the year-round service. The majority of the coaches were either stored in order to cater for high peak services (8,900 coaches) or were used in the regular summer service (2,000 coaches), with an additional 2,100 coaches being under repair.

Though suburban services came close to cover their direct costs, they fell far short to pay for indirect costs allocated to them. The main reasons for them being unprofitable are due to the peak nature of their traffic and the low fares charged to commuters into the focal cities. Stopping-trains predominantly served the rural community and are almost without exception represented by the dotted lines in map 4. The Report goes into great detail about the stopping-trains' unprofitable operations, "*...to dispose of any idea that stopping-train services could be preserved, as an economic alternative to buses or private transport, if only some ingenuity were shown by railway operators. This really is not so, and it is obvious that a high proportion of stopping passenger train services ought to be discontinued as soon as possible... So far as the services themselves are concerned, closure proposals have been determined by the inability of the services to produce revenue sufficient to cover the direct costs of operating them.*"⁴⁰⁵ The suggested closures would amount to a route mileage for passenger traffic of about 5,000, leading to expected savings in the range of £33 million per year against a loss of £15 million in revenues. Further savings were expected after complete closure of some of those lines, which would still carry desirable freight traffic. Due to parallel bus services in most of the areas affected by line closures, special hardships were expected to be very rare. The final proposals of the Reshaping Report concerning closures of passenger services are illustrated in map 6.

⁴⁰⁵ British Railways Board (1963), p. 18

Image removed due to third party copyright

MAP 6: Proposed Withdrawal of Passenger Services

Source: British Railways Board (1963)

Closures of unviable lines were inevitable to reduce the high fixed cost elements and provide for self-supporting services rather than the common practice of cross-subsidies, which was tied to limited charging powers and the principle of non-discrimination between services with different cost-patterns. Nevertheless, British Railways offered far more potential for productivity increases and savings. While staff numbers in 1948 amounted to 648,740 they were down to 474,538 in 1962 (*chart 44*). The Report notes that over 60 per cent of the railway costs are costs of manpower and concludes that “...great scope for economy lies in the improvement of utilisation of locomotives, wagons, containers, coaches, cartage vehicles and the staff associated with their use and maintenance.”⁴⁰⁶ Accordingly, Joy blamed the BTC for running a very inefficient railway. The persistence of these inefficiencies, he argued, “...was an obvious cost of nationalisation, which relieved management of the pressures which would have existed if they had not had the Exchequer to meet their debts.”⁴⁰⁷

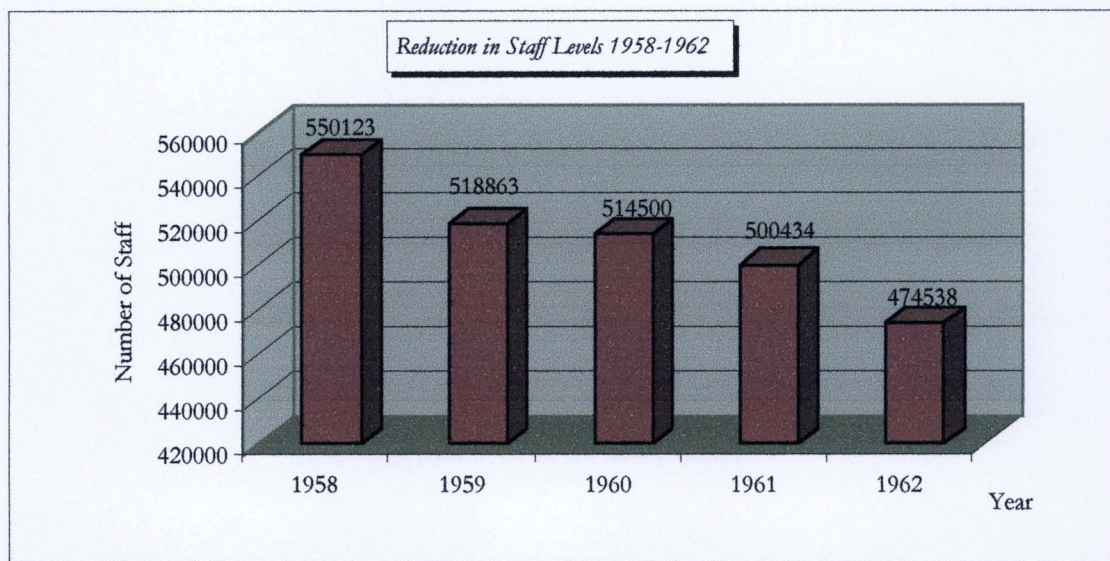


CHART 44

Source: British Railways Board (1963), p. 50

However, it was clear to the authors of the Reshaping Report that, though savings and reductions in services, manpower, rolling stock etc. were a necessary condition for a modern and viable railway system, it was by no means sufficient for British Railways' future existence. Structural reforms and an innovative approach to business were inevitable. Therefore, the remaining steam locomotives had to make way for modern diesel and electric engines, the logistics for handling freight had to undergo a radical overhaul and the introduction of so-called Liner Trains was to be studied, thereby combining advantages of

⁴⁰⁶ British Railways Board (1963), p. 49. For the full details of the *Reshaping* report on potential savings in administration, maintenance and manpower see pp. 49-53

⁴⁰⁷ Joy (1973), p. 142

road and rail transport. The *Liner Trains* were conceived to provide a fast, containerised shuttle service between depots, located in the main centres. Road vehicles would then distribute the cargo from the special depots to their final customers. Accordingly, British Railways was no longer prepared to give up the potentially good traffic to road haulage companies, but was inclined to capture its share of the freight market, signalling a remarkable shift in attitude towards its customers. Map 4 positively illustrates that there was huge potential for profitable freight business, estimated optimistically to be in the range of 54 million tons, which British Railways had, however, neglected so far. Map 8 shows a very similar basic pattern to map 7 and displays the suggested routes for the proposed Liner Trains, which were anticipated to gain a share of 16 million tons of the total 54 million tons potentially favourable to railways.⁴⁰⁸ British Railways' lethargic approach of the past towards its customers and intermodal competitors was apparently inappropriate and outdated by Richard Beeching's proposals. However, White notes, that *"...the detailed reasoning of the report was disappointing. Technological developments were ignored, particularly the potentialities of electrification, so important to the Southern. Also, no account was taken of any regional differences, the whole railway system being assumed to be homogenous. The unique place of the Southern was unrecognised. The approach to a period of rapid economic change was also inflexible. The plan failed also to recognize the consequences of the imminent 'container revolution' on the ports, or the rapid growth of continental traffic."*⁴⁰⁹

⁴⁰⁸ British Railways Board (1963), p. 59: The report argues that there was a considerable tonnage of potentially good rail traffic, which was, however, not carried by the railways. Accordingly, an additional 8 million tons could be carried in train load quantities, 30 million tons were considered to be favourable to rail by virtue of their consignment sizes and a further 16 million tons might be gained due to the proposed Liner Trains.

⁴⁰⁹ White (1982), p. 206

Image removed due to third party copyright

MAP 7: Flows of Freight Traffic

Source: British Railways Board (1963), Aldcroft (1968)

The Reshaping Report anticipated that its full implementation would lead to eventual savings in the range of £115 to £147 million, thereof savings arising directly from closures ranging from £34 to £41 million. However, the full potential of the plan would only unfold, if the whole plan was implemented with vigour, as the proposals were strongly interdependent. In that case, however, the Report predicted that the railways' deficit might be eliminated by 1970.⁴¹⁰

⁴¹⁰ British Railways Board (1963), p. 60

▼

MAP 8: Proposed Routes of Liner Trains

Source: British Railways Board (1963), Aldcroft (1968)

Richard Beeching prepared a detailed scientific analysis concerning costs and benefits of train services and general operations. The Report resulted in conclusions about the railway system's future viability and necessity of certain operations, notwithstanding the criticism that calculations and projections were based on tentative estimates and insufficient data – in fact, past figures were quite rare and future figures not available.⁴¹¹ Though the Report favoured a drastic shift to a railway system with a new role and reduced network, it was the only path to proceed if the railways were expected to improve their financial viability in the long term. Towards its end, the Report highlighted one of its main assumptions “...that the railways should be used to meet that part of the total transport requirement of the country for which they offer the best available means, and that they should cease to do things for which they are ill suited. To this end, studies...concluded that, in many respects, they are being used in ways which

⁴¹¹ Foster (1975), p. 83 criticised the lack of knowledge of railway costs. While the report's estimates were still based on considerable averaging, Foster (1975), p. 75 asserted that the railways attempted to maximise revenue rather than profits due to lack of knowledge. Thus, they kept uneconomic lines and the railways also “...had a hazy idea of how they might cut costs and a hazier one of the relative profitability of cost-reducing investment.”

emphasise their disadvantages and fail to exploit their advantages."⁴¹² Finally, British Railways had recognised that they must focus on its core business, if its purpose was to run a profitable business. Prior to the Reshaping Report, the railways neither had a consistent strategy based on their competitive advantages, nor more than a rough idea what to do.⁴¹³ An obsession to satisfy social ideals by serving remote areas with low traffic densities and to charge universal prices across the network despite a variance in the cost structure contradicts the goal of a competitive or even profitable railway system. It is impossible to achieve both sets of objectives. British Railways faced the choice between a social service or a profitable business. If the government desired to maintain unprofitable services due to social considerations, it was clearly the government's and not British Railways' obligation to pay for socially desirable services.

Beeching's report was soon supplemented by a further report of the British Railways Board in 1965, in order to examine the development of the major trunk routes over the next twenty years.⁴¹⁴ However, the report on the trunk routes emphasised that it was aiming to select routes for future intensive use and not to pick lines for closures in the first place, essentially by comparing 1964 traffic volumes with the projections for 1984. While the report admitted uncertainties involved in those estimates, the 20-year time horizon was considered to mark the limit of a realistic appraisal.

Route selection was found to be a prerequisite to a viable railway system. Unit railway costs fall corresponding to increases in traffic density due to the high fixed costs inherent in railway transport. According to the 1965 report, British Railways' costs were inflated as a direct result of excess capacity on the network, due to duplication of lines and modernisation investments, which were further increasing the total route capacity. Thus, only about a third of the total through route capacity was used in 1964. *"Therefore, unless future traffic levels over the through routes are likely to be many times higher than at present, the expenditure of the very large sums of money necessary for maintenance, renewal, and improvement of all existing through routes cannot be justified, and the concentration of traffic and of development expenditure upon selected routes is clearly desirable."*⁴¹⁵

⁴¹² British Railways Board (1963), p. 57

⁴¹³ Classic discussions of core competencies and strategies to achieve and maintain competitive advantages are provided by Brandenburger and Nalebuff (1996), Kim and Mauborgne (1997), Porter (1997) and Prahalad and Hamel (1990) on whom the authors' comments are based.

⁴¹⁴ British Railways Board (1965)

⁴¹⁵ British Railways Board (1965), p. 9. The report analyses the traffic flows in 1964 and 1984 with a variety of 27 different maps, which are displayed in the report's chapter IX.

The 1962 Transport Act marked a considerable shift in railway policy from an *integrationist* to a *competitive* approach of railway organisation and co-ordination, thereby reversing much of the 1947 Act. The main aim of the 1962 Act was “...to provide for the re-organisation of the nationalised transport undertakings now carried on under the Transport Act, 1947, and for that purpose to provide for the establishment of public authorities as successors to the British Transport Commission, and for the transfer to them of undertakings, parts of undertakings, property rights, obligations and liabilities...”⁴¹⁶ The 1962 Transport Act dissolved the British Transport Commission and transferred its functions and property to four separate public authorities, the *British Railways Board*, the *London Transport Board*, the *British Transport Docks Board* and the *British Waterways Board* as set out in the first section of the Act. Section two subdivided the British Railways Board into six regional boards, the *Eastern*, *London Midland*, *North Eastern*, *Scottish*, *Southern* and *Western Railway Boards*, which were thenceforth responsible for the operation of train services in Great Britain. The regional boards had a greater degree of commercial freedom than the former Area Boards, which were replaced by the six subsidiaries of the British Railways Board, though strategic decisions, such as the eventual size of the network, remained with the Minister of Transport and the British Railways Board.

Beeching departed from the Railways Board in 1965 following a change in government in the previous year, hinting at a general change in railway policy. The change of government terminated his project “...before they had time to work themselves through, so we shall never know whether they would have worked. What is undoubtedly true is that the subsidy bill for the railway would have been unmanageable had Beeching Part 1 not been implemented.”⁴¹⁷ The evidence for a shift in railway policy was soon provided in the 1966 White Paper on Transport. The White Paper criticised the lack of intermodal transport co-ordination in the 1962 Transport Act and rejected its priority for commercial viability of the railways, emphasising their wider role for society. Contrasting previous railway policy, the paper announced a “...considerably larger system than seemed likely with the previous policy of widespread closure.”⁴¹⁸ Whereas the government required the Railways Board to conduct its operations with *efficiency and enterprise* according to paragraph 28 of the paper, the government also accepted responsibility to subsidise uneconomic services for the first time, as long as the services were to be retained for reasons of social policy: “The Government will assume responsibility for the losses on services retained for social reasons, or on wider cost/benefit grounds, though the loss on such

⁴¹⁶ Public General Acts (1962)

⁴¹⁷ Welsby (1998), p. 234

⁴¹⁸ Parliamentary Papers (1966), paragraph 20

*services which meet mainly local needs may ultimately be assumed by the local community. The Railways Board will then be given realistic financial objectives to assist them to move as soon as possible to a fully economic basis of operation.*⁴¹⁹ Though the government made a step into the right direction by accepting its and the communities' responsibility for social policy instead of transferring the burden to finance social services to the railways, the new government missed the point highlighted in the original Reshaping Report. Some services were simply not economically viable – even if the railway operators had shown some ingenuity.

The White Paper's recommendations founded the basis of the 1968 Transport Act. The Act established six public transport industries – *British Railways, British Waterways, British Transport Docks, National Freight Corporation, National Bus Company* and *Scottish Bus Group*. Its underlying principle was a return to the pre-1953 integrationist' policies of the 1947 Act, though the government did not repeat the mistake to group all modes of public transport under a single organisation, such as the former British Transport Commission. Clearly, the then Labour government had learned one lesson. Nevertheless, the government was tempted to venture another – though smaller than in 1947 – grouping experiment in freight transportation. The first section of the 1968 Act established the National Freight Corporation to provide “*...properly integrated services for the carriage of goods within Great Britain by road and rail; and...to secure that, in the provision of those services, goods are carried by rail whenever such carriage is efficient and economic...*”⁴²⁰ Obviously, the government's intent was the discrimination in favour of rail freight, but it is more than doubtful whether they knew what they were doing. The condition of efficient and economic carriage lacks a closer definition by the legislation, which comfortably offered room for manoeuvre from the government's point of view. However, taking the Act's conditions literally, the government could easily agree with Beeching's proposals, if it was in favour of rail freight *only* if both conditions hold, which is clearly implied by the conjunction *and*. Now, supposing the government had a maximisation of society's welfare in mind, when it rightly called upon the railways to provide *efficient* freight operations, it demanded at the same time *profitable* rail freight services. So far, there is nothing wrong with that. If this was the government's understanding of efficient and economic rail carriage, the government's discrimination in favour of rail freight in the 1968 Transport Act is at best redundant. The wording of the Act set a condition, which is the basic concept of private enterprise. As long as rail freight is both a profitable and an efficient means of transportation, anything close to the term

⁴¹⁹ Parliamentary Papers (1966), paragraph 141

⁴²⁰ Public General Acts (1968)

market failure is certainly non-existent. In that case, nationalised rail freight operations lacks justification and may well be left to private entrepreneurs, who are likely to invest in profitable and efficient services.

Other important implications of the 1968 Act were a specification to relieve the railways of most of its capital debt and the government's assurance to issue grants to the British Railways Board for the provision of unremunerative services, as long as the Minister of Transport considered the service to be *desirable* for social or economic reasons.⁴²¹ In order to grant the railways some financial freedom and ease the pressing interest payments, the Act envisaged a reduction of the interest-bearing capital debt of the British Railways Board to £300 million to take effect by January 1969. Section 20 made provision for grants to *Passenger Transport Executives (PTEs)* to secure passenger rail services in their respective metropolitan areas.⁴²²

As a result of the 1968 Transport Act and the preceding change in railway policy towards more centrally co-ordinated integration rather than competition, many of the original proposals of the Reshaping Report were weakened, reversed or abolished. Still, considerable progress had been achieved in the first years after Beeching's Reshaping Report. Within four years of the report, total route mileage had been cut from more than 17,000 to 13,000 miles by the end of 1966 with 2,000 passenger stations shut and impressive developments in freight, where the total number of freight depots and stations came down from 5,200 in 1962 to only 1,500 in 1966. Staff levels were also on the decline from a total labour force of 475,222 to 338,951 in the same period, thus raising hopes for productivity improvements. Diesel and electric traction increased markedly, affecting the journey times on many main lines, while passenger accommodation and quality of service improved at the same time. In freight the focus had shifted on concentration upon major terminals, replacing the costly multiplicity of terminals. In addition, every effort was made to encourage through-train movements or large consignments and the carriage of containerised merchandises with Liner Trains, as suggested in the Report. The first Freightliner service between Glasgow and London was introduced in 1965 with new routes following. Finally, the government recognised its duty to subsidise the Railways Board, when asking British Rail to serve social policy considerations. Contrasting these positive developments, Aldcroft concluded that the Board was financially much less successful.

⁴²¹ Public General Acts (1968), section 39 is concerned with grants for unremunerative services and section 42 with debt relief.

⁴²² Public General Acts (1968), section 20

Despite annual savings of £115 million in the period 1962 to 1966 due to the progress made, rising costs of operations owing to price and wage increases in the range of £95 million consumed a large share of the savings.⁴²³

⁴²³ Aldcroft (1968), pp. 200-209

2. New Opportunities for the Railways – the Conservatives' policy

2.1 Reforming British Railways

Notwithstanding the previous approaches to reform, the financial difficulties continued. Adding to the 1968 Act, the 1974 Railways Act further reduced the capital debt of the British Railways Board to £250 million and increased the British Railways Board's borrowing powers.⁴²⁴ Also, the act implemented a clear distinction between freight and passenger traffic, with priority for passenger traffic. As the legislation obliged the British Railways Board to sustain the 1974 level of passenger services, subsidies in form of *Public Service Obligations (PSOs)* were granted to the British Railways Board.⁴²⁵ The Board also operated local services for the PTEs and obtained further subsidies through their contracts with the PTEs.⁴²⁶ Though the Railways Act stabilised the situation in the railway industry, British Rail was hit by the recession after 1978. The financial constraints on BR's budget led to cuts in infrastructure maintenance. When the government realised that British Rail was unable to guarantee the 1974 standards without further subsidies, it opted for an organisational reform of British Railways. The traditional structure of functional and regional managers was replaced with a management of clearly defined business sectors. The prominent objectives were a reduction in state subsidy and a more commercial operation of BR.⁴²⁷

The sector management was launched in 1982, when five business sectors were established, comprising *InterCity* services, *Network SouthEast*, *Provincial*, *Freight* and *Parcels*.⁴²⁸ Assets and staff were ascribed to the sectors, while they were defined to be homogeneous in types of traffic and in their material equipment to increase the transparency and lines of responsibility in British Rail.⁴²⁹ This was one of the two main advantages of sector management. In addition to the more transparent managerial control with identifiable and responsible sector managers, they also had a tight control over the assets specific to their sector. Eventually, the business sectors acquired full control over their train operations. However, the organisational structure played host to potential conflicts of interest and thus, required various complicated internal contracts. Nash and Preston exemplify this case

⁴²⁴ Public General Acts (1974)

⁴²⁵ Finally, the PSOs were established as an instrument to explicitly distinguish between viable railway operations and those deemed worthy of social subsidy.

⁴²⁶ Irvine (1987), p. 6 and Schmitz (1997), p. 38

⁴²⁷ Nash and Preston (1994), p. 22 and Schmitz (1997), p. 40

⁴²⁸ Note that *Network SouthEast* was formerly *London & SouthEast*.

⁴²⁹ Nash and Preston (1994), p. 21

with the East Coast Main Line. Though the prime user might well be InterCity services, Provincial, Freight and Network SouthEast traffic depend upon access to the line.⁴³⁰

The reform established accountability for costs and revenues of BR's new sectors. This resulted in an unambiguous distinction between commercial sectors, such as InterCity, Freight and Parcels, and subsidised sectors, embracing Provincial and the Network SouthEast services. The government introduced financial targets for the commercial sectors to earn a commercial rate of return on their assets, set at 8% in real terms.⁴³¹ Though the government acknowledged that Provincial Railways would depend upon ongoing state and PTE support, the inter-urban and commuter train services on the Network SouthEast were envisaged to operate without subsidies after 1992/93. The government announced that Network SouthEast's subsidies would cease, because it was inequitable to support the prosperous metropolitan area of London with funds provided by the general taxpayers.⁴³² Public subsidy to InterCity services was eliminated by 1988 and total subsidy paid to British Rail had been cut by a quarter between 1983 and 1987.⁴³³ Real fare increases and a rise in labour productivity led to an enhanced performance of British Rail in the 1980s. However, BR was strongly affected by the recession in the early 1990s (*charts 48-52, chapter 4.1*),⁴³⁴ again requiring rising subsidies and destroying the prospect of Network SouthEast breaking even.⁴³⁵ In 1991 a further management reorganisation was on the agenda with full responsibility of the business sectors for all aspects of their services in the *Organising for Quality* approach.⁴³⁶

This was to result in seven divisions, basically comprising the former with some changes and the establishment of internal profit centres either along specific routes and regions or according to the type of traffic carried. *InterCity* operated the national high-speed passenger network, *Regional Railways* was running urban and rural services outside the South East as the successor body of Provincial Railways. The *Network SouthEast* managed commuter and other services throughout the London and South East region, whereas

⁴³⁰ Nash and Preston (1994), pp. 21-22

⁴³¹ Nash and Preston (1994), pp. 22

⁴³² Allemeyer (1993), p. 16

⁴³³ National Audit Office (1996), p. 14

⁴³⁴ The economic situation is mirrored for passenger traffic in charts 48-50 and regarding freight traffic in charts 51 and 52. The charts are displayed and discussed below in chapter 4.1.

⁴³⁵ Nash and Preston (1994), p. 22

⁴³⁶ National Audit Office (1996), p. 14, White (1998), p. 110 and Charlton (2000), pp. 31-32. Charlton (2000), p. 32 emphasises that the *Organising for Quality* approach was an important forerunner to privatisation, as BR's managers acquired knowledge of the cost structures and requirements of their customers due to a higher degree of autonomy and more transparent operations

European Passenger Services Ltd. was set up to plan and operate the new Channel Tunnel passenger services. On the freight side, *Trainload Freight* carried bulk freight in whole trainloads, mostly serving coal, metal, petroleum and construction industries. *Railfreight Distribution* had been established as a separate freight operator in charge of the containerised Freightliner operations, linking the then 25 freight terminals to Britain's deep sea ports. As a counterpart to European Passenger Services, Railfreight Distribution was also supposed to run international freight services through the Channel Tunnel, while the Post Office made use of the passenger trains for transportation of parcel freight.⁴³⁷

Throughout the 1980s, the British government aimed at cutting the subsidies to British Rail and to allocate the full infrastructure costs to the corresponding business sectors in order to avoid cross-subsidies and strengthen sector management responsibility. The infrastructure costs were allocated according to three pricing principles. The *Prime-user-costing* had been employed between 1983 and 1985. In this framework, it was most important to find the prime user of the system, as the prime user would obtain management responsibility and priority on the line. The next step was to inquire which facilities would be redundant if freight trains were no more running their trains on the line. Those costs were then allocated to the freight sector, while the same method was then applied to regional and other train services. The remaining costs had to be covered by the prime user of the line, e.g. in the above East Coast Main Line example by InterCity. The prime-user-costing was seen as unfair to the prime user, as he would also have to recover the entire costs for excess capacity and eventually cross-subsidised other business sectors. In the British case, costs for various parts of the network that were more or less redundant were allocated to the prime user, generally InterCity services.⁴³⁸

Sole-user-costing replaced the former in 1985 and begins with the prime user's track costs, down to the least important user of the line. Contrasting the prime-user-costing, the sole-user system does not focus on the currently existing infrastructure, but is based on railway infrastructure as it should have been if modern technology was employed. The prime user is substantially relieved under the sole-user system, compared to the prime-user-costing principle. The cost differential between both systems reflects the excess capacity of the infrastructure.⁴³⁹ The third pricing principle, the *Location-costing* allocates maintenance costs and investments to the business sectors responsible within the sole-user-costing. This

⁴³⁷ Welsby (1991), p. 218

⁴³⁸ Aberle and Brookshire (1990), p. III-42 and Irvine (1987), p. 21

⁴³⁹ Aberle and Brookshire (1990), pp. III-42-45

principle is unambiguous as long as a single business sector uses the corresponding infrastructure exclusively, whereas an arbitrary allocation key must be used if the line is used by more than one sector.

The reform programme that was introduced in the aftermath of the Beeching plans was quite remarkable. Some British Rail subsidiaries without natural monopoly features were privatised during the 1980s, such as ferry services operated by *Sealink UK* and *Hovercraft*, the catering subsidiary *Travellers Fare*, the *British Transport Hotels* and *British Rail Engineering Ltd.*, which produced locomotives and rolling stock, but was also involved in maintenance business.⁴⁴⁰ The non-transparent national railway monopoly had been transformed into a more efficient public undertaking with clear lines of responsibility and control, approaching private business models. Still, Schmitz argues rightly that public limits on borrowing powers reduced the entrepreneurial freedom of the business sectors, as the limits equalled a check on BR's investment policy.⁴⁴¹ But government as the taxpayers' elected principal naturally must have a control over its agent, though it might be disappointing from BR's point of view. As the final entrepreneurial risk of BR rests with the government, unrestrained borrowing powers would set wrong incentives for BR's managers, who might find an expansionary business policy appealing, especially as they would not have to consider its economic viability. Though Schmitz' view is theoretically right, a relaxation of borrowing power without individual responsibility could lead to disastrous consequences and virtual over-spending. However, a politically dependent system is bound to be short-term oriented, neglecting strategic long-term investments, as BR's funds are commonly in competition with other government priorities.

While British Rail's total passenger revenues went up by 22% in real terms between 1983 and 1990/91, demand for passenger services rose by 10% and the level of investment into the railways had doubled when investment levels peaked in 1992-93 over 1983 (*chart 53, chapter 4.1*). Subsidies reached an unprecedented low point in 1988-89 with £446 million, though they started rising steadily to £2,171 million in 1992-93, largely due to the recession (*chart 45, chapter 3.1*). InterCity services reached profitability from 1989 and did not any longer depend on public subsidies. The trend of British Rail was contrary to most

⁴⁴⁰ The 1981 Transport Act created the preconditions for disposal of subsidiaries of the British Railways Board in Public General Acts (1981). See also National Audit Office (1996), p. 14 and Irvine (1987), p. 13 with regard to the subsidiaries that were sold.

⁴⁴¹ Schmitz (1997), p. 48

European countries, where the deficits reached new records nearly every year.⁴⁴² In 1991, the deficit of British Rail amounted to 0.12% of the British GDP, compared to an average of 0.7% in the remaining members states of the then European Community.⁴⁴³ Though British Rail exceeded most European railway undertakings in economic terms, Nash and Preston argue that the re-emergence of increasing deficits, the slow-down in labour productivity improvements and concerns with regard to future investments may have led the government to look for new solutions during the recession in the early 1990s.⁴⁴⁴ In July 1992, the government proposed the most drastic measures so far. The Conservatives' White Paper on *New Opportunities for the Railways* in July 1992 argued for privatisation and a new structure of the rail industry, forming the basis of the 1993 Railways Act.

⁴⁴² Allemeyer (1993), pp. 15-16 and Schmutz (1997), p. 48

⁴⁴³ Allemeyer (1993), p. 11

⁴⁴⁴ Nash and Preston (1994), p. 23

2.2 Digression: Deregulation in the UK bus industry

Prior to 1985, UK bus operations were undertaken by the National Bus Company and Scottish Bus Group, via PTE subsidiaries and their contracted operators. Still, many small and a few larger private bus operators, such as Barton Transport, had upheld their independence outside of PTE areas in addition to municipal bus companies, whilst the coaching business remained primarily in the private sector. The then situation in the bus industry may be characterised by “...gross inefficiency, resource waste, and minimal attention to the customer. (The idea of seeking to attract new customers was rarely mentioned). Revenue support, which stood at £10 million in 1972, rose to £520 million ten years later, while passenger kilometres fell from 60 billion to 48 billion over the same period. At the same time, costs rose by 15 to 30 per cent over the rate of inflation, and fares were increased by more than 30 per cent. So much for the supposed advantages of an integrated and co-ordinated industry, almost all of it in public ownership!”⁴⁴⁵ Hibbs and Bradley further argue that this drastic state of affairs was the direct result of the antiquated licensing system dating back to the 1930s.⁴⁴⁶ Under the road service licences, the exact route, timetable and tariffs had to be specified. Subsequently, the major reform of the industry was undertaken in the 1985 Transport Act, which made provision for a transfer of operations of the National Bus Company to the private sector and abolished all remaining road service licenses.⁴⁴⁷ The Act also recognised the necessity of social services, such as concessionary fares for some groups of passengers and granted subsidies for discounted tariffs and bus routes on unviable routes. The National Bus Company was wound up and divided into 72 undertakings, a third of which was sold to private companies, whereas the remaining two thirds were management-buy-outs with employee participation with a total sale price of £325 million.⁴⁴⁸ While the sales of the National Bus Company and the Scottish Bus Group were completed in 1988 and 1991, the majority of the PTE subsidiaries followed on the course to privatisation. Only London seemed to be exempt from the developments. Though the London buses were sold between 1993 and 1995, they are operated through franchises and the “...London network...offers an example of a centrally-planned, regulated system run entirely by privately-owned operators on a contract basis.”⁴⁴⁹

⁴⁴⁵ Hibbs and Bradley (1997), p. 5

⁴⁴⁶ Hibbs and Bradley (1997), pp. 2-3

⁴⁴⁷ Public General Acts (1985), §1, 47. The 1980 Transport Act had already removed quantity and price controls from the industry, see White (1997), p. 2

⁴⁴⁸ Schmitz (1997), p. 35

⁴⁴⁹ White (1997), pp. 2-3

The conversion of the bus, coach and rail industries into something closer to true transport *markets* exhibits some interdependency and was backed by a similar overall economic philosophy.⁴⁵⁰ When the bus and coach deregulation took place, British Rail was already undergoing major reforms, but it was another seven years to the White Paper *New Opportunities for the Railways*. Though bus deregulation may provide some lessons, they must not be overstated, as the final outcome of the reforms differed to some extent, most noticeably in on-street-competition versus franchised train operations, access rights to the infrastructure and the scope of regulation.

The bus and coach industry clearly dominates the railway industry, as various bus operators acquired railway franchises (*table 2, chapter 3.1*). Here, *National Express Group* is undoubtedly outstanding, controlling a total of 9 out of 25 passenger rail franchises in 2001. The operator obtained four franchises from *Prism Rail* in July 2000, a consortium made up of bus industry executives. In the financial year 2000-01 *National Express Group* received more than 38% of the total rail franchise payments (*tables 3 and 4, chapter 3.1*). Though the linkage might give rise to fears that the operators could exploit their dominant market position, the argument is somehow startling.⁴⁵¹ Over the previous decades, it was generally a great concern of politicians to *integrate* the transport market. Their approach to integration was limited to legislative efforts and created public monopolies, the reform of the bus and rail industries in the 1980s and 1990s resulted in integration by private endeavour. Though some operators like *National Express* acquired a considerable share of the bus and railway markets with the consent of the industry regulator, *National Express* does not possess a monopoly in the wider transport market and meets harsh competition by private car travel and also rail or air traffic. However, a dominant company might have a considerable competitive advantage over other operators, not least *because* it can offer a superior product, such as connecting integrated services.⁴⁵² Whereas the bus companies operate in a contestable bus market, the British Transport Commission did possess an incontestable monopoly, granted by the government.

⁴⁵⁰ White (1997), p. 11

⁴⁵¹ According to Preston et al. (2000), p. 104 the Monopolies and Mergers Commission ruled on *National Express Group's* acquisition of *Midland Main Line*. Though it approved the case, the Commission imposed certain restrictions "...to ensure that bus services were not run down to divert traffic to rail."

⁴⁵² Greenspan (1967), p. 66 discusses the harmful effects of antitrust policy and the restriction of entrepreneurial freedom and draws the following conclusion of supposedly harmful monopolists. "It takes extraordinary skill to hold more than fifty percent of a large industry's market in a free economy. It requires unusual productive ability, unflinching business judgment, unrelenting effort at the continuous improvement of one's product and technique. The rare company which is able to retain its share of the market year after year and decade after decade does so by means of productive efficiency – and deserves praise, not condemnation."

The operation of coaches and buses is characterised by low barriers to entry and neither implies strong economies of scope, nor of scale and accordingly no natural monopoly situation.⁴⁵³ The vertical separation of railway operations and infrastructure management led to a more comparable cost structure of the bus and rail industries. Still, the competitive structure of the industries shows considerable differences. The bus and coach market may be characterised by light regulation, whereas the railway market is tightly regulated. *“Stricter controls on service standards, quality and pricing have been introduced, notably in the regulation of certain major fare categories (Savers, and season tickets) initially so that average annual increases should not exceed RPI, and from 1999, RPI-1%. Considerable effort has been directed toward protecting existing service levels enjoyed by users, provision of through ticketing...and publication of a national timetable.”*⁴⁵⁴ According to White, the regulation in the railway market contrasted markedly with the regulatory efforts in the coach industry after the 1985 Transport Act, which neither promoted co-operation in timetabling, nor through ticketing. The timetable information was rather erratic and no checks on fare increases were provided.⁴⁵⁵ This was also one of the major criticisms of the bus deregulation. Hibbs and Bradley, however, point out that considerable regulatory and bureaucratic efforts restrict the bus industry, as local authorities exercise their remaining powers. There were also examples that councils did not allow bus operators to advertise their timetables at bus stops, naturally contributing to the lack of timetabling information.⁴⁵⁶

The deregulated bus market resulted in increased competition in the transport market, predominantly constraining InterCity and Provincial railway services.⁴⁵⁷ Intra-modal competition in the bus and railway markets in the aftermath of the reforms differed strikingly. While the train industry was supposedly *privatised* by franchised train operations, buses and coaches were involved in strong on-the-road competition. *“And, as the theory of contestable markets would expect, the potential of new competition has proved itself a powerful incentive to maintaining and improving standards of service.”*⁴⁵⁸ Hibbs and Bradley note an influx of competitors in some areas, such as Greater Manchester and Merseyside. Though they agree that it led to confusion due to the absence of reliable timetabling information, the competition resulted in greater orientation towards the customer preferences and an

⁴⁵³ Burchell (1997), paragraph 4 and Schmitz (1997), pp. 34-35

⁴⁵⁴ White (1997), p. 11

⁴⁵⁵ White (1997), p. 11 and Schmitz (1997), p. 37

⁴⁵⁶ Hibbs and Bradley (1997), p. 17

⁴⁵⁷ Irvine (1987), p. 7

⁴⁵⁸ Hibbs and Bradley (1997), p. 23. Emphasis in the original.

enhanced performance.⁴⁵⁹ Marketing and service innovations were introduced, such as the minibus after 1984, more frequent services and new direct routes, reducing uncomfortable changes and waiting times.⁴⁶⁰ Despite a drop in passengers travelling outside London along the long-run annual trend of 3%, White observed an overall growth in bus kilometres of 25-30% and of total distance travelled since deregulation.⁴⁶¹ Government support for tendered socially necessary services dropped from £974 to £281 million between 1984-85 and 1993-94, while operating costs of local bus services outside of London went down from 140 to 121 pence per mile.⁴⁶² Adding to the overall improvements, the government gained financially by reducing public subsidy to the bus industry, the sale price of the companies and the annual corporation taxes that had to be levied after deregulation.⁴⁶³

⁴⁵⁹ Hibbs and Bradley (1997), pp. 11, 15-17

⁴⁶⁰ Hibbs and Bradley (1997), pp. 18, 21

⁴⁶¹ White (1997), p. 3

⁴⁶² Hibbs and Bradley (1997), pp. 15-16. The data provided is at 1994/95 prices.

⁴⁶³ White (1997), p. 9 and Hibbs and Bradley (1997), pp. 27

2.3 The 1992 White Paper

The story of the Conservative government's bold move into railway privatisation has been told many times.⁴⁶⁴ During the 1980s the Conservatives' privatisation programme gained momentum with obvious attractions to apply it to BR.⁴⁶⁵ First, government believed that private sector management would bring about more innovation than public sector management, as government would always back up state-owned undertakings.⁴⁶⁶ Welsby highlights his advocacy of private ownership of the British railways due to conflicting aims of railway policy versus public policy priorities, while the government had further obligations towards the general economy. *"The result is continuous and inconsistent interference in the management of the company. These conflicts were present for all the old nationalised industries but the temptation to intervene always seemed stronger on the railways than in other sectors. Playing trains has always been seductive for politicians."*⁴⁶⁷ As a state-owned undertaking prior to 1982, BR was largely exempt from the pressures of private entrepreneurs to operate profitably and according to their customers' preferences.⁴⁶⁸ However it must be said that British Rail had taken a clear lead role under European railways since the implementation of sector management in 1982. Now, the Conservatives intended *"...to enable the railways to respond to the increasing demands of customers and to provide the quality of service those customers want."*⁴⁶⁹ Second, the opening up of the railway industry would promote the innovative potential injected with the new management. Third, government would be relieved of their straitjacket-relationship with the railways that tied the Exchequer to fund the industry and its risk if BR remained in the public sector.⁴⁷⁰

In 1992 the Conservatives suggested a highly complex, but far-reaching reform of British Rail to encourage *innovation*, minimise *public spending* and align BR with the *preferences* of customers.⁴⁷¹ The Conservative government's expectations reflect a textbook case and strong belief in the benefits of private entrepreneurship. The 1992 White Paper *New*

⁴⁶⁴ The following selection of recent works provides differing accounts of the privatisation movement in the UK: Bradshaw (2000), Bradshaw and Lawton Smith (2000), Freeman and Shaw (2000), Grantham (1998), Shaw (2000) and Wolmar (2001).

⁴⁶⁵ Rees (1994), p. 45

⁴⁶⁶ Welsby (1998), p. 235 and Welsby and Nichols (1999), p. 58

⁴⁶⁷ Welsby (1998), p. 236

⁴⁶⁸ Welsby and Nichols (1999), p. 57

⁴⁶⁹ Freeman (1992), p. 82 excluding the original bold print

⁴⁷⁰ Welsby (1998), pp. 235-236

⁴⁷¹ Gerondeau (1997), p. 145

Opportunities for the Railways officially listed the benefits anticipated from private sector involvement in railway operations, as cited below:⁴⁷²

1. *Orientation towards the customer's preferences:* "Management and employees in the private sector have greater incentives to provide the services which the customer wants. The profitability of their company – and at the end of the day their jobs – depend on providing a service which attracts custom. Nationalised industries do not face such acute pressures."⁴⁷³
2. *Competition and end to monopoly power in railway transport:* "New operators will be allowed to provide services, giving customers a choice and stimulating improved services and value."⁴⁷⁴
3. *Freedom of management:* The government was concerned about political interference with the BR management and was aiming at a reform "...with less scope and justification for Government involvement in managerial issues."⁴⁷⁵
4. *Quality standards:* The franchising contracts with the several train operating companies would include enforceable quality standards. Franchisees in breach of the standards, such as punctuality, reliability and overcrowding are liable for penalties.
5. *Motivation and efficiency:* By deregulating railway operations, the government expected that the companies would reflect local and regional identities with a better understanding and service of the demands of the locals.

The government considered, *first*, a sale of British Railways as a single entity, which was often claimed to be the preference of the British Railways Board.⁴⁷⁶ The then Prime Minister John Major favoured the *second option* to split BR into private regional companies. The *third model* contemplated was a privatisation along the existing business sectors, while the *fourth concept* was a vertical separation between the infrastructure and operation of services. The first two schemes were rejected on grounds that British Rail's losses were too great and the single national undertaking or the regional entities would have to rely on continued large subsidies from the taxpayers for the foreseeable future. The government assumed some scope to privatise British Rail along its business sectors. Though private InterCity and freight services were feasible, the freight business was by no means homogeneous with performance varying markedly across the freight business sectors. In regional passenger traffic, a future of Regional Railways was unthinkable without large amounts of public subsidy and Network SouthEast services would require rapid and

⁴⁷² Parliamentary Papers (1992), pp. 4-5

⁴⁷³ Parliamentary Papers (1992), pp. 4

⁴⁷⁴ *ibid.*

⁴⁷⁵ *ibid.*

⁴⁷⁶ However, Reid (1992), pp. 9-10 stated that the British Railways Board had never expressed a desire to have BR sold as a whole. Reid rather preferred something like a creeping privatisation with progressively increasing opportunities for private sector involvement.

substantial price increases, if they were supposed to operate profitably. In addition, the government envisaged competition as the major source to enhance the railway system's efficiency. Therefore, the opening up of markets was seen to be more important than the gains from simply transferring ownership from government to private entrepreneurs. Also the first and second options were discarded, as they would offer less scope for competing train services.⁴⁷⁷ European legislation placed an additional constraint upon the government's choice due to Directive 91/440/EEC.

Eventually, the government opted for a vertical separation between a state-owned national infrastructure company, *Railtrack*, various *Train Operating Companies (TOCs)* and *Freight Operating Companies (FOCs)*. However, the passenger train companies would only own a few of the necessary assets for their operations. Passenger services were to be organised in 25 temporary franchises, similar to the then profit centres of British Rail.⁴⁷⁸ The TOCs would lease their rolling stock from *Rolling Stock Leasing Companies (ROSCOs)*, to which BR's rolling stock was to be transferred prior to privatisation. The vertical separation into the railway tracks and associated infrastructure, such as electricity supply, the management of depots, stations and the signalling system on the one hand and the provision of railway transportation on the other hand, was found to be most appropriate to accommodate the government's objectives to promote competition and inject the benefits of private sector management into the railway system. The new structure for British Rail would go far beyond the European requirements of the Directive 91/440/EEC. The European legislation played an important role in legitimising the British government's efforts to implement a radical reform agenda for the railways.⁴⁷⁹

Subsidies to the proposed franchisees of passenger services were to be provided where subsidy was required to maintain socially necessary services. And the National Audit Office noted later that the "*...Government considered that the process of regular re-letting of franchises would create competition in the market, ensuring that services are run by the most efficient operator, resulting in time, in reductions in the amount of public subsidy required by the Train Operating Companies.*"⁴⁸⁰ If the authority responsible for the franchise arrangements should decide that a service was no longer socially necessary, the subsidies would cease and the same closure procedures as prior to the privatisation of BR would apply.

⁴⁷⁷ Parliamentary Papers (1992), p. 3 and National Audit Office (1996), pp. 15-16

⁴⁷⁸ Nash and Preston (1994), p. 24. Initially, the Treasury suggested to create more TOCs, as it anticipated increased competition among the bidders in the franchising process, Shaw (2001), p. 9.

⁴⁷⁹ Knull and Lehmkuhl (1998), pp. 4-5

⁴⁸⁰ National Audit Office (1996), p. 18

The government foresaw a clear role for a future *Office of Passenger Rail Franchising (OPRAF)* in its White Paper, as the remit of the Office was the franchising of passenger train services on the government's behalf. "*The Authority, after consultations with the private sector and BR, will agree with the Secretary of State a programme for franchising train services. The Government will decide a budget for grants for these services, and set broad objectives for service levels, service quality and fares. Taking account of these broad objectives, the Authority will specify the minimum services a franchisee will provide and the minimum quality standards. Open competitions will be held for private sector companies to run services. Individual services will continue to be provided by BR only if no satisfactory private sector bid is received.*"⁴⁸¹

OPRAF was to be in charge of the tendering process, but had no regulatory functions towards the industry. The *Office of the Rail Regulator (ORR)* would become the sole economic railway regulator and had to assure fair arrangements for track access and charging. Also, the ORR would promote competition and prevent abuses of monopoly power. Potential for abuse of monopoly power was exclusively suspected in London commuter services and in the operation of railway tracks and associated infrastructure. No special regulation was envisaged for privatised freight and parcel services, as they were operating in a highly competitive environment.

The White Paper emphasised the paramount importance of safety for the travellers and the workforce of the privatised companies in a fail-danger industry. The government expected the new safety framework to place the primary responsibility for safety with Railtrack and the train operating companies, while the *Health and Safety Executive (HSE)* would supervise the railway companies' compliance with the strict safety requirements as the sole safety regulator of the industry.⁴⁸²

The 1992 White Paper proposed to set up Railtrack as a monopolistic state owned track authority and to privatise the freight and parcel operations. Temporarily, BR's passenger services would become operating companies under BR's organisation until the entire passenger business had been transferred to private sector franchises. At this early stage the government envisaged a right of access to the rail network for private passenger or freight operators, so long as they would meet strict safety and environmental standards,

⁴⁸¹ Parliamentary Papers (1992), p. 7

⁴⁸² Parliamentary Papers (1992), p. 17

to be overseen by a new regulator.⁴⁸³ The franchised passenger services would then compete with open access train operators on a publicly owned infrastructure.⁴⁸⁴ Similarly important is the government's long-term objective "...to see the private sector owning as much as possible of the railway. Powers will therefore be taken to allow the future privatisation of all BR track and operations."⁴⁸⁵ Also, the White Paper visualised light regulation for the railways, leaving a high degree of managerial freedom to the actors in the new railway market. The ROSCOs and freight operators were left almost without regulation and the market was assumed to restrain even the TOCs, except for London commuter services. Except for the London area fares policy were to be left to the operators and franchisees would have wide discretion over their output levels, checked solely by minimum service levels that were substantially below BR benchmarks. Thus, monopoly regulation could largely be restricted to the public sector monopoly in the infrastructure.⁴⁸⁶ The further political process considerably watered down the White Paper's proposals of open access, the sale of all BR track and operations and light-handed regulation.

Substantial amendments were made during the passage of the Bill through Parliament, as the proclaimed benefits of the reform were less than self-evident at the time.⁴⁸⁷ The minimum service requirements were upgraded to more restrictive *Passenger Service Requirements (PSR)* and some fares would be subject to regulation. The amendments and also the open access provision would have an adverse effect on the franchise bids, as open access operators could openly challenge the franchisees on their most profitable routes. This naturally reduced the attraction to operate a franchised passenger service and simultaneously increased the subsidy requested. As a result, open access provision was postponed to sweeten the franchises in a package deal of tighter regulation compensated by a temporarily protected market. The change of mind was responsible for far-reaching implications of the reform. The incentives of the private rail companies' and their actions would have differed markedly, if they had the perspective of full ownership of the temporary franchises at a future date in addition to harsh competition in the railway market by new entrants from the very outset of privatisation. Welsby notes that the "...effects of these changes on the smooth operation of the privatised railway were given scant consideration and in some cases it is doubtful if the implications were even understood – for example, the franchised passenger railway finished

⁴⁸³ Parliamentary Papers (1992), pp. 4, 13-14

⁴⁸⁴ Welsby and Nicholls (1999), p. 60

⁴⁸⁵ Parliamentary Papers (1992), p. 4

⁴⁸⁶ Welsby (1998), pp. 236-237

⁴⁸⁷ Welsby (1998), p. 237

*up with fewer managerial degrees of freedom than were previously enjoyed by BR under state ownership.*⁴⁸⁸

Towards the end of 2001, neither the opening up of railway markets by means of open access rights, nor the material privatisation of the franchise companies is in sight. In contrast, the private TOCs generally enjoy temporary monopoly rights, Railtrack is on the verge of effective re-nationalisation, whereas the regulatory authorities gained a tighter grip on the passenger franchises over the last year.

⁴⁸⁸ Welsby (1998), p. 237

3. The vertical separation of the British railway system

The Railways Act of November 1993 provided for a vertical separation of track infrastructure and train operations, as well as a horizontal separation of the train operations itself into 25 passenger train companies. Main objectives of the legislation were the injection of competition into the supply of a declining railway industry and the minimisation of public spending.⁴⁸⁹ The Act was based upon the propositions as set forth in the 1992 White Paper, with the various exceptions emphasised above. Sections 15 and 17 of the Railways Act provided for the theoretical obligation of facility owners to permit the use of railway facilities by other persons, where the facility may either be a track, station or a light maintenance depot. However, on-track-competition was constrained by the franchise agreements and potential entrants were required to obtain a licence for their operation from the ORR. In response to the Secretary of State, the Office of the Rail Regulator had implemented moderation of competition arrangements until March 2002, effectively protecting the franchised operators from competition-on-the-track.⁴⁹⁰ The terms of access agreed upon by the facility owner and another person require approval from the Regulator, who may modify the proposed terms of access after consultation with both parties. Also, an eventual sale of the franchises was not within the immediate remit of the Act.

In the first section, the Act provided for the appointment of the *Rail Regulator* and an officer to be known as the *Director of Passenger Rail Franchising* by the Secretary of State. Their duties were codified in sections 4 and 5, similar to the initial suggestions in the 1992 White Paper. According to the Act, the Franchising Director's main functions broadly embraced the franchising of passenger services on the basis of competitive tendering and the monitoring of the franchise operations. The tendering process for the carriage of passengers by railway explicitly excluded the participation of public government bodies or ministers. Franchising agreements were required to include the duration of the franchise, while they may include provisions concerning an extension of the period or fares and any provisions the Franchising Director may think fit. Grants made available by the Franchising Director in consequence of the franchise agreements were to be provided by Parliament. Originally, the Rail Regulator's principal duties included the promotion of

⁴⁸⁹ The objectives coincide with the Conservatives general privatisation agenda, Richardson (1994), pp. 62-63

⁴⁹⁰ ORR (2001), www.sra.gov.uk. Swift (1995), pp. 73-74 considered the Regulator's position on imposing moderation of competition arrangements and the resultant trade-off between promoting competition and attractive investment opportunities. As Wolmar (2001), p. 243 put it, Swift dumped "...the very concept of on-rail competition...in the bottom drawer..."

competition and the promotion of the interests of passengers, the prevention of monopolistic abuses and the approval of access arrangements between facility owners and train companies.

The direct result of the 1993 Act was a reorganisation of British Rail into 106 businesses. Railtrack, the owner of the infrastructure network, provides access to the 25 train operating companies and to freight operators. The TOCs themselves lease rolling stock from three ROSCOs that receive maintenance services from six heavy maintenance depots owned by three separate companies. They also offer their services to the freight operators. Railtrack relies on a number of suppliers for the upkeep and modernisation of the track system. The basic structure of the railway industry following the 1993 Railways Act is illustrated in figure 1 below.⁴⁹¹

Image removed due to third party copyright

FIGURE 1: The Privatised Railway Industry Structure

Source: Department of the Environment, Transport and the Regions (1998), p. 21 based upon: National Audit Office (1998)

Evidently, the British railway reform was a highly complex undertaking. Adding to the original complexity of relationships between the TOCs, freight operators, Railtrack, ROSCOs, OPRAF, the ORR, the HSE, the Department of Transport and various suppliers, the structure of the system changed shape after the 1997 general election. The Department of Transport was replaced by the *Department of the Environment, Transport and the*

⁴⁹¹ Public General Acts (1993), National Audit Office (1996) and DETR (1998), p. 22. Charlton (2000) provides a brief overview over the new structure.

Regions (DETR) and in 2001 by the *Department of Transport, Local Government and the Regions (DTLR)*. The Transport Act 2000 established the *Strategic Rail Authority (SRA)* as successor body to OPRAF, adjusted the role of the ORR and abolished the British Railways Board. The industry was shaken by a number of tragic railway accidents. In the consequence of the Hatfield crash in October 2000, Railtrack imposed over 1000 Emergency Speed Restrictions and the system went into a prolonged crisis, culminating in Railtrack being placed in public administration in October 2001. Now, the structure of the whole British train system was increasingly called into question.

Chapters 3.1 to 3.5 explain the functions of the various players in the British railway industry according to their *original* design, in addition to the brief outline of the functions given above. Chapter 3.6 draws upon the changes that followed Labour's 1998 White Paper and chapter 3.7 discusses the outcome of the tragic train accidents, including the winding up of Railtrack. Chapter 4 assesses the British experiment in four parts. First, chapter 4.1 illustrates the developments of the sector since the mid-1980s with empirical data. Chapter 4.2 comments upon the absence of competition in the infrastructure and train operations, while chapter 4.3 looks at the regulation in the industry. Finally, chapter 4.4 deals with the safety issues and the fear of consumers, before chapter 5 draws a conclusion.

3.1 The Train Operating Companies

The Railways Act reorganised British Rail's passenger transport businesses, InterCity, Network SouthEast and Regional Railways into 25 TOCs, basically in line with BR's former profit centres (*table 2*). Though the TOCs were initially part of British Rail, the Act made provision to franchise them to private bidders, who would tender for the right to run a passenger railway for a specified period of time as set out in the detailed franchise agreements. Under the original arrangements, the franchises were awarded to the bidder who offered the highest amount of franchise royalty to the government or rather, requested the smallest subsidy payment to operate the service.⁴⁹² Accordingly, the amount of the fee to OPRAF or subsidy from the office of the Franchising Director was determined in a competitive tender process for each train franchise, as illustrated for all 25 TOCs in tables 3 and 4. Though the level of subsidy required by the applicants was the prime factor in awarding the franchise treaty, the National Audit Office underlined that the bids had to be *acceptable* in terms of the level of service proposed. The right to operate a franchise might be revoked if the franchisee failed to meet the terms agreed upon in the franchise treaty.

Table 3 and 4 show past, respectively future payments as negotiated in the franchise contracts and portray that only Gatwick Express was operating without subsidy from the beginning, in effect paying the government for the franchise contract. However, a number of franchise agreements are on the agenda for re-franchising in the next couple of years according to Table 2, with negotiations already under way. The successor body to OPRAF, the Strategic Rail Authority, is expected to push for higher returns for the public, both in financial terms and in service quality provided by the passenger rail operators.

⁴⁹² Gerondeau (1997), p. 145

<i>Franchise Owner</i>	<i>Franchise Operator</i>	<i>End</i>	<i>Length</i>
<i>Connex Transport UK Ltd.</i>	Connex South Eastern	Oct 2011	15 yrs
<i>FirstGroup plc.</i>	Great Eastern Railway	Apr 2004	7 yrs 3 mths
<i>FirstGroup plc.</i>	Great Western Trams	Feb 2006	10 yrs
<i>FirstGroup plc.</i>	North Western Trams	Apr 2004	7 yrs 1 mth
<i>GB Railways Group plc.</i>	Anglia Railways	Apr 2004	7 yrs 3 mths
<i>GoVia Ltd.</i>	South Central	May 2003	7 yrs
<i>GoVia Ltd.</i>	Thameslink Rail	Apr 2004	7 yrs 1 mth
<i>M40 Trains Ltd.</i>	Chiltern Railways	July 2003	7 yrs
	Arriva Trains Merseyside (formerly		
<i>Arriva plc</i>	Merseyrail Electrics)	Feb 2003	3 yrs
	Arriva Trains Northern (formerly		
<i>Arriva plc</i>	Northern Spirit)	Feb 2003	3yrs
<i>National Express Group plc</i>	c2c (formerly LTS Rail)	May 2011	15 yrs
<i>National Express Group plc.</i>	Cardiff Railway Company	Apr 2004	7 yrs 6 mths
<i>National Express Group plc.</i>	Central Trains	Apr 2004	7 yrs 1 mth
<i>National Express Group plc.</i>	Gatwick Express	May 2011	15 yrs
<i>National Express Group plc.</i>	Midland Main Line	Apr 2008	12 yrs
<i>National Express Group plc.</i>	ScotRail	Apr 2004	7 yrs
<i>National Express Group plc.</i>	Silverlink	Oct 2004	7 yrs 6 mths
<i>National Express Group plc</i>	Wales & West	Apr 2004	7 yrs 6 mths
<i>National Express Group plc</i>	West Anglia Great Northern	Apr 2004	7 yrs 3 mths
<i>Sea Containers Ltd.</i>	Great North Eastern Railway	Apr 2003	7 yrs
<i>Stagecoach Holdings plc.</i>	Island Line	Sep 2003	7 yrs
<i>Stagecoach Holdings plc.</i>	South West Trains	Feb 2003	7 yrs
<i>Victory Railways Holdings Ltd.</i>	Thames Trains	Apr 2004	7 yrs 6 mths
<i>Virgin Rail Group Ltd.</i>	CrossCountry Trains	Apr 2012	15 yrs
<i>Virgin Rail Group Ltd.</i>	West Coast Trains	Mar 2012	15 yrs

TABLE 2: *The Franchised Train Operating Companies*

Source: SRA (2001d), p. 45 and www.sra.gov.uk

Note: During 2001 negotiations were undertaken with the respective franchisees to implement 20-year franchises on Chiltern Railways, Connex South Central and South West Trains GoVia assumed operations on the South Central franchise after an early changeover agreement with Connex. National Express Group acquired Prism Rail plc in July 2000 The SRA approved the resultant change of control of West Anglia Great Northern, Wales and West, Cardiff and c2c franchises under some conditions, SRA 2001a), p 20.

The SRA has entered into franchise agreements with 25 Train Operating Companies for the provision of train services. Total contracted commitments under these agreements is £386.8m. The table below sets out the obligation for each franchise and the date which the contract either finished or met the first break clause.

Image removed due to third party copyright

TABLE 3: Past Payments and Receipts from the TOCs

Note: All figures are in £'000s (brackets indicate receipts from an operator)

Source: SRA Annual Report 2000-2001, p. 102, www.sra.gov.uk

Image removed due to third party copyright

TABLE 4: *Future Payments and Receipts from the TOCs*

Note: All figures are in £'000s (brackets indicate receipts from an operator)

Source: SRA Annual Report 2000-2001, p. 103, www.sra.gov.uk

The Franchising Director excluded British Rail from participating in the bidding process in order to encourage *newcomers* to the rail industry, as well as *management* and *employee buy-out teams*. The National Audit Office's concluding statement on the tendering procedure for the first three franchises acknowledged that the Franchising Director generated a good degree of competition between the different bidders and at the same time matched the condition to offer value for money by choosing the future service provider with the lowest requirement for financial state support. Eventually, all the 25 TOCs were franchised to private bidders between February 1996 and March 1997, just in time for the

1997 general election. The basic model for the franchising process is portrayed below in figure 2.⁴⁹³

Image removed due to third party copyright

FIGURE 2: Stages in the Franchising of the first three Passenger Railway Franchises

Source: National Audit Office (1996), p. 3

The Franchising Director made provision for passenger service requirements to the privatised rail industry, targets on punctuality, reliability and prevention of overcrowding with the respective franchisees, equalling or often exceeding the standards prior to privatisation of the railways. Neglect of the arrangements could result in fines and eventually termination of the railway franchise. Fare regulations were put in place, aiming at the conservation of weekly season tickets and one type of return ticket, usually the Saver ticket.⁴⁹⁴ Still, the fares regime had some degree of flexibility, insofar that improvements in quality of service were a credible argument for fare increases upon request from the Director of Passenger Rail Franchising. OPRAF would only regulate other fares if train

⁴⁹³ National Audit Office (1996), p. 8-11, concerning the arrangements between the TOCs and the Franchising Director.

⁴⁹⁴ Stannard (1997), paragraphs 11-12

operators held a dominant position in the intermodal transport market. Fare increases were then restricted to increases in the retail price index. OPRAF's successor body, the SRA, declared in its 2000-01 Annual Report that approximately 39% of the TOCs revenue comes from fares regulated by the SRA. Fare increases were limited to RPI minus 1% from January 1999, equalling real fare reductions.⁴⁹⁵

A major achievement of the British approach to privatisation was a greater transparency in the actual costs of operating certain passenger services. The funding structure of the British railway system changed from a system of government grants and loans to a system based on direct franchise payments to train operators. In addition, some of the train operators receive other means of support, such as grants paid by seven metropolitan PTEs for the provision of passenger railway services in their respective areas, amounting to a total of £283 million in 2000-01.⁴⁹⁶ The total government transfers between 1985-86 and 2000-01 are summarised in chart 45, including government receipts from the railways, such as Railtrack's debt repayments and the sale of the ROSCOs. The chart clearly shows the success of the sector management introduced in 1982 and the effects of the glooming recession on subsidy payments rising to their peak in 1992-93. Chart 46 illustrates the total amount of franchise payments to and from the operators. Accordingly, the operators were anticipated to start repaying the government's subsidies from the financial year 2005-06 (*see also table 4*), when payments from the operators would exceed overall franchise subsidies.

⁴⁹⁵ SRA (2001a), p. 19

⁴⁹⁶ Arriva Trains Northern, Central Trains and ScotRail benefited from part funding from the PTEs, SRA 2001d), p. 18

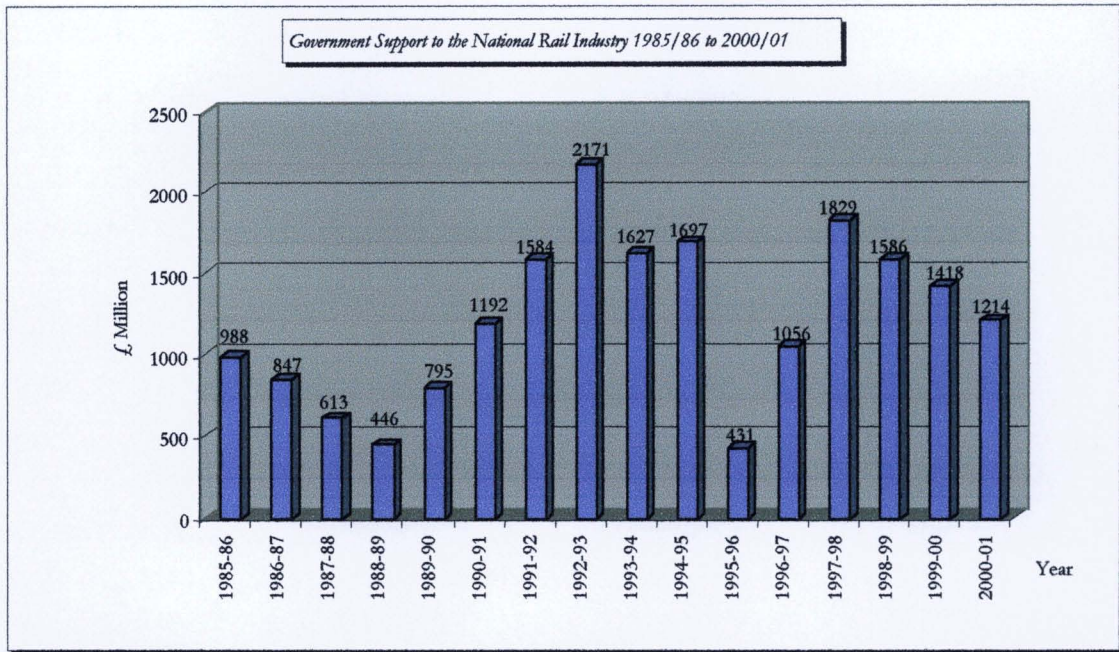


CHART 45

Source: SRA (2001c), p. 28

Note: The figures include grants from central government, Passenger Transport Executives and other elements. While the central government grants comprised the Public Service Obligation grant prior to 1993-94, they were paid via OPRAF, respectively the SRA after privatisation. A further major contribution to the full subsidy is provided by the seven metropolitan Passenger Transport Executives under section 20 of the 1968 Transport Act, to secure rail transport in their metropolitan areas. Other elements included in the figures are the rail industry's changes in indebtedness and proceeds from the sale of ROSCOs. Freight grants are excluded.

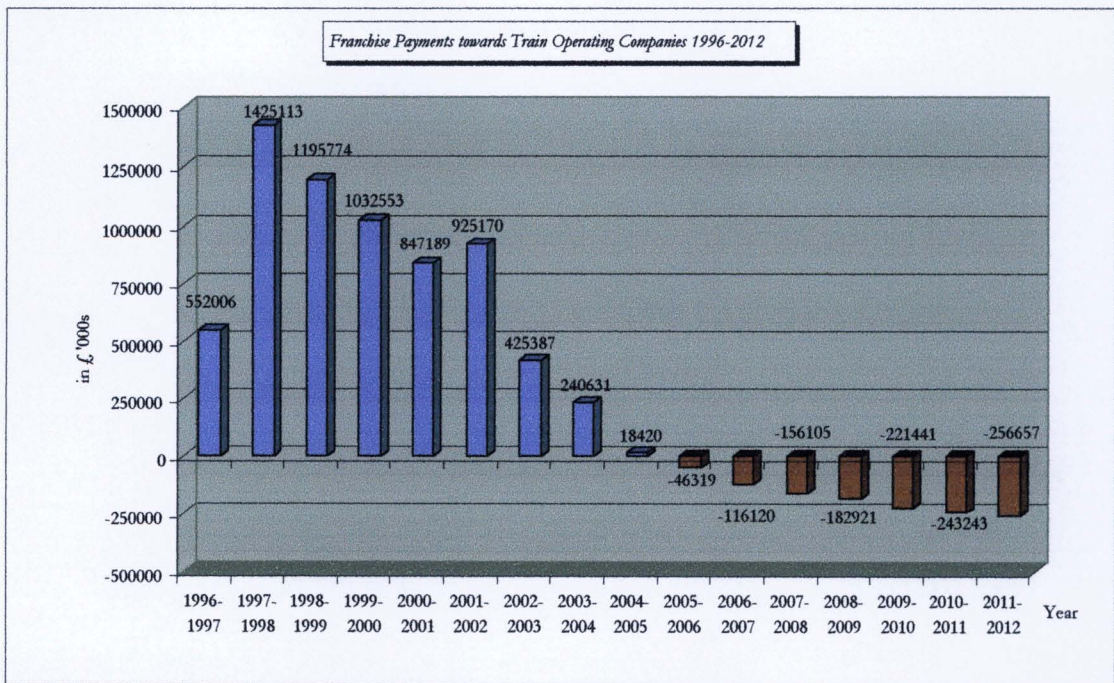


CHART 46

Source: SRA Annual Report 2000-2001, pp. 102-103, www.sra.gov.uk

3.2 The Freight Operating Companies

The structure of the freight industry substantially differs from the passenger rail industry. Freight Operating Companies offer the carriage of goods by railways. *“The FOCs are not franchisees in the same way as passenger Train Operating Companies (TOCs), but are commercial companies with no public obligation to provide a given level of service. The freight business operates in an ‘open access’ environment whereby any operator can run freight trains subject to obtaining a safety case, licence and access to the rail network. Access to the rail network is provided by Railtrack. The FOCs have Track Access Agreements with Railtrack, paying a fixed amount for access to the network and a variable amount depending on how many trains they run.”*⁴⁹⁷ The access price regime for the FOCs was altered in April 2001 to promote rail freight. Now, the SRA covers the fixed component of the access charge, whereas the operators solely pay the variable cost element.

The rail freight industry has seen considerable improvements since privatisation. Charts 51 and 52 in chapter 4.1 support the SRA’s allegation that the declining trend in rail freight has been reversed following privatisation of the freight operators.⁴⁹⁸ The government was disinclined to impose regulative forces to rail freight, as it realised the amount of intermodal competition in the entire transport market. Accordingly, regulation similar to the passenger rail industry has been absent from the national rail freight market.

The Regulator exclusively oversees licence arrangements and access prices. The FOCs do not automatically receive public sector grants, though individual businesses may apply for freight grants awarded by the Department of Transport, respectively its successor department DETR. The 2000 Transport Act, however, transferred the responsibility for freight grants to the new Strategic Rail Authority.⁴⁹⁹ Two options of grant are available to encourage rail freight transport, either the *Track Access Grant (TAG)* or the *Freight Facilities Grant (FFG)*. While the TAG provides financial assistance to meet the access charges payable to Railtrack, the FFG may be granted to support one-off capital investment costs, e.g. for special loading requirements, storage facilities, sidings or connections to the rail network. According to the Strategic Rail Authority, the freight grants totalled £23 million in the financial year 1999-2000 and increased to £36 million in the following year.⁵⁰⁰ In May 2001, the SRA unveiled its Freight Strategy. The strategy targets 80% growth in rail freight

⁴⁹⁷ www.sra.gov.uk: Rail Freight Industry

⁴⁹⁸ SRA (2001a), p. 39

⁴⁹⁹ SRA (2001a), p. 40

⁵⁰⁰ SRA (2001c), p. 20. Nash (2001) points out to the Regulator’s limited role in control over FOCs. For general information on freight grants see also: DETR (1997) and www.ews.railway.co.uk

over ten years from the 1998-99 level at an estimated costs of £4 billion, as set out in the government's 10 Year Plan.⁵⁰¹ The SRA's phased investment programme will focus on four sets of strategies on the network, interchanges, funding and service delivery.⁵⁰² The Freight Strategy reserved £1.5 billion for network improvements, such as diversionary routes, additional capacity, electrification and an enhanced quality of the infrastructure. As the SRA noted substantial investment in freight rolling stock since privatisation the SRA requested that Railtrack's speed restrictions of 45mph to 110mph for bulk to mail trains should be relaxed to make allowance for the new rolling stock. In addition, the network should be cleared to allow for axle loads of 25.5 tons, while train lengths on key corridors should accommodate freight trains as long as 775m.⁵⁰³

The freight market is dominated by three major FOCs.⁵⁰⁴ *English Welsh and Scottish Railway (EWS)* is the largest nationwide freight rail operator in the UK, moving over 1,000 trains per day and over 100 million tonnes of freight every year. Right after Wisconsin Central Transportation purchased British Rail's bulk freight services, the operator was reborn as EWS and invested in 280 new locomotives to replace parts of the antique fleet inherited from British Railways. EWS realised that wagonloads would constitute their highest growth potential. Though consignments may be as small as a single wagonload, they may also range up to full trainloads of 500 up to 3,000 tonnes. Whereas a major part of EWS' business comprises traditional goods such as coal, minerals, steel, petroleum, chemicals, mail and parcels, EWS is also extending its business into comparatively new markets for the railways, including food, retail, cars and timber products. In 1997 EWS purchased Railfreight Distribution, the operator of freight services through the Channel tunnel. Railfreight Distribution became EWS' international division, now called EWS International with responsibility for European services. The company claims to offer its customers flexible solutions in the UK and on the European continent with intermodal operations to combine the advantages of rail, road and sea transport, thereby aiming at a market-led, integrated transport solution.

Freightliner Ltd. is the successor to British Rail's former Freightliner service as subsidiary of Railfreight Distribution, which was purchased by a management buyout in

⁵⁰¹ SRA (2001b), p. 7 and DETR (2000c)

⁵⁰² SRA (2001b), pp. 14-34

⁵⁰³ SRA (2001b), pp. 18-19

⁵⁰⁴ Clarke (2000) provides a detailed account on the privatisation of freight services and also the political efforts of the government to involve the Wisconsin Central President, Ed Burkhardt. Burkhardt rejected early approaches of the UK government, as he disapproved of the vertical structure of the British system, the splitting of Trainload Freight and the strong emphasis on passenger services, Clarke (2000), p. 194.

May 1996. The company is specialising on the carriage of containers between Britain's deep sea container ports and its inland terminals in industrial centres. Freightliner moves over one million containers a year with roughly one hundred trains each day. In addition to rail services, it also offers direct road delivery to the customers' premises, arranging for next day delivery to all destinations in the UK. In 1999 Freightliner diversified in bulk rail freight and launched *Autoliner*, its automotive division.⁵⁰⁵ The third major company, *Direct Rail Services (DRS)*, is mostly engaged with British Nuclear Fuels Ltd. on the carriage of nuclear materials. The Office of the Rail Regulator received further applications for rail freight operating licences from *Mendip Rail Limited* and from *GB Rail Freight Limited* in 2000 that have both received approval.⁵⁰⁶

⁵⁰⁵ www.freightliner.co.uk

⁵⁰⁶ ORR (2000a), p. 19 and www.sra.gov.uk

3.3 Railtrack

Notwithstanding arguments for a horizontal separation of the infrastructure provision, the Conservative government took the view that a single infrastructure operating company was preferable to a variety of network operators.⁵⁰⁷ The then Department of Transport assumed that a single national track company would preserve the integrity of the entire railway system and could enforce uniform safety standards. Moreover, the Department held the view that a single track operator would serve strategic investment needs of the railway network and the future company was believed to be fair to the various train operating companies seeking access to the infrastructure, while guaranteeing efficient timetabling administration.⁵⁰⁸

The Act created the state-owned company Railtrack by 1st April 1994 after establishing Railtrack as a separate British Rail division in February of the same year. Railtrack assumed ownership of virtually all track and associated infrastructure, such as signalling, stations and depots, formerly owned by the British Railways Board. The assets of Railtrack are summarised in figure 3 below, including 16,652 route kilometres of track infrastructure in the financial year 2000-01, of which 5,167 were electrified, around 40,000 bridges, viaducts and tunnels, 9,000 level crossings, 2,508 passenger stations, 90 light maintenance depots, 1,000 signal boxes and control centres.⁵⁰⁹ While most of the passenger stations were leased to the respective TOCs operating the route, Railtrack manages 14 major stations on its own. The company's responsibility embraces the general maintenance and development of the railway infrastructure, the timetabling administration, train planning, the signalling system, the safety of vehicles accessing the network, the co-ordination and safety of daily operations. This was accomplished with a total workforce of 11,200 in 2001, slightly down from 11,500 at the time of flotation.

Railtrack sets up and enforces safety standards applicable to the entire network and its users, the train operating companies and station operators. Railtrack also formulates a railway safety case that has to obtain approval from the Health and Safety Executive. Railtrack's safety case "*...covers all significant health and safety implications of its activities and their*

⁵⁰⁷ Below, a competitive model of network operators shall be discussed. The single private railway network manager Railtrack was subject to light regulation, while the franchised train operating companies were carrying a substantial share of Railtrack's risk of market demand due to guaranteed income arrangements. Though Railtrack was indirectly affected by intermodal competition, proper quality regulation would have been the second best option to a competitive model as put forward in this thesis.

⁵⁰⁸ National Audit Office (1996), pp. 19-20

⁵⁰⁹ DETR (1998), p. 24 and SRA (2001c), p. 32

effect on other railway operators. Railtrack must also approve safety cases submitted by the train operating companies which describe how each operator assesses and controls risks to the health and safety of staff and the general public. The Health and Safety Executive, as the sole statutory regulator with regard to rail safety, enforces relevant legislation as well as examining the safety cases of train operating companies submitted to Railtrack for approval.⁵¹⁰ The safety regime introduced in 1994 reflects Railtrack's and the TOC's obligations under the Health and Safety at Work Act of 1974. Latest development in the rail crisis and its impact on Railtrack are considered in chapter 3.7.

Image removed due to third party copyright

FIGURE 3: Railtrack's Asset Base

Source: Department of the Environment, Transport and the Regions (1998), p. 25 based upon: National Audit Office (1998)

The then Department of Transport, now part of the Department of Transport, Local Government and the Regions, privatised Railtrack Group plc by floating the entire 100 per cent of Railtrack's shares on the London Stock Exchange in May 1996 at the issue price of 390p, thereby raising £1.9 billion for the government. One of the major criticisms with regard to the railway privatisation focussed upon the argument that the government might have realised higher proceeds from the sale of Railtrack. Put differently, it was

⁵¹⁰ DETR (1998), p. 26

questioned whether Railtrack was sold at a bargain price on the stock market.⁵¹¹ The flotation price did not fully reflect Railtrack's assets and endowments and Railtrack's income from access charges was largely guaranteed up to March 2001, until new arrangements were approved by the Regulator's review.⁵¹² The flotation was taking place after the sale of the rolling stock operating companies and 54 of British Rail's over hundred divisions, while the franchising process of passenger rail was right on track. The Department of Transport deemed the successful flotation of Railtrack of paramount importance to the further success of the privatisation and, in particular, the franchising process.⁵¹³

The government's *prime objective* with regard to Railtrack was its flotation as soon as reasonably practicable. Three further goals were, however, closely tied to Railtrack's flotation. First, the government aimed to obtain a good deal for the taxpayer by maximising total equity and debt proceeds. Second, the government intended to widen and deepen share ownership. The government's third target was the wider implication from the railway privatisation for their entire reform programme. It was in the government's interest to convince the electorate that the privatisations across the British economy were the only way forward and, indeed, a splendid success for Conservative policy.⁵¹⁴

Proceeds from Railtrack's sale amounted to £1.9 billion. Still, the company's massive public sector borrowing of nearly £1.5 billion, mainly to the National Loans Fund, had to be taken into account. As the National Loans Fund had to be discontinued after the sale, the Department of Transport decided to cancel Railtrack's debt, while at the same time introducing new debt of £586 million. The arrangement equals a net debt write-off of £869 million by the government. The total revenue from the sale, though, adds up to nearly £2.5 billion from the actual sale plus the debt repayment.

The DETR report on the flotation of Railtrack admits that the early sale may have had an adverse impact on the sale price, as the market was only beginning to comprehend the working of the previously highly protective railway industry, its various players and the regulative forces involved. The report emphasises that both the Department of Transport and their financial advisers SBC Warburg "...were concerned not to lose the confidence of investors

⁵¹¹ White (2000)

⁵¹² Welsby (1998), p. 243

⁵¹³ DETR (1998), pp. 2-19 present the arguments of the Department surrounding the privatisation and the Government's aims in more detail.

⁵¹⁴ DETR (1998), pp. 15-19, 61-68

*which they had made efforts to build up.*⁵¹⁵ Initially, the Department considered a sale in the autumn of 1996, but decided against this option due to the prospects of the forthcoming general election. The government contemplated that a sale closer to the election might curb market demand, driving down the eventual market value and the government proceeds of Railtrack's sale. Whereas the then Department of Transport argued that a delayed sale might have produced negative side effects for the upcoming franchising negotiations and the railway privatisation as a whole, the DETR report clearly favoured a later sale of Railtrack, as institutional investors would have gained a better knowledge of the structures of the rail industry. However, the Conservative government disagreed that a delay to the autumn of 1996 would provide investors with much further insight than was already available.

The then Department openly favoured a full privatisation of 100% of Railtrack's share capital rather than a partial sale of the company. Again, this was partly due to the uncertainty surrounding the upcoming general election and New Labour's election pledges to re-nationalise the railways.⁵¹⁶ In addition, the Department feared that investors could lose confidence in the government's knowledge of the railway industry and its commitment to the privatisation process as a whole. *"The Department's marketing advisers for the offer to the general public...considered that retaining a residual equity stake in Railtrack might create a perception in the market that this spelt a lack of confidence in the Government's ability to achieve sufficient demand for a full sale. That perception would, in their view, have been sufficient to ensure that the privatisation was a failure."*⁵¹⁷ In addition, a partial sale was believed to imply to investors a greater incentive for government to interfere with business and shareholder interests. Naturally, a partial sale would have affected the eventual sale price and thereby, the proceeds to the government. While the Department took the view that a full privatisation would lead to higher proceeds, proponents of a partial or phased privatisation underlined that investors would be able to assemble more information about the privatisation of the rail industry. Besides, they regularly pointed towards the sharp rise of Railtrack's shares, interpreting that a phased sale would have yielded much higher returns for the government. Chart 47 displays the stock market performance of the company between 1996 and 2001. Trade in Railtrack shares was suspended on 8th October 2001 at £2.80, when Railtrack went into public administration. The share price would have developed in a different way, if the government had retained a

⁵¹⁵ DETR (1998), p. 4

⁵¹⁶ The former Minister Steve Norris attacked Labour's role in the privatisation process: *"Labour threats to re-nationalise at the time we were selling the railways drove the price down. ...It was a cynical, deliberate act of political and economic sabotage directed at frustrating the last Government's privatisation plans. It failed."*, Norris (1998), p. 11

⁵¹⁷ DETR (1998), p. 5

proportion of the shares. Both the Department of Transport and the Treasury objected to a partial or phased sale, as they perceived "...a very real risk of the sale failing altogether."⁵¹⁸

Image removed due to third party copyright

CHART 47: Share Prices of Railtrack 1996-2001 as of 8th October 2001

Source: www.comdirect.co.uk

While the government tried to secure a good deal for the taxpayers, they were also aiming to widen and deepen share ownership with the general public, in order to gain more public support for the Conservative policy of privatising state assets. This policy stance implied that the privatisation would be irreversible after an eventual election victory of New Labour, if the Conservatives managed to spread the shares as widely as possible under employees and the public. Logically, the new shareholders would strongly oppose any attempts of expropriation. Still, the government learned that it was hard to find new investors for a complex privatisation process. Thus, the Department of Transport focussed

⁵¹⁸ DETR (1998), p. 9

on deepening share ownership. The government maintained the momentum of their privatisation programme by venturing into one of the most widely debated industries.

Railtrack's shares were issued at £3.90 in May 1996, with the share prices skyrocketing thereafter, until they reached a maximum price of £17.68 on 23 November 1998, giving Railtrack a market value of some £9 billion, up from £1.9 billion at the time of the sale in 1996. This marked rise in Railtrack's market value gave support to the argument that the company was sold at a bargain price to the detriment of the taxpayers and the benefits of Railtrack's shareholders. Whereas this viewpoint might have had some foundation at the writing of the DETR report in 1998, the drastic fall in Railtrack's market value gives support to the theory that the share value of Railtrack was massively inflated. Some industry observers alleged that the appointment of Tom Winsor as Rail Regulator in 1999 had adverse effects on Railtrack's stock market performance, as he was considered to be tough on regulation.⁵¹⁹ Though the news about a tough new Rail Regulator logically had some effect on the stock market, it would be grossly unfair to put the entire blame on the Rail Regulator. Up to the final winding up of Railtrack on 7th October 2001, the tight regulatory environment that had already been implemented by the 1993 Railways Act, the political uncertainty surrounding the Hatfield crash, Railtrack's handling of the crisis, Railtrack's management competence or incompetence and the anticipated consequences after Hatfield possibly had a greater effect on the plummeting share price. The number of accidents and the subsequent investigations into railway safety increasingly questioned the logic of the 1993 Railways Act and the vertical separation of the British railway system. At the time of writing, the future structure of Railtrack was still unclear, as highlighted below in chapter 3.7.

Railtrack's main expenditure is its investment in maintaining the infrastructure. In 1997-98 alone, maintenance costs for the upkeep of the network amounted to £702 million. Most of the maintenance works were subcontracted to various track renewal and infrastructure maintenance companies as illustrated in figure 1. For the next decade, Railtrack had planned investments into its network in the range of £27 billion, including planned upgrades to the East and West Coast Main Line services.⁵²⁰

⁵¹⁹ Financial Times (2000a)

⁵²⁰ www.comdirect.co.uk

Railtrack's income in 2000 was made up to the extent of 85% from access charges paid by passenger rail franchisees, while receipts from freight access amounted to 6% of Railtrack's revenue. The remaining 9% were provided by rental income from Railtrack's property (5%), other income (3%) and sales of commercial and development property (1%).⁵²¹ The access charges are paid to Railtrack under contracts agreed upon with the rail operators and approved by the Office of the Rail Regulator. The access contracts specify performance regimes between the individual transport operator and Railtrack with either bonus or penalty payments for punctuality, as well as train slots granted to the passenger or freight operators. Railtrack's revenue from access charges totalled £2.3 billion from passenger rail franchises (93%) and freight companies (7%) in 1997-98. The Secretary of State implemented the level of charges for access to Railtrack's network in 1994-95 when Railtrack was still in public ownership. The charges were to cover operating expenses, asset maintenance costs and eight per cent return on capital. The Rail Regulator's 1995 review of the charging principles came to the conclusion that Railtrack's charges to passenger operators should fall by eight per cent in real terms for the fiscal year 1995-96 in relation to 1994-95. As the Regulator envisaged annual real term decreases in Railtrack's operating costs of three per cent in addition to a potential for lower maintenance costs, the Office of the Rail Regulator demanded further real term reductions of two per cent annually until the implementation of new access charges in 2001 in order to reflect Railtrack's estimated cost reductions in the access regime. The Regulator "...believed that this level of charges would enable Railtrack to maintain and renew the network effectively and efficiently in modern equivalent form, and to sustain the national timetable of services."⁵²²

The initial access price regime for Railtrack's network involved a two-tier structure of fixed and marginal costs plus an element of either penalty or bonus payments for punctuality.⁵²³ The fixed charge was based on avoidable costs and a share of joint costs, which was inevitably arbitrary and does not reflect the profitability of the respective train services. Due to the small share of the marginal cost element in total access charges, train companies had an incentive to run additional services even with lightly loaded trains on a network that was already close to full capacity. "*The variable charges include no element either to allow for congestion or the opportunity cost of slots or for externalities such as air pollution. Moreover, it gives no incentive to Railtrack to enhance capacity to provide for extra services; in fact Railtrack argues that the variable element does not even cover wear and tear cost, so it is clearly in their interest to discourage*

⁵²¹ www.corporateminformation.com

⁵²² DETR (1998), p. 28. For the data see p. 27.

⁵²³ Nash (1997), p. 4 and Nash (2001)

expansion of services. From the point of view of efficiency, the result is that the system has no mechanism to ensure efficient use scarce capacity. Adjustments in capacity or quality may be made by negotiation between Railtrack and the operators beyond the access rights held by operators, but these negotiations are complex, involving often several operators as well the Strategic Rail Authority and the Regulator, and there is an obvious incentive for operators other than the main one affected to seek to 'free ride'.⁵²⁴ Such complex and time-consuming negotiations obviously involve high transaction costs, which had to be taken into account when companies were taking their initial investment decisions.

Following the Regulator's 1995 review, the ORR published his draft review of Railtrack's access charges in July 2000 for the second control period commencing in April 2001 until 31 March 2006. After responses from relevant industry parties, the Rail Regulator published his *Final Conclusions on The Periodic Review of Railtrack's Access Charges* in October 2000.⁵²⁵ Due to disincentives imposed upon the TOCs as a result of the high fixed cost element of around 91% and low variable cost components, Railtrack suggested to the Regulator to increase the variable element of the access prices.⁵²⁶ While the variable component was subsequently increased to roughly 20% of the total access price, marginal wear and tear costs and a capacity charge were included in the ORR's final conclusions. However, the capacity charge equalled only 50% of the estimated congestion costs arising from the train operations.⁵²⁷ With regard to the FOCs, the SRA pays the fixed element, so that the operators themselves are priced on a variable cost basis for their access to the infrastructure. This arrangement replaced the former system of negotiated access charges between the freight operators and Railtrack. Non-franchised newcomers to the passenger rail market are solely required to pay the variable component of the access price. Though the new regime discriminates in the favour of entrants to the passenger services, the majority of the TOCs still received major franchise payments from the SRA in 2001. Not least is the opportunity of open access to the railway market very limited due to current franchise contracts and the protection from competition until March 2002.⁵²⁸ The pricing system for the second control period substantially distorts the railway and transport markets and is static over the control period of five years, where flexibility is needed to adjust for investment needs. *"From the day of privatisation its revenues were more or less fixed, according to a formula laid down by its regulator. But nobody, not least Railtrack's management, knew*

⁵²⁴ Nash (2001)

⁵²⁵ ORR (2000b)

⁵²⁶ Welsby (1998), p. 244

⁵²⁷ ORR (2000b), p. 12. The ORR suggested to compensate Railtrack for the remaining congestion costs in the next control period.

⁵²⁸ ORR (2001), www.sra.gov.uk

*what its costs would be. There was no proper inventory of the state of the track and signals, and therefore no idea of how much investment would be needed to fix them.*⁵²⁹

Railtrack could have challenged the proposed access arrangements with an appeal to the Competition Commission, as provided in the 2000 Transport Act. Despite Railtrack ended up with roughly £1 billion less than requested in their ORR approved expenditure level, Railtrack accepted the charging regime in January 2001, which was subsequently implemented in April.⁵³⁰ Railtrack's *overall revenue requirement* from access charges for the TOCs for the second control period is built upon three components. First, Railtrack had to recover its expenditure from the access charges levied to operate, maintain, renew and enhance the network. Second, Railtrack must be allowed to achieve a return on its assets that is then added to the required level of expenditure. The third component comprises Railtrack's projected income from other sources than rail infrastructure, such as stations, property, open access and freight revenues. The projected revenue from other sources is subtracted from the sum of the level of expenditure and the return to determine the overall revenue requirement that has to be recovered via access charges.⁵³¹ The final ORR arrangements set Railtrack's expenditure level for 2001 to 2006 at £14.9 billion and granted Railtrack a real pre-tax rate of return of 8%.⁵³²

The Conservative government's Railways Act tried to implement a radical U-turn after decades of railways' dependence upon public sector financial support and the goodwill of politicians. Though the private sector rail franchises are still subsidised by the Strategic Rail Authority, the absolute figures are on the decline, as has been shown in tables 3 and 4, as well as chart 46. Initially, Railtrack obtained most of its income from access charges from passenger and freight rail operators. As a result of the access price regime for the second control period, Railtrack received £4.7 billion in government grant, mainly to make up for the spiralling costs of the West Coast Main Line modernisation, improved signalling and safety measures.⁵³³ Previously, public grants to Railtrack were strictly limited. But the Conservatives' intention to create political independence for the railway industry

⁵²⁹ Economist (2001b), www.economist.com

⁵³⁰ ORR (2000b), p. 8

⁵³¹ ORR (2000b), p. 6

⁵³² ORR (2000b), p. 9

⁵³³ Economist (2000b), p. 36. Ford (2001b) compared infrastructure investments under the private regime to the costs under BR and found that costs per mile more than doubled. The cost inflation of the West Coast modernisation is especially startling as it had been agreed upon in 1996 between OPRAF and the pre-privatised BR at £2.4 billion and is expected to more than triple, if it will ever be completed. Apparently, Railtrack's accountants must have had dropped a few figures.

was left in shambles in the aftermath of the rail accidents of Southall, Ladbroke Grove and Hatfield. Following disputes between the DTLR and Railtrack about further government funding of Railtrack plc, the network operator went into public administration on 8th October 2001. The current railway crisis has made concrete anticipations about further subsidies highly speculative. But even prior to the crisis the railway market was subject to various regulations and rigid obligations from contracts. Increasingly, Railtrack's and the franchisee's future is subject to political bargaining.

3.4 Suppliers

While British Rail owned, maintained and operated all of its rolling stock, the rolling stock was seen as a major burden to the TOCs due to their short franchise periods, relative to the economic life cycle of rolling stock, averaging 30 years. Accordingly, the Conservative government opted for leasing arrangements of British Rail's passenger rolling stock to the new train operators to save them the high initial investment costs in new or refurbished trains and lower entry barriers to the new railway market. The Secretary of State ordered the British Railways Board to create three British Rail subsidiaries by April 1994 and transfer BR's passenger rolling stock of 11,000 vehicles. Accordingly, *Angel Train Contracts*, *Eversholt* and *Porterbrook* were established. The leasing arrangements between the newly created ROSCOs with the 25 Train Operating Companies were already in place in December of the same year, prior to the commencement of the franchising process. Subsequently, the government sold the ROSCOs for about £2.6 billion in early 1996 to a private sector consortium, a management buyout and an employee buyout team.⁵³⁴

The ROSCOs are subject to the general competition law, with further regulation being absent.⁵³⁵ The majority of the leases tied the TOCs to the ROSCO until 2004, though a few leases expired in 1998.⁵³⁶ Effectively, the leasing contracts provided the ROSCOs with a guaranteed income over the leasing period, minimised competition between ROSCOs and transferred the risk of demand variations in the final consumer market to the TOCs. Though they rarely owned any assets themselves, the passenger rail franchises had to meet their franchise agreements with OPRAF, their leasing contracts with the ROSCOs and high fixed access charges with Railtrack.

Six heavy maintenance depots serve the rolling stock companies, carrying out heavy maintenance work for passenger and freight rail companies. The depots were sold to three private bidders between April and June 1995.⁵³⁷ Railtrack's infrastructure maintenance and renewal services are undertaken by seven infrastructure maintenance firms and six track renewal companies, which were sold until July 1996 (*see figure 1*).⁵³⁸

⁵³⁴ National Audit Office (1996), p. 19

⁵³⁵ Welsby (1998), p. 245 and White (1998), p. 117

⁵³⁶ Schabas (1997), p. 2

⁵³⁷ DETR (1998), p. 22

⁵³⁸ DETR (1998), p. 22

3.5 Government authorities involved

In order to supervise the new industry structure the Conservative government created the Office of the Rail Regulator as the *sole economic regulator* of the railways and the Office of Passenger Rail Franchising as a *public funding body* for passenger rail services. Their separate roles are best understood from figure 1. The head of OPRAF, the Franchising Director, awarded the franchises and paid subsidies to passenger franchisees, whereas the Rail Regulator is concerned with licensing and access arrangements of the TOCs to the railway infrastructure. The 1993 Railways Act empowered the Secretary of State to appoint both the Rail Regulator and Franchising Director, who appointed their own staff, subject to Treasury approval.⁵³⁹

In their New Opportunities White Paper, the Conservatives proclaimed they would introduce competition and open up the railway industry, moving away from central government planning to control by the market. However, by no account did they go full circle by dismissing the state owned railways into a free market environment when it came to the compromising Railways Act. Nash argues that the design of the system “...left the government with extensive powers over the rail system.”⁵⁴⁰ Welsby and Nichols add that even though “...the rhetoric of privatisation had been concerned with liberating management, the Railways Act of 1993 had the effect of ensuring that in many ways the privatised industry was subject to more regulation than its nationalised predecessor had ever been.”⁵⁴¹ OPRAF and the ORR dominated the regulatory framework, complemented by the *Secretary of State*, the *Health and Safety Executive* and the *Office of Fair Trading*. Though the Rail Regulator was legally independent from political control, as the then Conservative government was concerned about the private sectors’ willingness to invest in the rail industry “...OPRAF was clearly an instrument of government policy, taking its objectives direct from the Secretary of State...”⁵⁴² OPRAF was responsible for the terms and conditions of the individual franchise agreement, with regard to quality of service, price controls, duration of the franchise contract, levels of subsidy and finally, the terms upon which the franchises are awarded to bidders.

After the 1997 general election of the new Labour government, changes in transport policy towards more integration were announced in a White Paper, also affecting

⁵³⁹ House of Commons (1993a) and Public General Acts (1993), clauses 1-5

⁵⁴⁰ Nash (2001)

⁵⁴¹ Welsby and Nichols (1999), p. 61

⁵⁴² Nash (2001)

the Franchising Director's and Rail Regulator's roles. Labour's 1998 White Paper *A New Deal for Transport* and the resultant replacement of OPRAF with the Strategic Rail Authority, as well as changes to the safety structure of the UK railway system, are examined further below.

3.5.1 The Rail Regulator

The Rail Regulator is the sole *economic* regulator specific to the rail industry. His principal remit is the promotion of competition in the railway market and, logically derived from this objective, the prevention of anti-competitive behaviour, such as the abuse of monopoly power. The Rail Regulator's responsibilities regarding competition are shared with the Director General of Fair Trading. Closely connected to the aim of encouraging competition on the railways is the Regulator's obligation to promote and protect the passengers' interests and maintain network benefits of the railway industry.⁵⁴³

To achieve those goals, the Rail Regulator regulates the access to tracks and associated infrastructure, such as stations, depots, electricity supply and signalling. The train operators are required to obtain a licence from the Regulator prior to operating trains on the railway network. In addition, the access agreements between the individual train operators and Railtrack need to be approved by the Regulator.

As the Regulator's role is mainly concerned with competition and the prevention of the abuse of monopoly power it is hard to see what extra benefits the Regulator adds to society's welfare, as the Office of Fair Trading and the Regulator's functions are at least overlapping. In Germany it is currently discussed whether the railways should have their own regulatory body. The German equivalent to the Office of Fair Trading, the *Bundeskartellamt* strongly argued against a special regulator for the railways, as its functions are within the remit of the *Bundeskartellamt* and a further authority with similar tasks would double the inputs and obscure the competencies and responsibilities of the corresponding government agencies.⁵⁴⁴

⁵⁴³ DETR (1998), pp. 22-23, House of Commons (1993b), p. xii, National Audit Office (1996), pp. 16-20

⁵⁴⁴ Frankfurter Allgemeine Zeitung (2001d), p. 17

3.5.2 The Franchising Director

Originally, the Secretary of State issued the Franchising Director's prime objectives in March 1994: *"1. to secure the railway passenger services in Great Britain are provided under franchise agreements as soon as reasonably practicable; 2. to secure an overall improvement in the quality of railway passenger and station services."*⁵⁴⁵ In addition, the Secretary stated subsidiary objectives, including the promotion of efficient and economic railway services, the cost effective development of the railway system and the award of franchises to companies that have substantial involvement of former British Rail employees.

Therefore, the Franchising Director *"...negotiates, awards and monitors franchises granted to private sector bidders for the train operating companies and sets the maximum level of regulated fares that they can charge. The Franchising Director also stipulates the minimum service requirements that the train operating companies are required to provide and specifies targets for punctuality, reliability and prevention of overcrowding."*⁵⁴⁶ The Franchising Director's duties embrace the regulation of key fares and the monitoring of fare increases. Fare increases, however, are restricted by the RPI-X formula, i.e. fares might only rise by the Retail Price Index minus X per cent, where X=1 for the period 1999 to 2003, equalling a fall in real terms. However, a number of popular fares such as advance purchase tickets are set explicitly at the discretion of the train operating companies.⁵⁴⁷ Only exceptional circumstances would permit OPRAF the temporary operation of franchises, such as rejected closure applications or delays in the award of franchises.

The Franchising Director's powers were widened in November 1997, when he was equipped with re-defined objectives by the Secretary of State for the Environment, Transport and the Regions. The Secretary of State intended to strengthen the train companies' orientation towards passenger preferences, when he asked the Franchising Director to increase the number of rail passengers, work towards better quality of services and administer the current franchises in the interests of the passengers.

Though the Franchising Director had considerable decision-making flexibility under the terms of the 1993 Act, the Director was required to consult the Secretary of State on a number of occasions, such as the duration of the individual franchise agreements and

⁵⁴⁵ National Audit Office (1996), p. 21

⁵⁴⁶ DETR (1998), p. 23

⁵⁴⁷ Parliamentary Papers (1998), p. 95

major commitments in infrastructure investments. Also, the Franchising Director had to consult the Rail Regulator with regard to the companies involved in the tendering process and fare regulations the Franchising Director intended to implement.⁵⁴⁸ The New Labour government replaced OPRAF with the SRA in the 2000 Transport Act. The SRA formally assumed operations in February 2001.

⁵⁴⁸ National Audit Office 1996), pp. 6, 20

3.5.3 Rail safety bodies

The Health and Safety Executive's primary goal is to ensure "...that risks to people's health and safety from work activities are properly controlled."⁵⁴⁹ Complementing the ORR as the economic regulator, the HSE is the sole safety regulator for the railway industry and is responsible for both the enforcement of legislation and the examination of the railway safety cases. The *Health and Safety Commission (HSC)* is the government's statutory adviser on railway safety to whom the HSE reports. The Commission is directly accountable to the Secretary of State for Transport, Local Government and the Regions and to other Secretaries of State for the administration of the 1974 Health and Safety at Work Act throughout Great Britain. Whereas the HSE is the statutory regulator of railway safety, the most important role in the guarantee of safe operations, however, rests with the individual players in the railway market. "Railtrack has primary responsibility for ensuring the safe operation of the rail network, and each part of the railway industry has a legal responsibility to ensure that it operates safely, but the Government looks to the HSC/E to use their wide-ranging powers to ensure that safety standards are maintained, and improved where necessary."⁵⁵⁰

The Health and Safety Commission's advice contributed to the system of safety regulation that commenced in 1994. According to the safety regime for the railways, the train operators submit their individual railway safety cases to Railtrack for approval. The train operators' safety cases are risk assessments of their operations, including proposed risk management strategies. Railtrack has to prepare its own safety case and submit it to the HSE.

The *Safety and Standards Directorate (SSD)* was Railtrack's main internal body for its own safety management procedures, while its final responsibility rested with Railtrack Line, the operational side of Railtrack. In a DETR review of the Safety and Standards Directorate in February 2000, the Department issued concerns about SSD's dual role as it has internal and external safety responsibilities without a clear dividing line.⁵⁵¹ Additionally, the report expressed disapproval regarding the interdependency of Railtrack's commercial interests and the safety interests of SSD. Thus, the Department suggested the re-organisation of Railtrack's safety management procedures with the SSD as an independent subsidiary of Railtrack. The restructured SSD which was temporarily renamed *Railway Safety*

⁵⁴⁹ www.hse.gov.uk

⁵⁵⁰ DETR (1999b), paragraph 25

⁵⁵¹ DETR (2000a), paragraph 3

Limited (RSL) for the report's sake, would become the independent focus for safety in the rail industry. While RSL would inherit most of SSD's functions, the report recommended that the Health and Safety Executive should take over the responsibility to approve the TOCs individual safety cases from Railtrack.

DETR's initiative followed repeatedly expressed unease on the part of the Environment, Transport and Regional Affairs Committee. The Committee had argued for the removal of SSD from Railtrack on a number of occasions with the main purpose to remove Railtrack's responsibility for safety regulation.⁵⁵² In October 2000 the Rail Regulator announced the creation of a new wholly owned subsidiary of Railtrack, the *Independent Railway Safety Activity (IRSA)* that acquired the responsibilities formerly carried out by the SSD from 1st January 2001.⁵⁵³ Railtrack's modified network licence codifies IRSA's responsibilities and rules out any commercial functions of IRSA.⁵⁵⁴ This latest development is especially interesting in the light of the discussion in section IV about an entirely independent safety operator.

⁵⁵² In its report of 17th December 1999, the Committee argued for the SSD's removal from Railtrack for the third time, DETR (1999b)

⁵⁵³ DETR (2000e)

⁵⁵⁴ Department of Transport (2001), pp. 6-9

3.6 A New Deal for Transport: New Labour's transport policy

The New Labour government published their White Paper *A New Deal for Transport: Better for Everyone* in July 1998 with an emphasis on an integrated transport policy. The Paper foresaw the creation of a non-departmental public body, the Strategic Rail Authority, to work towards proper intermodal integration of the railway system and increase railway traffic as a share of total passenger and freight transport. Labour's principal aim was to initiate a renaissance for the railways. But the government saw the fragmentation of the system as a major burden towards achieving this aim. The Paper demanded a coherent network rather than a collection of franchises.⁵⁵⁵ Therefore, the 1998 White Paper pledged to establish a national Strategic Rail Authority “...to provide a clear, coherent and strategic programme for the development of our railways.”⁵⁵⁶ The 2000 Transport Act formally established the SRA as successor body of OPRAF by February 2001.

Though the government claimed that the respective roles of the Franchising Director and the Rail Regulator created confusion even within the industry, it suggested to replace OPRAF with the SRA. Main tools for the SRA's policy were accordingly the re-franchising process, management of current franchises, as well as the administration of subsidies to the TOCs. The SRA acquired a key role to strategically develop the railway network.⁵⁵⁷ It is, however, hard to see why the government assumed it would be easier to differentiate between the SRA and the ORR than between the ORR and OPRAF.

The White Paper revealed the underlying principle of the change in railway policy. While the Conservatives originally proclaimed that they were aiming to separate politics from business, New Labour's purpose rather resembles a guidance of private sector business. When “...opportunities arise for negotiating franchises, the new Strategic Rail Authority, guided by Ministers, will ensure that arrangements are made so that train operators structure and market their fares to offer value for money for their customers, and to reflect the fact that the railway is a national network which needs to be marketed accordingly and in a way which encourages people to switch from car to train.”⁵⁵⁸ The philosophy behind the approach is dominated by central planning. Assuming rational consumers, they know better than politicians or anyone else whether products,

⁵⁵⁵ Parliamentary Papers (1998), p. 94

⁵⁵⁶ Parliamentary Papers (1998), p. 43

⁵⁵⁷ Winsor 2001), p. 33

⁵⁵⁸ Parliamentary Papers (1998), p. 96

such as the train services they enter, offer value for money according to *their own* preferences.

The government intended to have a bigger say in the railway market, or rather, in railway *policy*. New Labour had a stronger belief than the past Conservative government in the beneficial effects and superiority of ministerial guidance over a competitive market place, even though it would limit the benefits of competition. The government regarded the British railway system as a single national system and it was not the private sector's task to integrate the railway network, but the government's. Also, Labour assumed *they* had to convince people to leave the cars at home and travel by public transport, instead of leaving the decision to the citizens' preferences. The potential train customers will prefer their private car use until their utility of using a train service exceeds their utility from using cars. Now, it is the TOCs' job to attract customers to their services. They have to run the railway under strict franchise constraints and earn money from the operations – however they achieve their objective. The White Paper's suggestions distort individual preferences and the market by interfering and guiding according to politicians' preferences and ideals. Naturally, they claim that they – and not the train companies – are creating the railway system “...for the benefit of the people that it exists to serve. The Strategic Rail Authority will be our prime vehicle for this... Passengers must in future have a greater voice in train services which are paid for with their fares and their taxes.”⁵⁵⁹ Now, what greater voice could the passengers have other than voting by feet against the services which do not match their preferences?

Admittedly, it is justified to expect efficient products from the taxes paid. In a free market, however, the customers would pay for the services they demand directly. The underlying assumptions of the 1998 White Paper fundamentally contrast with the 1992 White Paper's assumptions. While the 1992 Paper planned to curb politicians' involvement in the railway industry, more scope for regulation was on the agenda in the 1998 Paper. And indeed, the New Deal for Transport assumed that the government was *creating* the railway system, whereas the New Opportunities for the Railways suggested to shed as much responsibility from politics to an independent railway system, at least envisaging open entry to the transport market and an eventual sale of the train operating companies.⁵⁶⁰ If the political process prior to the 1993 Railways Act had followed the suggestions of the 1992 White Paper, Britain would have established a *full-scale privatisation* in railway transport.

⁵⁵⁹ Parliamentary Papers (1998), p. 97

⁵⁶⁰ Parliamentary Papers (1998), p. 97: “We want passengers to have a real say in the railway system which we are creating.”

The Conservative's 1992 White Paper aimed at a deregulation from a centralised railway *administration* towards a decentralised and competitive railway *market*. The role of the pace setters was transferred to private sector companies in limited passenger rail franchises. New Labour's 1998 White Paper contrasts the 1992 White Paper by re-regulation and a demand for a more integrated industry. Labour considered the government's and the SRA's guidance as principal forces in shaping the railway system, whereas the views expressed in the 1992 Paper envisaged private companies as innovators.

Labour assigned a number of key tasks to the independent Rail Regulator. Those included the setting of access charges to tracks and stations as well as an assessment of Railtrack's performance and investment levels in accordance with the access charges paid by the transport operators. Despite proclaiming the necessity for an *independent* Rail Regulator, the government announced that the Regulator's duties were amended "...to have regard to statutory guidance from the Secretary of State on his broad policy objectives for the passenger and freight railway."⁶⁶¹ The newly introduced statutory guidance to broad policy objectives supports the above arguments about the substantially different underlying principles of railway policy. Labour wanted to be an active player in the railway game, while the Conservatives' goal in their 1992 White Paper was to get a good seat in the front row to exercise some supervision over the market.

The White Paper's proposals were at the very basis of the Transport Bill, presented to the Commons in December 1999. The Bill received royal assent in the following year. It provided for the establishment of the Strategic Rail Authority as set out above. The Franchising Director's functions, his property, rights and liabilities were transferred to the SRA in Schedule 15 of the 2000 Transport Act. The Office of Passenger Rail Franchising was abolished, while the Rail Regulator's role was adjusted to the new environment and other duties. Finally, the Transport Act abolished the British Railways Board and transferred its property, rights and liabilities to the Secretary of State.⁶⁶²

In May 2001 the SRA unveiled its Freight Strategy⁶⁶³ to complement the government's 10 Year Plan published in the previous year to "...tackle congestion by improving all types of transport – rail and road, public and private – in ways that increase choice."⁶⁶⁴ The Plan

⁶⁶¹ Parliamentary Papers (1998), p. 97

⁶⁶² House of Commons (1999) and Public General Acts (2000), especially Schedules 15-18

⁶⁶³ SRA (2001b)

⁶⁶⁴ Financial Times (2000b)

comprised financial commitments amounting to £180 billion over a decade, a third of which was reserved to improve the national railways network with new track, signalling, stations and rolling stock. John Prescott, the then Secretary of State, made assurance that “...almost three-quarters – £132 billion – will come from the public purse...We will secure that investment through long-term partnership with the private sector: new rail franchises lasting up to 20 years, 30-year contracts for roads and a 30-year public private partnership for London Underground.”⁵⁶⁵ Nevertheless, it is now more than doubtful whether the investment will meet the government’s targets of 50% growth in passenger rail and 80% growth in freight rail transport.⁵⁶⁶

Connex South Central was the first franchise operator to lose out in the re-franchising game. Their South Central franchise comprises commuter services between London, Surrey and Sussex with 100,000 passengers per day. The Strategic Rail Authority awarded the network to GoVia, a subsidiary of Go-Ahead. After agreements with Connex on an early changeover of the old seven year franchise, GoVia assumed operation on the commuter network in August 2001.⁵⁶⁷ Further negotiations between GoVia and the SRA were under way towards a new 20 year franchise with planned investments of £1.5 billion in new rolling stock, stations and major track upgrades to increase capacity. GoVia aims at doubling passenger numbers in the next 20 years, while the UK network is expected to grow by 52 per cent. As the sacking of Connex’ followed prolonged complaints about their late, dirty and overcrowded trains, the SRA’s decision to end Connex’ South Central franchise was seen as a warning to other franchise operators who were also criticised for poor performance.⁵⁶⁸

Changes to the industry’s overall structure were on the agenda after the SRA’s official launch in February 2001. The chairman of the recently established Commission for Integrated Transport made a case for a merger of the ORR and the SRA.⁵⁶⁹ Further, he argued for a vertical re-integration of TOCs and the lines they use on a leasing basis from Railtrack. At the same time, talks were under way between FirstGroup, Stagecoach and

⁵⁶⁵ DETR (2000b)

⁵⁶⁶ Grant (2001), p. 26. Ford (2001a), p. 17 suggests that the railway part of the 10 Year Plan is possibly nothing more but a meaningless concept since the latest events in the railway market.

⁵⁶⁷ SRA (2001f)

⁵⁶⁸ Financial Times (2000d), p. 1, Financial Times (2000e), p. 4, Financial Times (2000f), p. 21, Financial Times (2000c), p. 26 discuss the SRA’s decision to sack Connex’ from operating the South Central franchise due to poor performance.

⁵⁶⁹ The 1998 White Paper announced to establish the Commission to “...provide independent advice to Government on the implementation of integrated transport policy...”, PP(1998), p. 92

National Express with the Strategic Rail Authority and Railtrack to explore possibilities for re-integration of track and operations. John Prescott, the deputy prime minister, was trying hard to *think the unthinkable* in the aftermath of Hatfield, considering that the number of train operators could be as few as four or five. Still, the *Financial Times* claimed that radical change was not on the SRA's agenda as the SRA's chairman Sir Alastair Morton found that "...a number of rail industry chiefs know they have had quite enough restructuring."⁵⁷⁰ In March 2001 *The Economist* predicted that the process of re-franchising and re-structuring might well produce a rail industry of four or five regional operators in sole charge of railway transport in their areas, with Railtrack being "*in essence a large property company with minor operational responsibilities.*"⁵⁷¹

The reduction to four or five franchises is not currently on top of the agenda, but the SRA established longer franchises for periods of 20 years. Also, the SRA created three new franchises comprising several old franchises, the *TransPennine Express*, the *Wales & Borders* and the *Wessex* franchise. Planning is under way to form an *OrbiRail* franchise for round-London services, which is unlikely to come into being before 2003-04.⁵⁷²

⁵⁷⁰ *Financial Times* (2000e), p. 4

⁵⁷¹ *Economist* (2001a), p. 39

⁵⁷² SRA (2001a), pp. 27-29 and Abbott (2001) on over- and underground rail developments in London

3.7 The railway crisis

Every action in life involves risk and thus, a trade-off between the expected costs and benefits of each action. The railway tragedies at Clapham Junction (1988), Southall (1997), Ladbroke Grove (1999) and Hatfield (2000) had shaken the railway industry. In the aftermath of the accidents, it was sometimes claimed that they were a natural outcome of the privatisation that starved the railways off funds. However, total investment figures on the railways more than doubled since privatisation. Though the argument might then proceed that British Railways were already on a dietary investment programme prior to privatisation, the current private rail industry does obviously not deserve the blame for low spending prior to their involvement. Either the former governments are to blame for under-investment of BR, the private sector for the current quality of investment schemes or, more likely both.⁵⁷³

In a report to the Rail Regulator, *Booz, Allen & Hamilton* underline that Railtrack *"...has to work, for the most part, with the infrastructure inherited from BR, especially with what seems to be rather poor ballast over much of the network; what Railtrack can be held responsible for is if it is replacing poor-quality ballast with the same... What is more relevant is the extent to which Railtrack is currently adopting maintenance philosophies which are inefficient, given the infrastructure that exists. There were clearly a number of policies during the first control period that were sub-optimal – not least the structure of contractual arrangements which seems to have provided almost no information about what was happening... In summary, we are sure that Railtrack is still pursuing sub-optimal policies, and these will be increasing costs above what could be achieved..."*⁵⁷⁴ Arguably, the doubling of investment figures since privatisation solely makes a point about the amount of money spent on the railways, abstracting from quality for money. And indeed, Ford wondered about the productivity of investment schemes under BR compared to the private regime. Following a detailed analysis of major projects over the last decades Ford concludes, as a rule of thumb *"...current schemes are costing two to three times what BR would have paid for the same project."*⁵⁷⁵

Under the state run system, BR was in competition with other state-owned industries and public projects for scarce public funding. The decision on spending more for

⁵⁷³ Bagwell (1984), p. 25 confirms that government financial support to BR was generally on a small scale compared to other European railways. He cites a Leeds study revealing that revenues covered 71% of BR's total costs, while only Swedish railways were more self-supporting at 83% in 1977.

⁵⁷⁴ Booz, Allen & Hamilton (2000), ch. 4, p. 5. The Economist (2001b) confirms the assumption about the state of the infrastructure, though there is no inventory of its condition.

⁵⁷⁵ Ford (2001b), p. 21

safety on railways may be politically desirable. Naturally, it results in a trade-off between investment in rail safety and other public or private projects that would receive lesser funds. The trade-off is a constraint on excessive spending for individual projects. Notwithstanding the amount of safety investment, a totally safe railway system is an illusion. It would logically imply an immediate cancellation of all train services on Railtrack's network. There is no guarantee that rail accidents will never occur again, unless the railway is brought to a complete standstill. Political promises of a safe railway system may serve short-term political purposes but whatever investment or initiatives are pursued, railways are a fail-danger technology where chance plays a major role. Nevertheless, there are ways to make the railways even safer than they are today. In their *Southall and Ladbroke Grove Joint Inquiry into Train Protection Systems*, Cullen and Uff comment upon the following protection systems:⁵⁷⁶

- The *Automatic Warning System (AWS)* provides a warning and braking system at red or yellow signals. Though the AWS is fitted to the UK network, the driver may cancel it and the technology is outdated.
- The *BR-Automatic Train Protection System (BR-ATP)* has been installed in the early 1990s on the Great Western and Chiltern lines, but the Cullen and Uff Inquiry judged the BR-ATP as an antique technology.
- BR and Railtrack had developed the *Train Protection Warning System (TPWS)* jointly from 1994. Its fitting will be made mandatory from 2003. However, the main shortcoming of TPWS is its limited effectiveness to maximum speeds up to 74mph.
- TPWS+ is an enhanced version, which would be capable of stopping trains with speeds exceeding 74mph at red signals, whereas TPWS-E would offer a possibility to upgrade to the *European Train Control System (ETCS)*.
- The ETCS is currently undergoing tests in Europe. It has the advantage to increase overall track capacity, accommodating for the expected rise in UK rail travel. The ETCS may evolve into a European Standard, as its fitting is required by European law.

Following the Ladbroke Grove disaster, the Deputy Prime Minister John Prescott requested a report on *Signals Passed At Danger (SPADs)* from Sir David Davies, the President of the Royal Academy of Engineering, which was then taken account of in the Joint Inquiry report of Cullen and Uff.⁵⁷⁷ The Joint Inquiry report recommends the

⁵⁷⁶ In their HSC (2001) report, the Cullen and Uff Joint Inquiry extensively commented on the different options of Train Protection Systems. Though the systems are briefly outlined, they are not the focus of this thesis.

⁵⁷⁷ Davies (2000), www.raeng.org.uk

installation of the TPWS+ system, whereas further decisions concerning TPWS-E should be left to the railway industry, as it could not be installed before late 2003 and the costs would substantially exceed the costs of the simpler versions of TPWS. European legislation requires that high-speed lines be fitted with the ETCS system when signalling systems are renewed or upgraded.

In addition to the technical measures, other means to make the railways safer than they are today may result in a further re-organisation of the railways or simply in internal re-structuring of Railtrack's and the operator's safety management procedures. In the case of a SPAD like in the Ladbroke Grove/Paddington rail crash there must be an immediate and clear line of communication to other train drivers approaching the potentially perilous location. SPADs are a major source of accidents when compared to broken rails, the cause of the Hatfield crash, despite broken rails averaging two per week in Britain. However, Hatfield's four victims, the disruptions of the British rail network for half a year including major loss of confidence in the railways and the political uncertainties surrounding Railtrack's future might have been avoided. Railtrack's maintenance contractors Balfour Beatty already detected cracks in the broken rail at Hatfield several months before the accident. Whereas a new rail was stored at the site for five months waiting to be fitted, Railtrack had difficulties in arranging for a temporary suspension of services on the busy line in order to carry out the replacement works as delays would result in fines for Railtrack. A different set of priorities in Railtrack's penalty scheme, its internal procedures and unambiguous management responsibilities might have avoided Hatfield and the entailed loss of life and confidence in the railways that also resulted in millions of forlorn revenues and penalties.

In the months following the board's acceptance of the Regulator's *Final Conclusions on the Periodic Review of Track Access Charges*, Railtrack's financial crisis unfolded, partly as a consequence of Hatfield and the massive cost overrun in the West Coast Main Line upgrade.⁵⁷⁸ Although Railtrack's then Chief Executive Steven Marshall designated the review as disastrous, his board refrained from challenging the Regulator and accepted his verdict that made allowance for £14.9 billion for operations, maintenance, renewal and enhancement of the network during the second control period 2001 to 2005.⁵⁷⁹ The figure was up from £12.9 billion during the first control period between 1996 and 2000 but £1

⁵⁷⁸ Economist (2001b), www.economist.com and Ford (2001a), pp. 17-20

⁵⁷⁹ ORR (2000b), p. 7 and Ford (2001a), p. 17

billion less than demanded by Railtrack. Ford judges that “...*Railtrack did not understand the basics of its business.*”⁵⁸⁰ Though Railtrack’s income was inadequate to cover rising maintenance and renewal costs, the track operator was bought off by the government’s early release of £1.5 billion grants and £500 million for unachieved freight revenue with a potential for further subsidies.⁵⁸¹ Railtrack could have appealed to the Competition Commission under the arrangements under the 2000 Transport Act to adjust and delay the implementation of the charging regime but refrained from according measures.⁵⁸²

Suddenly in June 2001 Railtrack claimed it would have to invest an extra £3.8 billion over the next five years just to keep the rail network in a reasonable condition. Railtrack scaled back spending by 30% on investments that were not yet committed, but the commitments alone “...*were assuming nightmare proportions: the West Coast main line upgrade, originally priced at £2.3 billion, was passing £7 billion and still climbing.*”⁵⁸³ Apparently, Railtrack’s unfolding financial crisis could not have been a surprise to its board. However, the board accepted ORR’s review in January. Railtrack demanded an additional £2.6 billion as well as a suspension of the regulatory regime. Railtrack’s £138 million dividend to shareholders at the same time didn’t go well with ministers.⁵⁸⁴ The Secretary of State forced Railtrack into insolvency, because he did not consider it reasonable to support Railtrack with further public subsidy. Following Byers’ action to place Railtrack under public administration, it was openly debated whether the Secretary blackmailed the supposedly independent Regulator prior to the events, as the Regulator could have bailed Railtrack out with additional subsidies. In a letter to the High Court on the administration proceedings, the government’s advisers stated that the Secretary had informed Railtrack’s chairman that he would “...*introduce a bill at the earliest opportunity giving him the direct power to direct the rail regulator.*”⁵⁸⁵

The DTLR planned to turn Railtrack into a not-for-profit trust, independent of government and on a fully commercial basis.⁵⁸⁶ However this supposedly commercial structure may look like, it seems for sure that the new undertaking requires large injections of taxpayers’ money, while the Secretary of State “...*has to prove that whatever takes charge of the*

⁵⁸⁰ Ford (2001a), p. 17

⁵⁸¹ Ford (2001a), p. 17 and Grant (2001), p. 26

⁵⁸² ORR (2000b), p. 17

⁵⁸³ Grant (2001), p. 26. This inflation in projected costs fits well into Ford’s rule of thumb above.

⁵⁸⁴ Grant (2001), p. 26

⁵⁸⁵ Financial Times (2001d), p. 3 and Ford (2001a), p. 19

⁵⁸⁶ Ford (2001a), p. 19

*railways will work better than the old Railtrack did.*⁵⁸⁷ And he may encounter increasing difficulties in encouraging private investors to part-fund the bill. Though Byers constantly claimed that his move was no renationalisation of the infrastructure operator, the confidence of capital markets in the government's commitment to public-private partnerships has been thwarted. This might also have implications for further public-private projects of the government, such as the part-privatisation of London Underground that is on Minister's desks.⁵⁸⁸ Still, engineering firms that undertake maintenance and renewal for Railtrack were discussing a scheme to run the infrastructure provider as a not-for-profit organisation as proposed by the government. The original idea of the DTLR, however, seemed to suggest that the members of the new organisation would be industry stakeholders appointed by the SRA.⁵⁸⁹

⁵⁸⁷ Economist (2001b), www.economist.com

⁵⁸⁸ Financial Times (2001b), www.ft.com and Financial Times (2001d), p. 3 for Stephen Byers' attempts to give industry leaders reassurance.

⁵⁸⁹ Grant (2001), p. 27 and Frankfurter Allgemeine Zeitung (2001h)

4. An assessment of the reform process

4.1 Performance

The years following privatisation have seen a rise in both passenger and freight rail transport (*see charts 48-52*). In 2000-01 passenger rail travel was at its highest level since the late 1940s and was anticipated to increase by a further 50 per cent by 2010.⁵⁹⁰ Freight lifted rapidly went down until 1994-95, stabilising in the range of 100 million tons per year thereafter, whereas freight moved shows a steady increase up to 18.1 billion ton kilometres in 2000-01, pointing towards increased average journey lengths.⁵⁹¹ The government's 10 Year Plan and the SRA's Freight Strategy anticipated a further 80% growth of rail freight.⁵⁹² Total passenger kilometres went up by 37% and freight moved by 39% over the 1994-95 figures. However, the increase led to capacity bottlenecks on Railtrack's network, as the company could hardly accommodate such drastic growth. Chart 52 shows a slower rise of coal in proportion to other freight moved, hinting at the private FOCs attempts to diversify into a wider freight market, as mentioned above. The charts also illustrate the success of the implementation of sector management to British Rail in 1982. But the upturn of the passenger figures was soon curtailed by the recession in the early 1990s and started to recover only at the time of privatisation.

Apparently, the rail figures are highly sensitive to the overall economic performance, which seemed to support the growth of the rail industry after the 1993 Railways Act. The freight business shows a serious decline in 1984-85 as a consequence of the miners' strike. The major disruptions following the accident near Hatfield on 17 October 2000 had a further temporary impact on the rail industry, when Railtrack imposed over 1000 Emergency Speed Restrictions across the network. Severe flooding and weather conditions during the autumn of 2000 aggravated the disruptions to the industry and led to temporary closures on several routes. Despite these negative influences on the rail industry, passenger numbers increased slightly by 2% during 2000-01.⁵⁹³ Nevertheless, their effect is visible in the small reduction of passenger revenues in 2000-01 as a consequence of compensation payments to travellers and the minor setback of the growth trend in freight traffic (*charts 50 & 52*). Still, it is likely that the expected downturn of the economy in 2001-

⁵⁹⁰ Economist (2000a), p. 36 and DETR (2000b). Detailed performance assessments on every operator are provided in sSRA (2000c).

⁵⁹¹ sSRA (2000b), p. 17

⁵⁹² DETR (2000c) and SRA (2001b), p. 7

⁵⁹³ SRA (2001e). The weather in the autumn of 2000 was the wettest in England and Wales since 1872.

02 will have a more serious effect on the railways, if the trend follows the experience of the early 1990s. Naturally, a shrinking economy would affect trade and business travel on the railways with consequences for freight and passenger traffic in business centres.

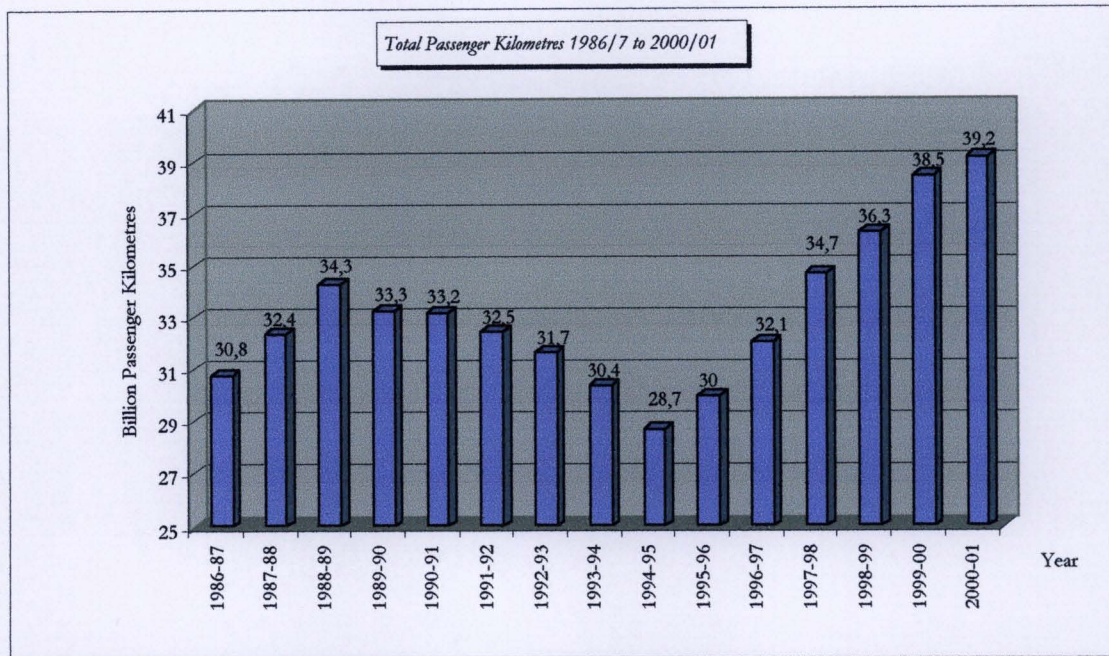


CHART 48

Source: SRA (2001c), p. 4

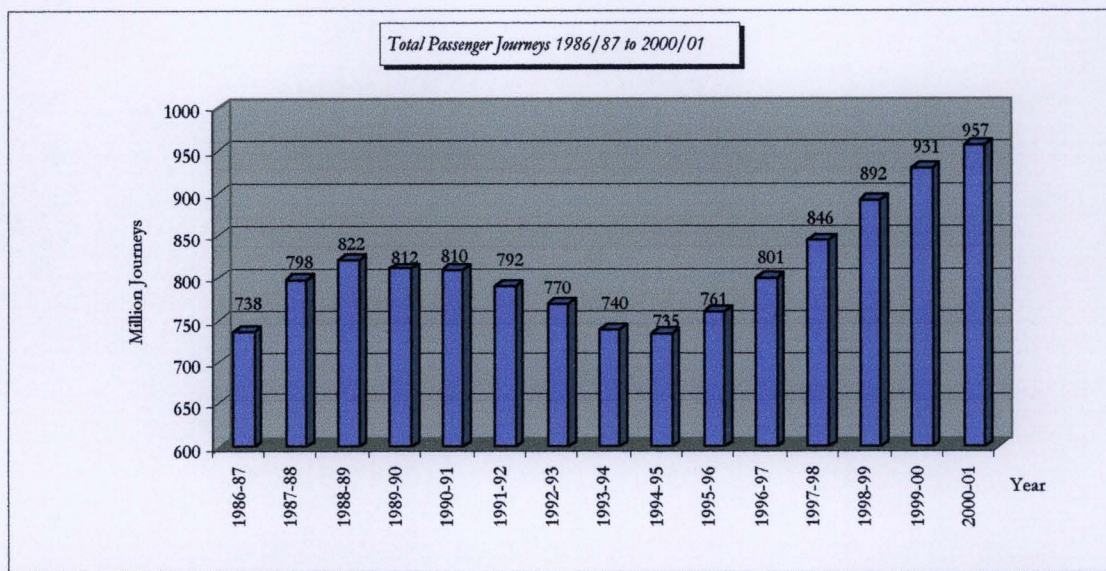


CHART 49

Source: SRA (2001c), p. 7

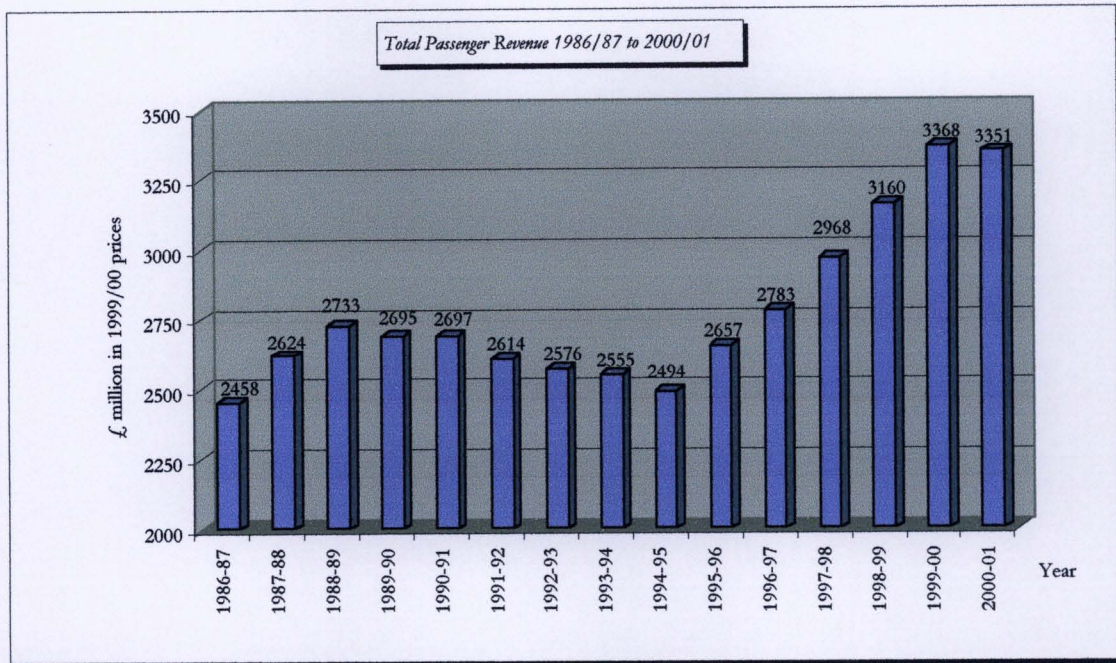


CHART 50

Source: SRA (2001c), p. 10

According to the Strategic Rail Authority's data on investment, figures post privatisation more than doubled in real terms, with an increase of 29% over the 1999-2000 figures in the last year as a direct result of the accident at Hatfield (*chart 53*). Since the railway reform it was constantly claimed that the investments were insufficient for the rising transport needs on Britain's railways, above all with regard to infrastructure investments. The investment data embraces expenditure on rolling stock, track renewals, new routes, electrification, signalling, buildings, plants and equipment. Chart 45 above already illustrated the decline in overall government support to the railway industry. Whereas the total government support to the rail industry was expected to fall further due to the trend in franchise payments depicted in chart 46, the number of past railway tragedies in Southall, Ladbroke Grove and Hatfield, as well as Railtrack's move into public administration are expected to have an adverse effect on overall public transfers to the railways. The actual figures will remain a mystery, until specific measures with regard to railway safety and the future relation between Railtrack and the government have been resolved.

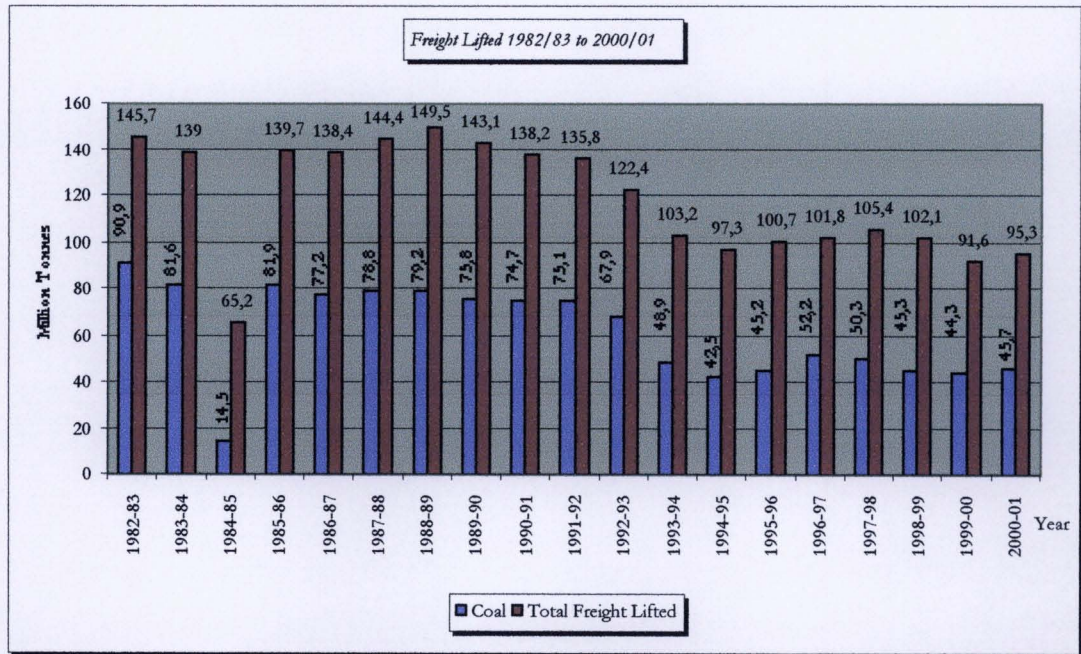


CHART 51

Source: SRA (2001c), p. 25 and www.sra.gov.uk

Note: Due to changes in compilations of freight traffic estimates after privatisation, exact comparisons of the pre and post privatisation periods are not possible. Therefore, there is a break in the figures after 1995-96.

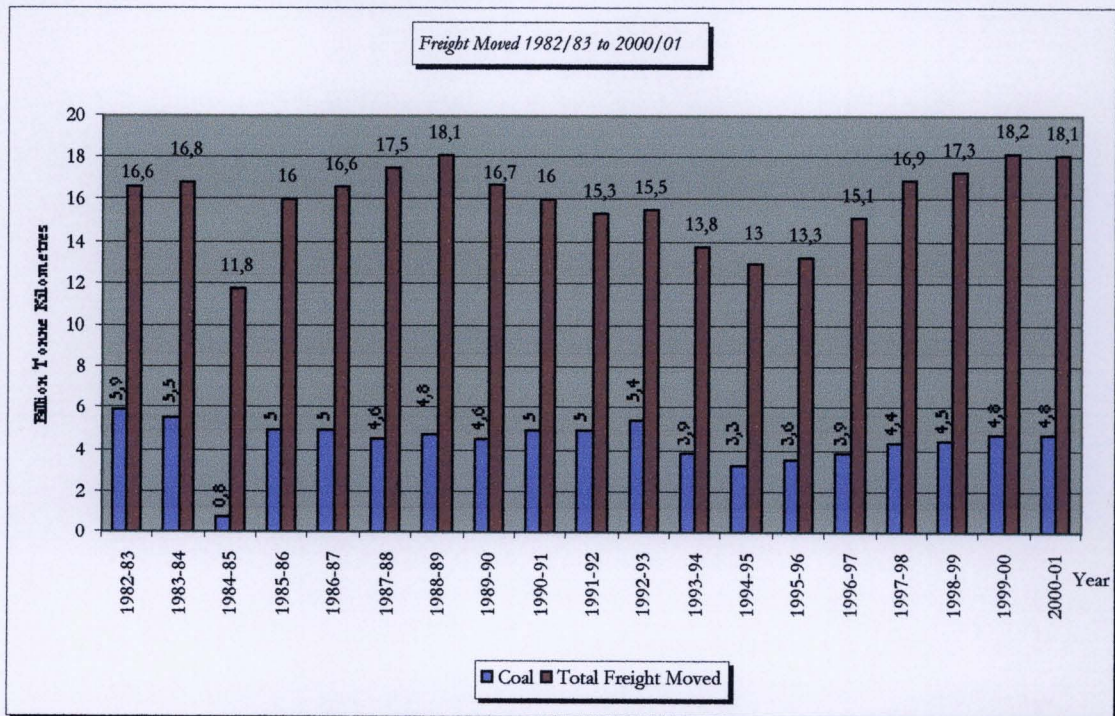


CHART 52

Source: SRA (2001c), p. 23 and www.sra.gov.uk

Note: Due to changes in compilations of freight traffic estimates after privatisation, exact comparisons of the pre and post privatisation periods are not possible. Therefore, there is a break in the figures after 1995-96.

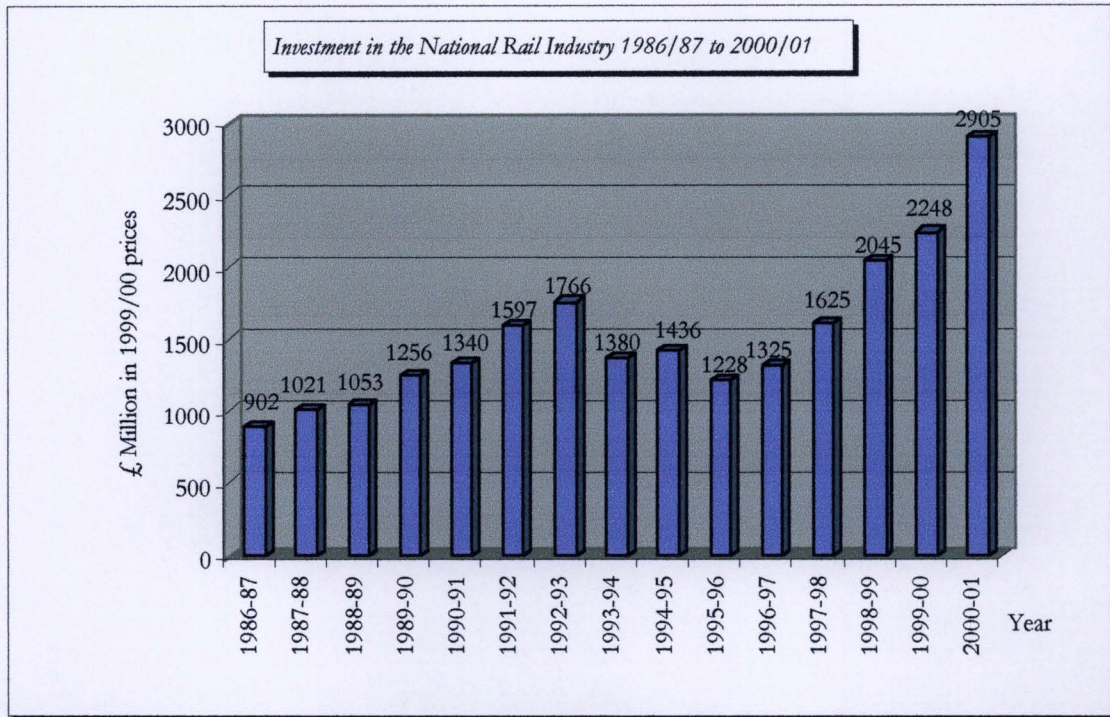


CHART 53

Source: SRA (2001c), p. 29

Note: Passenger Transport Executive grants for investment are not included. Due to a change in accounting measures in 1994, the figures pre and post 1994-95 are not exactly comparable. The data exclude depreciation.

4.2 Infrastructure and train operations

Apparently, competition in the market for rail track access is almost absent. The TOCs depend upon Railtrack for the application of their safety cases and access contracts, regulated by the ORR. As the only supplier of infrastructure access, Railtrack exercises considerable market power in the railway industry.⁵⁹⁴ However, regarding the wider transport and communication market, Railtrack's railway market power is considerably curbed.⁵⁹⁵ Assuming an efficient access price system, Railtrack has a rational interest in granting access to every operator who pays the way and thus, creates revenues for Railtrack by means of track access charges, though some discrimination may pay off for Railtrack. Lost traffic to train companies means lost revenue for Railtrack. If the incumbent TOCs or newcomers, in co-operation with Railtrack, attract further traffic volumes to the railways from other modes of transport or create new markets, both the train operator's and Railtrack's receipts will rise, creating a win-win situation for both parties. Should Railtrack exercise its dominant position in the railway industry and charge excessively high access prices, it behaves irrationally by eliminating its own foundations and income in the long run. Even in the unlikely case that Railtrack may behave irrational, thereby eradicating the basis of other businesses in the railway industry, a complaint to the Office of Fair Trading on account of abuses of monopoly powers should be sufficient.

Indeed, the previous argument is only true for an efficient access price regime. In contrast, the charging scheme in operation during the first control period until March 2001 led to inefficiencies and distortions in the transport industry. The high fixed element of the access price set an incentive for train operators to run additional trains, even if they were only lightly loaded. Railtrack claimed that the variable component did not even cover wear and tear costs. Accordingly, Railtrack would rather have an incentive to *discourage* additional services, as they would equal a cross-subsidy from Railtrack to the operator. Following Railtrack's comment to the Rail Regulator, the variable component of the access charge was increased for the second control period and a capacity charge was implemented to promote more efficient allocation of scarce slots on the network. The pricing policy discriminates in favour of newcomers and freight operators, as both are solely charged for

⁵⁹⁴ Tom Winsor, the Rail Regulator issued a warning to Railtrack, that they must not behave like a dictator in the industry, *Financial Times* (2000h).

⁵⁹⁵ Bradshaw (2000), p. 234 argues that Railtrack's "*monopoly status*" was one of the least satisfactory outcomes of rail privatisation, as the relationship between the regulator and Railtrack is characterised by asymmetric information. Above others to obtain yardsticks for Railtrack's cost structure, Bradshaw suggests a break-up of Railtrack, "...although any break-up of the company might herald the regrouping of the railway into vertically integrated entities." Section IV shall analyse a railway structure with competing track operating companies.

the variable costs. The charging schemes for the first two control periods until March 2006 more or less guaranteed Railtrack's revenue allowance, further discouraging Railtrack from expanding the network or run it more efficiently. The Regulator's approved revenue allowance for Railtrack is based on track access revenues from train operators. The franchised services, however, have franchise conditions to meet that guarantee Railtrack's income.

Also, competition between train operators is still limited to a few major connections, mainly out of London up to the north of England and Scotland, where competition between different routes developed, e.g. between Virgin on the West Coast Main Line and Great North Eastern Railways along the East Coast, or passenger services by Silverlink up to Birmingham. Still, neither the open access to new entrants, nor a full privatisation, i.e. an eventual sale of the franchises have so far materialised on the government's agenda. Though the 1992 White Paper suggested open access and a final sale of train operations, it is doubtful whether the Conservatives would have met their own original proposals, which were watered down in the policy process leading up to the 1993 Railways Act and compromised in the first franchising process due to anticipated adverse effects on the amount of subsidy to the TOCs and the prospects of the upcoming general election.

Following guidance from the Secretary of State, the Rail Regulator decided in 1994 that competition on the track should be restricted for the period of the initial franchises through moderation of competition arrangements of the ORR. The government was concerned that the threat of open access might have an adverse effect on the prices of the initial franchising process and also on the overall success of the privatisation.⁵⁹⁶ During the first stage of the moderation of competition arrangements, competitive entry generally required the approval of the incumbent franchise operator, if traffic flows generated more than 0.2% of the franchisee's revenue on a specified flow. The franchise operator nominated all such flows to the Rail Regulator for approval. The TOC might also request nomination of flows not currently served by an existing train operator, if a potential newcomer could endanger the franchisees core market on that alternative route. Thus, potential entrants were restricted to operate services on flows that generated less than 0.2% of the franchisee's revenue. Alternatively, only flows on which no through service was

⁵⁹⁶ Bolt 1997), p. 10

provided were subject to open access competition.⁵⁹⁷ In September 1999 the second stage relaxed the protectionist access arrangement to a threshold of 20% of the incumbent franchisee's revenue on nominated routes. Non-nominated services are open to potential competitors. This stage is expected to expire in March 2002 and "*...the Regulator does not believe that it would be appropriate to introduce new moderation of competition arrangements from 1 April 2002. Instead he intends to consult on the appropriate long term approach, in the context of the Strategic Rail Authority's...franchise replacement programme.*"⁵⁹⁸ Since privatisation, competition in the privatised market has been strictly restricted to overlapping or parallel franchises and to emerging open access providers, such as *Hull Trains'* non-franchised passenger operations between Hull and King's Cross. The moderation of competition was implemented to facilitate the successful franchising process.⁵⁹⁹

Before the passing of the Railways Bill in 1993 Glaister and Travers commented on the government's proposals to implement open access rights at some future date. They suggested, "*...the outcome could be that passenger services on profitable routes would be provided entirely by 'open access' operators in competition with one another. Services on unprofitable routes would be operated under franchises, if the Franchising Director decided they were worth running at all.*"⁶⁰⁰ Notwithstanding its advantages, Glaister and Travers highlight likely complications, as the open access competition would eliminate profits that were used to cross-subsidise loss-making operations. In the end, the general taxpayers would lose, as they would have to fund the unviable services that are preserved.⁶⁰¹ But this exactly is the point of so-called public services, which are to a lesser – or often greater – extent paid for by the general taxpayers, whether or not they ever use the specified public service. Over the past, cross-subsidies from profitable to uneconomic services resulted in the profitable sector losing competitiveness with other modes of transport that did not have to comply with comparable obligations and could skim the cream on the most promising routes. Open access providers would indeed opt for profitable routes and they might also find former unprofitable routes or links that were already out of service to offer some economic potential. These services are not a *public*, but a *private service* in an industry like any other industry. Public services should be in the realm of the government and accordingly the government and in the event the taxpayers must be ready to fund the unviable services for

⁵⁹⁷ Jones (2000), p. 376

⁵⁹⁸ ORR (2001), www.sra.gov.uk

⁵⁹⁹ Preston, Whelan and Wardman (1999), pp. 86-89, 92 studied the scope of open access competition and concluded that competition-on-the-track would generally result in a transfer of rents from producers to consumers and from incumbents to newcomers, rather than an increase in overall welfare.

⁶⁰⁰ Glaister and Travers (1993), p. 41

⁶⁰¹ Glaister and Travers (1993), p. 41

the advancement of public welfare. In that case, public subsidies would be transparent and easily accounted for by the taxpayers.

It may well be that the Regulator will move into this direction after the expiration of the moderation of competition arrangements in 2002, when he considers his further approach to open access operators in conjunction with the SRA's re-franchising process. According arrangements would still require the SRA to tender unviable routes of regional or social importance if government so desires, while the Rail Regulator's functions might move to the marketplace and the Office of Fair Trading. The train operators could then compete in a railway market instead of an administered regime of price and output controls.

The duration of the first franchise agreements between OPRAF and the TOCs was designed to be in the range of 7 to 15 years, depending upon the investment needs of the franchise. Preston, Nash and Wardman estimated that an extension of the franchises by five years would have reduced annual subsidies by £415 million, equalling a 21% reduction of the total subsidy bill.⁶⁰² Also, short franchise periods may very well discourage investment in the system, though proponents of the short franchises stressed that shorter periods would promote the competition for franchises.⁶⁰³ Further, it might be expected that incumbent franchise owners try to run ahead and invest in their franchise in order to be rewarded in the re-franchising process, but this strategy is highly sensitive to political decisions. Labour's initial claims of a re-nationalisation of the railway system should have served as a reminder to the then Conservative government that the re-franchising process and the performance of the TOCs depend upon public policy, contrasting the aim of the Conservatives to create a railway system independent of politics. It is inherent to franchise systems that rules of the game may be altered in the next round of franchises, and this is indeed what happened with Labour's New Deal and tighter rules in the re-franchising process. The uncertain future of railway policy under either a Conservative or Labour government, the prospects of re-nationalisation, tougher regulation and the possibility of different rules after a general election or whenever it suited political bargaining are disincentives to the franchisees' investment policies. The SRA extended franchise periods to 20 years in a more strategic approach. Admittedly, the longer franchise duration erects legally protected market barriers for the specified service. Thus, open access provisions to

⁶⁰² Preston, Nash, Wardman et al. (1997), ch. 4

⁶⁰³ Preston et al. (2000), p. 103

the entire railway network are needed more urgently than before to challenge the franchised operators to provide high-quality services to the consumers.

It is often claimed that one of the major drawbacks of the British railway reform is its institutional complexity, involving high transaction costs. This shall be discussed in section IV, which argues that transaction costs also occur within a single national railway company, such as British Rail or Deutsche Bahn AG. Negotiating costs or costs of enforcement may even be lower in a decentralised railway market between a number of companies and regulators than in a centralised single railway company. Nevertheless, the diversity of public regulatory bodies has been called into question further above. A network of obligations imposed upon the rail operators markedly increases negotiation and compliance costs. Also, the amount of 25 TOCs may not be optimal. The number of 25 companies is as arbitrary as the number of four companies after Britain's 1921 merger. It may well be that the railway market works more efficiently with fewer train operating companies and suppliers. As mergers are quite common to every market economy, a further concentration in the railway market might be expected to align closer to the market optimum.⁶⁰⁴

Passenger rail transport in the UK is undertaken by 25 different franchisees. But only 11 different companies own the 25 TOCs as depicted in Table 2 above. A prominent concern was that four of the 11 franchise owners are also major bus and coach operators, giving rise for potential market dominance or a drain of resources from the rail franchise towards the bus operator or vice versa.⁶⁰⁵ However, the combination between bus and train operators also offers considerable benefits in form of transport integration, which is so often demanded by advocates of re-nationalisation, re-regulation and alike. Integration of the entire transport industry was the major goal of the proponents of the 1947 Transport Act, which established the British Transport Commission and also the 1998 *New Deal for Transport*. Though public sector monopolies for the entire transport market were expected to produce massive benefits to society, a strong position of private firms leads to fears of monopolistic behaviour. Parliament was the sole regulator of the monopolistic British Transport Commission. In contrast, the ORR, the SRA, the HSE, the Secretary of State, the Office of Fair Trading, European competition laws and direct competitors check private companies in the transport market.

⁶⁰⁴ Interviewees in a study by Preston et al. (2000), p. 103 expected a consolidation in the industry to a final 4 to 6 operators in ten years.

⁶⁰⁵ Preston et al. (2000), p. 104

4.3 Regulatory interference

The Conservatives' 1992 White Paper envisaged broad objectives for the franchisees, no regulation of fares, except for London commuters, a combination of franchised and open access operations to the passenger rail industry and an eventual privatisation of franchises. The 1993 Railways Act, however, implemented tight regulation that was not foreseen in the White Paper. The result was a contradiction of the government's original objectives and an unsound privatisation process. Welsby and Nichols indicate that the privatised industry structure was more tightly regulated than the state owned BR and Nash confirms that the 1993 design granted the government extensive regulatory powers over the industry.⁶⁰⁶

The postponement of open access made the creation of the ROSCOs at best redundant. Instead, the BR's rolling stock could have been allocated to the franchisees, similar to Statens Järnvägar's transfer of rolling stock to the CPTA.⁶⁰⁷ While the idea of leasing companies for rolling stock would facilitate competition in an open railway market due to a reduction of entry barriers for newcomers, the necessity of ROSCOs is doubtful in an incontestable railway market. The ROSCOs received an invaluable income guarantee due to the design of the British approach to reforming the railways, as the TOCs were tied to the ROSCOs until 2004, though a few leases expired in 1998. Thereby the TOCs relieved the ROSCOs of the risk of demand variations in the final product market. The regulatory regime applied to Railtrack had a similar effect upon the TOCs, as the ORR more or less fixed Railtrack's income from access prices in his quinquennial reviews of the pricing regime in 1995 and 2000. The TOCs, however, had contractual obligations regarding their output level. In short, the TOCs had to carry a substantial risk of the assets they did not even own, guaranteed a long-term income to the ROSCOs and Railtrack and shielded both against an economic downturn.⁶⁰⁸ The contractual structure discriminated in favour of Railtrack and the ROSCOs, though they rather than the TOCs exhibited market power and were already safeguarded from competition due to the regulatory design.⁶⁰⁹

⁶⁰⁶ Welsby and Nichols (1999), p. 61 and Nash (2001)

⁶⁰⁷ See section III.A.4

⁶⁰⁸ Bradshaw (1998), p. 182 explains the government's reasoning behind this design: *"In order to sell the various component parts of the railway industry at a reasonable price, the government's advisers felt it necessary to sell the new companies with guaranteed contracts in place."*

⁶⁰⁹ This observation was largely shared by Welsby (1998), pp. 9-10. Welsby criticises that the TOCs that *"...were intended to be the spearhead of commercialism of the railways and the figureheads of the privatised industry"* were *"...most heavily regulated..."* Welsby recommends a reduction of the ROSCOs' market power, a reform of the charging principle towards a higher share of variable charges and a reform of the incentive structure in the institutionally separate railway system.

Railtrack's access charges were subject to the Rail Regulator's control, but regulation of ROSCOs was absent, though the leasing companies were subject to the general competition law. Competition between ROSCOs was also almost absent due to long-term contracts that had been agreed upon prior to franchising passenger operations. And competition from rolling stock producers would only emerge if TOCs required rolling stock in addition to the leasing contracts or when the contracts were running out.

The reformed British railway structure was tied together through a net of supervisory and regulatory bodies, such as the SRA, the ORR, the HSE, the Secretary of State and the Office of Fair Trading. The regulatory variety is indeed surprising, especially before the background of the 1992 White Paper, which suggested that government involvement would be curbed. Also, it clearly highlighted perceived monopoly power in London commuter services and the operation of the infrastructure. The regulation, however, focussed on the TOCs. Currently, 39% of the TOCs' income comes from fares regulated by the SRA. Passenger Service Requirements restrict adaptations of franchisees output levels according to market demand. They have to meet comprehensive franchise obligations set by OPRAF (and then the SRA) that limit their flexibility and entrepreneurial freedom. Licenses and access agreements are in the realm of the ORR and safety cases require Railtrack's approval. In addition, the Rail Regulator was supposed to promote competition and the passengers' interests. The latter are most certainly diverse and one might wonder whether there was a model customer whose interests the Regulator was promoting. Competition is the only objective, non-discriminatory regulator, taking the interests of all passengers in account.

Adding to competitive market forces, the obvious regulator for abuses of market dominance is the Office of Fair Trading. Also, European competition rules laid down in articles 81 and 82 of the Treaty of Amsterdam may be affected if trade between member states is affected: "*Any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States.*"⁶¹⁰ Accordingly, the rules of the competitive game are already set at both the national and international level in order to protect the players from potential abuses of other players. The added benefits of a further economic regulator are therefore at best questionable, if not absent and distorting.

⁶¹⁰ European Union (1997), article 82

If the 1992 Paper had materialised, the British approach could have been characterised by light-handed regulation. Regulatory forces would have checked the market power assumed in the infrastructure and London commuter operations. Franchised passenger services would have seen minimum service requirements instead of PSR's with an inherent flexibility and standards developing in competitive services. The franchised services would have taken care of social services and received subsidies in return. Open access operators could have checked the TOCs price/output combination. They might also have challenged claims on subsidised services, similar to Sydvästen's challenge to the incumbent Statens Järnvägar.⁶¹¹ The 1992 White Paper advocated choice, but the subsequent reform restricted choice. Efforts to deregulate the industry to create a market for railway services were sacrificed to regulatory interference and ministerial wisdom.

⁶¹¹ See section III.A.4

4.4 Safety

Safety issues were one of the prime concerns about the British Rail network after the dangers had been highlighted by the disruptive Southall, Ladbroke Grove and Hatfield accidents in 1997, 1999 and 2000 with a high number of casualties. In the wake of each crash followed an understandable public outcry, which was immediately echoed by politicians who were taken over by the something-must-be-done mood and were promising immediate *action* of some kind.

However, Railtrack moved first and brought Britain's train system close to a standstill. Railtrack's action was literally remarkable and indeed, quite preposterous. The track operator imposed over 1200 Emergency Speed Restrictions across the rail network, often as low as 20 miles per hour and replaced hundreds of miles of rails. One might argue that the public outcry in the aftermath of Hatfield left Railtrack not much of a choice other than reducing the risk to a minimum with extensive speed restrictions. Jenkins noted in *The Times* "...hysteria has now grabbed hold of sanity. As every passenger will attest, speed and comfort are being sacrificed to the maxim, better safe than blamed. As a result, millions of passengers are being driven off the trains on the roads, where many more will die or suffer serious injury. The railway is now a classic of brainless regulation. Who could blame Railtrack if it left its 'emergency timetable' in place for ever, until ministers agree to 'take the blame' for changing it?"⁶¹² Wolmar highlighted the role of Cox who took office as Railtrack's director of operations just seven weeks prior to the crash as a newcomer to the rail industry.⁶¹³ Instead of running the railways, Railtrack's executives made it their priority to avoid another broken rail at all cost.⁶¹⁴ Wolmar maintained that Railtrack's overall reaction to the crash and the imposition of crawling speed restrictions against the advice of senior engineers was the result of lacking engineering expertise.⁶¹⁵

Though the actions taken in the aftermath of the accident might improve long-term rail safety, it resulted in double journey times or worse in the short-term, forcing several rail users back on the road. *The Economist* questioned the rationale behind the measures taken, arguing that the "...chaos is likely to cause more deaths than it saves and the money that is supposed to

⁶¹² Jenkins (2000), p. 22

⁶¹³ Wolmar (2001), pp. 1-10

⁶¹⁴ It is alarming to observe that not even the executives of Railtrack trusted the quality of their network themselves and resorted to such drastic measures. And the costs were excessive, indeed. Wolmar (2001), p. 7 stated that the disruptions in train operations amounted to "...well over £1bn, partly in compensation claims and partly in much unnecessary engineering work."

⁶¹⁵ Wolmar (2001), pp. 10-14

*save lives is being misspent.*⁶¹⁶ *The Economist's* continued that the measures produced a rail crisis that drove about a third of the railways' passengers back to the roads in the month following the fatal Hatfield accident.⁶¹⁷ However, the accident rate per kilometre is 12 times higher on the roads than on the railways. Calling upon road-safety experts, *The Economist* estimated that the extra traffic on the roads could result in five additional deaths. Over the last thirty years a total number of six people have died due to broken rails, including the four victims of Hatfield.

As a matter of fact, fatalities on the roads easily outnumber deaths on the railways. Whereas 3,423 people died on the roads in 1999, 33 people were victims of rail accidents in the same year, 31 of the latter figure actually died in the fatal Ladbroke Grove crash. Though the number of kilometres travelled on the roads is higher than on the railways, the accident rate in proportion to the kilometres travelled on the roads is substantially higher. Still, railway accidents with a comparatively large number of victims naturally attract more public attention and press coverage than the 1999 average of nine daily deaths on Britain's roads. Considering the higher level of fatalities on the roads, the Cullen & Uff Southall and Ladbroke Grove Joint Inquiry specifically pointed towards the "...disproportionate reaction of the media to rail mishaps of any kind."⁶¹⁸ In their view, one of the main reasons of the public's concern is that they do not have any control over the events in case of an accident. The passengers are solely left at the driver's discretion. The report also notes that the public attitude in Britain changed over the years. Even major rail crashes did not produce a reaction comparable to the most recent accidents. According to the report this may be due to legislative changes, such as the 1974 Health and Safety at Work Act and the misleading perception of parts of the public that the privatised railways would give a higher priority to profits than to safety.⁶¹⁹

The Economist calculated the costs of a single life attributed to the different train protection systems, resulting in £15 million per life saved with the enhanced and £5 million per life saved with the common TPWS. As local authority spending on road safety rarely exceeds £100,000 investment in accident prevention measures, *The Economist* questioned whether the priorities on spending would be right. "From society's point of view, though, it is far from rational to spend 150 times as much on saving a life on the railways as on saving a life on the roads.

⁶¹⁶ *Economist* (2000b), p. 35; see also *The Economist's* leader on p. 23 of the same issue.

⁶¹⁷ Wolmar (2001), p. 16 cites that congestion went up by 40% in the two weeks after Hatfield and was 20% above pre-Hatfield levels five weeks after the crash.

⁶¹⁸ HSC (2001), p. 11

⁶¹⁹ HSC (2001), pp. 2 and 4

*A bereaved mother cares little how her child was killed. Many more lives could be saved if the money currently being poured into avoiding spectacular but rare railway crashes were spent instead on avoiding the tragedies that happen ten times every day on the roads.*⁶²⁰

The blame culture following each accident and even minor derailments was neither good for the victims, nor the railway industry. *The Economist's* figures illustrate the massive amount needed to make the railways safer than they are today. But in addition to the train protection systems, further investment is required in Railtrack's infrastructure that has to be carried out over several years.⁶²¹ The transport minister Lord Macdonald acknowledged negative effects of investment under previous state-ownership and observed that we "...are dealing with a very large mechanical railway and things break. We must compensate for decades of under-investment as quickly as possible."⁶²² Society and its political agents have to make a decision about the trade-off of public investments in safety on the railways. The opportunity costs of attributing more public funds to railway safety are lesser public funds in other policy areas, whether it is road safety, health care or environmental policy.⁶²³ As the Joint Inquiry report noted that "...sums which can be devoted to safety issues are necessarily limited and other demands on public funds mean that questions of priority must be addressed."⁶²⁴ The priority, however, seems to be clear. In June 2001 the DETR confirmed that more resources could be diverted from roads and local transport investment to the railways – with the entailed consequences for victims in road accidents.⁶²⁵

In a fail-danger industry like the railways it is vital to be aware of the potential dangers and provide for clear competencies in emergencies. SPADs as in the Ladbroke Grove disaster require a straight line of communication to other decision makers, such as the driver of the approaching train and the operator of the signalling system. In case of a

⁶²⁰ Economist (2000c), p. 23 and also Wolmar (2001), pp. 186 187

⁶²¹ Jones (1999), p. 17 cites Colin Robinson of the IEA: "I do think people are expecting results in the rail industry too quickly. Improvement will undoubtedly happen, but it is going to take 5-10 years before there is a noticeable difference."

⁶²² Marston (2000), p. 1. Bartholomew (2000), p. 28, quotes average investment levels of £850 million a year in the two decades prior privatisation, comparing to increased investment of roughly £2.4 billion in 2000. He argues that nationalisation and not privatisation was to blame for the recent railway catastrophes: "The decades of neglect left the railway with out of date signals, old safety systems and antique rolling stock. It is the nationalisation of the railways, rather than privatisation, that lies behind the number of deaths and serious injuries that have taken place in recent years. It was under nationalisation, too, that the unions became so powerful in the rail industry. That added substantially to the cost of repairs and improvements that were desperately needed."

⁶²³ Using the government's official guideline figure of £3.2 million per life saved on the railways compared to the £100,000 available for equivalent figures on the roads, leads Wolmar (2001), p. 186 to a drastic conclusion: "In other words, over thirty times more is spent per life saved on the railways than on the roads, which, incidentally, kill 3,500 people per year. Equivalent sums spent on road safety, or indeed kidney machines or even other types of railway safety schemes, would save many more lives."

⁶²⁴ HSC (2001), p. 3

⁶²⁵ Financial Times (2001a), front page

railway accident, responsibilities must be transparent, without the possibility to pass the buck. Section IV suggests according safety operations.

5. Conclusion

Initially, the British railway privatisation was judged to be a success. This at least was a widespread notion until the recent railway accidents, when the reputation of the British approach to privatisation lost ground. In the early 1990s, the necessity of change in the industry was obvious for both Labour and the Conservatives. The approach the Conservatives were pursuing was more radical than any of the reforms in Europe. The EEC Directive 91/440 as discussed in section III.A. was a welcome legitimisation to justify the rather radical reform programme before the British public, though privatisation in the UK exceeded the modest European requirements.⁶²⁶ But a radical approach was needed to save the ailing railway network that depended on political bargaining between a variety of interest groups to decide upon investment levels, prices and other key figures during much of the post-war period.

From a statistical point of view, the figures suggest that the reform was a success. Investment data as well as passenger and freight rail transport went up by impressive degrees after privatisation, whereas franchise subsidies went in the opposite direction. However, Railtrack's financial crisis in the aftermath of Hatfield, a massive inflation in route construction and upgrading costs spoil this rather encouraging picture, as the government had to take financial responsibility from the bankrupt track operator. Though it would be over-optimistic to ascribe the industry's growth entirely to the reform initiated by the 1992 White Paper and its watered-down version in the 1993 Railway Act, the U-turn in the railways' performance coincides significantly with the privatisation of the industry. Still, exogenous factors, such as the boom of the UK economy also benefited the railways.⁶²⁷

Notwithstanding the performance figures, an overriding concern for the British passengers and the public is safety on the railways, again highlighted by the tragic accidents in Southall, Ladbroke Grove and Hatfield. However, the disproportionate actions due to

⁶²⁶ Knull and Lehmkuhl (1997), p. 4

⁶²⁷ see Shaw (2001), p. 7. Studies for the U.S. draw similar conclusions. The 1980 Staggers Act deregulated the U.S. railroad industry. Ellig (2001) concludes: "Of course, the fact that rate reductions followed deregulation does not necessarily mean that deregulation caused all of the rate reductions. ...Some or most of these changes could also have been exogenous; in that case, some or most of the reductions in revenue per ton-mile caused by these factors should not be attributed to deregulation." Domergue and Quinet (2001) conclude in their brief overview over the European railway reforms and improving traffic statistics that "...it is too soon to credit this favourable evolution solely to the rail reforms. The general upturn in economic activity must have played a large role, but the rail reforms may be partly responsible as supported by the fact that the change has been greatest in UK freight where the reforms were most dramatic."

political panicking were neither beneficial to the victims and their families, nor to the railway operators and their customers. Further investments in safety measures may be essential to regain the reputation of the railways, but there is no guarantee for safety in a fail-danger industry. The suggestions made in the Joint Inquiry report on the European Train Control System may well pave the way for a single European railway safety agency. However, section IV suggests a system with an independent safety operator in an open access environment, also in charge of daily traffic management and the allocation of slots without removing the rail firms' individual responsibility for safe operations. The structure would ensure competition in a true railway *market* and would remove the necessity of excessive public regulation.

If the railways exploit their competitive advantages over other modes of transport, a shift of the modal split in favour of railways may be expected. Though legislative efforts might contribute to the shift, the railways' reaction to intermodal challenges and increasing congestion is most important. The protection of the incumbents in the railway market might have had some justification at the beginning of the railway reform. But the time has come to open up the market for entrants and to go full circle in privatisation, including a sale of the franchises to the private sector and entailing open access competition with unregulated fares. Private train operators have proved that they are able to run the railways. The SRA, PTEs or local government bodies may continue to pay subsidies, wherever railway services are considered beneficial to the region or individuals, but do not pay their way. The Office of Fair Trading would monitor the companies' competitive practices and a national or European railway safety body could be in charge of the overall safety procedures, while the companies would be responsible for their actions, just like every other private business. The future of the single national track owner is still undecided and Railtrack may well be separated horizontally or may be forced to lease their tracks to major regional operators. The TOCs are already franchised to a relatively small number of franchise owners and a further trend towards concentration may be expected, if political concerns of market power are left aside. Section IV also takes the implications of a horizontal separation of tracks and a concentration of train operating companies into consideration.

The *New Opportunities for the Railways* White Paper provided valuable ideas for a reform of the railways in the dynamic transport market. Unfortunately, the 1993 Railways Act was substantially flawed, as the most important provisions of the White Paper had

been watered down or removed during the Bill's passage in Parliament. The creation of ROSCOs to lower entry barriers is essentially useless, if insurmountable entry barriers are erected by franchised passenger operations that exclude competitive entry to the market. Without open access, there is no reason why the rolling stock could not have been included in the original franchising contracts. Adding to this, the ROSCOs were sold when medium-term leases for virtually the entire fleet of rolling stock had been signed, virtually guaranteeing an income to the leasing companies.⁶²⁸ Also, the Rail Regulator fixed Railtrack's income from access charges that carried only a small amount of variable costs. The guaranteed revenue removed incentives from Railtrack and the ROSCOs to enhance the efficiency of their respective products. As a consequence, the risks of the final market have been lifted from the asset owners, while the franchised passenger operators are left to fulfil their contractual obligations, subject to substantial uncertainties of the final market and the overall economic development. While Railtrack, the ROSCOs and infrastructure suppliers were privatised, the private franchise operators own very few assets. The franchise may be revoked if the government so decided under the current framework, deterring further investment. Though the then Conservative government acknowledged market power exclusively in the infrastructure and in London commuter services, it went for a re-regulated railway market predominantly where no considerable market power was assumed, that is in train operations. Glaister noted this trend already in 1994, as "... *'administered pricing', 'moderation of competition' are being developed as policies which, in the short run at least, are designed to defeat market signals by rendering them irrelevant.*"⁶²⁹ In this light it is difficult to judge the bodged British privatisation as a success and also to award the British model the term privatisation.⁶³⁰ This is still a long way to go. The latest crisis on the British railways must be used wisely. The next section offers a design for privatisation that could be based on the approaches to reform undertaken in Britain and other European countries, but requires some re-thinking of the basic structure of railway systems.

⁶²⁸ Welsby (1998), p. 246 and Welsby and Nichols (1999), p. 70

⁶²⁹ Glaister (1994), p. 133

⁶³⁰ Cynics might rather choose British Rail instead.

Section IV

Privatisation – An Alternative Model

A. General assumptions

After the period of relatively free railway entrepreneurship in the 19th century had been overthrown by regulation and eventually nationalisation, the railways in Germany and later in Britain were organised as monopolistic public companies which were sole rulers over railway transportation in protectionist transport markets. This monolithic structure is portrayed in figure 4 below, in which one company generally owned and operated layers I, II and III. The discussion in the preceding sections has shown the following, generally for the United Kingdom, Germany and also partly for other EU countries:

1. *The railways were originally set up as private companies due to differing motives.*
2. *Government regulation of the railway industry was already on the agenda in the 1840s, gaining pace in the latter half of the 19th century.*
3. *The railways were nationalised for a number of reasons, outlined in sections I and II.*
4. *The reasons for nationalisation based on market imperfections were unjustified from an economic point of view, as discussed in section II.*
5. *Regulation or outright nationalisation of the private sector involved political and social policy considerations.*
6. *Privatisations in the last decade of the 20th century followed different perceptions about the role of private enterprise and railways in society.*

In the aftermath of WWII, the Deutsche Bundesbahn and British Railways operated passenger and freight services on their own infrastructure networks until they were affected by the railway reforms in the 1990s. This section investigates the three layers of railway networks in horizontal and vertical combinations, ranging from the vertical and horizontal integration in one company to a number of companies emerging from horizontal and vertical separation at the other end of the scale. The latter case could produce a variety of different passenger and freight train operating companies and railway track operators. The passenger and freight rail firms in layer III will be termed POCs and FOCs, while the term TOCs is used for addressing both as train operating companies. The railway infrastructure network could be run by several safety operating companies (SOCs) in layer II and rail track operating companies (ROCs) in layer I. This is the starting point for a fully fledged reform, decentralising vertically and horizontally integrated railway

firms, potentially into a variety of new, independent firms, while simultaneously opening the market for newcomers by providing open access to train operations.

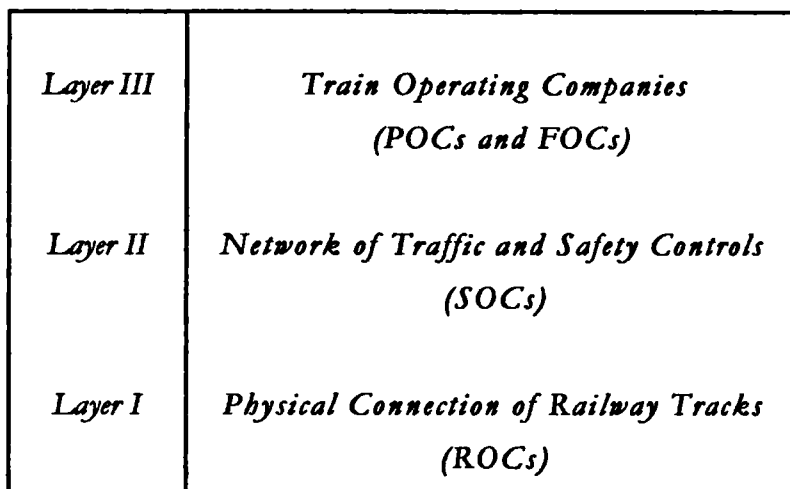


FIGURE 4: *Vertically Integrated Railway System*

Some assumptions were already implied. The theoretical analysis of the railway industry is founded on the following assumptions:

1. *Methodological individualism*: This principle means that economic behaviour and action originates from individual behaviour and action. It is always individuals who take decisions and make moves. So called government decisions are resulting from individual action. Thus, it is solely individuals, never the government, the society or other nebulous collectives taking decisions or action.⁶³⁰
2. *Rational utility maximisation*: The individual players involved in the market act rationally in their self-interest, aiming to maximise their own utility function. Thus, the owner of the infrastructure network will maximise the revenue from access charges paid by POCs and FOCs, as long as his decisions are based on his profit function. Still, the owner's utility function might comprise other goals next to the pure profit motive. This assumption simply states that individuals guided by reason will not contradict their self-interest. The owners of the train operating companies, however, are likely to lure passengers and freight cargoes on their trains, instead of leaving them stranded on the platforms and driving past or leaving them to other railway companies or

⁶³⁰ Blankart (1994), p. 10 and Schumpeter (1995), pp. 333-340. Schumpeter (1995), pp. 334-335 clearly distinguishes between the *political* and *methodological* individualism. The political individualism issues a variety of assertions, e.g. that individual freedom benefits the welfare of the entire society. However, methodological

intermodal competitors. Nevertheless, it does not mean that railway companies have to accept every customer. It is very well possible that the firms dodge some low-paying customers in order to keep a certain reputation. Utility maximisation does not necessarily mean maximisation of passengers or trains on the network.

3. *Non-discriminatory open access to the networks:* Every train company which complies with minimum safety standards may run freight or passenger trains, provided they have been allocated a slot on the network of tracks and traffic controls and pay an access charge to the network providers, such as ROCs and SOCs. No train company may be discriminated against if they conform with the minimum standards provided for in the initial privatisation arrangements, that is entrants must not suffer access charging differentials relative to existing firms.⁶³¹ The assumption of free access rights is essential in seeking a rational alternative to the models of privatisation employed in Europe, as Sharkey has "...shown that free and unrestricted entry can in theory be a viable substitute for direct regulation in a natural monopoly or natural oligopoly market."⁶³² This assumption of non-discriminatory open access shall be relaxed further below.
4. *Distribution of property rights:* The government *owned* and *operated* the railway system. Accordingly, contractual arrangements between the government and the private sector railway industry may be negotiated at the time of privatisation, such as a non-discriminatory open access provision or obligations to run (un-)subsidised trains to remote villages with virtually no traffic volume but high costs. As long as these or any other contractual arrangements are agreed upon *prior* to the actual privatisation with full information to the bidders for the services, they are not infringing upon the railways' property rights, as they were simply derived from the previous state ownership and in the end from the ambiguous processes which led to nationalisation in the first place. Nonetheless, it must be clear that any kind of contractual arrangement will have an effect on the sale price of the industry's divisions. The governmental requirements might even be such that no private company applies to run the infrastructure. Alternatively, applicants may ask the government for subsidies to fulfil the demands or the government could

individualism has nothing in common with its political counterpart. It is a simple statement that economic behaviour is based on individual behaviour and actions.

⁶³¹ Stigler (1968), p. 70

⁶³² Sharkey (1982), pp. 152 and 164

opt to run the infrastructure as a public company, while only the train companies would be sold off. It is a utopian task to dream up a railway structure from a state of nature environment, where the railways would be left to themselves might be easier, as no predictions about the final outcome or structure could be made by definition. Still, the variables in the real world scenario were set by government regulation and nationalisation. Therefore, the possibility to start from scratch is ruled out. Now, it's the governments' responsibility to release the industry, so that the railways may flourish, if the market so demands.

5. *Transaction costs exist:* Thereby it is acknowledged that transaction costs are usually greater than zero. The concept embraces both ex ante and ex post costs of contracting.⁶³³ Accordingly, search for information, contracts, monitoring, enforcement arrangements and other exchange transactions are not freely available. If transaction costs were equal to zero, there would be no reason to have a firm at all. Instead of intra-firm activities, all transactions could then be carried out on the market via the price system.

Even though the railways' future in the early 1990s looked bleak in both Britain and Germany, the governments had the opportunity to shape the future path of the railways. Governments must use their scope wisely in order to design a railway system without the fallacies of the past monolithic railway bureaucracies. Governments have the chance to design a system with a variety of freedoms which would then allow the companies to operate profitably in a competitive transport market and to regain market shares which they lost due to their past inefficient organisation. However, exact scientific predictions cannot and must *not* be made.⁶³⁴ These should be left to the magical women with crystal balls. The following analysis will investigate how to maximise the railways' *potential* in a privatised industry from the outset. Final decisions must be left to the individual firms and their owners subject to the restraints of the above assumptions. The synthesis will then compare the suggested model with European reform models outlined in section III, focussing on the British and German railway privatisations. Though one model of railway privatisation will be most favourable from an economic point of view, some governments may favour other models presented due to political considerations.

⁶³³ Mahoney (1992), p. 566

⁶³⁴ Hayek (1996), p. 14 argues that scientific predictions in market processes are impossible because knowledge is spread over all individuals in society.

B. Network economies and the railway industry

Railway services are characterised by the network character of their production. A network may be defined “...as a large technical system consisting of different layers of raw services interconnected with each other through which the final consumer service is generated.”⁶³⁵ With regard to the final product *railway transportation of passengers*, it would be useless to offer passengers a seat in a train without the train having the right of way on any track at all. And a railway infrastructure is similarly useless without train operations on its network and a network of traffic signals and safety measures protecting the trains from collisions. The services involved in the end product *railway services* require a smooth co-operation between all parties involved in the production. The raw services are interconnected with each other and the capacity of *each* layer involved determines the capacity of the *whole* system. In the following, three layers of a railway system will be analysed more closely, although most debates on railway systems traditionally assumed the possibility of vertical separation into two layers only, namely the infrastructure networks (*see figure 5, layers I & II*) and the operation of railways (*see figure 5, layer III*).⁶³⁶

⁶³⁵ Blankart (1998), p. 1 [without original emphasis]

⁶³⁶ Knieps (1996) made a strong case for a vertical separation of former railway monopolists into three different layers instead of the traditional two, which will serve as a basis for the discussion. The ‘Open Systems Interconnection’ model of the International Standard Organisation (ISO) consists of seven layers. Blankart (1998), p. 2 uses a model with four layers in his discussion (1. Physical connection; 2. Means of transport; 3. Dispatching; 4. Delivery to final user). For the purposes of the following model the restriction upon three layers is sufficient, as the model will not discuss Blankart’s layers three and four, but will be restricted to layers one and two of his model, the main activity of former national railway companies. It is nevertheless useful to keep the other layers in mind, as the companies might find it beneficial to offer their customers a ‘door-to-door’ service for freight, luggage and passenger transport.

<i>Layer III</i>	<i>Train Operating Companies (POCs and FOCs)</i>
<i>Layer II</i>	<i>Network of Traffic and Safety Controls (SOCs)</i>
<i>Layer I</i>	<i>Physical Connection of Railway Tracks (ROCs)</i>

FIGURE 5: *The Layers of Railway Systems*

In this analysis, the first layer of railway systems is the physical connection, i.e. the railway track infrastructure. The second layer is the network of traffic control systems, while the train operations comprise the third layer of a railway system. Because each layer puts a restraint on the other layers, as the operation of trains (*layer III*) is limited by the maximum capacity the track and the traffic control networks (*layers I & II*) can carry, co-ordination and adjustments between the players in the railway market is essential to produce an efficient railway system. The exact means of co-operation are controversial and may be summarised by the markets versus planning debate. The possibilities for interconnection of the layers will be a focus of this section. Blankart briefly summarises the views of the conventional planning wisdom in noting that the interconnection of the layers can be dealt with “...through either planning or markets, i.e. by hierarchical flat or by decentralized agreement. According to the conventional wisdom only planning is efficient in a large technical system. Markets would lead to incomplete adjustment in particular in regard to standards. Whereas capacities on each layer may be adjusted to the demand coming from a neighboring layer (provided that there are no problems of market power...), standards are said to be unlikely to adjust under the invisible hand of the market. In railroads e.g. decentralized action is said to lead to rail systems with varying rail width, different signalling techniques, different brakes and different buffer heights so that network islands, each with differing sets of standards, would emerge. The reason is that individuals when deciding on standards only consider their own utility and not that generated to other participants of a large technical system. They disregard the externalities generated to others and therefore prevent that the full potential of the system will be exploited in decentralized markets... In order to avoid such externalities, adjustment on each layer should be made centrally. One single organization would work more efficiently according to the conventional wisdom than many competing

*organizations. Centralization would, however, inevitably lead to market power. The large technical system would become a natural monopoly with the power and the incentive to reduce supply, to set prices above costs and to generate excessive profits. Such market behaviour should be prevented by government regulation. Political power should neutralize market power so that performance can be achieved which is similar to that of competitive firms though no competition takes place. ...Note that markets have no role in the conventional wisdom of large technical systems.*⁶³⁷

Though this analysis is tailored to the railway industry, it is applicable to other network industries with minor alterations, broadly encompassing utility industries, such as transportation, communication and energy supply.⁶³⁸ An incomplete list of network industries would include systems as diverse as railways, roads, airports, waterways, ports, telecommunications, broadcasting, postal services, electricity, water, gas supply, sewage etc, but may also be extended to non-utility services such as financial, internet or interpersonal networks. In Europe, a considerable number of the mentioned utilities were for long supplied by public companies for various reasons. This has been discussed for the case of railways in section II and it was highlighted that the economic arguments for the operation of public railways are at best very weak. Furthermore, it has been stated that politicians might have other reasons to favour a nationalised railway network, mostly arising from a perceived social policy background. The final decision is for the politicians and their agents, the electorate to determine and cannot be the focus of this analysis. Nevertheless, in the past those non-market activities led to distortions of the marketplace, mostly with inefficient utility firms, resulting in costly and low quality end products. Therefore, it is for the advocates of state interference to prove that their actions are worth pursuing, not for the protagonists of the unhampered market. Many countries have already privatised a number of network industries or had them short-listed as potential candidates, whether for economic, budgetary or social policy reasons.

⁶³⁷ Blankart (1998), pp. 2-3 (emphasis in original)

⁶³⁸ Geddes (2000) mainly focuses on the U.S. electricity industry but also surveys other utilities, such as telephone, gas and water supply on pp. 1187-1191 with a brief excursion to the deregulation debate that gained pace in Europe on pp. 1191-1192. His study provides a vast overview over almost the entire utility literature. Cave and Mills (1992) focus on the U.K. utilities industry. See also Littlechild (1995) and Moorhouse (1995) on electricity deregulation, Cave (1994) on the introduction of competition in the UK telecommunication sector, McTigue (1998) on telecommunications in New Zealand and Rodriguez (1998) on privatisation of postal services in Guatemala. Byatt (1995), Scheele (1991) and Scheele (1997) illustrate the successful privatisation of the UK water industry that was criticised on environmental grounds.

Kay emphasises the importance of product homogeneity in network economies.⁶³⁹ Though the amount of passengers travelling between two points on the rail network is often very similar, it is quite impossible to transfer only the net balance of passengers over the network. In contrast, electricity supply is a rather homogenous product where only the net balance is shipped over the electricity grid, resulting in considerable savings. Nevertheless, certain similarities typically remain in utility networks, such as high initial capital investments to provide the railway or grid infrastructure, or in case of other network utilities gas or water pipelines, telecommunication lines or antennas, airports and roads infrastructure to name but a few. The investments in the network infrastructure represent high sunk costs as described earlier in the debate on contestability, making it difficult to move operations, but also to enter the market with a competing service provider.

It was to a large extent due to the sunk costs, the barriers to mobility and the perceived natural monopoly character of network utilities, that governments refrained from private sector involvement, as it was feared that private network monopolies would be the natural outcome and they would exercise their dominant market power to charge monopolistic mark-ups on the price, supply inferior quality or even both. However, the previous analysis of state-owned railway industries should have proved that the same applies to government controlled or owned monopolies. As customers of inefficient and protected state-owned rail undertakings commonly had to realise, the quality was at best poor, if not appalling. Passenger and freight charges were generally very high, despite the government's heavy subsidies to public companies – which, however, did not impress their high-cost structures very much. Though subsidies may usually result in lower direct fares, they are not available for free. Abstracting from their distorting effects on the market, the general taxpayers have to step in, paying for the subsidies and lower railway fares – whether they ever use the train system or not. Though the fear-of-monopoly-argument was a welcome justification for nationalised companies, the argument was simply applied to the private sector, the public sector apparently being exempt from similar temptations. This issue was addressed in the brief public policy discussion in the broader context of the nationalisation debate. In summary, however, it can be said that public choice economists would not readily agree with the perceived sacred role of national governments and its politicians. Furthermore, it were governments who actually created mobility barriers and a protected transport *administration*, which at that time had

⁶³⁹ Kay (1994), p.77

nothing whatsoever in common with a transport *market*, with free exchange transactions between individuals. Despite the sunk costs in the railway infrastructure, there were ways of opening up the administration towards creating a more open market. Measures to do so in network utilities, specifically in the railway industry, are the aim of this section.

1. The mystified meaning of integration⁶⁴⁰

In the case study on the British privatisation, it has been pointed out that the British Labour Party's transport policy was dominated by the belief that the railways had to be integrated into a broader transportation system. This was especially obvious in the 1947 Transport Act, but similarly in New Labour's *New Deal for Transport*. Those kinds of legislative integration attempts stem from a central planning attitude. What is often termed vertical or horizontal separation therefore poses a seemingly obvious threat to the conventional integrationist's viewpoint. However, it need not necessarily do so. Whereas a monolithic railway or transport organisation, such as the British Transport Commission, is one way of integrating the transport sector by planning, an integration over the market is another possibility, which shall be called *market-based integration* hereafter. Williamson considers a vertical integration in the conventional usage of the term as "...the organization form not of first but of last resort – to be adopted when all else fails. Try markets, try long-term contracts and other hybrid modes, and revert to hierarchy only for compelling reasons. Absent pre-existing monopoly power, in the event of which strategic considerations can arise, the logic of transaction cost economizing reserves integration for those transactions for which the condition of bilateral dependency is substantial."⁶⁴¹ Shelanski and Klein et al. also consider the conventional logic of vertical integration as a rather extreme form of internal governance that could also be substituted by intermediate forms, such as long-term contracts and other contractual arrangements.⁶⁴²

Neither a vertical, nor a horizontal separation aim at a *disintegration* of the railway industry as a whole, solely at *institutionally* separated companies, that is a *different organisation* in a number of businesses, instead of a single and, indeed, monopolistic firm. This monopoly situation is a direct consequence of government intervention, nationalisation and the blind, but possibly even well-meant pursuit of an integration in one public company. This section designs a railway market without major barriers to entry or exit and provides a basis for competition between different private sector companies. Competition is however only possible if non-discriminatory open access to the infrastructure networks is guaranteed and if the complications of the sunk cost element are addressed properly.

⁶⁴⁰ This title was inspired by Hibbs(2000): *Transport Policy: The Myth of Integrated Planning*

⁶⁴¹ Williamson (1991), p. 83 assumed strong property rights regimes.

Integration is inherent to network industries due to network externalities to other users. An individual's utility deriving from a network is a function of the network's technology and the number of customers using the network facility.⁶⁴³ This leads to the problem of the *critical mass* of a network required to operate it beneficially and the problem of *network islands*. Network islands reduce the benefits of positive externalities when networks exist with *similar* though not identical technologies next to each other, thereby making it impossible to interconnect the networks with each other. Thus, in the early days of railroading the narrow and broad gauge and further varieties of gauge widths made it necessary for passengers and freight to be transferred to another rail car. In England, the broad gauge connecting London with the West Country lost out towards the already extensive narrow gauge network, while the problem never occurred in Germany due to the import of English locomotives requiring a standard gauge from the very beginning. Today, interconnection between different gauges can be observed at each railway crossing between Europe and former Soviet Union countries, but also within the EU when entering Spain. Either passengers have to change trains or the entire carriages are lifted up and fitted with suitable wheel equipments. While varying gauge widths and technology differences reduce positive network externalities, they may also be used on purpose in order to deter entry and erect market barriers. This was one reason for the huge variety of gauges in the 19th century United States. Today, it is still impossible for German high-speed trains to access the French railway network due to technological differences. The critical mass of a network is especially obvious in the telecommunications industry, where the individual's utility increases the more users the network incorporates or for the railway industry, the more potential customers can be reached via the existing stations and lines. Therefore, it pays for the players in the railway market to participate and *co-operate voluntarily* in the railway game.

Now, in a horizontally and vertically separated railway system without government cushions to protect the railways' share of the tasty transport market pie, the players need to co-operate to score in the game and survive. Other train companies in either of the three layers are not only competitors, but principally complementors, which Nalebuff and Brandenburger define as follows: "*A player is your complementor if customers value your product more when they have the other player's product than when they have your product*

⁶⁴² Shelanski and Klem et al. (1995), pp. 344-345

⁶⁴³ Blankart and Knieps (1991), p. 8-13 give a detailed account of networks' utility.

*alone.*⁶⁴⁴ Most obviously, it's again a train passenger valuing the product even more, if he would actually receive a passage over the network, that is the end product railway transport, instead of being left in a carriage in a parking lot. And local customers living close to a city will value a high speed connection between urban conurbations more, if the service is complemented by local train or bus services so that they could get home instead of being stranded at a station at night. The essential role of complementors is even more apparent when looking at the three vertical layers rather than horizontal services, because train operating companies are pretty useless without the railway track and vice versa.

⁶⁴⁴ Nalebuff and Brandenburger (1996), p. 18 (emphasis in original). The authors' book "*Co-opetition*" is an impressive game-theoretical approach to introduce a new mindset in strategic thinking, aiming at the individual players to change not simply the way they play the game of business, but to actively shaping the game.

2. Transaction costs

In his 1937 article on the nature of the firm, Ronald Coase analysed the reasons for the emergence of firms.⁶⁴⁵ He clarifies two alternative means of co-ordinating production – either by an entrepreneur as the central planner in a firm or alternatively by co-ordinating production by means of the price mechanism, thereby mirroring Blankart's argument upon co-ordination of networks to produce a final good by central planning or market organisation. *"Within a firm these market transactions are eliminated and in place of the complicated market structure with exchange transaction is substituted the entrepreneur-co-ordinator, who directs production. It is clear that these are alternative methods of co-ordinating production. Yet, having regard to the fact that, if production is regulated by price movements, production could be carried on without any organization at all, well, might we ask, Why is there any organization?"*⁶⁴⁶ Though the co-ordinating entrepreneur traditionally very much resembles the central planner, there are also market-based approaches to business organisation and governance.⁶⁴⁷

The question on the existence of organisations is central to Coase's article and leads back to the concept of market-based integration as suggested above or the concepts of horizontal and vertical separation, as they were traditionally named. It had been assumed further above that transaction costs are greater than zero. Were that not the case, firms would have no reason to exist, indeed, and we would not have to bother about institutional integration or separation at all. But *"...the operation of a market costs something and...by forming an organization and allowing some authority (an 'entrepreneur') to direct the resources, certain marketing costs are saved. The entrepreneur has to carry out his function at less cost, taking into account the fact that he may get factors of production at a lower price than the market transactions which he supersedes, because it is always possible to revert to the open market if he fails to do this."*⁶⁴⁸ The co-ordination via the price system is not for free, because transaction costs

⁶⁴⁵ A reprint of Ronald H. Coase's 1937 ground breaking article was published in the 1988 edition of "The Firm, the Market and the Law".

⁶⁴⁶ Coase (1988), pp. 35-36

⁶⁴⁷ Gable and Ellig (1993) present an alternative to the central planning attitude, which is usually predominant in private firms. Their market-based approach to management was applied to Koch Industries, an immensely successful and rapidly growing company. Koch Industries' CEO Charles G. Koch stated in the foreword to the study: *"We are convinced that Koch Industries' success stems primarily from our management philosophy, which we call 'market-based management'."* In addition, Gebert and Boerner (1995) provide a detailed account on the traditional, centrally planned business organisation. They offer their solutions for a more open system, based on philosophical arguments from Karl R. Popper's publication on the open and closed societies in Sparta and Athens.

⁶⁴⁸ Coase (1988), p. 40 and Vaubel (1991), p. 264

in the real world are greater than zero. Those mainly include costs of collecting information about prices and quality in the market, negotiating, contract and control costs. Though these transaction costs might be minimised by developing certain techniques or a rule based approach for the players in the (railway) game, they cannot fully be eliminated – not even by internalising transaction costs of the price system by intra-firm organisation. Still, the costs might be reduced compared to a co-ordination via the price mechanism, as a series of contracts with a number of suppliers could be substituted by one intra-firm contract. Taking the path of cost reductions by intra-firm organisation to its logical conclusion, it might seem surprising that production of the various goods in the global economy is carried out by a multiplicity of firms instead of a single big firm, or even one world firm.

However, the intra-firm co-ordination has a number of costs entailed.⁶⁴⁹ Especially heterogeneity of transactions may result in the market becoming the lower cost institution. *“This would seem to imply that the costs of carrying out exchange transactions through the price mechanism will vary considerably, as will the costs of organizing these transactions within the firm. It seems therefore possible that, quite apart from the question of diminishing return, the costs of organizing certain transactions within the firm may be greater than the costs of carrying out the exchange transactions in the open market.”*⁶⁵⁰ If a new product is developed on the free market, switching from the former to the new input factor for the final output may not be too cost-intensive, if co-ordination is carried out by the market, anyhow. However, it might involve high transaction costs if the production of an intra-firm factor input becomes outdated. The production of a more innovative input factor may be entailed to major disinvestments plus further investment costs. Naturally, this spells a disincentive for innovative capacity within the firm itself. Imagine a single national, vertically integrated railway company, which also produces its own locomotives. Assume that another company in the same country or abroad comes up with an innovative new locomotive. If the national railway company were to buy the new engine, it might very well be the death-knell to their own locomotive engine division. Still, they might keep up pace with intermodal competition in the transport market. Should the railway company decide to stick to its own locomotive producing division to protect jobs and avoid disinvestment costs, it might very well result in an overall loss of the railway’s market share due to antique engines or other techniques. Though the railway company’s

⁶⁴⁹ Mahoney (1998), p. 569 focuses on three categories, that are, bureaucratic, strategic and production costs.

⁶⁵⁰ Coase (1988 , p. 45

transaction costs might initially have been lower compared to an organisation via the price mechanism, a dynamic market might lead to radically different outcomes within a brief time span.

The example presented is not even far from the real post-privatisation world. After *Wisconsin Central Transportation* had acquired *English, Welsh and Scottish Railways (EWS)* to undertake UK freight services, they decided to purchase engines from a Canadian company, which were both cheaper and better in quality than their British counterparts. As often, British unions protested - unsuccessfully - as they anticipated job losses in the British locomotive production business. But EWS had a choice and opted accordingly to invest its resources in the use, which produced the greater value, serving its own and its customers' interests. It would be interesting to measure the impact of that single investment decision on external effects, more specifically upon the trend on the British railway network to attract more freight traffic from the roads to the railways – an often proclaimed aim of transport politics.

So long as a possibility for active or potential competition exists against the *big firm*, it will emerge at some point, as long as the government does not opt to protect the market by erecting legal and, thus insurmountable, market barriers. If there is potential for innovation, firms will get kicked out of the market, if they cannot keep pace with innovation, or in Schumpeter's words they will die a *natural death*. This is the core to evolution, to the disturbance of existing structures, which is "*...more like a series of explosions than a gentle, though incessant, transformation.*"¹⁸⁵¹ Also, there may be decreasing returns to scale in the big firm. At some point, the costs of an additional intra-firm transaction will equal the costs of a transaction on the market. The advantages of the least-cost institution are also undermined if the intra-organisational efforts increase in an expanding firm to such a point, that the entrepreneur fails to invest the resources in the profit-maximising factors of production. At another level, these diminishing returns of monolithic organisations became obvious in centrally planned economies, such as the Soviet Union or the German Democratic Republic. Simply, there was no scientific way to route the factors of production to their uses where they promise the greatest return on investment. No central planner can ever oversee all individual preferences and investment opportunities, even if he so wanted. In line with the assumption on methodological individualism, the decisions must be taken by the individuals who know best about their

preferences, whether in a social setting like a socialist society or simply in a marketplace where the factors of production shall be invested in the most profitable uses. Planners should work towards “...creating conditions under which the knowledge and initiative of individuals are given the best scope so that they can plan most successfully...”⁶⁵²

This gets us back to the integrationist’ question on how to organise a formerly monolithic railway industry. Again, there is no fail-proof way of so doing according to any kind of scientific method. The approach pursued here is based upon the above assumptions, leaving as many decisions as possible to the judgements of the individuals, such as customers and owners of railway enterprises. If they want an increased integration under the new structure proposed, they may enter into contractual agreements of any kind, whether co-operations, joint ventures or mergers.⁶⁵³ Mahoney demonstrated that vertical contracting could act as a viable alternative to vertical financial ownership, while it is a substitute if transaction costs are absent.⁶⁵⁴ After the government has taken the first steps to dismantle the former state-owned monopolist, the further path of action must be their choice. According to Coase, “...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 or the costs of organizing in another firm.”⁶⁵⁵

⁶⁵¹ Schumpeter (1939 , p. 102

⁶⁵² Hayek (1946), p. 26. Hayek (1946), pp. 26-31 discusses two opposing definitions of planning, namely planning a blueprint for society versus planning for conditions under which individuals may flourish.

⁶⁵³ Blankart and Knieps (1991), p. 2 suggest that the individuals should decide, whether or not networks are created at all rather than calculating costs and benefits of networks scientifically. They claim that markets are generally suitable to reveal the individuals’ cost-benefit considerations, but they moderate their viewpoint due to potential special characteristics of network economies. Those are investigated in greater detail in their work.

⁶⁵⁴ Mahoney (1998), p. 564

⁶⁵⁵ Coase (1988), p. 44

3. Regulating agencies and bottleneck regulation

The overriding question is: *Who sets the rules for the railway privatisation and thereafter?* This question has already been addressed, when making the initial assumption that property rights were fully allocated to the government prior to the reform, as it owns and runs the entire system. After the privatisation, the rules will be according to the contractual arrangements between the government and the individual players in the emerging railway market. The government may shed its entire control over the railways or, more likely, it may try to keep some controlling stake in the privatised industry, in form of a regulatory agency or even by means of direct interference through the transport minister and the government. Blankart favoured an approach of *minimalistic regulation* of bottlenecks for the regulation of *network economies*. However, with regard to the railway industry, there is no reason to stop half-way through at bottleneck regulation. Therefore, Blankart's approach shall be considered briefly, before considering a free market without a specific *public* railway regulator at all.

Applying the arguments to other utilities would require only a slightly different course of argument, especially with regard to the proposed vertical and horizontal structure of the railway industry further below. Most prominent is still the open access arrangement. Moorhouse makes a strong case against government regulation in electricity generation and concludes in favour of competition: *"The technical and economic knowledge exist to permit the substitution of market competition for state ownership or government regulation in the electricity generation industry. The chief advantages of making that substitution include a reduction of costs and lower final user prices, closer alignment between the array of services offered and consumer preferences, and greater incentives for ongoing discovery and innovation."*⁶⁵⁶ McTigue suggests that privatised industries can only flourish with the absence of government regulation. Potential competition in unprotected markets is the overriding regulator in networks. He exemplifies his arguments with the deregulation and privatisation of New Zealand's telecommunication market, which he was overseeing as a Cabinet Minister.⁶⁵⁷ Geddes' survey of utility literature concludes that the past reforms of utility regulation were very successful, resulting in large net welfare gains to society.⁶⁵⁸ Caplan and Stringham offer a more radical approach, showing that markets are a superior co-ordinator in network

⁶⁵⁶ Moorhouse (1995)

⁶⁵⁷ McTigue (1998)

⁶⁵⁸ Geddes (2000), p. 1192

economies than central planning.⁶⁵⁹ Lal underlines their view by drawing on Mises' and Hayek's insights who "...pointed out that, though such a form of planning might be theoretically feasible in a world where information about resources, technology, and the myriad actual and possible production processes and tastes of consumers could be costlessly acquired by the central planning authority, in the real world it would be impossible. The market-based price mechanism is essential because it makes use of the division of knowledge which is unavoidable in any real world economy."⁶⁶⁰

Blankart uses a similar approach, arguing that markets are superior to central planning as they promote a wide variety of demand and search for new technologies. Accordingly, the management of a single large technical system is unlikely to place much emphasis on offering a variety of different services to their customers because it would harm the network operators' standardisation efforts. Thus, the firm would rather rely on standardisation of services, even if customers would be prepared to pay a higher price for a greater choice.⁶⁶¹ Apparently, Blankart uses the Hayekian⁶⁶² argument, aiming at the innovative potential both approaches offer and concludes that the market is the superior search engine: *"Planning relies on organized search according to the hierarchical rules of the large technical system. Collective decisions within the organization are needed before an old technology or product can be replaced by a new one. Those interested in the status quo have an opportunity to oppose against those who want to go ahead. Therefore collective decision making on innovations will always end in some compromise. In the market, in contrast, innovations are decided by the demanders outside the organization. Innovation depends on their and not on the members' approval. Moreover many ideas are in continuous contest. Search on the market place takes place on a broader basis than in hierarchical organizations. Therefore markets seem to be superior, when search is involved."*⁶⁶³ Nevertheless, he concludes that markets may not work in some segments of large technical systems, that is, wherever bottlenecks exist. His proposed concept of minimalistic regulation therefore aims to promote competition wherever feasible and regulate only those segments of the network where markets are imperfect. Potential market imperfections have already been considered in section II. However, the possibility of monopolistic bottlenecks in the

⁶⁵⁹ Caplan and Stringham (2001) exemplify their arguments with the delicate production of a free market in defense services.

⁶⁶⁰ Lal (1997), p. 213. See also Hayek (1946), Hayek (1996), Mises (1952a) and Mises (1952b).

⁶⁶¹ Standardisation, rather than innovation prevailed on the British railway network, as mentioned in the historical study. Freight cars were often half empty, because standard sizes of freight cars were mostly used, rather than new smaller sizes at lower costs.

⁶⁶² See Hayek's 1974 Nobel Prize Memorial Lecture in Stockholm *Die Anmaßung von Wissen*. in Hayek (1996) and his 1944 critique of planning in *The Road to Serfdom*, Hayek (1946), pp. 35-37 and Hayek (1999), p. 17

⁶⁶³ Blankart (1998), pp. 5-6

railway market must be taken into account, that is a combination of natural monopolistic elements with sunk costs.

For the sake of the argument, a monopolistic bottleneck shall be assumed on the line between London and Glasgow, as illustrated in figure 6 below. Usually, only a few sections of the network will constitute a monopolistic bottleneck, instead of the entire railway service from London to Glasgow. Now imagine the following situation in the passenger market between London and Scotland. Let the fictitious T Co be the sole provider of passenger travel between London and Glasgow, owning the train operations, the infrastructure and the terminal stations. *Highland Express Trans*, a company specialising in high-speed light freight and parcel services all over Britain, also owns a track connecting the same cities, which Highland Express uses exclusively for its high-speed freight operations.

Due to unused capacity on its railway infrastructure and Highland's observation of highly profitable passenger traffic on the England-Scotland route, Highland Express considers to enter the passenger business and compete with the incumbent firm Scotland Express. However, Highland Express does not have access to a passenger terminus in either of the cities, as its freight trains were aiming at freight depots in the outer suburbs of both London and Glasgow, instead of arriving close to the city centres. The company now faces the choice either to invest in new terminal buildings and connecting tracks or to use the existing facilities of the incumbent. This situation is displayed in the figure below, where the incumbent Scotland Express owns the entire connection from the city centre of London to the centre of Glasgow *via line a* d), while the entrant owns the long-distance railway infrastructure between both its freight depots F_1 in outer London and F_2 (*via line c*) in the Glasgow suburbs.



Entrant *Highland Express*: $F - c - F_2$

FIGURE 6: *Monopolistic Bottlenecks in a Railway System*

The newcomer to the passenger market, Highland Express Trains, would face sunk investment costs in the local connection from the freight depots (F_1 and F_2) to potentially new terminal buildings in the town centres. However, this option might be legally restricted in an urban area, which is already heavily congested. In that case, Highland Express would need access to the incumbent's tracks and station facilities from the outer suburbs into the town centre, if it wanted to compete for a fraction of the passenger market. Now, there's scope for the concept of minimalistic regulation, which would exclusively target the monopolistic bottlenecks and only if joint use of the tracks and stations is technically feasible. In the given example, the links from the freight depots to the train stations are the only facilities which inhibit a monopolistic leeway for the incumbent, e.g. in charging the newcomer monopolistic access prices or applying discriminatory standards, by which the incumbent might place a discriminatory burden on his competitor.

The concept of minimalistic regulation may be generalised as illustrated in figure 7 below. A firm that doubles all its inputs and produces double the amount of output, exhibits *constant returns to scale*. More generally, constant returns to scale are present, if a firm increases all inputs by the factor t and produces t times as much output. If, however, the output grows by less than t , the production technology creates *decreasing returns to scale*. The third case of *increasing returns to scale* is given, whenever the output expands by more than t .⁶⁶⁴

⁶⁶⁴ Formally, returns to scale can be summarised as follows, given only two input factors x_1 and x_2 for simplicity, $t > 1$:

constant returns to scale: $f(tx_1, tx_2) = tf(x_1, x_2)$

decreasing returns to scale: $f(tx_1, tx_2) < tf(x_1, x_2)$

increasing returns to scale: $f(tx_1, tx_2) > tf(x_1, x_2)$

Varian (1995), pp. 302-303 for the formal description of returns to scale.

	<i>Flexible investment costs</i>	<i>Sunk investment costs</i>
<i>Constant or decreasing returns to scale</i>	Competitive markets (many suppliers)	
<i>Increasing returns to scale</i>	Contestable markets (one supplier)	Monopolistic bottleneck (one supplier)

FIGURE 7: *The Limits of Markets in Large Technical Systems*

Source: Blankart (1998), p. 7

Constant returns are the most natural or plausible case as it is relatively easy for a firm to copy its own activities. Accordingly, a firm's owners will not be delighted to learn that their production technology is characterised by decreasing returns, as it should at least be able to copy its own production activity. However, would railway systems be characterised by either constant or decreasing returns to scale, no necessity for the government to interfere with the market process would arise (*figure 7, upper box*). Many suppliers would compete with each other, notwithstanding whether sunk investments would be involved. Small sized companies may easily enter the market with equal costs in case of constant returns or lower costs than large firms in case of decreasing returns. Whenever one firm should be tempted to charge a mark-up over competitive prices, the firm immediately attracts newcomers and endangers its position in losing customers to entrants or other firms already in the market.

However, large technical systems may exhibit increasing returns to scale (*figure 7, lower boxes*). Therefore, it will be cheaper for one firm to serve the entire market demand than to share the market with a selection of other suppliers. Imagine there is only one railway track operator providing a line in each direction between London and Glasgow. As long as the capacity of his track is not fully utilised, the construction of any number of new railway tracks by other companies would be a waste of resources, as long as the new lines do not involve radical changes in comparison to the production technology of the former, such as innovations, thereby creating new demand for the entrant's services or attracting customers away from other modes of transport. Should the track operator decide for any reason to offer the use of his tracks exclusively to firms A and B, but

refuse firm C having access to his tracks, the latter is obviously in a position where it cannot offer any railway services on the line London-Glasgow. No alternative route being available, he can either invest in an own railway track or leave it. Whenever increasing returns occur in combination with sunk investment costs, the firm is said to have a monopolistic bottleneck (*figure 7, right lower box*). The access to the bottleneck is the prerequisite to run the service and government regulation is usually seen as safeguarding competing train operating companies from being discriminated against or exploited by the owner of the monopolistic bottleneck, whether by outright exclusion of certain TOCs or by monopolistic access charges.⁶⁶⁵ Assuming, the London-Glasgow line is extremely busy, a further track operator might enter the market and construct new railway tracks between the two terminal cities in order to gain his share of the market demand. Despite increasing returns to scale and sunk investment costs, the size of the market could allow further track operators to work profitably. While the example of the track between London and Glasgow involves entry barriers in the form of sunk investment costs, regulation is not required if sunk costs are absent and the market is contestable. Even though it is cheaper for one company to supply the entire market with the service (*figure 7, left lower box*), the firm will refrain from charging monopoly prices, as it is subject to potential competition.

Therefore, Blankart would only agree to regulation of incontestable monopolistic bottlenecks in large technical systems. As a result, the problem of network regulation would be strictly limited, indeed. Still, the question remains whether the railway market is characterised by major bottlenecks which could give rise to monopoly power in the first place. Considering monopolistic bottlenecks for the railway industry, two determinants must be taken into account, *first*, other forms of competition, recognising the existence of other markets and *second*, the future structure of a privatised railway industry. When Blankart reached the conclusion that markets are imperfect in dealing

⁶⁶⁵ The monopolistic bottleneck is said to be an *essential facility* as discussed extensively in Lipsky and Sidak (1999). The essential facility doctrine is “...*paraphrased in terms compelling in their simplicity: A monopolist in control of a facility essential to other competitors must provide reasonable access to that facility if it is feasible to do so.*”, Lipsky and Sidak (1999), pp. 1190-1191. While the phrase itself did not appear in any reported judicial decision until 1977, the doctrine dates back to cases such as the Terminal Railroad Association, culminating in the Supreme Court’s 1912 decision in favour of the Terminal Railroad’s concentration efforts against the government’s advocacy of dissolution. In their rather critical approach with regard to essential facilities, Lipsky and Sidak argue that essential facilities produce the familiar problems of monopoly. “*Under those circumstances, no quantity of antitrust enforcement will change the structural characteristics that give rise to the essential facility problem...society is faced with the same unappetizing alternatives available in any public utility context: public ownership, regulation in the classic ‘rate-base/rate-of-return’ mold, incentive regulation, and various in between solutions...*”, Lipsky and Sidak (1999), p. 1220.

with large technical systems he disregarded other forms of competition, which could restrict the bottleneck operator's market dominance, namely *intermodal*, *substitutive*, *locational* and *geographical* competition. Notwithstanding the special characteristics of other network economies, it is insufficient to observe the railway market on its own as if it existed independently in the economy. The railway system itself is interlinked with other industries in the transport and in other product markets.⁶⁶ Thus, the arguments of increasing returns to scale plus sunk investment costs are not sufficient to justify regulation of the railways. Accordingly, Kessides and Willig (1995) suggest that "...railroad services are far more contestable than these impediments to rail entry would suggest, because there are often strong competitive pressures from other modes of transportation – such as trucking or water carriage – on the rates charged for shipment of a wide variety of commodities."⁶⁷

Intermodal competition and other forms of competition do and did constrain the railways, which were losing considerable market shares across their passenger and freight divisions in both Germany and Britain in the past, as shown in the case studies above. Intermodal competition in the wider transport market stems from other modes of transport, such as road, air, canal and sea traffic but also from pipelines in the carriage of products such as gas or petroleum. It is hard to imagine any place in Europe, let alone Germany or Britain, which is served by a railway but cannot be reached by an alternative mode of transport, neglecting price, quality or the effort entailed to the alternative. In freight transport, however, the situation might be different, esp. in countries with wide open lands such as Russia or the United States. But even if there are bottlenecks in freight haulage to certain places, must the government interfere with an otherwise functioning market economy?

In addition, products which are currently carried by rail freight could be substituted by other products, thereby wiping out both, the product's and similarly the railways' market by *substitutive competition*. Assume a lonely coal mine in the middle of nowhere, being served by one railroad, without any other affordable transport links in the vicinity. Apparently, the mine is tied to the ground and cannot move operations. In this case, the coal mine is obviously trapped and the railway company might be expected to charge monopoly prices. So, this clearly appeals to the concept of minimalistic regulation. Does it? At the outset of this section, the actors were assumed to be rational utility

⁶⁶ Foster (1992), p. 123 also noted the disciplining influence of the stock market and the prospects of hostile takeovers that constrain management.

maximisers. Accordingly, it does not make sense for the railway to price the coal mine out of the market, as it is itself in competition to other coal mines and other energy resources, such as nuclear power, oil, gas, solar power and others. The coal mine and the railway firm are operating in a bilateral monopoly. Eventually, both actors must play together, as they can either flourish together or ring each other's death bells. In Brandenburger and Nalebuff's terms from further above, the coal mine and the railway firm are complementors. And the game is called *co-opetition*.

While the example of the coal mine illustrated the case for substitutive competition for so-called captive shippers, a railway firm serving industries or people in remote places is also subject to *locational competition*, as the railway's customers could also re-locate their business, as long as their disinvestment costs are not prohibitive as in the case of the coal mine. And again, they will have to offer their end product at a competitive price, if they are not themselves enjoying monopoly rights. It's also substitutive competition, once again.

Grimm and Winston modelled different means of competition in the deregulated U.S. railroad industry. They found huge benefits of *geographic competition*, which occurs if a number of railroads could *potentially* serve a firm, even if the shipper is located 50 miles from that potential service provider, reminding the actual freight operator that it must not charge a mark-up on competitive prices exceeding the discounted value to build a new competing line over time. *“Geographic competition...has a large impact on rates. Receivers who can be served by two or more railroads from different origins enjoy a 25 percent rate reduction from average charges. Finally, intermodal competition from truck and water modes strongly disciplines rail rates. Shippers' rail charges fell dramatically if they use water transportation for some of their traffic.”*⁶⁶⁸

Further, they investigated whether so-called captive shippers in the U.S., that is shippers who do not have reasonable alternatives for moving their produce,⁶⁶⁹ have to cope with inferior quality of service than non-captive shippers. They found that the captive services are neither more unreliable nor slower than non-captive freight services. They discover only a small deadweight loss associated with inflated freight rates for captive shippers, which *“...indicates there is little justification on economic efficiency grounds for*

⁶⁶⁷ Kessides and Willig (1995), p. 5

⁶⁶⁸ Grimm and Winston (2000), p. 59

*proposals to address the captive shipper issue. Deregulation's annual benefits to shippers, in general, are largely intact because the loss to captive shippers amounts to roughly 10 percent of these benefits. ...In particular, alternative sources of competition in freight markets limit the share of traffic that is truly captive, and even shippers who are captive in a particular market may have some leverage in rate negotiations through plant location competition and product competition.*⁶⁷⁰

Obviously, the rationale for minimalistic or even greater regulation of monopolistic bottlenecks is not as self-evident as it seemed at the outset. Diverse forms of competition restrict the bottleneck owner's perceived market power. Still, the second determinant remains in deciding whether bottleneck regulation is required. The future structure of the privatised railway industry may restrict any remaining monopoly power considerably. As scrutiny towards the restructuring shall be given below, the following remarks may only be regarded as a first guideline.

So far, the railway industry was usually a vertically and often also horizontally integrated industry, owning and operating tracks, passenger and freight transportation. Thus, the end product *railway transportation services* was produced by one company in its entirety. Re-thinking the industry based on the layers of railways, opens up further characteristics for regulation of perceived bottlenecks. Accepting the existence of monopolistic bottlenecks implies that the railway market is a closed economic system. In that case bridges, stations and urban railway tracks into stations might constitute what is generally deemed a monopolistic bottleneck. This construct, however, lacks contact with reality, as the railways are acting in a highly competitive transport market with further interactions with other markets as shown. Nevertheless, the government has a far-reaching authority to shape a privatised and competitive railway industry with almost no monopolistic elements.⁶⁷¹

⁶⁶⁹ Ellig (2001)

⁶⁷⁰ Grimm and Winston (2000), p. 66. The concepts of competition have been discussed as locational and substitutive competition.

⁶⁷¹ At this point it is necessary to remind the reader of the actual meaning of monopoly as clarified by Schumpeter (1943), pp. 98-99: "*Monopolist means Sin el Seller. Literally therefore anyone is a monopolist who sells anything that is not in every respect, wrapping and location and service included, exactly like what other people sell: every grocer, or every haberdasher, or every seller of 'Good Humors' on a road that is not simply lined with sellers of the same brand of ice cream. This however is not what we mean when talking about monopolists. We mean only those single sellers whose markets are not open to the intrusion of would be producers of the same commodity and of actual producers of similar ones or, speaking slightly more technically, only the single sellers who face a given demand schedule that is severely independent of their own action as well as of any reactions to their action by other concerns.*"

Below, it will be argued that considerable sunk costs are indeed characteristic for the railway industry. However, they are restricted to the infrastructure networks, comprising railway tracks, signalling networks and stations at most. Still, investment costs of station terminals could be partly recovered by selling them to other users, independent of railways, even after a potential end of railway operations, especially as major terminals are often located in high-value inner city districts. If governments opt for a full-scale vertical and horizontal separation of the railway industry, train operations would be offered by numerous passenger and freight train operators (TOCs, comprising both POCs and FOCs), running over tracks of several rail track providers (ROCs), controlled by one or more safety and signalling firms (SOCs).

Now, if the TOCs have a choice to operate services over tracks of competing providers, the dominance of track providers is eroded and their dependence turned upside down. In order to maximise profits, ROCs compete with each other to attract FOCs and POCs to their lines or networks. Failure to do so results in loss of access revenues. Now, it is rather the track firms who depend on the train operators' traffic. Should they charge monopolistic access prices, the train operators could either withdraw from their network or even from the entire railway business. Train companies can *vote with their feet*, or wheels, as they own capital on wheels, which they may employ virtually everywhere. The ROCs in contrast own capital that is literally tied to the ground. The tracks leading into stations could be owned individually or jointly by several ROCs, or they might also be owned by a single rail track provider. The same constellations are possible concerning the ownership of railway terminals. And even if only one company owns the entire lines into a busy urban railway terminus, including the station, it does not confer dangerous monopoly power to that company, as its revenues depend on train operating companies actually accessing the tracks and stations. A prerequisite for competition is, however, the assumption of non-discriminatory open access to the railway network, without pre-determined slots for the next 7 to 15 years as in the British reform, which in effect tied the franchisees to their lines without having the chance to compete on the track with other operators or to escape from Railtrack's access pricing regime, as Railtrack is the only UK operator of the track and signalling infrastructure, including the major stations. If there were competing ROCs, the Office of Fair Trading could supervise anti-competitive behaviour in the railway industry. The remaining function for other regulatory bodies, such as the Office of the Rail Regulator or the Strategic Rail Authority as outlined in the UK study, are at least questionable. However, regulating functions

could be performed by the SOCs. Responsibility for the handling of safe day-to-day operations lies with the second layer, the network of traffic and safety controls. The tasks of the SOCs could comprise signalling systems, supervision and approval of minimum technical and safety standards for train and track operators, allocations of slots and the co-ordination of other activities, such as through-ticketing and the provision of neutral train information and reservation systems. Before turning to a more detailed analysis of the individual layers and its players, the results may be summarised as follows:

1. The government sets the rules for the game at the outset of the privatisation process in contractual arrangements.
2. The rationale for monopolistic bottleneck regulation and therefore for the concept of minimalistic regulation is weak. It depends first, on the extent of intermodal, substitutive and locational competition and second, on the future structure of the railway market.
3. A full-scale vertical and horizontal separation of the railway industry could make *public* railway regulation redundant.
4. The Office of Fair Trading could monitor anti-competitive practices, whilst the SOCs could be responsible for further matters with regard to regulation, as set out in the initial privatisation contracts and agreements between the government and the SOCs.

C. Horizontal integration versus separation

Chapter B.1 argued that the conventional terms of vertical and horizontal separation could be misleading, as the objective of neither vertical nor horizontal separation is to rip the railway system apart. Instead, the approach targets an *institutional* separation of large technical systems in markets to facilitate *non-discriminative* and *competitive* railway operations, thereby leading to a *market-based integration* of the railways. Scale and scope economies are essential in the debate on horizontal and vertical separation of the *big firm*, which was previously the dominant co-ordinator for railway activities. Economies of scale and scope are decisive in determining the structure of the reformed railway market and whether an institutional separation of the layers of the railway industry is a viable option at all. If considerable economies of scale and scope prevail in the railway industry, the best structure might well be a single public or private company. However, there is no reason why public or private railway monopolies should enjoy *legal* market protection, granted by the government, especially if economies favour a monopolistic or dominant structure. Still, should railway transportation be characterised by neither scale nor scope economies, an atomistic separation might serve the industry and its customers best.

Investigating each of the horizontal layers separately, a smooth co-ordination of the services on each layer is essential to reap the full network benefits of the railway system. Thus, it is not all competition, but also co-operation, because the players involved in railway transport are dependent on each other. Imagine the network providers if the railway track in a country had been split into regional and high-speed networks which were then sold to various companies: whilst the high-speed infrastructure owner is responsible for fast connections to the major centres, the regional network is needed to bring the customer to his town in the vicinity of the city which is served by high-speed rail links. And the regional provider of the network benefits from more travellers arriving at the station who might then want to go on a journey on his network. These are clearly positive network externalities of the regional and high-speed networks, rationally favouring an interconnection. In a competitive third layer of train operations, the case for co-operation is even more obvious: if the train companies refuse to co-ordinate their timetables, such that the customers constantly miss their train connections, customers might refrain from using rail travel at all, moving to another means of transport eventually.

All the players involved in the railway system can mutually benefit if they co-ordinate some of their activities. *“Business is cooperation when it comes to creating a pie and competition when it comes to dividing it up. In other words, business is War and Peace. But it’s not Tolstoy – endless cycles of war followed by peace followed by war. It’s simultaneously war and peace. As Ray Noorda, founder of the networking software company Novell, explains: ‘You have to compete and cooperate at the same time.’ The combination makes for a more dynamic relationship than the words ‘competition’ and ‘cooperation’ suggest individually. ... You can compete without having to kill the opposition. If fighting to death destroys the pie, there’ll be nothing left to capture – that’s lose-lose. By the same token, you can cooperate without having to ignore your self-interest. After all, it isn’t smart to create a pie you can’t capture – that’s lose-win.”*⁶⁷²

In the railway game, the pie is the good *railway transportation of passengers and freight*, which is part of the bigger transport market pie. Whereas rapid growth of the railway pie might entail a reduction in the other modes’ share of the entire transport pie, an innovative railway system could also contribute to the growth of the transport market as a whole, branding the product *transportation* as a valuable experience. Again, even intermodal co-operation can be beneficial to all players, thereby creating a win-win situation. In the past, however, the powerful railways wanted to dominate the big game of transportation. Having played for some time, they grew too confident of their invincibility and became tired of observing other players’ actions and strategies around the game’s board. While the railway system had captured a good share of the transport pie in the mid-nineteenth century from waterways, turnpike and road operators, the share grew smaller with innovations around the turn of the century and was largely absorbed by other players in the transportation business, such as airlines, road traffic, communication companies and others, who were determined to get a share of the pie. What was left for the railways was a government-protected piece of cake or pie with the railways rather watching the situation passively instead of actively facing the competitors by rapidly innovating and reacting to customers’ demands.

Chapters C and D of this section are concerned with the scope of horizontal and vertical separation in a privatised railway system. First, chapter C will investigate for each of the three layers separately, whether either of the following characteristics 1. to 4. is involved and what the results mean for 5. and 6. Second, chapter D will then discuss the

effects of a vertical separation of the layers. Finally, chapter E shall assess the reform proposals in the light of issues which have been neglected so far, such as a restriction of open access provision, access and congestion pricing, as well as public service obligations or subsidies for social services of the railways.

1. *Sunk investment costs* are capital costs which cannot be recovered, even by total cessation of production. Once invested, the investment is irreversible. Thus, railway tracks, pipelines, roads or canals cannot easily be ripped out of the ground and sold to another market.
2. *Economies of scale* may occur due to economies of density, firm size or length of haul.⁶⁷³ Economies of density are present on a given railway line, if average costs fall when the traffic volume of the line is increased. Economies of firm size result from lower average production costs in big rather than in small railway firms or network sizes, and economies of length of haul lead to lower average costs on longer rather than shorter journeys.
3. *Economies of scope* are present in multi-product companies, if the costs of joint production are lower than the production of the same good in separate organisations, that is $C(\sum x_i) < \sum C(x_i)$, where x_i are the individual goods produced, e.g. representing freight and passenger transport or train and infrastructure operations.
4. *Network externalities* occur when the actions of one actor in the marketplace have positive or negative effects on other actors, which are not represented in the other's cost function. The sudden decision of a rail track operator to cease operations immediately produces a negative externality and reduces the network benefits to all users of the network. A new local operator who adjusts his initial operations to the timetable of a long-distance operator in the vicinity in order to act as a feeder, produces positive network externalities for the long-distance operator and for local customers along his line, as they value the end product rail service from A to B higher, if they can actually access A in the first place. This definition of positive network externalities coincides with Brandenburg and Nalebuff's earlier account on complementors: "*A player is your complementor if customers value your product more when they have the other player's product than when they have your product alone.*" Accordingly,

⁶⁷² Nalebuff and Brandenburger 1996), pp. 4-5 (emphasis in original)

⁶⁷³ Rahmeyer (1996), p. 4. Braeutigam, Daughety and Turnquist (1984), p. 4 point out that at least two types of scale economies are prevailing in the railroad industry, namely economies of density and economies of size.

complementors have a built-in incentive to co-operate in order to mutually attract customers.

5. *Intra-layer competition* is competition within the layer as if it would be a closed economy, irrespective of external influences. Is competition between different TOCs, feasible and efficient?
6. *Government regulation* – is there a scope left for government regulation or intervention with regard to each layer discussed? Is potential market dominance an issue within the layer?

1. Layer I: the physical railway track infrastructure (ROCs)

The prime functions for the *Rail Track Operating Companies (ROCs)* of layer I are the *provision and maintenance of a high-quality track infrastructure network* for passenger and freight services in exchange for the payment of access prices to the ROCs. Train stations and depots may be owned by the infrastructure companies, train operators or other companies that would also receive an access charge from train companies, just like access charges paid by airlines to make use of airport facilities. The infrastructure providers' activities involve mainly long-term decisions and negotiations with various players in the transport market, such as other railway infrastructure operators if there is more than one ROC, train operators, traffic safety and control firms, construction companies, train station and facilities operators, politicians, local, regional and national administrations, representatives of public consumer groups and so forth. Nevertheless, actual train operations are likely to be dealt with on a more short-term basis, depending on the process of allocating slot access rights to the TOCs.

The railway infrastructure is characterised by a high amount of fixed costs and comparatively low variable cost elements.⁶⁷⁴ In addition to being fixed, these costs are sunk, i.e. they cannot be recovered, even by total cessation of production. It is simply impossible to rip them off the ground and sell them somewhere else, as they are geographically tied to their location. Apparently, entry barriers are present in the railway track network, as has been argued in the nationalisation debate. The track infrastructure is clearly characterised by economies of scale, in particular in the form of economies of density. The more trains use the network, the lower are the costs to be carried by individual trains. If only a single train would use a certain line, it would have to recover the entire trackage costs. So, if more trains are using the line, all of them have to share the trackage costs between them, lowering average costs considerably up to the capacity constraint of the track, in particular as the variable costs are low. The study on the British privatisation already hinted at a possible expansion of the networks' capacity, either by trading safety for a higher carrying capacity on the system or by actually improving safety technology that would, however, also increase the system costs. When the railway track infrastructure is operating close to the capacity constraint, it might make sense to duplicate the facility to accommodate for a potential growth in transportation demand.

Economies of scope exist in interconnecting two previously separate infrastructure networks, which had so far been completely isolated from each other. A physical interconnection could attract further traffic, as more connections could be offered to the users and potential users of both networks. Thus, the interconnection also creates positive network externalities. Stackelberg argues that such economies favour a single network provider.⁶⁷⁵ However, the network benefits and transaction costs are more substantial to his argument. Both ROCs would have an incentive to free ride, that is, to wait for the other operator to invest in the interlinking track, facing high capital costs, whilst the operator who refrained from investing could not be prevented from benefiting from additional traffic and revenues, without having to face the investment costs. Though both ROCs would be locked into a prisoner's dilemma situation, it is not a one-shot, but a repeated game, even if not with the same but with other operators.⁶⁷⁶ Thus, the companies will co-operate in a joint investment effort or with some profit-sharing arrangements, assuming they are rational utility maximisers. However, what does indeed favour a single operator are the transaction costs involved in negotiating and monitoring these arrangements and possible disagreements concerning the allocation of the additional revenues.

Scope economies based on interconnection of previously separate networks are, however, limited. Clusters of regional economies are usually focused upon a core, which means that a direct link to the outer regions of the separate clusters might not create substantial additional trade, traffic and therefore revenues. Technical standards applied to the networks might create some further negative effects. Interconnections usually require the same standards for the whole network. Now, it might well be that the standards and the entailed investment and maintenance costs for solely local or freight traffic lines are kept on a level way too high for those traffics. This would then drive costs and might even result in line closures though they could have operated profitably with lower standards.⁶⁷⁷

⁶⁷⁴ Stackelberg (1990), pp. 194-198 for economies of scale and scope in the infrastructure.

⁶⁷⁵ Stackelberg (1990), p. 196

⁶⁷⁶ Admittedly, the game cannot be repeated indefinitely due to scarcity of land resources. Thus, rational players might be expected to defect in the last round and choose the free-riding instead of the co-operative solution. As rational players will anticipate the defection in the last round they will already defect in the previous round, pre-empting the other's action. That would be the rational outcome in a finitely repeated game, when the total number of rounds is announced prior to the start of the game. However, in this case, there is no ex-ante announcement as the amount of interconnections is simply uncertain and depends upon the dynamic nature of progress of the industry and development of the network.

⁶⁷⁷ Stackelberg (1990), p. 197

Accordingly, the infrastructure network may be organised in a number of interlinking regional operators⁶⁷⁸ or specialised operators for high-speed, local, regional, international or freight traffic, where feasible.⁶⁷⁹ Still, the structure should ensure that both economies of scale and scope are realised and it seems that especially the economies of scope and transaction costs impose some constraints on a separation in a huge variety of small networks. As long as horizontal mergers between ROCs are not prohibited, the railway market is likely to observe a range of mergers until the network size reaches its optimal scope. Open access has been assumed for TOCs and there is no reason why it should not also apply to the railway infrastructure. Still due to high sunk costs it is less likely in the market for the provision of track infrastructure that a whole bunch of new entrants will venture into the market immediately. They might stand a chance of entry where the incumbent's tracks are already close to the capacity constraint and entrants might also opt to diversify in overlapping markets. Instead of investing into traditional railway infrastructure, they could also invest in new technologies, such as magnetic traction, in order to capture a market share of both the traditional railway and short to medium distance airline markets.

The major advantage of a horizontally separated infrastructure networks is the reduction of monopolistic bottlenecks and as a result, government regulation of bottlenecks. Regional infrastructure providers who are competing with each other for increased traffic on their networks will then be restrained by the disciplining forces of intra-layer competition in the market for track access rights and the entire market for transportation.

⁶⁷⁸ The study on the Swedish railway reform mentioned that this was exactly the case in Sweden. The state railways were aiming to interconnect the regional or local networks.

⁶⁷⁹ Ewers (1993), p. 8 noted prior to the railway reform that a number of very small non-national railway firms were operating quite successfully in companson to the Deutsche Bundesbahn. This indicated that potential cost reductions due to large scale are no justification for a nationwide monopoly in the operations of the track infrastructure. Starkie (1989), p. 180 also suggested different track operators, but restricted his argument mainly on parallel lines, neglecting the potential offered through regional networks.

2. Layer II: the network of traffic and safety operations (SOCs)

The second layer of traffic and safety operations, the *Safety Operating Companies (SOCs)* are based on their counterpart in air traffic, the air traffic control agencies, such as Eurocontrol. The functions of the traffic and safety control companies are primarily the *ex-ante capacity management* as a kind of clearing-house institution and the *guarantee of safe and efficient day-to-day traffic flows*. In the case of accidents or SPADs, there must be a clear line of communication and control which resides solely in the SOC. The train operators involved immediately report the incident to the safety operator, who will then take the necessary measures and precautions.

Most obvious potential tasks are the allocation of slots to the individual TOCs, operation of signalling systems, supervision and approval of minimum technical and safety standards for train and track operators, strategic planning for the network and co-ordination of network activities between the layers, such as through-ticketing, provision of neutral train information and reservation systems and timetabling co-ordination during the slot allocation process. The collection of access charges for both the ROCs and the SOC might also be carried out by the SOC. Nonetheless, the list is not definite, it might embrace less or more *co-ordinating functions*, depending on the initial design preferred by the government in charge. As the SOC is responsible for the safe operations of daily train services it would only be consequent to transfer regulatory responsibilities to them as the unbiased private regulators for the entire railway industry.

Still, final responsibility for the safety of operations remains exclusively with the individual TOCs and ROCs. They are by no means relieved of their liabilities and responsibilities to operate safely. The SOC is solely overseeing the general network safety and has a *contractual* power to intervene, wherever they feel that safety is no longer guaranteed. Those rules and regulations have to be set up and agreed upon in the initial privatisation contracts between the government and all players in the railway industry. These rules must not be static and allowance needs to be made for adjusting them to technological progress.

Similar to the track infrastructure, the actual signalling system exhibits fixed costs which are sunk. Still, the SOC will have to make major investments in innovative computer systems to run the daily operations and conduct the capacity management.

Though these costs are also fixed, they are not sunk as in the physical infrastructure of tracks or signalling networks. Much of the SOCs resources will have to be invested in intelligent software solutions, rather than in physical material. Thus, their cost structure is very different from that of the ROCs. And again, economies of density constitute the major factor for economies of scale. The more trans use the network, the lower are the costs imposed on the individual train operators. Clearly, substantial economies of scope are involved in the operation of the safety firms, as their software solutions require large investments. Thus, it is cheaper for a single or a few firms to commit funds to research and development of advanced technologies rather than forcing several firms to do so by separating the second layer into various units.

An atomic separation of the second layer requires constant co-ordination between the SOCs, as they need to agree on a set of minimum standards, the same traffic signals and a flawless transfer of control over trains passing from a network controlled by one SOC to another one, involving high transaction costs, hampering the exploitation of network benefits, such as uniform signals, safety regulations and standards. In emergencies it is especially important to have the sole responsibility for immediate actions centrally controlled, as the time corridor for countermeasures is unlikely to allow for communication to find the responsible control centre.

Competition between a few SOCs might be feasible, if their networks coincide with the networks of regional or local infrastructure operators. But it would still lead to higher transaction costs than the organisation in a single company, whenever trains are passing the border points between two networks. Furthermore, the SOCs would also have to enter negotiations upon minimum standards and regulations. Most importantly, the major co-ordinating and strategic planning organisation would have to concentrate on intra-layer instead of inter-layer co-ordination functions, reducing the overall benefits the introduction of a separate second layer could contribute to the railway industry. In the end, a single interregional, national or even European safety company could be advantageous.

However, that does not result in competition being absent from the second layer. But competition between several SOCs could be replaced by *competition for the field*, a

concept which was originally proposed by Edwin Chadwick in 1859.⁶⁸⁰ Accordingly, the traffic and safety company could recurrently be auctioned off to a single firm under a franchise agreement. Thus, this concept allows competition to take place prior to the production process, “...with would-be natural monopolists competing for the right to serve the market in which each rival could serve the market at the lowest cost, adopting the best technology.”⁶⁸¹ After the franchise period has passed, the incumbent operator and potential rivals may apply to run the safety operator in the next session.

The SOC can then take on the crucial and central role in the reformed railway system, as its allocation of the slots and the resulting co-ordination of the passenger and freight services is the key to reaping the benefits of the railway *network* as an *integrated*, but *market co-ordinated* system. Assuming that the railway reforms will start off within the borders of the nation states, national SOCs would be set up as clearing-house institutions in allocating daily train slots and supervisors of railway safety. The respective SOCs might then be auctioned off with invitations for tenders on a national and, later possibly an international or at least European scale. The successful companies may also apply for more than one SOC in the auction processes. Having invested in technological innovations which contributed to winning the franchise of the SOC in one country, the company's efforts to win further franchises would be based on previous experiences. By means of that franchising process, one or a few companies with a superior technology and organisation might run the entire European network of safety and control companies in the end, thereby creating an integrated European network of railways, benefiting the players in the market and enabling the railways to successfully compete with other modes of transport.⁶⁸²

Competition for the field would make any government regulation of the SOCs redundant. Still, the government would have a considerable leeway of control in every renewed franchise of the SOC. The auction process for temporary franchises also offers

⁶⁸⁰ Chadwick (1859), p. 385 proposed this concept whilst observing sanitary conditions in the English water supply industries: “...I proposed, as an administrative principle, competition for the field, that is to say, that the whole field of service should be put up on behalf of the public for competition, - on the only condition on which efficiency, as well as the utmost cheapness, was practicable namely, the possession, by one capital or by one establishment, of the entire field, which could be most efficiently and economically administered by one, with full securities towards the public for the performance of the requisite service during a given period.”

⁶⁸¹ Lal (1997), p. 221

⁶⁸² Knieps (1996), p. 32 explicitly suggests that a harmonisation of national safety agencies for supervising train operations could reap some of the potential benefits of horizontal integration until a European agency might finally emerge.

the opportunity for a flexible design of the rules and regulations supervised by the SOCs for the railway industry. Should train or track operators feel discriminated by the safety franchisee, either the Office of Fair Trading or European Union competition authorities might investigate the matter.⁶⁸³

This design also offers benefits for countries preferring a stronger state involvement in railway policy, as the franchising process of the SOCs naturally offers scope for government interference. The government could even decide to grant the entire operation of the safety network to a public agency, which however eradicates the competition for the best technology, as this is inherent to the auction process for the most efficient and safe operations of the SOC. Whatever politicians should decide, they must make that decision *once* and *at the outset* of the privatisation, in order to provide the railway industry with guarantees for their own strategic planning.

⁶⁸³ The European competition rules laid down in articles 81 and 82 of the Treaty of Amsterdam have already been mentioned in section III.A.: *“Any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States.”*

3. Layer III: the train operations (TOCs)

The function of the third layer is simply the *operation of passenger and freight train services*. One of the main features of the models of a privatised railway system below is the *non-discriminatory open access provision* as assumed above, irrespective of the vertical structure of the system. Open access means that access to the network is open to every train company which complies with minimum safety standards as set out in initial privatisation arrangements by the government and the SOCs in exchange for the payment of an access charge to the network providers.

Even train services embody some economies of scale, as certain tasks benefit from indivisibilities of services, such as minimum lengths of trains. According to Ewers, though, they are supposed to be fairly weak, ruling out a national monopoly for train operations.⁶⁸⁴ Also, economies of scope can be discovered in the train services, e.g. with standardisation in locomotion technology. Stackelberg points to a German universal locomotive, which may be used for high speed passenger transport and freight traffic.⁶⁸⁵ The standardisations would also result in cost reductions in maintenance efforts and would offer greater flexibility to employ the engine wherever capacity bottlenecks should occur. Freight traffic, however, is characterised by an opposing trend, as freight companies focus on the requirements of their customers, employing rather specialised cars instead of standardised carriers, thereby accepting loss of scope economies. However, natural monopoly theory does not apply to the train operations. Even though locomotives and carriages represent fixed costs, they are not sunk, as they can easily be moved to another location if market entry of a newcomer should fail. Due to the absence of sunk costs, no market barriers exist. Thus, the incumbents in the market for railway transport have to face potential competition. The market is not a natural monopoly, i.e. a single seller cannot serve the market cheaper than several sellers. Market barriers being absent, actual competition will prevail between train operating companies.

The pressure of both, actual and potential competition will lead to a supply of railway transport which is geared to meet the varying preferences of the consumers. Some companies might focus on high-speed passenger or freight traffic throughout Europe. Others might specialise on regional passenger transport, perhaps building an integrated

⁶⁸⁴ Ewers (1993 , p. 8

⁶⁸⁵ Stackelberg 1990), pp. 198 199

network with local bus and taxi companies instead of leaving passengers stranded at a railway station in the middle of the night. Some firms might specialise on low-quality but cheap transport, while others will operate a high-quality, high-speed service aiming at business travellers and a share of the short or medium distance airline market. Trains may offer facilities to passengers, ranging from bars, restaurants, small conference, hotel, video and cinema facilities to saunas, gyms, massage treatments, libraries, entertainment and internet cafes. Whether passengers are travelling for a short or long time span, train companies will be forced to offer the customers the deal they are demanding in order to capture a share of the highly competitive transport market. Instead of neglecting market gaps, niche markets and some classes of freight and passengers, firms may pick these gaps deliberately if they can work profitably, using their competitive advantages in price, quality and speed over other modes of transport.

Nevertheless, it might well occur that a single train operator *could* operate train services in an area cheaper than two or more operators. Imagine a short local railway line between two towns or villages, connected with a single track. The operator runs one train that departs from, e.g. Luzern on every full hour and arrives in the small village of Engelberg after twenty-five minutes, only to depart for Luzern five minutes later, and so on. Now, this train serves the demand quite well, leaving not much room for a competitor. Furthermore, the single track makes it more difficult to compete, as there is only an interval of five minutes, when another train could pull into the terminal right behind the first one. But despite this seemingly monopolistic market power of the sole incumbent, there is no need for regulation.

There is, indeed, potential competition and a newcomer might enter the market at any time without having irreversible costs in his production. The monopolist on that line has no credible threat at hand to keep potential competitors from entering the market if he charges a monopolistic mark-up. The newcomer could either bid for the slots being left over on that line and outperform the incumbent by offering cheaper or rail travel with an all-exceeding service or target the incumbent's slot whenever the SOC allocates the slots anew.

However, if open access to the network is prohibited, e.g. by franchising an entire line for a number of years to one company or selling a vertically integrated service *without* allowing competition on the track, the incumbent could slow down in its efforts to

innovate and stay ahead, exceeding any potential entrant, because there is none to compete with, except for intermodal competitors. Market barriers of that kind could be erected by government legislation or discrimination between the different layers. For example, imagine that the infrastructure is owned by a single company that also runs a TOC on its own tracks. Though the company must be obliged by a railway reform law to grant other operators than its own TOC access rights to the infrastructure, it might discriminate against competitors by overcharging others on the access price to the network or by allocating the prime slots during peak hours to its own train company instead of rivals if the SOC would also be vertically integrated. Therefore, *non-discriminatory open access* to the entire network is essential.

Apparently, the open access is slightly limited due to the SOC's safety regulations. Minimum standards are justified for two reasons. First, it was assumed that the government owned and operated the railway system and would set the rules for its privatisation. Second, considerable network externalities are involved in the safe operation of the whole railway system. Even if a company's reputation would be entirely lost after a rail accident, negative externalities would harm the railways' reputation as a whole, because the public would link the accident to the general system and not to the particular company. Absence of minimum standards and regulations to the network would invite freeriders to benefit from the general reputation of railway transport, regardless of the safety measures the entrant has employed on its trains. Assuming poor safety equipment and consequently lower short-term costs in one company, it might offer cheaper transport than its competitors, while it is enjoying a free ride on their reputation of the product *safe rail travel*. In case an accident should indeed occur due to the lack of safety precautions the reputation of that company may be lost entirely, forcing it out of business. However, neither the victims of the accident nor the other railway operators who have to regain the reputation for railway transport's safety will benefit from the firm's punishment by departing the railway market.

In a competitive marketplace for railway transport, competition between several train companies is a likely outcome. Though competition is entailed with substantial efficiency gains compared to a monopolistic supply of transport, the drawbacks may be higher transaction costs for everyone involved. As an example, take the passenger who intends to travel between Hamburg and Munich. Assume, that there are three high-speed links, either via Cologne, Hanover or Berlin. While the direct connection via Hanover

might be shorter, the connection via Berlin might be quicker due to a company offering the most up-to-date technology. To make the choice for the pitiful customer even worse, there are several different companies operating on each of the routes, some stopping more often than others, some having different services aboard and so on.

But the solution is easy at hand, as entrepreneurs will take up the opportunities and offer transaction-cost reductions for the confused individual. An Internet or specialised travel agency may note the passenger's preferences and choose the according service. Examples are plentiful on the Internet today, as a quick look into flight bookings on the rapidly developing market for cheap, executive or whatever air travel will instantly prove. Similar institutions are likely to emerge for safety and quality of railway travel. Results of regular voluntary inspections could be published in magazines, such as the German *test Stiftung Warentest* or easily on the Internet.

Therefore, a consequent reduction of transaction costs can be expected due to emerging institutions, such as (internet) travel agencies or publishers making use of the otherwise high search and information costs for customers of the transport market. Some of them might focus on the railway market, others on the entire transport market, bringing the best deals to the consumers of transport.

In freight transport, resources are wasted when freight trains are doomed to wait for hours at depots on account of outdated and slow transshipment facilities, in the event losing business to road hauling or other modes. However, with open access on the network, industry could hire their own trains or run their own freight operator on certain routes, directly connecting their markets.⁶⁸⁶ For industries with small lots, specialised freight companies may emerge in order to pick up the opportunities with innovative computerised logistic solutions.

Due to the absence of market barriers, actual and potential competition prevails in layer III. Also considering the SOCs regulatory oversight, additional government

⁶⁸⁶ www.bahn.de (2001) and www.banverket.se (2001), press notices: IKEA Rail AB has taken a leading role in European rail deregulation. On Friday, 29 June 2001, IKEA Rail AB, the newly founded rail subsidiary of the Swedish furniture company IKEA has signed track access agreements with three European track operators, the German DB Netz AG, the Danish Banestyrelsen and the Swedish Banverket. IKEA Rail will run daily freight trains between Älmhult and Dusburg in each direction every weekday from September 2001, thus requiring ten slots per week.

regulation is redundant and would lead to distortions in the efficient working of the transport market.

D. Vertical integration versus separation – market-based integration

Before dealing with five main models of a privatised railway structure, it is necessary to test the railways for economies of scope within their vertical structure. Conventionally, it has been argued that economies of scope exist between both infrastructure networks (*layers I & II*) and the actual operation of trains (*layer III*) for the following three reasons:⁶⁸⁷

1. *Research and development* activities require combined efforts between TOCs and the infrastructure operator;
2. the latter might lose its *contact to the market* and the final customers as a consequence of vertical separation; and
3. the *management of traffic flows* will be considerably burdened in an institutionally separated system, e.g. with regard to timetabling and slot allocation, as well as flexible day-to-day management of operations.

Ewers makes clear, that economies of scope are indeed existing, even though they do not provide a rationale for a mutual monopoly of the infrastructure and train operations. In contrast, the conventional argument claims that vertical separation would eliminate the said economies of scope, which is why railway companies must remain vertically integrated.

First, *research and development efforts* are said to be most effective, if the research activities are simultaneously geared towards tracks *and* rolling stock. Therefore, separate research departments in different train operating companies and network providers are supposed to be inferior to research undertaken in an integrated company. Irrespective of possible economies of scope in this area, research and development activities may, however, be undertaken by companies, which are independent of either train operations or infrastructure and traffic control networks. Apparently, those independent research and development firms cannot neglect any of the complex activities in the railway

⁶⁸⁷ Knieps (1996), pp. 38-42 and Ewers (1993), pp. 9-11 discuss the three reasons almost identically, investigating the conventional arguments. The Council of Academic Advisers of the Society for Public Policy (Wissenschaftlicher Beirat der Gesellschaft für öffentliche Wirtschaft) represents a stronghold of the conventional view expressing the three concerns, Gesellschaft für öffentliche Wirtschaft, pp. 10-14. Still, cost studies of economies of scope are not available to validate the arguments.

industry, but must investigate their interrelations, e.g. between rolling stock and tracks.⁶⁸⁸ With the liberalisation of global and European transport markets, a trend towards international research and development companies is most likely, striving for innovations which they can profitably sell to world wide transport markets rather than limiting their efforts to a national scale in a nationally integrated company. Thus they might even exploit potential economies of scale in research better than integrated railway firms.

The second argument, namely that the infrastructure provider may lose the *contact with the marketplace* is simply irrational, when considering the initial assumptions. Supposedly, the infrastructure company does not provide the track for altruistic reasons, but is essentially motivated by making a profit, the train operators will be required to pay an access price to the infrastructure provider, which they will then pass on to their passengers or freight customers. Owing to intermodal competitive pressures and substitutive railway connections of other infrastructure providers, the companies will aim to meet the preferences of their direct customers, the train operating companies, as well as taking the train operators' customers' demands into account.

Third, the *capacity management and organisation of daily traffic flows* has been mentioned above as a further point in favour of an integrated railway system due to economies of scope. Though the traffic management is undoubtedly a complex task, its complexity does neither depend on the separation or integration of the vertical layers, nor on the amount of train operators on the track, but simply on the *number and speed* of trains. The need for a safe and co-ordinated traffic management is essential in both separated and integrated railway systems. Above, it has been suggested that these operations could be undertaken by interregional, national or, later, even European SOC in a vertically separated system, auctioned off to the aspiring operators of traffic and safety management. The SOCs would be in sole charge of the overall capacity management and the supervision of traffic flows, they are bridging the supposed gap which is feared to be left as a result of a vertical separation of the railway system.

⁶⁸⁸ Sweden has often been quoted as a negative example of co-operation between the private train business and the state-owned infrastructure operator. Ewers (1993), p. 10 however reasoned that the private train company's complaints about the incompetence of the public infrastructure company must not be surprising. He sees a possible solution to the infrastructure company's lack of incentives in a greater separation from government and the obligation to run profitably.

Dismissing the three generally quoted reasons in favour of economies of scope between the combined layers I and II with TOCs does not mean that synergies are absent in a vertically integrated railway systems. But their exploitation does not necessarily require integration in a single enterprise. So far, the argument was made solely against the conventional view, that synergies would exist for three reasons between the train operations on the one hand and the combined layers of the infrastructure network on the other hand. A vertical separation of the infrastructure networks into ROCs and SOCs was simply unthinkable. It is interesting that it was not even considered, but a more challenging debate was apparently halted for the three reasons mentioned afore. Eventually, Knieps provoked the conventional thinking and suggested to separate the physical track network from a safety agency similar to the ROCs.⁶⁸⁹ Though their foundations were not very challenging, vertical synergies might occur between TOCs and the provision of small branch line stations. Alternatively, the ROCs or independent companies with expertise in running stations could own the stations, collecting access charges from the TOC operating the local branch.

As a vertical separation between TOCs (*layer III*) and the infrastructure (*layers I & II*) was already seen as a radical step, an integrated infrastructure remained unchallenged. But there is no reason that the status quo must uphold, if scope economies are absent between layers I and II. Consequently, Knieps argues that the network of tracks and safety controls does not exhibit significant economies of scope, supporting the rationale that a break-up of integrated railway systems into ROCs and SOCs plus the train operations of layer III would at least be feasible without imposing major costs upon the railway system.⁶⁹⁰

Naturally, there is a strong demand for co-ordination between the ROCs and the SOCs, involving transaction costs. The SOCs have already been referred to as something like clearing-houses for train slots. As the ROCs are required to maintain and renew their track infrastructure, certain slots have to be taken out of business to allow for maintenance works. Quite obviously, the safety operator cannot allocate the slots, which

⁶⁸⁹ Knieps (1996) suggested to split railway transport into three layers similar to air transport, which he investigated in the same study. Therefore, I am indebted to him in imitating an argument that is mostly neglected in the public debate and rejected as being impossible. This study however shows that an approach to railway organisation in three layers offers several benefits to the industry and the transport market and may serve as a solution to problems currently encountered in Britain, Germany and other European countries.

⁶⁹⁰ Knieps (1996), pp. 41-42

are used by the track operator to carry out repairs. Notwithstanding, whether layers I and II are integrated, the track department or ROC has to reserve the slots with the traffic management department or the SOC, respectively. The transaction costs for the reservation procedure are unlikely to differ much between internal or external co-ordination. The process is essentially the same, whether in long-term track investment planning or due to immediate incidents, when the SOC needs to block slots which were already allocated to train services.

Most of the business operations of the SOCs and ROCs appear to be unrelated to each other. The ROCs provide their track infrastructure and invest in new routes, according to market demand. The SOCs deal with the ex-ante capacity management of the railways and channel the daily traffic flows as requested by the TOCs, subject to availability of slots. While the co-ordination between ROCs and SOCs seem to be limited to more exceptional circumstances, the TOCs will have to deal with the safety operator on an almost permanent basis. If there are vertical synergies, they could be expected between layers II and III rather than between I and II. Again, the market seems to be appropriate for co-ordinating the actions of TOCs on the railway network with a company *unbiased* between the TOCs allocating the slots and making sure that operations run safely and smoothly.

1. Model A: Integration of layers I, II and III

The full vertical integration as illustrated in figure 4 is the traditional model of railways, in itself representing two different structures in its horizontal dimension. State-owned railway companies were usually vertically integrated, commonly as the sole or at least the major provider of national railway transport. Also, the 19th century private railway enterprises were generally vertically integrated companies.⁶⁹¹ The principal differences rested first, with the ownership of the companies and second, the market dominance of railway transport. The state-owned railway firms had a virtual national monopoly over railway transport as they were also horizontally integrated, whereas the private railway companies were often massive enterprises, but never national monopolies. Even the government-induced 1921 merger of British railway companies resulted in four regional monopolies, but solely in the market for railway transportation with competition in the market for transport and occasionally competition between lines.

The above assumption of non-discriminatory open access renders a full vertical and horizontal integration invalid. The importance of the assumption has already been dwelled upon, but its relevance for real-world railway reforms must also be noticed. The European Union has issued a number of consultation documents and passed influential legislation on access pricing and non-discriminatory access to the EU's railway and other utilities' infrastructure networks, thereby pointing towards a trend favouring liberalisation in network industries.⁶⁹² A vertically integrated, but horizontally separated railway system, as was most popular in the 19th century, would meet certain difficulties in the current situation, most importantly with regard to the safety network. From a theoretical point of view, a vertical separation into a variety of SOCs as part of vertical railway businesses is feasible, though naturally entailing transaction costs, which are likely to rise in proportion to the number of SOCs and overlapping network operations. In addition, especially the British real-world perspective sets narrow limits to the theoretical feasibility due to the recent safety crisis mentioned in the case study on the UK in section III.C. The British are unlikely to be prepared for any further experiments, as some of them apparently felt like being actors in a test-case scenario for a textbook railway

⁶⁹¹ The historical study has highlighted that open access to the tracks of those vertically integrated companies was a legal requirement for licensed train operators (see e.g. the Royal Prussian Railway Law of 1838), though it was only used on one occasion by the Prussian government as a threat as described in detail above.

privatisation. Thus, Model D will consider a railway industry structure with vertically integrated train and track operations, while the safety provision is carried out by SOCs embracing several or even all national or European integrated train companies.

⁶⁹² Non-discriminatory access to railway infrastructure was at the centre of the EU's directives as detailed in section III.A.

2. Model B: Integration of layers I and II

The integration of the track infrastructure and traffic control networks in a monopolistic public or private enterprise with several competing train companies on the network was among the first reform proposals of railways in Europe, as portrayed in figures 5 and 6. In the proposals, the ROCs and SOCs were integrated in an uncontestable, naturally monopolistic enterprise. Still, this is not to say that private operators should be prohibited from operating or establishing its own infrastructure networks. Solely, the government owned railway company is re-structured according to the vertical structure in the illustrations provided.

The model in figure 8 is very similar to the current structure of the railway industry in Germany. The vertically integrated Deutsche Bahn AG is the dominant provider in layers I, II and III, while other train operators are competing with the DB's passenger and freight transport subsidiaries. Other railway networks are strictly limited to a few railway lines. The DB's dominant position in the German railway market was a logical result of the German privatisation process, as the DB inherited the former state monopolist Deutsche Bundesbahn.

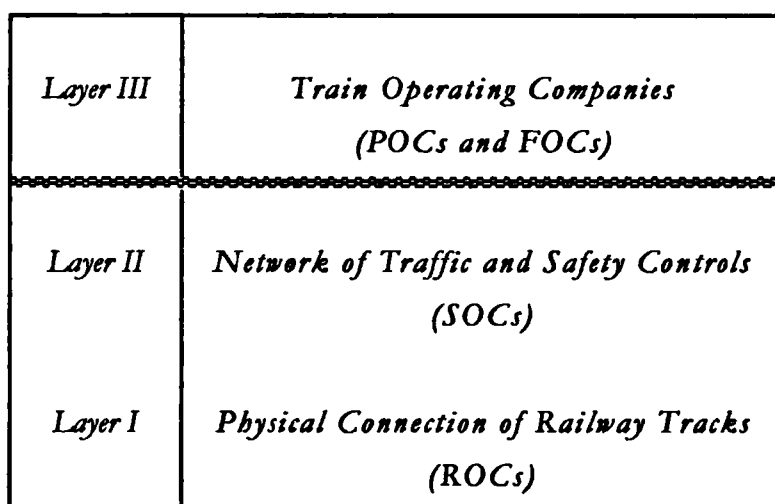


FIGURE 8: Vertical Integration of Layers I & II – Network Provider(s) may run own TOCs

Figure 8 shows vertically integrated ROCs and SOCs with separate TOCs, though the marked line indicates that the network provider may run his own trains on his infrastructure if he so wishes. Now assume a dominant network provider like the DBAG runs his own passenger and freight trains in a competitive layer III. As long as the access prices to the infrastructure are equal to every user of the infrastructure, presumably there

is not much to worry about. However, notwithstanding open access to layer III, it cannot be guaranteed that the access will also be non-discriminatory.

The German case study has exemplified that one of the main complaints of smaller competitors for train operations in layer III were indeed the access prices and the conditions of the pricing regime. Both the reforms of the pricing schemes introduced in 1998 and 2001 have emerged as the DBAG's subsidiary track owner DB Netz' reaction to the persistent criticism, that the pricing would discriminate in favour of major railway companies with a large demand for slots and long-term contracts, essentially the other subsidiaries of the vertically integrated Deutsche Bahn holding. Also, the potential of price distortions due to cross-subsidies within a company is inherent to vertically integrated firms. Thus, the track operating division might overcharge all POCs and FOCs, whilst cross-subsidising its own train operating division to undercut competitors' final product prices.

True, the network operator has an incentive to get as much business on the network as possible, as he is subject to intermodal competition. Nevertheless, it may pay off to sacrifice some earnings in access prices and a part of the transport pie in exchange for forcing other train operating companies out of the market, while his own train company receives hidden cross-subsidies in order to offer cheaper tickets and better quality than competitors. Also, the network provider might rationally discriminate in favour of his train company in the allocation process of the most profitable slots, rather than granting the best slots to competitors. In the case of congestion and delays the network provider is likely to give priority to his own company, while the worst-case scenario might involve open discrimination in the daily traffic management on purpose.

The development of the single market in the European Economic Community area and concerns about market dominance prompted the European Community in 1991 to issue the Council Directive 91/440/EEC, demanding at least accounting separation between the train operating and railway track divisions of vertically integrated private or public railway companies. Cross-subsidies were explicitly prohibited in article 6. The following article 8 demands the introduction of non-discriminatory access prices for all users of the infrastructure, payable to the provider of the railway tracks, whereas the

mode of access is left for the member states to decide.⁶⁹³ This has been discussed above in section III.A.

Thus, government regulation is an essential safeguard to monitor and guarantee non-discriminatory and fair access to the track and signalling infrastructure in a vertically integrated railway industry structure with a competitive supply in train operations. This industry structure does not uphold a neutral role for a private company to act as a mediator and co-ordinator of common interests, such as a private SOC. Whilst positive network externalities exist, favouring horizontal co-ordination to some extent, owners of major networks might do very well without their minor competitors, whereas the latter could become dependent on the dominant operator's benevolent co-operation to run his own services successfully. Cross-subsidies and other strategic market barriers adopted by the incumbent could deter entrants from the incumbent's track network, even if they offer a superior service to the incumbent. As long as the incumbent is not operating close to the line's capacity, the sunk costs of the infrastructure can be expected to discourage investment in a parallel network to challenge the incumbent.

Accordingly, a major restraint on misuse of market power cannot be expected from intra-industry competition in this model. Intermodal competition would be the industry's main self-regulating force. Thus, a vertically integrated industry offers scope for government regulation, to assure a fair and non-discriminatory use of the railway infrastructure, whether in a special railway regulatory agency or under the jurisdiction of the Office of Fair Trading or its national counterparts.

⁶⁹³ European Economic Community (1991), Directive 91/440/EEC

3. Model C: Integration of layers I and II with institutionally separate TOCs

This model of railway reforms is very similar to the previous one, with a small, however very significant, difference in design. The combined network provider is prohibited from running own passenger or freight trains in layer III. Roughly, this path was pursued in Sweden in 1989. The network provider Banverket was established as a public authority, whilst private sector competition was envisaged for sections of the actual train operations as described in the European case study above.

<i>Layer III</i>	<i>Train Operating Companies (POCs and FOCs)</i>
<i>Layer II</i>	<i>Network of Traffic and Safety Controls (SOCs)</i>
<i>Layer I</i>	<i>Physical Connection of Railway Tracks (ROCs)</i>

FIGURE 9: Vertical Integration of Layers I & II with institutional Independence of Layer III

In an alternative setting, the government could sell off the network provider to a private operator. Notwithstanding intermodal competition, the network company will - whether public or private - exercise considerable monopoly power in the market for railway transport, as other train operators depend on the provision of the infrastructure for the production of the end product railway transport. However, the relationship between the operator of tracks and safety controls on the one hand and the competitive supply of train transportation in layer III on the other hand is a mutual one. Again, all train companies are competing with other modes of transport for the carriage of traffic. Without passenger or freight revenue, there will be no revenue from access charges to the network manager. And the sunk cost element of railway systems resides in the network operator's outreach, not affecting the TOCs directly. Should either of the players in the railway market defect from a mutually beneficial solution, both parties in layer III and the combined layers I and II would lose to the advantage of other modes of transportation. Nevertheless, at least in the short term, it might pay off if the network provider defects

from the co-operative outcome by raising access prices by a margin. Even if he loses some customers, he might gain higher short term rents. His only task is to calculate the reservation price that maximises his revenues. This is the simplest form of price discrimination.

As the revenue maximising access price is likely to carry a monopolistic mark-up over social marginal costs of providing the infrastructure, government regulation of a dominant private network operator will be the common outcome in a railway reform in line with this structure. While the institutional separation of the TOCs from layers I and II in Model C allows the regulator to focus predominantly on the actual level of access charges, Model B also requires the regulator to take hidden cross-subsidies, differential treatments in the allocation of slots and further discriminations into account. Accordingly, the regulator will need to collect more information in Model B, entailing higher transaction costs and, due to imponderability in the information itself, regulation in Model B is also tied to higher uncertainty with regard to the regulations' effectiveness.

4. Model D: Integration of layers I and III with institutionally separate SOCs

In its desperate search for alternatives as salvation to the present chaos on the British railways and the helplessness of the surrounding politicians, the British government and industry are currently emerging with ideas of re-integrating POCs and the corresponding track infrastructure, presumably by means of a long-term lease of tracks from Railtrack to major POCs. The case study on the United Kingdom has revealed that the future structure of the British railway industry is once again open to further debate.

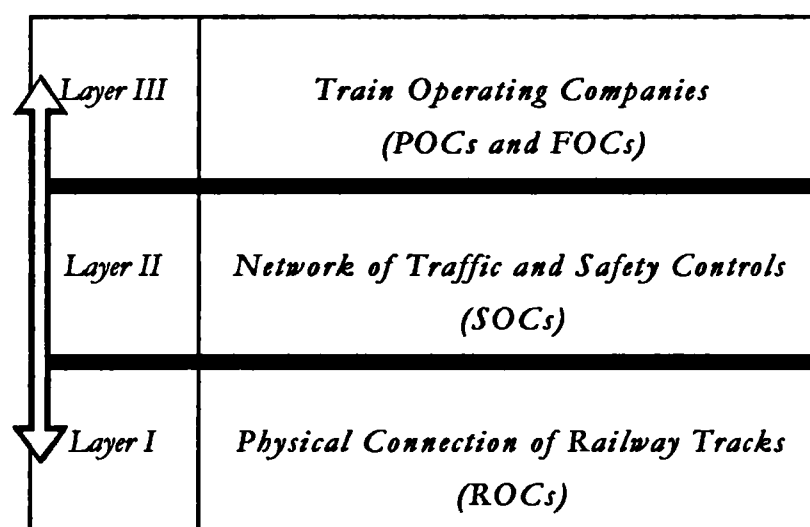


FIGURE 10: Vertical Integration of Layers I & III with institutionally separate Safety Operations

Adopting a vertically integrated structure along the lines of the current franchise operators in Britain would obviously require a comprehensive re-structuring of Railtrack, either dissolving the company completely or reducing it to administering long-term leases. However, proponents of the lease-option must explain why they would stop short of going full circle, if they favour splitting Railtrack. It is hard to see any advantages arising from a long-term lease over a sale of Railtrack networks to different franchise operators. Instead it would inject further uncertainty into the system with regard to a major re-shuffling of leases after the initial leases run out. The government might even reserve the right to get involved in the re-leasing process. A further question arises with regard to layer II as it might be too costly to split it up according to the new variety of separate track networks. Alternatively, an independent safety operator or Railtrack might run the

second layer, notwithstanding the choice between a sale or lease of Railtrack's layer I business operation, whilst layer I and III are integrated.

The debate on nationalisation of railway enterprises has shown that the basis for the market imperfections doctrine is at best very weak. Thus, the proponents' arguments were somehow supplemented by strong *concerns* about market dominance of private companies. Accordingly, the concerns usually associated with vertically integrated companies are fears of market dominance with an entailed discrimination against and an eventual squeezing out of small competitors. Depending on the government's choice of design, a vertically integrated railway market could still see major competition on the main railway lines, e.g. in the UK running more or less parallel from the South to the North, even if the train companies reserve exclusive access to the railway infrastructure. This notion of competition would then take the form of competition between lines, instead of competition on the track. The above assumption of non-discriminatory open access to the infrastructure, however, excludes this option. Accordingly, every train operator would be obliged to grant competitors access to its own vertically integrated infrastructure network in exchange for the payment of an access charge. If the competitors' access is indeed non-discriminatory, no one would have to worry about unfair pricing strategies of the track owner or discrimination in allocating slots. Nevertheless, the problem of co-ordinating safety operations between a number of different integrated railway companies remains unresolved in this model of integration, embracing all three layers in each train company.

This, however, is where the SOCs could take on an over-riding role. Now, imagine a nationwide or inter-regional monopoly of a public or private company in sole charge of the daily capacity management and overall safety operations as in figure 10 above. The competing vertically integrated train companies are running TOCs and ROCs, while they are obliged to grant non-discriminatory access to their ROCs to any other TOC. The slot allocation process, the collection of access charges, the day-to-day traffic management and co-ordination as well as the signalling operations are sourced out to the independent SOC, which could be a demoted version of Railtrack in the case of Britain's re-structuring example above, being a neutral and non-discriminatory mediator for all industry players involved.

While the government concerned needs to agree on a certain structure of access charges to the SOC's network at the outset of the privatisation with a possible oversight of the national or European competition authority, access charges to the ROCs' networks would be set individually by the track operators. The fair and non-discriminatory access for other TOCs could then be monitored by the industry's regulatory body, the safety operating company.

5. Model E: Full institutional separation of the three layers

Model E is apparently the most radical, and therefore probably the most mistrusted reform proposal. It suggests a full vertical separation of the railway systems layers, completely transforming the former railway networks. However, it is simply the next logical step from the proposals in Model D. The previous analysis of vertical integration at the beginning of this chapter did not find that the business operations between the three layers are strongly related to each other, though the TOCs have to co-ordinate with the SOCs constantly during the operations of their trains. But no substantial reasons were discovered, which could prevent or burden their co-ordination over the market. The resulting independent operation of layers II and III, however, promotes competition between passenger and freight train companies and the opportunity to draw the safety operator's forces together in a single or few franchised SOCs. Furthermore, a full vertical separation enhances the possibilities for internationally operating companies, which are no more bound by national borders. Note that current railway enterprises may run a few border crossing services into the vicinity, but many railway companies are still oriented towards national markets, though the trend is changing as visible with the operations of Eurostar, Thalys, but also certain freight services, such as IKEA Rail AB's ten weekly slots between Älmhult in Sweden and Duisburg in Germany, involving three European track operators.⁶⁹⁴

In a railway reform in line with model E the layers would be separated from each other at the outset of the reform. Thus, no company which actively operates in either of the layers would run a subsidiary in another layer to avoid cross-subsidisation and discriminatory behaviour. The railway system would be re-structured as shown in figure 11, with competing ROCs, franchised SOCs as well as active and potential competition of POCs and FOCs.

⁶⁹⁴ www.bahn.de (2001) and www.banverket.se 2001, press notices: see previous footnote in chapter C.3.

<i>Layer III</i>	<i>Train Operating Companies (POCs and FOCs)</i>
<i>Layer II</i>	<i>Network of Traffic and Safety Controls (SOCs)</i>
<i>Layer I</i>	<i>Physical Connection of Railway Tracks (ROCs)</i>

FIGURE 11: Full institutional Separation

Market liberalisation must acknowledge the dynamism of the railway market, realising that neither the government, nor economic wisdom can anticipate the future developments of the market. Even if there are no economies today, economies could emerge with the development of new techniques. The optimal market structure cannot be designed in a government's back office or in an economics department. Instead, it has to evolve by individual action, according to the individual preferences of the actors in the transport market. The railway entrepreneurs have to determine the structure which serves their customers' interests and thus, their own company. The governments' and academic approaches can at best determine the basic structure for the market which maximises the public benefit. After the basic design has been installed, government must let go to the extent specified in the privatisation arrangements, so that the industry can flourish.

As long as horizontal or vertical mergers, joint ventures or other forms of voluntary co-operation, that is *market-based integration*, do not harm the basic principle of non-discriminatory open access provision, they must not be ruled out. Some concentration in the industry is likely to occur over time in order to benefit from economies or transaction cost reductions. Due to the absence of sunk costs, the market for passenger and freight transport services is contestable. Even if there would be no actual competition in the market, potential competition will prevail, eradicating monopoly mark-up on the competitive market price.

This is, however, slightly more difficult in the market for track access, where sunk costs imply natural monopolistic behaviour. After an initial break-up of the

infrastructure, mergers in the ROC market could lead to regional or even interregional track operator monopolies. As long as layer II's SOC is acting as the impartial clearing house agency for the allocation of actual slots, monopolistic access prices are the main danger arising from a monopolistic market structure. Potential government regulation would only have to guard the access prices, though they are restrained by other than direct competition. Furthermore, it is doubtful whether railway track operators would be able to assemble a national or international track monopoly, notwithstanding whether it would be in their self-interest at all.

The same applies to vertical integration between ROCs and TOCs, as long as it does not impair the unrestricted access of potential entrants, or in other words, as long as it does not erect mobility barriers to market entry or exit. Naturally, the market-based integrationist' approach also includes intermodal integration, which might be favourable to some railway businesses if they could internalise positive network externalities, such as bus feeder services or superior knowledge in running transport businesses. Interestingly, many railway franchises in Britain are currently operated by bus and coach companies. The concept of integration has often been praised and Britain even attempted to integrate water, road and rail transportation under the British Transport Commission in 1948, resulting in a legally protected transport sector. While costs of failing public companies have to be borne by society as a whole, private sector companies have internalised the costs of failure, as they can put an enterprise out of business.

Nonetheless, the unbiased working of layer II is crucial for the arguments above. Relaxing its guarantee of impartial operation may result in discriminatory behaviour in the slot allocation process or the capacity and traffic management, if the SOC is operated by one of the companies in layer I or III. There are two ways of prevention, either by monitoring the processes by a regulatory agency or by prohibiting ROCs and TOCs from running layer II. Tight control of the SOC's daily management could, however, prove to be very costly or nearly impossible. As the amount of information required for the process is very complex, the collection and analysis of the data is first cost-intensive and second not likely to uncover minor discriminations, even though they might have a significant long-term impact. Therefore, the prohibitive solution could be the most cost-effective and transparent solution.

E. Assessment of the reform proposals

1. Scale and scope economies

Recapitulating the earlier analysis on horizontal and vertical integration versus separation leads to the following results with regard to the five models presented above.

The choice between models A to E should be indifferent to scale and scope economies involved in the infrastructure, such as economies of density and the physical connection of previously separate infrastructure networks. Though the latter favours fewer networks to an atomistic separation of the railway infrastructure, a ROC monopoly is not required. The economies of density may be exploited independently from the number of railway track companies, so long as they exclusively provide the physical rail infrastructure. Accordingly, the track infrastructure may be divided in interlinking networks of high-speed, regional, local and freight traffic, with further differentiations if necessary.

The situation in layer II is similar to layer I. The costs for individual train companies falls with additional users. The costs of joint production of safety products, such as the allocation of slots, signalling and the capacity management, will be lower if performed in one company, rather than in a multiplicity of firms. Only the incumbent SOC needs to invest in large specific research and development funds, whilst other transportation or software companies will however attempt to keep pace if they envisage themselves as potential future franchisees after the next auction procedure. While national or European markets could offer scope for a few SOCs competing with each other in the bidding for SOC franchises, a large number of SOCs appears to be counterproductive, especially if the networks are dealing with a large daily traffic volume crossing the borders between one or more SOCs. The constant co-ordination between SOCs in passing responsibility for train operations to a neighbouring SOC involves transaction costs. Most importantly, the transaction costs of finding the appropriate SOC to avert disasters may be prohibitive in the handling of emergencies. The main benefit of layer II as an inter-layer co-ordinating body and mediator between layers I and III would be burdened with intra-layer co-ordination tasks, instead. And again, each of the above models A to E offers similar potential to exploit economies and network externalities of the second layer.

The TOCs in layer III exhibit certain economies of scale and scope, which have been discussed above, such as indivisibilities and standardisation benefits. Neither, however, is an argument against vertical or horizontal separation. TOCs could run both freight and regional passenger services, exploiting universal locomotion technologies. High-speed passenger services might also commence high-speed express freight services if there are economies of scope, favouring a joint production. Also, minimum train lengths could be incorporated in a competitive supply of train operations, as competition does not mean that train services must consist of one engine attached to a single passenger or freight car. It is up to every company to decide upon its optimal train lengths or other indivisibilities of service. It does not justify a monopolised supply of train services.

Furthermore it has been concluded that the conventional reasons for a vertical integration of the three layers does not hold. Research and development production will no longer be confined to a national railway company and to political desires. Instead, railway enterprises will draw on a global pool of information and supply of innovative railway products tailored to the individual firm's needs. Presumably, international, global or specialised research centres can exploit economies in research far more effectively than smaller national train companies who can only commit limited resources to research and development activities. Also, the concern that the ROCs might lose the contact with the final customer has been relieved. The ROCs must not lose the contact to the market of passenger and freight transportation, otherwise it would drive them out of the market for transportation. In a horizontally separated layer I, other ROCs will be delighted to take over either the assets of the losing track provider or its customers via their own networks. The management of traffic flows will be carried out by the SOCs and is independent of the actual number of *existing* railway firms, but *solely* dependent on the actual number and speed of trains currently *running* on the tracks. The pure tasks of administering and maintaining the railway infrastructure are undertaken by the ROCs. Their assignments are, however, mostly independent from the business operations of the SOCs, though there is need for co-ordination, e.g. in blocking slots when repairs are due to be carried out.

As a result, neither economies of scale, nor economies of scope pose major burdens or concerns towards a market-based integration of railways, replacing former

railway structures. Therefore, no specific model should be favoured on account of the economies involved, alone.

2. Open versus exclusive access rights

Model A had been ruled out as a real reform model due to the impossibility of incorporating non-discriminatory open access to its infrastructure. However, relaxing the most prominent assumption made above has important consequences. Exclusive access rights in Model B could mean that the operator of layers I and II does not grant access rights to aspiring entrants to layer III, as the network operator is running his own TOC. If he accepts other train companies in competition to his own service provider, he might do so to his own conditions. Potential entrants or already existing TOCs do not possess any market power against the dominant network provider.

The situation is more positively leaning towards the TOCs in Model C. Now, the relationship between the independent TOCs and the network provider in layers I and II is inter-dependent. Though the TOCs cannot provide railway transport without access to the network, the network provider cannot exist without TOCs paying access charges. In the end, the game between the TOCs and the network provider is all about distribution of rents between them. To the detriment of the TOCs, the network provider might be able to extract some additional rents by marginally raising access charges and vice versa. Though the dominant infrastructure company appears to have considerable bargaining power at first glance, it has to recover high capital costs, whereas the TOCs could sell their assets fairly easily compared with the firm combining ROC and SOC services.

The trend towards higher bargaining power for layer III's train operators continues with Model D and even more so with Model E, as long as a single TOC does not purchase the entire ROCs in the marketplace. Though the train companies are integrated in layers I and III in Model D, it is a rational choice for the ROC divisions of integrated companies not to exclude other operators, if it provides additional revenues to cover the network's costs and even more so if access is priced according to the efficient component pricing rule. This charging principle developed by Baumol and Willig also compensates the incumbent operator for the opportunity costs he is foregoing by not operating the service himself.⁶⁹⁵ Accordingly, the incumbent will be indifferent towards the service provider and value another TOC in the same sense as his own's. In addition, the train operator concerned may also wish to offer train services extending over the borders of his own rail tracks. Therefore, he also depends on the benevolent co-operation

of other ROCs. American railway history provides numerous examples for different railway companies voluntarily granting access rights to each other.⁶⁹⁶

At the outset of privatisation the bargaining power in Model E will lean strongly towards the TOCs for the same reason as in Model C. Following likely mergers and acquisitions in the industry, the argument used in Model D applies. Thus, the necessity for enforcement of the non-discriminatory open access provision is falling in line from Model A to Model E, as it is partly self-enforcing for rational profit maximising companies. This also hints at the limited scope regulation must take in non-discriminatory systems.

⁶⁹⁵ The efficient component pricing rule shall be discussed in the next chapter below.

⁶⁹⁶ A study of American railroad history is included in the appendix, section VI.A.

3. Pricing of infrastructure and congestion pricing

The theoretical problem how to price access to the infrastructure in large technical systems emerged from a practical point of view with the deregulation of New Zealand's telecommunication market and its consequent privatisation in 1989. The former subsidiary of the post office was sold as a private unregulated monopoly in an unprotected telecommunication market to a consortium of Bell and Ameritech. The sale and purchase contract was based on the principle of non-discriminatory open access and competition from Sprint arrived in the same year.⁶⁹⁷ For railroads, Levin points out that the welfare maximising social optimum of marginal access pricing is unworkable due to the existence of fixed costs in the infrastructure.⁶⁹⁸ As the literature on the subject is vast, this can only present a brief overview and critique.⁶⁹⁹

Setting access prices to the railway network along with the approach of *fully allocated costs* means that the entrant has to compensate the owner of the infrastructure for the direct costs attributable to the track network in addition to his share of the fixed costs involved. The allocation of the fixed costs, however, leaves the entrant at an arbitrary discretion of the incumbent in correctly calculating and attributing the fixed cost element. In the UK case study the difficulties in allocating fixed costs to British Rail's different divisions have been shown. This is even more difficult in an industry with one dominant incumbent as in Model B, especially if the competitiveness of an entrant depends upon an unbiased and fair allocation of fixed costs in an incumbent firm. Thus, regulatory oversight over access prices seems to be more important in integrated railway enterprises than in separated businesses, as the former offer a greater leeway in shifting costs to the entrants. However, as the collection of information and the allocation of the fixed costs to individual services are close to impossible for integrated companies, it is

⁶⁹⁷ The former MP and Cabinet Minister from New Zealand Maurice McTigue (1998) described the general background of the privatisation process in New Zealand and the importance of the absence of regulation. Baumol and Sidak (1994), pp. 189-192 as well as Ergas and Ralph (1994), p. 3 discuss the access price system, which was decided in court. Though New Zealand's High Court decided in favour of the Baumol-Willig or efficient component pricing rule as a general charging principle, the Court of Appeal finally ruled against it on the grounds that the principle would not necessarily exclude monopoly profits.

⁶⁹⁸ Levin (1981), p. 394

⁶⁹⁹ For a more detailed analysis of access pricing rules see Cave and Doyle (1994), Economides and White (1995), Laffont and Tirole (1994), Locksley (1994) and Tye (1994).

even more so for regulating agencies with asymmetric information about the firm's cost function.

Laffont and Tirole proposed a *marginal cost pricing* approach to realise allocative efficiency and maximise welfare.⁷⁰⁰ However, the imposition of fixed costs of the network obviously eradicates the first best world of marginal cost access pricing, leading to a mark-up on marginal costs. They suggest covering the fixed cost element by *subsidy via taxation*.⁷⁰¹ The European case study illustrated a similar approach of marginal cost access pricing with a government subsidy to cover fixed costs that had been adopted in Sweden. Still, this concept distorts prices in the entire transport market in favour of railways, if the same pricing regime does not apply to other modes of transport. If governments aim at promoting railway transport, whilst discriminating against all other transport modes, this option might be pursued. A policy of strict non-distortion of market processes however assumes that *every* mode of transportation pays its way and not only the railways. In other words it requires access pricing schemes for roads and all other means of transportation. On the basis of the entire costs involved, the individual consumer would then have to make the choice of the mode of transport according to his own set of preferences.⁷⁰²

Baumol and Willig developed the so-called *efficient component pricing* or simply, Baumol-Willig rule.⁷⁰³ The access prices of the efficient component pricing rule are based on the *incremental costs* of the service plus the *opportunity costs*, that is the revenue the incumbent cannot realise due to the market entry.⁷⁰⁴ As the opportunity costs in Baumol's concept are deducted from the final product prices of the incumbent, the access price to the incumbent's infrastructure would include a monopolistic mark-up, if the

⁷⁰⁰ Laffont and Tirole (1994)

⁷⁰¹ Laffont and Tirole (1994), p. 1699-1670. Laffont and Tirole admit that their paper does not cover non-linear access pricing regimes, such as two-part tariffs which had been applied with the German InfraCard. On page 1670 they argue that "...it is an excellent tool to raise the money needed to pay for the fixed cost of the network. ...Similarly we have not discussed the important practical issue of peak load access pricing."

⁷⁰² The author advocated the private supply, financing and pricing of roads in a paper presented in Cape Town in 1999 on transport telematics and road pricing, Knipping (1999).

⁷⁰³ Baumol and Sidak 1994)

⁷⁰⁴ Blankart (1998), p. 11. Incremental costs are the additional costs incurred. The incremental costs are calculated by hypothetically comparing the total costs of the business with and without the service provided by the entrant.

incumbents' final product price inhibits a monopoly price.⁷⁰⁵ In addition, possible inefficiencies in the incumbent's production are left unchallenged, but even worse, the entrant has to pay for them by means of the access prices. According to Baumol and Sidak, the main problem does not reside with the efficient component pricing rule, but solely with a lack of price regulation. The dominant company will be unable to realise monopoly profits, if the *stand-alone costs* serve as an upper bound for price setting.⁷⁰⁶ However useful this concept is in vertically integrated markets as in models B and D, it becomes worthless when applied to vertically separated systems, such as in models C and E. The calculation of the opportunity costs is redundant in models C and E, as no revenue of the incumbent is foregone due to new train operators, because the ROC does not provide passenger or freight transport in the first place.

Though marginal cost pricing leads to allocative efficiency, marginal costs are making up nothing but a small share of the total costs of the infrastructure. If tax-funded subsidies are rejected by the government either due to the distorting effects mentioned earlier, budgetary or any other reasons, Ramsey pricing offers an alternative option to cover the full costs of railways, meaning that the fixed costs would be allocated to the different parts of the network inversely related to their demand elasticity.⁷⁰⁷ A relatively simple means of price discrimination to cover the fixed costs is congestion pricing. That means that peak hour services have to pay a higher charge than off-peak services.⁷⁰⁸ Also, slow freight or regional services wanting to run over parts of a high-speed line would have to compensate the track owner for their negative externalities caused, as they would block the line for a considerable amount of time, which might have allowed two or more high-speed trains to pass right after another. Thus, the slow train operator would simply have to buy two or more consecutive train slots to allow his train to run on the high-speed network. Ramsey-priced slots are likely to carry a relatively high mark-up over marginal costs at peak times, while past-midnight services are unlikely to be charged way above marginal costs. Also, higher access prices may be expected on lines where railway

⁷⁰⁵ Schwandt (1995), pp. 10-14 suggests to deduct the opportunity cost element not from the final product prices of the incumbent, but to use the fully allocated cost concept. Thus, he partly retreats to the arbitrary approach discussed earlier, which makes his proposal highly vulnerable.

⁷⁰⁶ Baumol and Sidak (1994), p. 196. Blankart (1998) makes the same argument for minimalistic price regulation in bottlenecks. Stand alone costs are the entire costs for the production of the service in a single instead of a multi-product firm. A price in excess of the stand alone costs would attract market entry and is therefore impossible in competitive markets.

⁷⁰⁷ Ellig (2001), Kessides and Willig (1995), pp. 3, 9-10, Laffont and Tirole (1994), p. 1670 and Stackelberg (1990), p. 197

transport or simply one ROC has a unique competitive advantage over intermodal or other ROC competitors, so that customers are unwilling to switch modes or track providers. This could be the case in heavily congested urban areas, when road transport takes by far longer than catching the train right into the city centre. A state-of-the-art rail track network could furthermore discourage high-speed train operating companies to switch to a neighbouring track provider with a considerably worse quality, offering the opportunity to charge a relatively high mark-up over marginal costs. The list is naturally incomplete and only hints at the large potential for price discrimination in order to cover the full costs of every ROC network.

The collection of access charges to both networks of ROCs and SOCs could be facilitated, if the safety operator oversees and allocates the access charge revenues, as the daily data flows on train operations and the process of allocating the slots are administered in the SOC. Thus, the SOC could be the lowest-cost institution due to economies of scale between the allocation of slots, the daily co-ordination of traffic flows and the collection of the corresponding access charges.

⁷⁰⁸ Glaister (1981 , pp. 65-69

4. Market power and regulation

The market power of the individual railway companies in models A to E differs markedly. Whereas the fully integrated railway company with exclusive trackage rights owns a regional or even national monopoly over railway transport, it is also a dominant actor in the transport market. The firms in Model B are allowed to operate both an integrated network company and their own train operations, thereby granting them a high degree of market power and a considerable leeway in discriminating against competitors on their own infrastructure networks. The leeway of monopolistic behaviour is clearly weakened in Model C, as the integrated network provider is now prohibited from running TOCs. Thus, the regulatory oversight necessary to guarantee non-discriminatory and fair access to the infrastructure is fairly low in Model C compared to Model A and also, Model B. It had been concluded earlier with regard to Model B, that a major restraint on misuse of market power cannot be expected from intra-industry competition, but only from intermodal competition.

Despite the strict separation in Model C, the network company will still exercise considerable monopoly power, as the TOCs rely on its provision of slots for producing transport services, even though it has been stated that their relationship is of mutual dependency. Nevertheless, the network provider could have an incentive to raise prices by a margin, sacrificing some lower paying TOCs in favour of TOCs who are willing to pay more for the final provision of railway transportation. Still, Model C outperforms Models A and B with regard to the extent of regulatory interference. The transaction costs of collecting information and monitoring the railway companies are significantly lower in Model C, as the regulator can focus on assessing publicly available access charges of the network provider, whereas the regulator would also have to monitor internal accounting and management procedures in Model B to exclude cross-subsidies, biased allocation of slots, special privileges or other strategic market barriers towards competitors.

Model D represents a further reduction of market power, and thus of the regulation required to guarantee non-discriminatory behaviour. Under this proposal, the capacity and safety management is franchised on a regular basis to an independent SOC, while train companies may be integrated in layer I and III with further TOCs not operating any infrastructure at all. In addition to the independent SOC, this model

introduces competition to the provision of railway infrastructure, thereby reducing the potential of monopolistic bottlenecks. While the SOC takes on a clearing-house role for train slots, it could also monitor the fair and non-discriminatory access to the competing railway networks as a kind of private intra-industry regulator, reducing a potential role of a public regulatory body to overall supervision of the access pricing regime enforced and controlled by the SOC. As the government's oversight over the SOC is already given with the competition for the field, further public regulation is not required.

The market power of individual companies is even more reduced in Model E than in Model D, representing a further step towards an unhampered railway market. The initial privatisation process establishes vertically separated companies in Model E, with competition *in* the field between TOCs and ROCs, as well as competition *for* the field in layer II. This intra-modal competition is complemented by intermodal and other forms of competition mentioned in the part on regulating agencies above. Thus, from the point of minimising regulation, Models A to E may be ranked in reverse order.

5. Cross-subsidies and social service subsidies

Cross-subsidies were a welcome method to complement government funding and to provide train services on account of social considerations. This usually implied that profitable services had to sacrifice their profits to cross-subsidise unremunerative train services, mostly in areas with a low population density. In turn, profitable services were charging a mark-up over costs involved with running their service, in order to keep the unprofitable lines in operation. But train services are not operating in a closed railway economy. Thus, soon not only the unprofitable lines were dependent on subsidies from profitable services and the government, but also the formerly profitable lines were losing out to intermodal competition, often also becoming dependent on state funding. In the end, the price distortions of cross-subsidies were harming the entire railway industry.

If governments intend to retain services for social policy reasons, they must subsidise the required services directly, instead of relying on a policy of intransparent cross-subsidies, as a result harming the entire railway sector, without serving the interests of the railway, its customers or the government. Sweden was the first country introducing a system of direct transfers for socially required services, as the country's regions could order regional train services in exchange for subsidies, followed by Germany's regionalisation attempt and the subsidies for TOC franchises in Britain.

Naturally, all of the models addressed above can easily accommodate additional state funding. Targeting and monitoring subsidies to the exact service required could be more effective in a separated than in an integrated system. If the national or regional government considers further infrastructure enhancements on their local line necessary, they may inject state funding into their local ROC. Should they prefer to save a local line from being closed down, they could also subsidise a provider of railway transport directly. The larger and more complex the company, however, the more difficult will it be to track and monitor the subsidies. A separated system simply offers a greater transparency compared to a single national railway enterprise.

The fear that governments will be unable to subsidise railway services in a vertically and horizontally separated private industry is entirely unfounded. In contrast, it could even be easier to subsidise Model E compared to Model A, as the transfers can be

targeted directly and exclusively to services where they are needed most from government's perception of social policy.

F. Conclusion

Summarising the preceding models, Model E appears to be the most transparent model, also minimising regulatory efforts. Non-discriminatory open access, though required by the privatisation arrangements, is almost self-enforcing in Model E, also reducing the perceived dangers of market power under non-discriminatory conditions. Subsidies can be made available by state governments, targeted directly to the part of the railway system, where subsidies are required from government's point of view. And the pricing of the infrastructure can also be tailored to political reasoning, though it should rather be left to the individual ROCs to determine. As fixed costs render marginal cost pricing impossible to recover the full infrastructure costs, congestion pricing offers an excellent second-best solution, resulting in a second-best use of the scarce railway capacity, which comes at least close to the optimal solution.

Models B to E each allow for limited government interference in the railway market. Public or private sector companies might even run either of the three layers, though at the immediate and indirect costs of losing the benefits of a competitive railway system. In section II on nationalisation above, a strong case has been made against state-owned railway systems and in favour of full-scale privatisation. Accordingly, governments must be aware of the trade-off of being actively involved in the railway industry.

Though the congestion pricing approach comes close to allocative efficiency, it can only be assumed that the model with a high degree of competition best promotes dynamic efficiency, that is the creation of a new demand curve by product innovation, a shift in the old demand curve by quality improvements or a shift of the production function by lowering costs.⁷⁰⁹ When discussing planning wisdom versus market potential in a discovery processes in chapter B., markets were assumed to work as a superior search engine in knowledge processes, as many different ideas are in continuous contest in markets, while the central planners' ideas do not have to stand that test. In his 1974 Nobel Memorial Prize Lecture, Hayek highlighted the role of markets as the most effective and superior mechanism to exploit knowledge. Scientific guidance is impossible

⁷⁰⁹ Ellig (2001): "The concept of dynamic efficiency thus captures a variety of diverse phenomena that scholars have described with terms like 'productive efficiency' (...), 'X-efficiency' (...), 'creative destruction' (Schumpeter), and 'entrepreneurship' (Kirzner 1973)."

because information and knowledge are spread over all individuals in society. In contrast to central planning, the market simply co-ordinates the knowledge of individuals.⁷¹⁰

Model E allows for competition in the field for TOCs and ROCs, as well as competition for the field in the SOC market. Thus, it seems that the degree of competition in the individual models may be ranked, again, in reverse order. In addition to the above, Model E has another important advantage over Model D, as the latter's design will very much depend on the government's idea of separating the railway market in competing, but vertically integrated, railway firms. Surely, the government is also responsible for designing the privatisation according to Model E, but the immediate outcomes are relatively small units of railway companies in layers I and III, which offer a more flexible approach. Mergers, acquisitions and joint ventures may easily be pursued if the companies involved consider it beneficial. As nobody can determine the perfect end state of the railway market, Model E offers greater potential to leave the decisions to the individual firms involved in the market, as they possess knowledge about their companies' cost structures and customers no central agency can ever collect or assess.

Model E is also the most transparent system that should allow a comfortable transition from the current system under question in the UK, especially as it acknowledges that railways are an opaque technology with a great potential for danger of failure in safety systems, while nobody knows the perfect end state. Thus, the market solution for the SOCs assures that the firm with the superior ideas and technology to guarantee safe operations wins the temporary license. The unimpaired safety firm has full oversight over the daily operations and the railway system as a whole, while it does not relieve the TOCs and ROCs of individual responsibility for safety.

⁷¹ Hayek (1996), p. 14. Laaser (1989), p. 2 makes the same argument, as the main advantage of competition is the co-ordination of knowledge spread over all individuals.

Section V

Synthesis

A. Comparison of the privatisation processes in Europe

Interventionism prevailed throughout the railways' early history and the period of nationalistic state railways, when train services were generally operating on a purely national scale, disregarding the competitive advantages of the railways over long distances in freight and passenger traffic. Despite deregulatory efforts in the 1990s, the European reforms were often watered down and culminated in re-regulation rather than in deregulation, let alone privatisation. Section I has shown the entrepreneurial potential of the early railroads until it was stifled by regulation and eventually nationalisation due to reasons explained in section II. The market share of European railways was down to 6.9% in passenger and 18.9% in freight transportation by 1990, when the European Commission was prompted to halt the shift in the modal split to road transport, as illustrated in charts 21 and 22. The Commission's moderate directive 91/440/EEC and subsequent directives considerably promoted the European-wide move to railway reforms.

Considering the case studies' results in Germany and Britain with reference to other European countries reveals that there is still much scope for liberalising the railways. With regard to an eventual *Liberalisation of European Railway Markets*, the reform projects may now be judged in the light of four characteristics: non-discriminatory open access to newcomers, the scope of the actual privatisation, the interventionist potential and the extent of state subsidies. Having uncovered the flaws of the current reform programmes in Europe, chapter A.5 reflects upon the implementation of Model E before going full circle with final conclusions drawn up in chapter B.

1. Open access provision

In the German case, access to the infrastructure network is provided by the DB Netz AG. Due to complaints of economists, competitors, the Kartellamt and others, DB Netz revised the access pricing regime in 1998 and again in 2001 to create a non-discriminatory system. But as long as DB Netz is a subsidiary of the DBAG holding, there is a conflict of interest with DB Netz and the holding. As has been argued above, there are various ways to discriminate against newcomers in an institutionally integrated DBAG, including informal contacts between the holding, its subsidiaries and the EBA's former Bundesbahn employees. In theory, however, open access to competitors had been granted with the railway reform and the 2001 revision of the charging system does not discriminate between train operators.

Originally, the British approach foresaw open access to Railtrack's infrastructure. However, the proposals were watered down in the further political process. As a consequence, open access provision was moderated until 2002 with a modest relaxation in 1999, but competition between parallel or overlapping franchise operators remains the most important means of intra-modal competition. Still, an increase of open access providers may be expected when the moderation of competition arrangement is finally relaxed, as non-franchised newcomers are discriminated in favour, if they can enter the market at all. This was due to the review of Railtrack's access charges as they are exclusively charged the variable access price to the railway infrastructure.

While some European railway systems, most notoriously the French state railway, still restrict open access to RFF's network, the Dutch and Swedish systems attracted newcomers, though dependent from political reasoning and party politics. In the Netherlands, open access was provided at zero prices until 2000, but the new coalition government banned competition on the track after the Lovers Rail experiment. The 1994 Deregulation Act passed by the Swedish conservative government would have implemented complete open access to Banverket's network. However, the new Social Democratic government immediately postponed the opening up of the market in the same year. Competitive tendering for regional train services has been used widely in both Sweden and the Netherlands. Also, freight traffic in both countries is subject to open access competitors.

2. Scope of privatisation

In section II, privatisation had been defined as the transfer of an economic activity from state ownership to the control of the capital market.⁷¹¹ Accordingly, the structural reform in Germany does not deserve the term privatisation. The DBAG is 100% state owned and a sale of the company has not yet been envisaged. The capital market's control is marginal and the risk of bankruptcy remains exclusively with the sole shareholder, the German government. Even after a possible future sale of the holding's subsidiaries, it remains doubtful whether the government will find investors willing to commit sufficient funds to the DB Netz AG, if the state holds the majority of the share capital as codified in article 2, §2(3) ENeuOG.

The British government sold Railtrack, the ROSCOs and maintenance suppliers. But train operations were franchised to 25 train operating companies. The franchises, however, may be revoked or altered in the next re-franchising process. The franchisees generally leased their rolling stock from the ROSCOs and paid access charges to Railtrack, as the ROSCOs and Railtrack own the majority of the assets. Though the franchise owners are subject to the control of the capital market, the train operators depend on government policy. Railtrack's future is still undecided, oscillating between the poles of outright re-nationalisation and the full control of the capital market without government bailouts. The DTLR suggested a not-for-profit trust as successor to Railtrack, operating on a fully commercial basis independent from government. Whatever organisational concept replaces Railtrack, it has to prove that it works better than Railtrack. It remains to be seen how the government intends to impose an incentive structure and the resultant investment programme in a not-for-profit trust. Thus, the proclaimed commercial working and the independence of government may soon prove to be an illusion without a profit incentive. After the government has established the new structure, Labour will be reluctant to let Railtrack's successor fail.⁷¹² Therefore, the new not-for-profit undertaking may be able to hold the government hostage for public funds, while the government subsidies impose conditions upon the trust.

⁷¹¹ Ewers (1995), p. 114

⁷¹² In a rather amusing column, the Financial Times (2001), p. 21 wondered about the name for the new undertaking and had options from *Nuuttrak* to the more cynical *BackTrack* or *British Rail* on offer. The reader may decide upon his favourite.

Neither in Germany, Britain, nor the above European countries is the railway industry a private *business as usual*. The railway systems under closer investigation in section III are owned by the corresponding states. However, Sweden and the Netherlands created the scope for considerable involvement of private companies in the provision of train services due to competitive tender procedures for regional traffic, but the state railways were still exempt from the pressures of the capital market across the European Union.

3. Interventionist potential

The entire Deutsche Bahn AG is operated as a state owned undertaking. The regional Länder governments receive large amounts of federal funds each year to run subsidised regional train services that are socially desirable. The Länder's choice of competitive tendering or direct commission of regional train operations provides them with a considerable amount of influence over private and state-owned train companies. Also, the government has some influence on staffing decisions in the state-run DB and on infrastructure investments. The transport minister announced the separation of the Netz AG, but DB's chairman has strong links into the government that eventually supported his stand against the minister. The EBA carries out direct supervision over the railway system, whereas the Kartellamt promotes competition and checks discriminatory behaviour. Notwithstanding the Kartellamt's opposition, the German government is determined to set up a special railway regulator. The new agency would embrace regulatory tasks that have so far been successfully undertaken by the competition authority.

The British railway system involves a complex network of supervisory and regulatory agencies, ranging from the SRA, ORR, HSE to the Office of Fair Trading and the Secretary of State. At first, the government's influence over the TOCs appeared to inhibit most of the interventionist potential due to the regular re-franchising procedure. However, Railtrack's collapse in October 2001 altered the picture, depending on the government's final choice of Railtrack's successor body. Irrespective of the changes after Labour took office in 1997, the Conservatives created an interventionist railway system, that was at odds with their earlier propositions in the New Opportunities White Paper. Welsby and Nichols suggested that *"...the Railways Act of 1993 had the effect of ensuring that in many ways the privatised industry was subject to more regulation than its nationalised predecessor had ever been."*⁷¹³

The railways in France, the Netherlands and Sweden are still state owned and highly intertwined with their governments. Especially RFF, NS Railinfrabeheer and Banverket depend upon massive state support and resulting state guidance. The change of government in both Sweden and the Netherlands further highlighted the sensitivity of the re-structured railway systems to political interference and uncertainty. The alleged independence from politics was also questioned with the Sydvästen and Lovers Rail

⁷¹³ Welsby and Nichols (1999), p. 61

experience and the immediate reaction from politics. Adding to national regulations, the national railway industries are subject to European directives and European competition law. Drawing upon the successful working of the German Kartellamt and the European competition law, excessive regulatory checks as in Britain or special railway regulators as suggested in Germany appear to be redundant.

Complex and duplicate regulatory bodies increase the bureaucracy and thus, transaction costs, limit entrepreneurial and innovative potential and create the danger of regulatory capture, favouring the incumbent operator. The incumbent state railway generally possesses superior knowledge than the regulator and may exercise influence on the regulatory framework that favours it over newcomers. In addition to direct means of state interference, there are more subtle means to influence the railway industry or favourable ministerial decisions. Long-term informal links between civil servants in the ministry of transport and the DBAG may exercise their influence one way or the other. The same danger is inherent in state agencies such as the German EBA, because the employees were recruited from the former Bundesbahn. Thus, it is more than doubtful whether the EBA can act as an impartial arbiter in the railway industry. The establishment of a special railway regulator leads to blurred responsibilities, higher transaction costs for the players and more distortions in a regulated industry. Regulatory nets leave the railways no chance to become an industry like any other industry and to serve the customers according to their own preferences. The guarantee of non-discriminatory competition in the transport market may safely be left to national competition watchdogs, European competition law, private regulation as suggested in section IV.C.2, but above all to the most effective form of regulation: *the marketplace*.

4. Extent of state subsidies

Subsidies to the national railway systems were paid out handsomely across the European countries under investigation. The German government freed the Bundesbahn and Reichsbahn of their accumulated debt, finances non-commercial infrastructure investments and supports other infrastructure investments with interest free loans. The Länder governments receive annual federal funds to support regional train services and the BEV took the long-term liability towards the civil servants in the rail industry on board, generously sponsored by the German taxpayers. The UK government intended to restrict public spending on the railways to franchise payments, but the British railway crisis and the final collapse of Railtrack contradicted the early intentions and required massive public commitments to upgrade and modernise Railtrack's infrastructure. Also in France, the Netherlands and Sweden, the railway infrastructure operators received large public funding. The access prices varied from zero pricing in the Netherlands to marginal access pricing in Sweden. In addition, the ministry of transport or regional governments tender socially desirable services and the state carries the risk of bankruptcy of the state owned undertakings.

Subsidies expose considerable interventionism, as the beneficiaries are cushioned from the pressures of capital markets, while non-beneficiaries are discriminated against and as a result market outcomes are distorted. Though subsidies may be understandable from a social policy point of view, politicians must be aware of the consequences if they intend to establish a level playing field for all modes of transport.

5. Model E implementation

The flaws in the structural reforms in European railway systems may be replaced with a full-scale privatisation according to Model E in section IV. The past reforms across Europe are an ideal foundation for the adaptation to Model E, the market-based integration centred on an institutional separation. Due to European requirements, the railway systems in Britain, France, Germany, the Netherlands and Sweden either established infrastructure subsidiaries or even separate entities. Except for France, passenger traffic is undertaken by separate divisions of the state railway and by private train operators, mostly running regional services.

Admittedly, the track systems expose monopolistic characteristics in bottlenecks. A horizontal separation of the infrastructure providers into various ROCs according to section IV.C.1 would substantially reduce government's necessity to oversee non-discriminatory pricing policies of the ROCs. In addition to competition for passenger and freight traffic, the ROCs are also exposed to constraints such as substitutive competition, explained in section IV.B.3. Taking Railtrack as an example, the company under administration could be split up into privately operated networks in the regions or along lines, such as high-speed, regional, freight and mixed-use lines, with different companies operating competing track systems into the terminal stations. While London offers some alternative terminals that could provide trains to any direction, cities such as Frankfurt or Leipzig do not offer alternative station facilities. This bottleneck problem could be resolved if competing ROCs operate their lines into Frankfurt terminal station. Also, an according arrangement for the infrastructure is unlikely to lead to management failures comparable to Railtrack's panic and the resulting standstill after Hatfield.

Full-scale privatisation of the state owned train operators combined with non-discriminatory open access provision would expose the railways to a *railway market* according to section IV.C.3. This structure would allow for intermodal mergers in the transport market that could lead to market based integration between train operators and coach firms, airlines, ferry services, taxi companies, road haulage and other companies. The players in the transport market must use their talent and knowledge to offer innovative and efficient logistics, tailor-made to consumers.

The core of the railway reform is the intermediate layer of safety operating companies as discussed in section IV.C.2. The SOCs are clearing-house institutions for train slots and also supervise the safe operations on specified rail networks. Accounting for national characteristics, the SOCs would acquire the signalling and associated infrastructure and take control of the entire traffic management on the railway networks. Concerns about the number of competing ROCs would be rendered irrelevant, as their networks and the daily traffic flows of TOCs are co-ordinated by the safety operator. However, the SOCs would have no power to exclude or discriminate against the TOCs or ROCs if they comply with the safety arrangements. The safety operator simply co-ordinates enquires on an *internal marketplace* and guarantees for a safe traffic management. The SOC is in sole charge of the traffic flows and handles all emergencies directly. If, however, the SOC should find that a train or track operator offends the rules agreed upon in his safety licence, the SOC may cease all operations on the track in question or of the train operator involved immediately. Further proceedings may then be dealt with the competition authority or a state authority such as the HSE.

Also, the SOC would have no power over access prices of the ROCs. The track operators would announce their prices for individual slots to the impartial safety and traffic management body that would then offer the available slots to the prices advertised by the track operator. While there would be competition between train and track operators, section IV.C.2 suggested to auction the entire national system initially to a single SOC under a franchise agreement. In the re-franchising process, some national SOCs might win auctions in two or more European countries, initiating a process of *Europeanisation* in railway transport, irrespective of national borders. Though it had been conceded earlier that governments might decide to run the SOC as a public agency, the benefit of competing for the best technology on an international level would be lost.

This clearing-house and safety body would be the sole public or private safety regulator on the railways with the consent of the ministry of transport or the HSE. Complementary, the competition authority would comprise the role of the sole economic regulator, except for the competitive marketplace. The Dutch system appears to possess the system closest to the suggested SOC with Rained, in charge of traffic safety and capacity management, and NS Verkeersleiding, the agency in control of daily traffic management.⁷¹⁴ In Britain, the implementation of the new safety operator would embrace

⁷¹⁴ van de Velde (2000), p. 10

the new IRSA and further functions currently undertaken by Railtrack. In Germany and Sweden, the SOC would have to acquire functions and the signalling infrastructure from DB Netz and Banverket, as well as responsibilities from the ministry of transport, the EBA and Rikstrafiken. The German discussion about a special railway regulator could be replaced by the new private clearing house with regulatory powers in safety operations. Across all countries, open access to train operations is a basic prerequisite for a successful implementation of Model E. The implementation also involves a re-structuring of the railway infrastructure that is currently under way in Britain. Even prior to the British railway crisis, it was discussed whether train operators should lease the infrastructure themselves. Though this raised concerns of discrimination against competitors, the structure suggested in Model E would come close to the idea of separate infrastructure networks, except for the discriminatory potential involved in the leasing model.

B. Concluding arguments

Regulation was present at all stages since the early days of the railroads. At first regulation was proclaimed as a necessary safeguard to protect other modes and the customers from the railways' market power, before the argument was slightly twisted. Now, regulation was called for to protect the railways from increasing intermodal competition. Notwithstanding the railway protectionism, the steady fall in market share was not halted. Following successful reforms in the 1980s in Britain and Sweden, more restructuring was on the agenda across the European Community.

The preceding prelude to the conclusion in the synthesis has already drawn together the analyses and recommendations made before. Summing up, the privatisation and deregulation attempts undertaken in Europe during the last decade have come far short of their early expectations. Generally, the legislation enacting the reforms was a compromised version of the original proposals of the same governments. This was especially true in Britain and Germany. Also, Sweden and the Netherlands initiated far-reaching proposals to complement their original reform projects, that were however reverted after a change of government. None of the current railway reforms is close to a *laissez-faire* approach. Instead, the railway systems are exposed to ongoing railway protectionism as they are dependent on party politics and policy changes that contradicted some more liberal proposals, such as the 1991 report of the Regierungskommission Bundesbahn, the Tories' 1992 White Paper on New Opportunities for the Railways and the Swedish 1994 Deregulation Act. Too many concerns and interests were compromised in the legislations initiating the structural reforms.

In the introduction to this thesis it has been argued with Mises and Hayek that the co-ordination mechanisms of a centrally-planned system and a market economy are incompatible. Still, the politicians' and interest groups' wish lists contained a mix of both, thereby eradicating the benefits of the market economy. Interventionism prevailed – politics and the resultant interference are at the core of the transport problem. This thesis advocates a concept of *market based integration* for the railways, scrapping the fatal balancing act of a contradictory *tightly controlled market approach*.

The core of this concept is a full privatisation of state-owned railway undertakings with the freedom of inter- and intra-industry mergers thereafter, as the market has to find

its optimal structure, which no well-meaning planning board or individual will ever be able to predict or shape. Only while governments hold the property rights to the railways, they must initiate strategic railway reforms before fully releasing the railways to their own fate or fortune. In a privatised industry, the railway companies are subject to the control of the capital market without any room for short-term political manoeuvring and muddling-through. The structure proposed here is based on three levels of railway systems that would be co-ordinated by market transactions instead of planning.

Private ROCs supply the entire track infrastructure of the railway network and compete for traffic volumes with other ROCs. They announce – unregulated – prices for individual train slots to the SOC, the combined clearing house institution for train slots, the owner of the signalling network and the sole safety regulator of the railway system. Finally, the TOCs compete for freight and passenger traffic and purchase the slots from the SOC to the prices announced by the ROCs, including a mark-up for the services provided by the SOC. A single national or possibly even European SOC at a later stage would economise on transaction costs between various players, as it works as an internal marketplace, whilst overseeing the safe operations of the railways and non-discriminatory open access as an impartial arbiter. Accordingly, the SOC is at the heart of the railway privatisation proposed here. Government involvement is curtailed to the provision of a license to the SOC and the general oversight of the competition watchdog.

The European changes to the railway industry undertaken so far may be seen as a first step to a full-scale privatisation as advocated in this thesis. Even the British railway crisis appears in a better light than one might assume, as Railtrack's move into public administration offers a new beginning according to the model set out above without violating private property rights. An implementation of the model would require a horizontal separation of Railtrack into competing ROCs, while the safety functions that were undertaken by Railtrack and the signalling infrastructure would be taken over by the SOC. A sale of the passenger rail franchises would complement the process as soon as current franchise agreements come up for re-franchising.

Implementation of the model in Germany requires first and foremost the continuation of the original reform by means of institutionally separating the infrastructure from train operations and the sale of the state-owned Deutsche Bahn's passenger and freight transport subsidiaries as envisaged, though supplemented by some alterations.

Apparently, the original reform proposal came close to the model suggested above but was halted due to political lobbying of the Deutsche Bahn and further interest groups. The reform process initiated in Germany needs to be modified to take account of competing ROC networks, whereas the SOC would acquire signalling operations and functions currently undertaken by the EBA, ending the political rope-pulling about a special railway regulator.

Regarding the Dutch, French and Swedish railways, it has already been noted above that the French have the longest road to travel before arriving at an industry structure that does not differ from any other industry. While France was so far reluctant to liberalise the railway industry, the Netherlands and Sweden opted in favour of reforms that got, however, stuck half-way through. In order to establish a full scale reform in accordance with the privatisation model above, Railned, NS Verkeersleiding and the Swedish Rikstrafiken would constitute the respective SOCs with additional functions in signalling and capacity management, esp. in the Swedish case. The infrastructure operators Nederlandse Spoorwegen and Banverket are the starting points for the establishment of private, competing ROCs. Further, the passenger and freight operations are still state-owned and should be sold in smaller units, though leaving the final say on the optimal size to market processes rather than government re-structuring. Thus, even though the government may offer several self-sustaining units for sale, it must not prohibit a single bidder from acquiring a combination of TOCs.⁷¹⁵

Notwithstanding the compromised and rather half-hearted approach to liberalising the railway industry, some improvements have been gathered in and may serve as a common starting point for a private railway market. Currently, the railways are still on hold, awaiting their release from often well-meant government protectionism. If politicians aspire a railway renaissance, they must refrain from distorting markets.

⁷¹⁵ Earlier, the case of Ed Burkhardt of Wisconsin Central has been noted. Burkhardt made the British government reverse her decision of selling off Trainload Freight in separate units to different bidders, before agreeing to purchase the company and run freight services in the UK under the heading of EWS.

Section VI

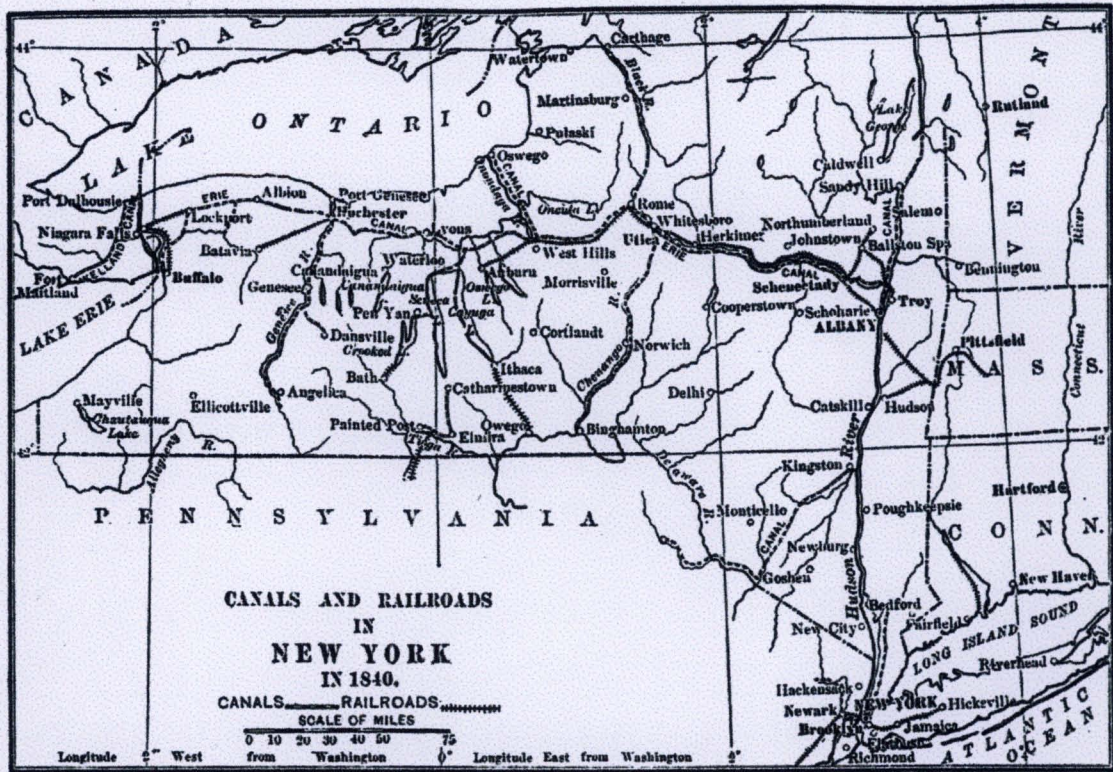
Appendix

A. The United States of America

1. The early railway promotion and organisational innovation

The early nineteenth century saw the development of a system of turnpike roads and canals as a result of the growing American economy. The steam-powered engine commenced its journey with the first steamboat on the Hudson River in 1807. Still, the longest canal measured less than 28 miles in total length in 1817, when permission was granted to build the 364-mile Erie Canal between Buffalo and the Hudson River (*map 9*). The Erie was completed in 1825 and opened up the Midwest of the United States, providing a transport link from New York and the Atlantic right to the Great Lakes and further west. Even though canals were costly and required heavy state subsidies, 1,277 miles had been constructed by the end of the 1820s, thus reducing average costs when compared to freight rates of road transport. However, neither system seemed appropriate to accommodate the needs of the trading community and society in general. Freight and passenger charges on turnpikes were expensive with rather uncomfortable coaches. Steam or canal boats, though by far more comfortable at comparatively low rates as well as being more appropriate for longer distances and heavy goods, had other drawbacks. Wrecks left in rivers were a permanent nuisance and regular cause of accidents. Additionally, many rivers and canal operating companies could only offer irregular or restricted transport operations due to either too high or low water levels as well as frozen waterways in winter.⁷¹⁶

⁷¹⁶ Stover (1961), pp. 3-10 and 34 reports on the development of roads and canals and on their drawback - 454 people died in accidents on western rivers, claiming 78 boats.



MAP 9: Canals and Railroads in New York in 1840

Source: Johnson and van Metre (1916), p. 12

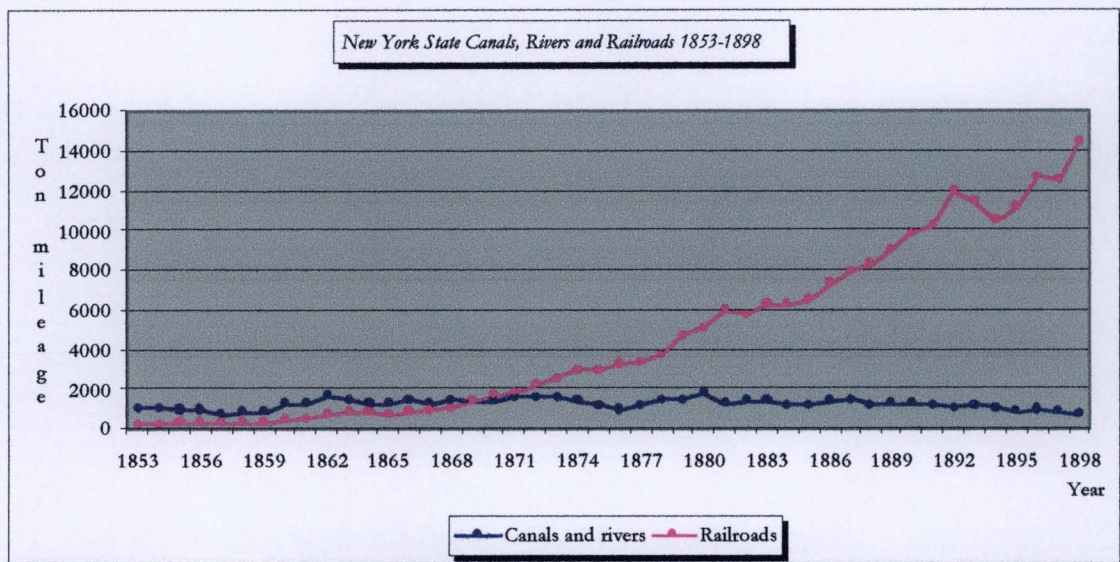


CHART 54

Source: U.S. Bureau of the Census (1949)

The advent of the railway offered an alternative mode of transport that was reliable throughout the entire year and promised a further reduction in tariffs. The era of steam locomotives on the American continent opened with an experimental locomotive on the Baltimore & Ohio railway in 1830, followed by the first steam-powered regular service in Charleston, South Carolina on Christmas Day of the same year. Though most

Americans welcomed the railway age, quite often buying shares of the companies, there was considerable political lobbying and opposition by the incumbent transportation firms against the competitive threat.

Apparently, the incumbents' dissatisfaction is a logical consequence of their high capital investments and the entrants' attack upon their dominant position in the transport market. The canal operating companies had committed themselves with massive investments in the canal networks. Suddenly, an unwelcome innovation arrived, threatening their returns. Having successfully competed with the turnpikes, the canals had a competitive advantage over road freight, especially in bulky or heavy goods travelling over long distances. Their temporary monopoly in that market was indeed very short-lived (*chart 54*). Already the very first railroad companies offered considerable cost reductions compared to road freight and established a serious competitive challenge to the canals.⁷¹⁷

Further major players in addition to the incumbent industries and the railroads were state governments. The lobbying efforts of the incumbents produced legislative discrimination against the innovative forces. *"Even when completed, the railroad frequently had to overcome the opposition of state governments loyal to their canals. In New York railroads running parallel to the Erie Canal had to pay tolls equal to those of the canal, and in Ohio and Pennsylvania special taxes were levied against rail traffic which competed directly with canal business."*⁷¹⁸

⁷¹⁷ Referring to the 1832 edition of the American Railroad Journal Stover (1961), p. 34 mentions the case of a mill owner thirteen miles out of Baltimore whose transportation costs with the Baltimore & Ohio Railroad were only a fourth of his previous costs.

⁷¹⁸ Stover 1961), p. 17 and Holbrook (1947), p. 231 report on the opposition the railways had to face.

Image removed due to third party copyright

MAP 13: Newcomers to the United States between 1850 and 1860

Source: Pred (1980), pp. 15 & 17

Image removed due to third party copyright

MAP 14: Urban Places in 1860

Source: Pred (1980), p. 18

Nonetheless, a rapid railway expansion marked the next decades (*maps 10 and 11*). The railway companies gained substantial speed advantages over the canals. They were able to offer a reliable service, not having to limit their operations in the winter, after flooding or in dry periods. They were able to build short lines not being commercially viable for canal operators and could directly deliver goods to the customers' doorways. As the trains did not depend on an extensive supply of water, they offered a rather inexpensive form of transport, as changes in altitude did not pose insurmountable obstacles to them. The railways opened up markets where virtually no transport infrastructure had previously existed, stimulated settlement and offered enhanced opportunities for the people to move westwards.⁷¹⁹ Maps 12 and 13 illustrate that settlement was concentrated in areas where the railways were spreading out as demonstrated in maps 10 and 11 between 1840 and 1860. Map 14 shows urban settlements as they existed in 1860 with concentrations along the more industrial East Coast and around the Great Lakes, mirroring map 11. As soon as the railway's transportation potential had been recognised, local business communities, farmers and other future beneficiaries along the proposed line started to promote railway construction in order to gain a competitive advantage over other markets. In anticipation of personal benefits in form of rising property values, expanding markets and quite simply an increase in the value of railway stock, they bought railway shares.⁷²⁰ *"The swift victory of the railway over the waterway resulted from organisational as well as technological innovation. Technology made possible fast, all-weather transportation; but safe, regular, reliable movement of goods and passengers, as well as the continuing maintenance and repair of locomotives, rolling stock, and track, roadbed, stations, roundhouses, and other equipment, required the creation of a sizable administrative organisation. It meant the employment of a set of managers to supervise these functional activities over an extensive geographical area; and the appointment of an administrative command of middle and top executives to monitor, evaluate, and coordinate the work of managers responsible for the day-to-day operations. ...Hence, the operational requirements of the railroads demanded the creation of the first administrative hierarchies in American business. The men who managed these enterprises became the*

⁷¹⁹ Hawke (1970), p. 3 summarises a commonly held view about the impact of the railways on both settlement and industrialisation in the United States: *"It was asserted that the railways opened the West to settlement, made available agricultural land, and hence provided an extended market and supported the labour force on which nineteenth century manufacturing depended. Further, the railways were thought to have so stimulated the iron and steel and other industries as to provide a base for industrialization. The railway was seen as the key element in nineteenth-century growth."*

⁷²⁰ As to the reasons for the railways' success, Chandler (1997), pp. 83-86 considers the 'all-weather transportation' the trains were offering as their most important competitive advantage over other modes of transport. Taylor and Neu (1956), p. 5 and Stover (1961), p. 31 emphasise the importance of local or city governments in railway promotion - they were often urged to invest in proposed railway schemes, buying stock of the companies.

first group of modern business administrators in the United States. Ownership and management soon separated."⁷²¹

The boom period of American railroads began in the late 1840s, experiencing a setback due to speculative excesses between 1853-1855. "Beyond doubt ...is the truly revolutionary effect of the mileage opened. Freight rates fell drastically and by 1854 averaged between two and three cents per ton-mile. The entrepreneurial function consisted, in this case, not so much in visualizing possibilities - everyone saw them and speculated on them - or in the solution of technological problems - the locomotive functioned sufficiently well by that time and was thenceforth improved almost automatically by a series of typically 'induced' inventions, and no major problems impeded the building of the lines - as in the leadership of groups, in successfully dealing with politicians and local interests, in the solution of problems of management and of development in the regions the roads opened up. It was 'getting things done' and nothing else, a variety of pure entrepreneurship stripped of all accessories."⁷²²

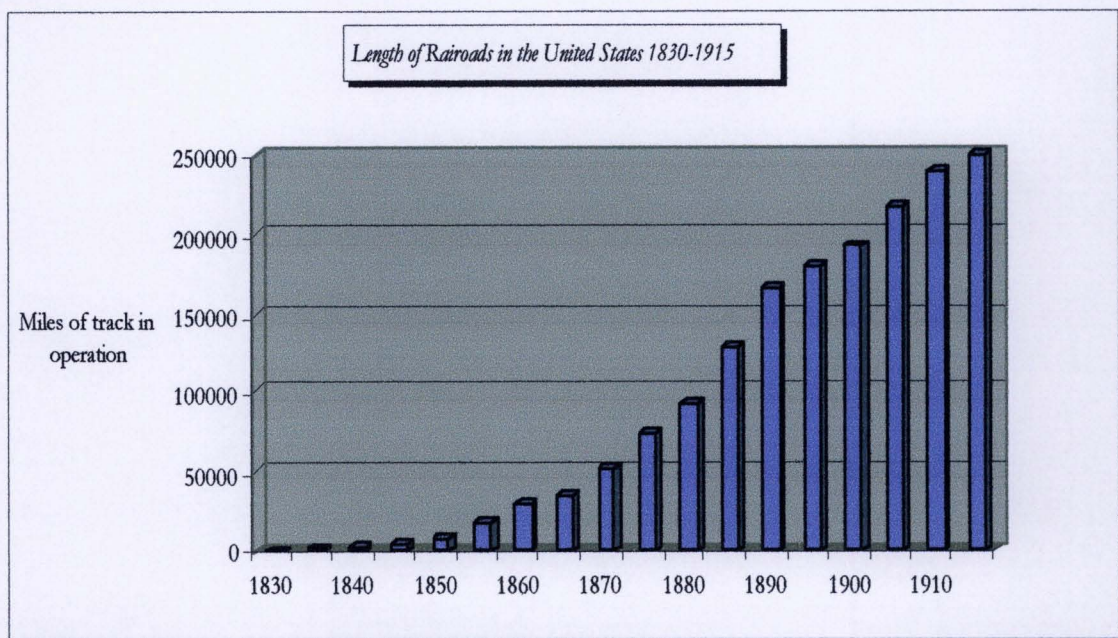


CHART 55

Source: Conversion into mileage based upon Mitchell (1998): International Historical Statistics: The Americas

⁷²¹ Chandler (1997), p. 87

⁷²² Schumpeter (1939), p. 327

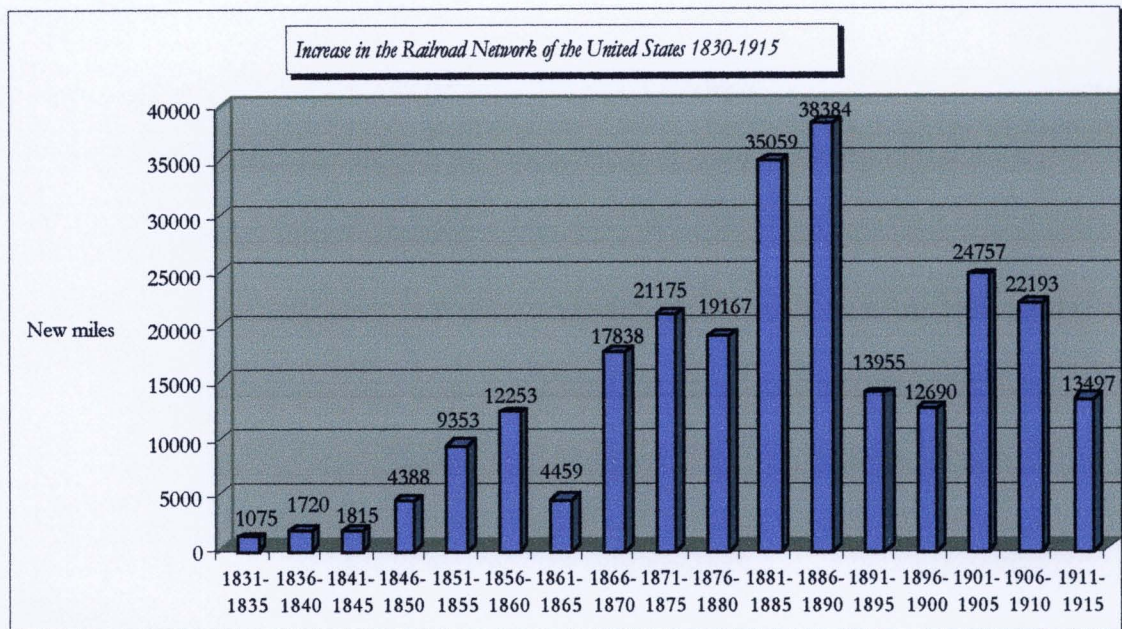


CHART 56

Source: Own calculations based upon Mitchell (1998): *International Historical Statistics: The Americas*

In mid-century the total mileage of the system went up from about 9,000 miles at the start of the 1850s to more than 30,000 miles ten years later. The same applied to the amount of investment made in the railway industry, which more than tripled from \$300 million to \$1.15 billion in that period, creating enterprises on a massive scale.⁷²³ The further development of the train mileage is illustrated in charts 55 and 56, with the latter highlighting the construction booms. The growth of the industry created new organisational challenges. The management of the railways in the first half of the nineteenth century was comparatively easy, with inward and outward trains usually running on a single track. On the busy Boston & Worcester Railroad, three trains per day left each depot at exactly the same time and were required to meet at a station in between, before they were allowed to proceed. Longer but less busy routes had one train a day in one direction, returning the following day to the point of departure. The busy Western Railroad was running three trains a day on a single track through a mountainous area without any means of communication and as soon as one train was slightly behind schedule, there was a potential danger of accidents. In 1841 a serious collision of two passenger trains called for immediate changes in management. Following an inquiry into the accident, the company created the first decentralised business enterprise, defining and delegating responsibilities for the operation of services. New headquarters were set up at Springfield to co-ordinate between the already existing three geographical operating

divisions. Precise timetables were designed and handed to the conductors, who had to adhere to the schedules and were granted full responsibility for their trains.

While the initial momentum for organisational innovation on the Western Railroad stemmed from safety measures, the further growth of the transport market required decentralised management and defined lines of responsibility, as pioneered on the Western. When the Erie Railroad had to face both high operating costs and a serious competitive threat from the newly created New York Central Railroad along the Erie Canal in 1853, Daniel McCallum was appointed general superintendent. He improved the organisational structure of his company that was already similar to the one of the Western, stating that *"...subordinates should be accountable to and be directed by their immediate superiors only; as obedience cannot be enforced where the foreman in immediate charge is interfered with by a superior officer giving orders directly to his subordinates."*⁷²⁴

The growth of the railway companies forced changes upon their management. The new structures from a rather centralised to a decentralised business enterprise were a necessary reaction to the ever-expanding operations.⁷²⁵ Companies were not anymore based at a single location, but had offices and employees scattered across huge areas. However, adding to their geographical extension railway firms were massive enterprises with regard to the workforce employed. Accordingly, new methods in management techniques and communication were a pure necessity for the railway industry. The invention of the telegraph in 1837 allowed McCallum to improve the co-ordination of train services and keep a constant flow of information between the offices. He developed a system of regular reports from his employees and new methods of accounting in order to collect and evaluate more statistical data that were required for an accurate calculation of costs and tariffs as well as to optimise traffic flows. McCallum maximised the company's revenue by improving traffic flows and reducing the waste of resources due to empty freight trains. In 1855 the Erie Railroad operated 200 locomotives, 2770 freight and 170 passenger and post cars, thereby making it perfectly clear that the traditional management of railways had passed away. The emerging modern enterprise simply had to adjust and

⁷²³ Stover 1861), p. 38. For details on the organisational innovation which the Western pioneered in 1840 see Chandler (1997), pp. 96-107. Due to his comprehensive study, only a minor account can be given in this thesis.

⁷²⁴ Chandler (1997), p. 102

⁷²⁵ However, Channon (2001), p. 6 notes a reversion towards functional structures at the end of the 19th century.

start to think from scratch, in order to survive in an entirely different environment.⁷²⁶ *“By the coming of the Civil War the modern American business enterprise had appeared among American railroads. The needs of safety and then efficiency had led to the creation of a managerial hierarchy, whose duties were carefully defined in organizational manuals and charts. Middle and top managers supervised, coordinated, and evaluated the work of lower level managers who were directly responsible for the day-to-day operations.”*⁷²⁷

While the period preceding the Civil War was marked by the improvement of internal affairs, such as the organisational structure of the company, external affairs between the operators dominated the period in the aftermath of the war. Despite the impressive pace of construction of new mileage there was still a lack of anything like a *network* of railways, let alone an integrated transport network. The companies rather existed next to each other as competitors than acknowledging any benefits from a more co-operative approach to operation of railways. However, the physical separation of the railways was not surmountable in the short term. Though many of the first companies in the east of the United States were using the English gauge, as they purchased English locomotives, the diversity in gauge differentials and the resulting interchanges of passengers or freight to another operator still placed heavy cost burdens on the customers. Together with several different time zones that became relevant with the railways' expansion to the West and a lack of connecting railway bridges, through services were often rendered virtually impossible. Connecting rail links between the different termini in cities and other gaps had to be built, equipment and operation had to be standardised in order to allow the handling of through-traffic. The settlement in the West and the growing trade between the eastern and western states made producers on either side aware of the potential benefits of an integrated transport network. They anticipated higher profits as they could send their produce to more distant markets. However, the cost of several freight interchanges was prohibitive. Because the physical separation of the railways was an artificial barrier to long-haul trade, demands for more conformity and an integrated network of railways were increasing.⁷²⁸ In order to improve the transport of freight over long distances and open up new markets, interfirm co-operation was essential. The railway companies needed to co-operate and work towards a railway network if they and the public were to reap the full benefits out of the transport system.

⁷²⁶ Chandler (1997), p. 120

⁷²⁷ Chandler (1997), p. 107

⁷²⁸ According to Stover (1961), p. 51, a trip between Charleston and Philadelphia required eight changes of carriages from the passenger due to different gauges. See Overbey (1982), pp. 15-18 and Taylor and Neu (1956) for more details on the trend towards the uniform gauge.

The necessity of standardisation was further highlighted in the Civil War, when massive troop movements and supplies had to be organised over long distances. The Civil War in the 1860s made a lasting impact on American railways. Co-operation between the various operating companies became inevitable and strengthened the network economies. The railways were providing the means for rapidly moving troops as well as the necessary supplies, which in turn increased their business. However, whilst the northern railroads prospered on account of the stimulation of demand, their southern counterparts had to suffer under enormous railway destruction. The South faced considerable problems of maintaining its tracks and transport operations due to shortages of rolling stock, locomotives and new rails, as they were largely produced in the North.⁷²⁹

⁷²⁹ For a more detailed overview on the railway's role in the Civil War see Stover (1961), pp. 54-63

2. Land grants and the first transcontinental railway

Public opinion in the period from the first railway on the Baltimore & Ohio in 1830 up to the outbreak of the Civil War was mainly in favour of a rapid railway development and expansion. The innovation of the railroad increased the potentials of trade and led to improved communications in the country, while making long journeys more comfortable and reducing the time of travel. Maps 15 to 17 demonstrate the railways' impact on cutting journey times. Whereas a trip from New York City to Chicago took up to six weeks in 1800, it was cut to two days by 1857. The political environment of the railway companies was to a major extent supportive. Governments promoted railway development by means of land grants and they refrained from regulatory interference in general terms, leaving the companies to themselves. However, the era of relatively unrestrained railway development was reversed after the war, with a public growing increasingly hostile towards the railway companies, urging state governments to regulate the operation of the railways. *"Speculative building, with many cases of financial maladministration, unfair discrimination in rates and service, and ruinous competition, caused a reversal of public opinion. Open antagonism took the place of friendly cooperation."*⁷³⁰ The corruption scandals of the first transatlantic railway connection both illustrate the public's anger and highlight the blame the government had to accept in the change in public opinion, due to railroad promotion by means of land grants.

Image removed due to third party copyright

MAP 15 and MAP 16: Rates of Travel in 1800 and 1830

Source Chandler (1997), pp. 84-85

Image removed due to third party copyright

MAP 17: Rates of Travel in 1857

Source: Chandler (1997), pp. 84-85

Though the American railways were built by private enterprise, the state granted land to some companies for the construction of railway lines. As the low population density in the western states did not promise immediate high returns to the operation of a railway, both federal and state governments were willing to promote railway construction in the West. Holbrook outlines the path American railway promoters were often pursuing when applying for so-called land grants: *“The typical plan of a railroad promoter of the era was first to organize a company whose title included two or more of the principal towns of regions through which it was allegedly to pass, or possibly merely the two terminal cities...Next came a charter involving land grants of alternate sections along the line of the proposed road. Next the railroad boys would incorporate a land company, owned by the directors of the railroad, to develop and peddle the lands. With the proceeds of the land sales, to which cash subsidies from federal, state, or even city sources often were added, plus the sale of mortgage bonds in Europe, actual construction of the railroad was begun. Construction, however, was not done by the railroad company, but by a separate concern, also owned by the railroad’s directors, which commonly paid off handsomely, although the grade was made and the rails laid at stupendous cost to the holders of the railroad’s stocks and bonds. A considerable number of American railroads were financed by methods that cost the railroad’s directors not a penny of their own in actual cash.”*⁷³¹

⁷³⁰ Cunningham (1922), p. 9-10

⁷³¹ Holbrook (1947), p. 154. One *section* consists of 640 acres.

The land grants were usually conditional upon rate reductions for government traffic on the land-grant railways. Many companies mortgaged their land or sold it to settlers in order to start construction of the lines. The companies even competed for newly arriving immigrants in the large Eastern ports to settle along their lines, offering them cheap train tickets and land on a long-term loan basis. In addition, the companies and states sent representatives to Europe and advertised in overseas newspapers for settlement along their lines. The competition for settlers was so fierce that the representatives even discouraged immigrants from choosing their competitor's land, as the land's quality was purportedly poor.⁷³² In the event, the railways had an enormous impact on settling the wide western lands of the United States, where settlement would have been an impossible exercise without the railway innovation. Even though contemporary politicians had to face objections due to the huge quantity of land granted to the railways, the land value would have been marginal without any sort of efficient transport links, literally paving the way for settlement and cultivation. The companies received government grants, sold the land to settlers and gained future passengers and freight in supporting the immigration and their settlement along their own line. Still, public commitment was mostly seen as a necessity. However, the state's choice in favour of land grants and loans resulted in a transport infrastructure, not built to provide efficient communication links, but to squeeze as much money from the government as possible. The most appalling case was the American prestige project of a rail link across the entire United States.⁷³³

⁷³² Holbrook (1947), pp. 155-161 and Stover (1961), pp. 91, 100-103

⁷³³ Fleisig (1975), p. 563 indeed concludes that the subsidies might be termed *quarantys*, as the railroad companies would have constructed the railroads at a similar speed, independent of the land-grants. Thus, the redistributions did not result in efficiency gains.

Image removed due to third party copyright

MAP 18: Major Trans-Mississippi and Pacific Railroads up to 1893

Source: Stover (1961), p. 85

Although Congress first considered the possibility of a route to the Pacific in the early 1850s, the American dream of a transcontinental railway came to an abrupt end with the economic depression towards the close of the decade. Soon again public and lobbying demands arose to venture westwards and integrate California into the growing system of railways. Due to its high risk and low anticipated traffic volumes outside the populous eastern states, the project was not yet considered viable to private enterprise. In 1862 Congress passed the Pacific Railroad Act, thereby granting two companies rights to construct and operate a transcontinental line linking the eastern to the western states and the Pacific. Both the Union Pacific Railroad and the Central Pacific Railroad Company were commissioned to engage in the project (*map 18, Nos. 1 and 2*). The latter was allowed to build eastward from Sacramento and the Union Pacific westward from the Missouri River. Federal assistance was made available by means of land grants and government bonds. *“Land grants of ten alternate sections per mile of public domain on both sides of the line over the entire distance were made; and the Federal Government agreed to lend the companies, in five per cent bonds, amounts ranging from \$16,000 to \$48,000 per mile, depending on the terrain.”*⁷³⁴

⁷³⁴ Holbrook (1947), p. 166. Stover (1961), pp. 67-73 presents further details on the first transatlantic link.

In effect both companies received a per-mile subsidy. Hence, a competitive race for government money was the logical consequence. As might be expected, the companies' principal concern was not the quality of the track, but the quantity built in the shortest time possible. The negative side effects of the government's incentives and the absurdity of that policy was highlighted in early 1869, when "*...the advance grading crews of the Union Pacific and the Central Pacific, in their eagerness to build as much subsidized road as possible, had passed each other with parallel lines. The construction was often hurried with flimsy bridges, narrow embankments, and improperly ballasted track...{The Union Pacific's chief engineer} admitted that his company's greedy insistence on continued construction in the winter months often doubled or even tripled building costs. The haste in construction was also caused by a public that wished to see the job completed.*"⁷³⁵ The transcontinental railway was finally opened to traffic in May 1869, presenting the first rail link between the Pacific and Atlantic oceans to the American nation.

When the initial enthusiasm of the opening of the first rail connection between the Atlantic and Pacific oceans had slowed down, the glamorous success story grew rather dark. Corruption scandals of the Union and Central Pacific, their construction subsidiaries, suppliers and politicians were revealed. The corruption of the Central Pacific's owners, the so-called Big Four – Hopkins, Huntington, Stanford and Crocker – was remarkable. The former merchants from Sacramento were not lacking ideas "*...in making an extra, illicit profit for themselves. At first the road was built for the partners by a construction concern called Crocker and Company. The transparent connections between the Central Pacific and Crocker's false-front corporation were so obvious that in 1867 the partners shifted to dealing with a newly created Contract and Finance Company...Any successful investigation was rendered quite improbable by the 'accidental' destruction of the company's books, perhaps by fire, in the early seventies.*"⁷³⁶ However, the Union Pacific did not miss out on the variety of opportunities for enrichment at the taxpayers' expenses. Though its chief engineer had calculated costs of \$30,000 per mile of track construction, the contract was given to a building firm called *Crédit Mobilier* at \$60,000 per mile with the difference being *Crédit Mobilier's* additional profits. In 1867 the building contractor itself revealed the scandal when declaring a dividend of nearly 100% "*...which, even in that era of robbery business ethics, was considered more than decent.*"⁷³⁷

⁷³⁵ Stover (1961), p. 70 and Holbrook (1947), p. 170 for the race and their parallel grading lines of the two railway companies.

⁷³⁶ Stover (1961), pp. 75-76. Stover (1961), pp. 68-76 presents more detailed information about the corruption scandals and the companies, as well as the political careers being involved.

⁷³⁷ Holbrook (1947), p. 171

The construction of the line had to circumvent a number of problems. Apart from high costs on account of the supply of water, timber, rails and other materials over long distances, the construction met further difficulties in the form of a rather chilly welcome by the native Indian population, as the railway was leading right through their territories and they neither considered themselves as immediate beneficiaries of the new railway line due to rising property prices, nor did they envisage themselves as customers.⁷³⁸ The large amount of per-mile-subsidies for the project diverted the companies' attention from efficient construction towards a race for every single mile of track. As the Union Pacific's chief engineer admitted, costs were further inflated by insisting on winter construction. The lines, not being properly built, soon required repairs and more investment. Additionally, costs were increased by both companies' lobbying efforts for the exclusive contracts, granting the Union and Central Pacific Railways monopolies. The bill for the appalling railway costs was at least shared between the taxpayers via the federal budget and the passengers of the transatlantic line due to charges including a monopolistic mark-up.

While the government's way of encouraging railway construction might have been done with the best intentions in mind, its effects may be observed in the shortcomings of inefficient and maintenance-cost-intensive railway connections. The climate of entrepreneurial freedom considerably slowed down in the aftermath of the Civil War, growing more hostile towards the turn of the century. Corruption scandals, political lobbying and bribery became ever more appalling and evident.⁷³⁹ By 1884 the hostility towards the railways was massive, tempting the Democratic Party to exploit the atmosphere. The Democrats claimed the Republicans were dominated by railroad interests and published a poster, supposedly portraying a map with the land grants given to railway companies (*map 19*). Even though the poster exaggerated the land the railway companies actually received (*map 20*) nearly fourfold, it had often since been reprinted in school textbooks.⁷⁴⁰

⁷³⁸ Despite of the army's efforts to protect the railway workers, their task was a rather tricky one and might best be summarised with General Crook's words, who stated that "*it was not easy for one soldier to surround three Indians*". The Central Pacific met less resistance by the Indians than the Union Pacific. In order to keep them calm, the owners of the Central Pacific even decided to hand the Indian chiefs a pass for the passenger cars and let them play around with the freight cars; see Holbrook (1947), p. 169 and Stover (1961), pp. 70-72

⁷³⁹ An extensive range of examples is provided by Stover (1961), pp. 114-124.

⁷⁴⁰ "*This map, which...was made for political purposes, has had a strange and influential history. It has been reproduced in many a school textbook since 1884 and is largely responsible, charges Mr. Henry of the Association of American Railroads, for the erroneous ideas most Americans hold today in regard to land grants. The map in question really*

Image removed due to third party copyright

MAP 19: Landgrants to the Railroads (election poster)

Source: Holbrook (1947), p. 159

Image removed due to third party copyright

MAP 20: Landgrants to the Railroads (actual)

Source: Holbrook (1947), p. 159

represents wagon-road and river-improvement grants, as well as those to railroads; and it also shows the full area of indemnity limits of both completed and uncompleted grants, but without explanation. The shaded portions, remarks Mr. Henry, represent approximately four times the number of acres actually granted to railroad companies.", Holbrook (1947), p. 160. Indemnity limits are the limits to alternate sections of land grants. They can be located as far as 60 miles away from the railway line, if land close to the railway was already given to others than the railway company.

The federal land grants allocated to the companies supported 18738 miles of railways in total length, amounting to 20% of the nation's 93,000 miles of track in 1880, when the majority of grants had been claimed. Despite the exaggeration shown in the misleading map (*map 19*), the lands granted to the railways were massive, totalling 6.8% of the United States' territory (*map 20*).⁷⁴¹ *"Thus, with the aid of federal government, a segment of the railroad industry was able to 'break free' from the competitive bounds which had prevailed in the East. As might be expected, the subsidies attracted the kind of promoters who always exist on the fringe of the business community and who are constantly seeking an 'easy deal'. Many of the new western railroads were shabbily built: they were not constructed to carry traffic, but to acquire land grants. The western railroads were true monopolies in the textbook sense of the word. They could, and did, behave with an aura of arbitrary power. But that power was not derived from a free market. It stemmed from governmental subsidies and governmental restrictions."*⁷⁴²

⁷⁴¹ Stover (1961), pp. 89-90; Stover also presents different estimates on the total value of the land the government granted to the industry. Holbrook (1947), pp. 157-162 discusses the government's direct monetary benefits from loans and land grants. Gates (1954) discussed the government's costs from land-grants and their effect on adjacent government property, whereas Rae (1955), p. 113 stated that *"there is ample ground for claiming that the returns from this policy outweighed its cost."*

⁷⁴² Greenspan (1967), pp. 64-65; see also Rand (1967), p. 103

3. The railroad cartels and the National Grange

Interfirm co-operation was necessary to move towards an integrated railway network. Having accomplished the most basic physical integration of the different lines, the companies were competing for through traffic in order to cover the high amount of fixed capital costs. The railroad managers quickly realised that they could gain more by co-operating than simply competing for the lowest possible rates and finally established the railroad cartels. Through traffic on the tracks often “...made the difference between a road's financial success and failure. The need to assure a steady flow of traffic created a constant pressure for railroad managers to obtain through freight from other roads on parallel routes. They did so by cutting rates and by aggressive advertising and selling. To control such competition railroad managers turned to cooperation. In order to obtain this constant flow of traffic across their lines, they made informal alliances with competing and connecting roads. When growing pressures to obtain through traffic weakened these alliances, railroad managers set up more formal federations, creating some of the largest and most sophisticated cartels ever attempted in American business. But these cartels rarely worked.”⁷⁴³

The 1873 depression led to a collapse of the informal pooling alliances that were set up to stabilise rates and avoid expensive price wars. The companies' desperate need for traffic led to free-rider behaviour, either secretly or even openly offering rebates and lower rates than competitors in the industry, thus undermining the arrangements of the alliances. The outcome was sometimes as absurd as the rate war between the *Erie* and the *New York Central Railroad*. Eventually, their competition resulted in the New York Central offering special rates for cattle carried between Buffalo and New York City. The Erie did not miss out on this bargain, ordered vast amounts of cattle in Buffalo and sent them right through to New York on their competitor's line with a comfortable profit.⁷⁴⁴

The railroad cartels had comparable fortunes. Though they were created in response to the collapse of the informal associations, they had exactly the same flaws. As neither of the associations was legally enforceable, the negotiated arrangements were only relatively stable in the prosperous years, when everybody benefited from voluntary co-operation. The destabilising effect entered the game, whenever a company had unutilised excess capacity. A violation offered immediate extra revenues due to excess capacity,

⁷⁴³ Chandler (1997), p. 123. Chandler (1997), pp. 126-144 provides a detailed analysis on the co-operation and competition between the railways, culminating in instable cartels.

⁷⁴⁴ Stover (1961), p. 115

equalling the opportunity costs of its compliance, so long as the cartel could not provide for credible threats when its arrangements were breached.⁷⁴⁵

However, it was not only the railways themselves, but also their customers who were dissatisfied with the constant rate wars. The published tariffs were intransparent and secret rates or rebates were offered exclusively to large customers. Western farmers felt that they had to pay the bills, whilst they were losing out in the rate-war game: the obvious outcome was a price discrimination with fairly low rates on competitive routes and high rates on routes with less or no competition, often to levels where the marginal benefits for their customers were just exceeding the marginal costs of sending their goods to the market. Especially the farmers in the West were suffering from high costs of transportation and the intransparent pricing policy of the railways.⁷⁴⁶ They depended on the railways, because their only alternative to send their produce to distant markets in the Eastern states was the long way round Cape Horn, or through the Panama Canal from 1914. *"The ultimate anger of the western farmer with the railroads was the more bitter because his need for them was so great and his original expectations had been so high. In the fifties and sixties, when he had few railroads, the farmer was so hopeful of achieving cheap transportation that he was not only willing to permit his own town and country governments to help finance them, but he also frequently mortgaged his farm to buy railroad stock. ...Around Watertown, Wisconsin, they mortgaged their farms for stock in a railroad that never materialized. Even when the lines were built the farmer often found his land mortgaged, his railroad stock of little value because of excessive 'water' or a reorganization, his taxes high because his township had also helped the railroad, and his transportation costs still excessive."*⁷⁴⁷

This was the environment in which the American railway companies were operating in the aftermath of the Civil War. Many farmers simply considered themselves having lost out in the game of American railroadisation, in which they had placed their hopes on more prosperity. They felt betrayed by the railways' practices of rebates, pooling arrangements, rate wars, corruption scandals and their high transport tariffs in the western regions compared to other modes of transport. The farmers got the impression that they

⁷⁴⁵ Johnson and Huebner (1911), pp. 288-315 present a detailed analysis of freight traffic associations, arguing that they were benefitting both the railroad companies and the public. According to Chandler (1997), p. 137 the cartels even developed their own executive, legislative and judicial bodies in an attempt to counter the system's inherent temptation to undermine the agreements.

⁷⁴⁶ Stover (1961), p. 114 reports of shippers's complaints in the post-Civil War era that the rates between New York City and Chicago often changed up to sixty times in one year, with levels often being as high as "not completely choke off business."

⁷⁴⁷ Stover (1961), pp. 120-121

had to pay the bills, whereas others were benefiting. Public opinion towards the railway companies became even more hostile, when labour disputes arose in 1877 following a wage cut of 10% on the *Baltimore and Ohio Railroad* due to declining revenues. While handsome dividends were still being paid on the Baltimore and Ohio, Pennsylvania and the New York Central Railroad Companies (*chart 60*), they cut the wages of their employees, which was unacceptable to the railway workers. As the companies refused to compromise, federal troops were called to avert the strikes, resulting in at least a hundred victims and several more workers wounded.⁷⁴⁸

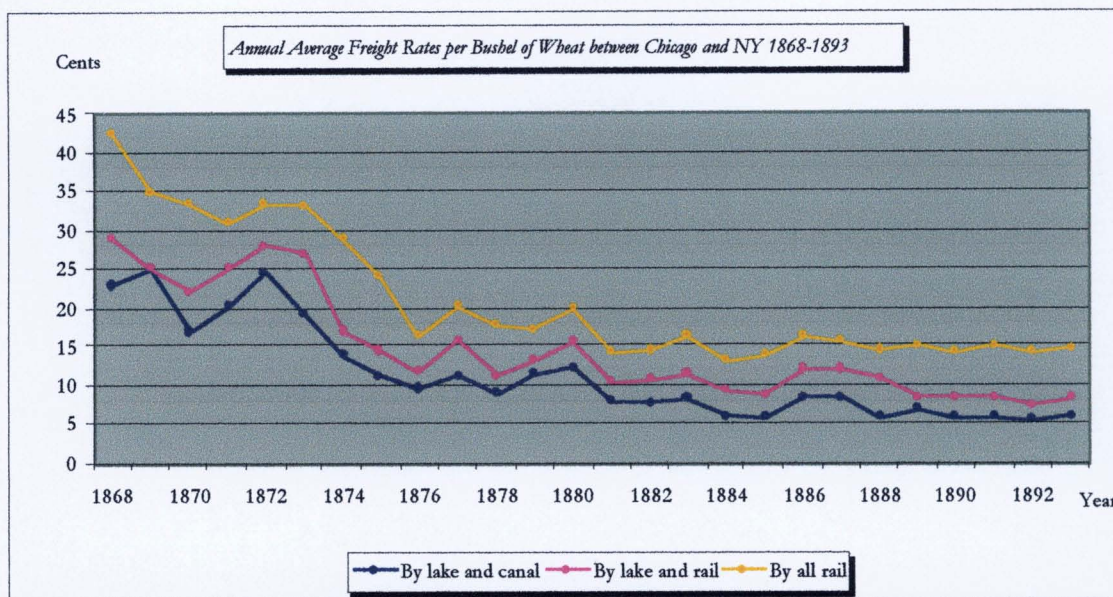


CHART 57

Source: U.S. Bureau of Statistics (1894)

⁷⁴⁸ Stover (1961), pp. 115-125 and Holbrook (1947), pp. 246-252 report on the complaints raised against the railways, the wage disputes and the military action against the striking workers.

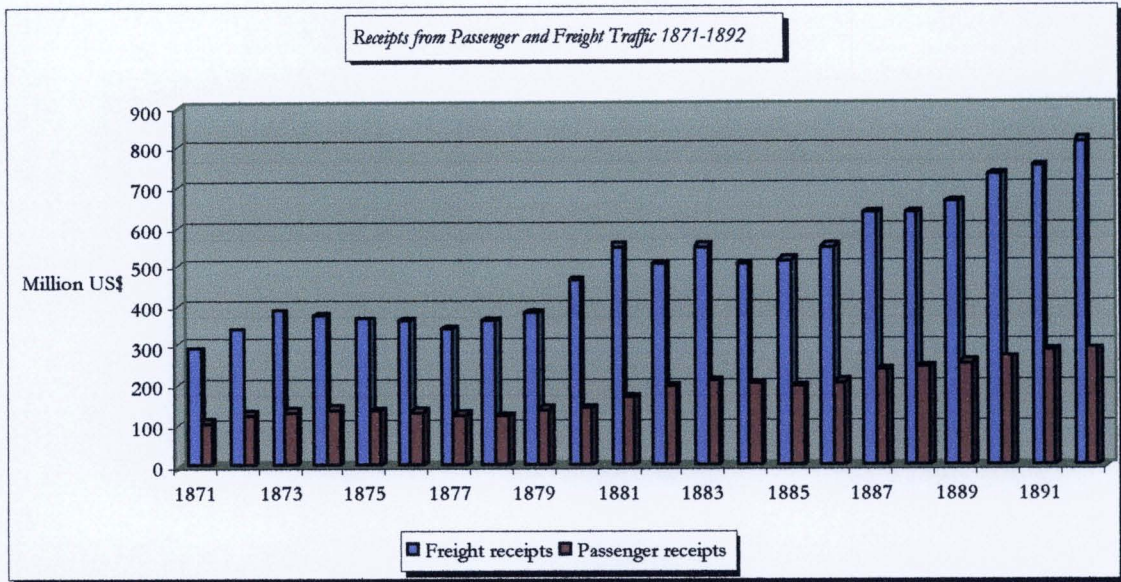


CHART 58

Source: U.S. Bureau of Statistics (1894)

Note: Chart includes all but the New York elevated railroads

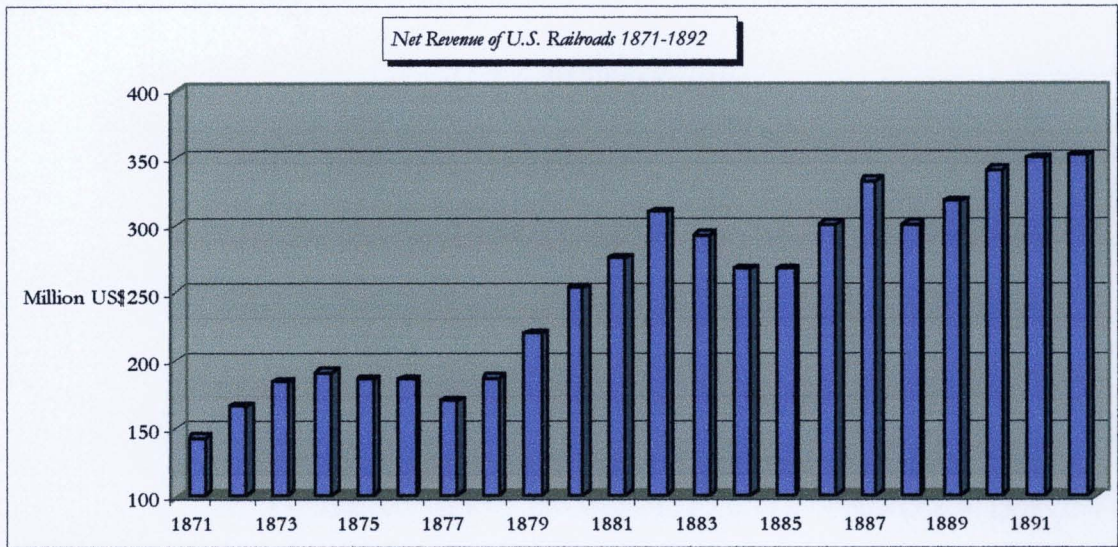


CHART 59

Source: U.S. Bureau of Statistics (1894)

Note: Chart includes all but the New York elevated railroads

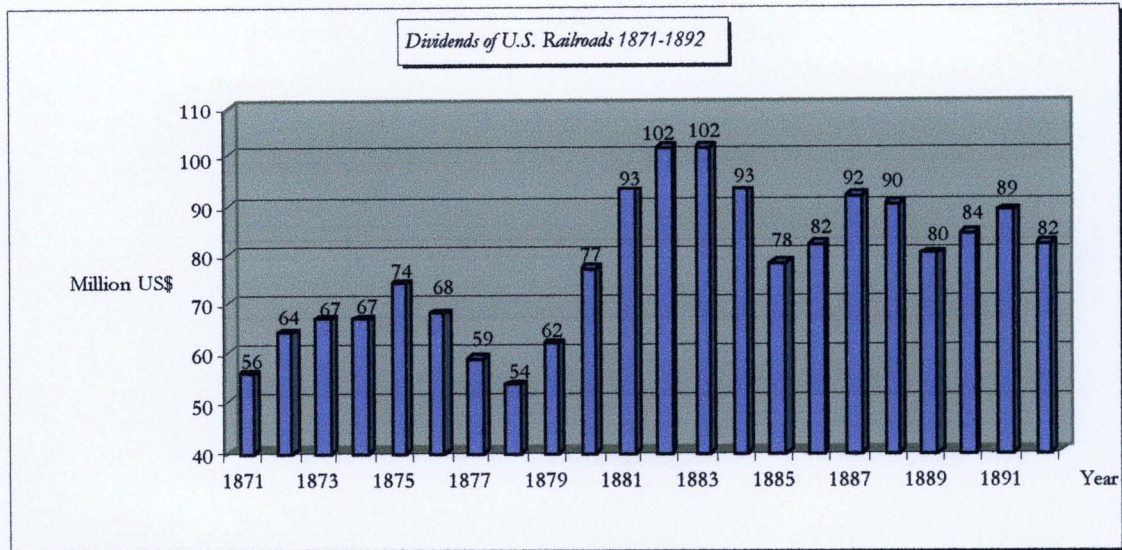


CHART 60

Source: U.S. Bureau of Statistics (1894)

Note: Chart includes all but the New York elevated railroads

For the first time the railroads' power was challenged by a movement emerging in the late 1860s, originally aiming to stimulate the farmers' social and intellectual welfare. The *National Grange of the Patrons of Husbandry* soon became politically involved as many farmers considered it as a powerful association for forming their protest against the railways' perceived abuses. By 1874 the National Grange had developed into a lobbying organisation for more regulation of the railways, counting more than 1.5 million members. The Grange's lobbying led to state legislation in the early 1870s in Illinois and Minnesota, with other states soon following suit. As a result, maximum levels of passenger fares were implemented, whilst freight rates had to be in proportion to the distance transported.⁷⁴⁹ Disregarding their own opinion on regulation, the politicians could not simply neglect the demands of the National Grange. Democratically elected politicians are by nature subject to a re-election constraint and cannot neglect an organisation representing a large share of their rural electorate.

The railways, however, were doing every effort to fight back. They appealed to the United States Supreme Court and mostly overturned the granger laws. *"The carriers also did considerable 'educational' work; they had able men explain the fallacies of much of the proposed or actual legislation to the farmers. They said that the new laws would not only prevent extension of the*

⁷⁴⁹ Stover (1961), pp. 127-130 and Taylor & Neu (1956), p. 3. Following a discussion of the National Grange, Holbrook (1947), pp. 236-240 condemns the laws passed in the states in response to the movement as preposterous legislation, stating Illinois, Minnesota, Iowa and Wisconsin as prime examples. *"Written in haste and often under great emotional stress, most of the so-called granger laws were probably as unfair as they were unworkable. Several were downright preposterous."*

rails, but would hamper operations of lines in use. And in Wisconsin, where a notorious act called the Potter Law had gone into effect, the roads of that state cut service to one train a day on many lines, and set to rolling all of the antiquated cars and locomotives they could assemble. 'A Potter Law,' said the railroads, 'calls for Potter cars, Potter rails, Potter time.' Badgered and met at last by the first competent opposition they had ever known, the carriers closed ranks, forgot their internecine wars of rates and rights-of-way, and fought back. They hired expensive counsel to hamstring the new laws. When they pretended to obey the laws, they managed by ingenious and subtle methods to show that the laws worked a greater hardship on the public than on the roads. And constantly they increased their efforts to conciliate the general public. ...Virtually all of the granger laws were soon repealed, or otherwise became inoperative; and by 1876 the Grange itself was on the decline. Comparative prosperity had meanwhile come to the farmer, and he no longer saw red when he looked at a train of steam cars."⁷⁵⁰ Still, the National Grange left a constant impression on the railway companies and prepared the ground for railway legislation on a national scale.

⁷⁵⁰ Holbrook (1947), p. 241; see also Cunningham (1922), p. 10 for the companies' reply to the granger laws.

4. Federal legislation

The attempts to control competition through co-operation in pooling associations or cartels had finally failed. Due to the impossibility of legally enforcing their arrangements, both associations had crumbled whenever their participants were tempted to attract further traffic to exploit their excess capacity. Instead of relying on unstable interfirm co-operation to guarantee a profitable amount of traffic flows, the management soon resorted to internalise the arrangements to obtain the necessary traffic. In the 1890s the total workforce of the *Pennsylvania Railroad* had risen to 110,000 employees, outnumbering any public institution as one of the largest companies in the world.⁷⁵¹ Paradoxically, the trend of system building was supported by the national legislation in 1887 and 1890, with the *Interstate Commerce* and *Sherman Acts*, when pooling arrangements were declared unlawful, leaving the companies not much of an alternative to concentration in the industry.⁷⁵² Hayek also supported the view that the highly protectionist policy in the United States aided the growth of monopolies.⁷⁵³

Following an earlier investigation of a Senate Committee on supposed railway abuses, the Supreme Court ruled against state regulation of freight services leaving the individual state's territory, as the federal government was responsible for interstate commerce. In the event, Congress passed the Interstate Commerce Act in 1887, to regulate trade between the individual states. It established the *Interstate Commerce Commission* to enforce what were supposedly *reasonable* and *just* transport charges.⁷⁵⁴ The Act also intended to prevent *unfair discrimination*, therefore outlawing rebates and pooling arrangements between the companies, though it had been a common practice in the early

⁷⁵¹ According to Chandler (1997), pp. 204-205 the entire US armed services employed 39,492 and the Post Office 95,440 workers in 1891. A detailed analysis of the era of system building is presented in Chandler (1997), pp. 147-187, with the companies' strategy progressing from a territorial towards an interterritorial one, creating enterprises on a massive scale. On p. 175 Chandler stresses the point, that enforceable pooling arrangements - contrary to the federal legislation in 1887 and 1890 - might have averted the need to build the massive systems: "*It was the response to competition and not the needs or opportunities to reduce costs through administrative coordination that led to the internalizing of activities and transactions of the already large, bureaucratic enterprises within a single giant megacorp. If the federal government had sanctioned pooling, the response might have been different.*"

⁷⁵² This was the era characterised by Chandler as system-building, Channon (1996), p. 154. Hadley (1890), p. 171 already anticipated the trend in 1890. Also, he strongly advised against the prohibition of pooling arrangements, as a direct prohibition would be highly unwise, Hadley (1890), p. 158. Baker (1940), p. 145 supported his view and advocated consolidation in the railroad industry to reduce wasteful duplication.

⁷⁵³ Hayek (1999), p. 18

⁷⁵⁴ Sharkey (1982), p. 27 claimed "...the inflexibility of the ICC may have intensified episodes of instability by preventing a rational restructuring of rates and the consequent flow of capital into the most productive sectors of the industry."

1870s.⁷⁵⁶ However, it was difficult to police that no discrimination between customers in the freight business was taking place. The Commission's power was limited and often involved long court actions but amendments were passed in 1906 and 1910, granting the Interstate Commerce Commission the powers to set maximum price levels and suspend rates.⁷⁵⁶ In 1890 Congress passed the Sherman Act, prohibiting horizontal and vertical restraints of trade in order to prevent firms to abuse a dominant position in the market. The proclaimed motivation behind the act was the belief that unrestrained free enterprise must lead to higher costs for society, infringing upon individual rights guaranteed by the constitution.⁷⁵⁷

Despite the acts, the railway companies continued construction on lines to close gaps in their integrated systems and amalgamated with other train operators. As a result, seven companies were in charge of two-thirds of the entire American railway network of 225,000 miles in 1906.⁷⁵⁸ But investments in infrastructure and equipment slowed down due to a rise in costs and the inflexibility of the companies to raise passenger and freight tariffs without the Interstate Commerce Commission's consent.⁷⁵⁹ The first decade of the 20th century *"...was marked by unusual activity on the part of state commissions and state legislatures. Many new laws were passed, nearly all of which either reduced revenues or increased expenses. The difficulty was aggravated by a conflict of regulating laws as between the states themselves, and as between the states and the Interstate Commission. Coupled with these adverse influences on net earnings came greater activity on the part of the railroad labor organizations in their demands for higher*

⁷⁵⁵ Hadley (1889), pp. 183-184 that the prohibition of railroad pools enabled *"...the most reckless among several companies to set the standard for the whole competitive business..."*

⁷⁵⁶ Cunningham (1922), p. 10-20 discusses the federal legislation in the decades right after the 1887 Interstate Commerce Act and its consequences on the efficiency of American railroads; see also Holbrook (1947), p. 242 and Stover (1961), pp. 131-134. Greenspan (1967), p. 65 holds government legislation responsible for the evils the Interstate Commerce Act was supposed to relieve: *"That Act was not necessitated by the 'evils' of the free market. Like subsequent legislation controlling business, the Act was an attempt to remedy the economic distortions which prior government interventions had created, but which were blamed on the free market. The Interstate Commerce Act, in turn, produced new distortions in the structure and finances of the railroads"* Judging upon the railroads' post-war development, Nelson (1960), pp. 502-503 supports Greenspan's general verdict on the negative effects of regulation in the United States, as it postponed necessary adjustments.

⁷⁵⁷ Schmidt (1993), pp. 203-205 leaves no doubt that the Sherman Act's major intention was to protect free competition. Greenspan (1967), p. 66 issues a clear verdict upon the early antitrust legislation in the United States: *"It takes extraordinary skill to hold more than fifty percent of a large industry's market in a free economy. It requires unusual productive ability, unflinching business judgment, unrelenting effort at the continuous improvement of one's product and technique. The rare company which is able to retain its share of the market year after year and decade after decade does so by means of productive efficiency - and deserves praise, not condemnation. The Sherman Act may be understandable when viewed as a projection of the nineteenth century's fear and economic ignorance. But it is utter nonsense in the context of today's economic knowledge."*

⁷⁵⁸ Stover (1961), p. 135

⁷⁵⁹ Pegrum (1957), p. 424 suggested *"...that the Commission feels that it is a better judge of what is good for the railroads than they are."* Similar notions seemed to prevail across the regulated railway industries in other countries, most notably with regard to the British Transport Commission (see section III).

wages. While the steadily growing burdens of increased operating expenses and taxes...forced net income downward, the railroads were unable to convince the Government regulating authorities that rates should be increased in a degree which would maintain net income. Consequently it became difficult to appropriate money for betterments, and during the decade which preceded our entrance in the World War the program of extensions, enlargements, and improvements was far below the normal rate of earlier years...The year 1915 marked the peak of railroad receiverships. In September of that year approximately 42,000 miles, or about one-sixth of the entire railroad mileage of the country was in the hands of the courts.⁷⁶⁰

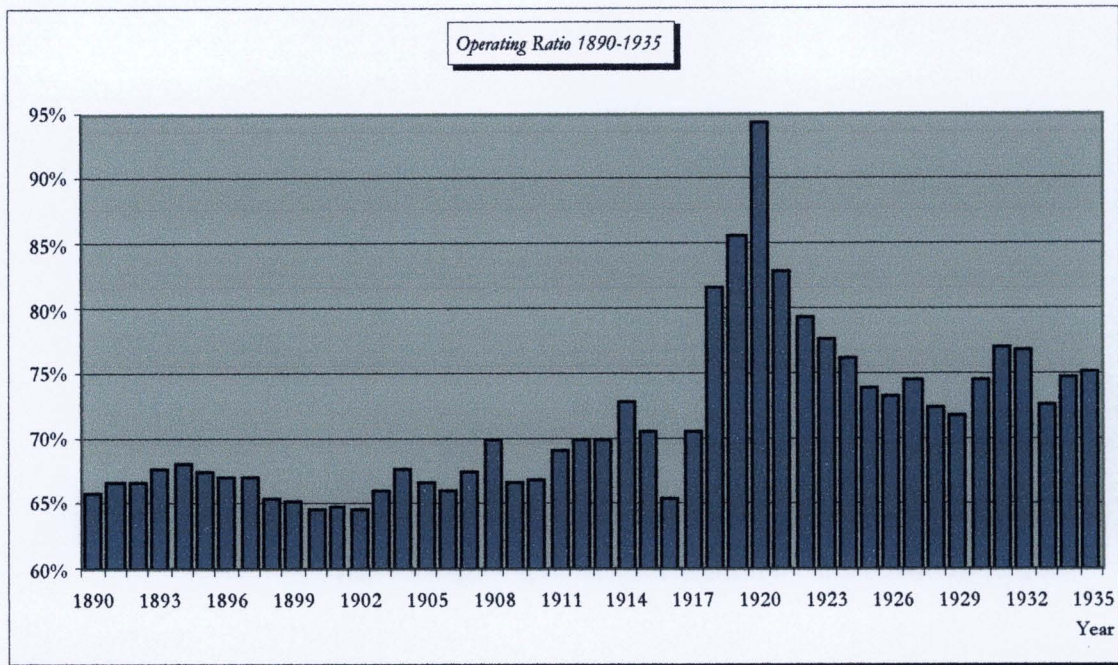


CHART 61

Source: U.S. Bureau of the Census (1960)

Note: Alteration 1916: Before, calculations were based on year ending 30 June, then 31 December

⁷⁶⁰ Cunningham (1922), pp. 18-19

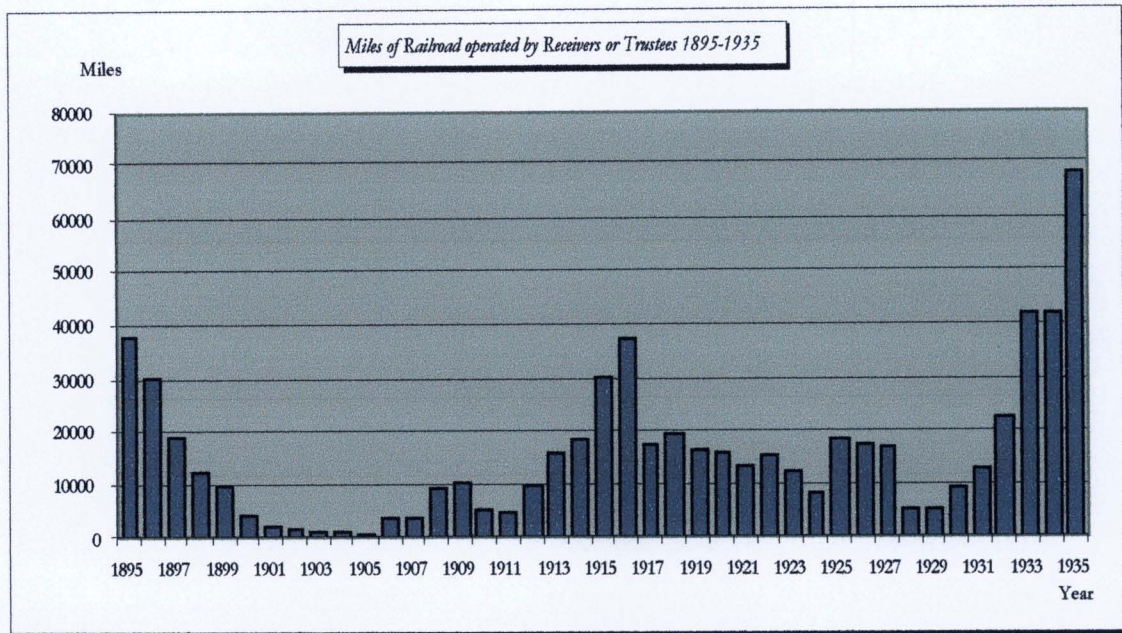


CHART 62

Source: U.S. Bureau of the Census (1960)

Note: Alteration in 1916: Before, calculations were based on year ending 30 June, then 31 December

These negative developments from the railroads' and eventually the customers' point of view are reflected in a deteriorating operating ratio across the industry and the railroads' financial difficulties around WWI and beyond (*charts 61 & 62*). As a consequence of increased government intervention, the flexibility of the railway industry was curtailed and net earnings diminished. Pricing issues were not any more internal business decisions but had to be shared with the Interstate Commerce Commission, reducing competitive pressures in the market. *Business management* of the railway business was more and more replaced by an *administration* of railroads. "Such growing bureaucratization of railroad enterprises had little impact on the ability of the roads to move a massive volume of traffic with speed and regularity, since required techniques for such movement had become well systematized and routinized. It may, however, have made railroad top management less flexible in meeting nonroutine situations such as the unexpected and novel transportation demands created by the nation's entry into World War I. It may, too, have made the roads ill-prepared to respond to post-World War I competition when new forms of transportation based on the internal combustion engine challenged the railroads."⁷⁶¹

⁷⁶¹ Chandler (1997), p. 187. Smith (1946), p. 493 suggested that the railroads have accommodated themselves to regulation and relied on government's wisdom.

C. Scope for research in transport economics – the pricing of roads

Implementation of Model E would establish a railway industry operating like any other industry. However, it is not sufficient to create a market for railway traffic, if considerable distortions remain in the overall transport market. An efficient transport system requires a level playing field for all modes in a competitive transport market.⁷⁶² Regarding the scarcity of capacity on the roads Hibbs noted, “...*there must be serious imperfections in the market for mobility so long as there is no market for the use of road space, which at certain times and places is an exceedingly scarce commodity.*”⁷⁶³

There has been a long experience with privately provided roads, from the early turnpike trusts to modern toll roads.⁷⁶⁴ Some countries, notably Germany, were reluctant to implement toll road schemes, but even where annual motorway tolls were introduced the systems were inefficient if linked to a specific vehicle rather than actual road usage. Instead of restricting road use, toll schemes with an annual fixed rate encourage excessive use of the facility, as the charge is independent from the point of use. However, transport telematics allows for exact charging of road use.⁷⁶⁵ While earlier proposals suggested the use of smart cards or radio beacons, the wide use of the *Global Positioning System (GPS)* for individual traffic routing offers simple methods in exact point-to-point road pricing and congestion charging.

The technology now available provides for a more radical approach to road user charging, as it is not confined to special toll booths or beacons on motorways.⁷⁶⁶ Still, it must be emphasised that road prices are a device *signalling* the true costs of scarce resources and not a tax on road use.⁷⁶⁷ If road pricing comprises the exact costs of road use, including congestion costs and environmental damages, a reform of financing roads must abolish fuel and excise duties that are currently levied, as well as the environmental tax on fuel consumption levied in Germany, as double charging distorts the price mechanism and

⁷⁶² Knieps (1991), p. 8

⁷⁶³ Hibbs (1993), pp. 70-71

⁷⁶⁴ Hibbs and Roth (1992), pp. 17-20. Poole and Orski (2000), p. 17 discuss the conversion from high-occupancy vehicle to high-occupancy toll lanes, investigating current projects in the United States, where a toll varying with traffic congestion is automatically deducted from the driver's prepaid account, ranging from 50 cents to US\$8.

⁷⁶⁵ Knipping (1999) advocates private supply and pricing of roads via telematic systems in a paper presented to the 1999 Institute of Electrical and Electronics Engineers Conference. Nijkamp, Pepping and Banister (1996), p. 20 comment upon the technological progress in telematics systems.

⁷⁶⁶ Ewers and Rodi (1995) analysed the possibility to privatise Germany's federal motorways in a comprehensive study and strongly advised an eventual privatisation.

the efficient resource allocation. The road prices signal the true costs to road users to confront them with transparent choices. If car owners do not use the road, they may not be charged for the pure possession of the vehicle, as they do not impose any costs on the road system. However, road operators may set up a two-tier system of fixed and variable charges to recover the fixed costs of the infrastructure.⁷⁶⁸

Recently, the German government agreed on the introduction of tolls for road haulage operators on motorways in accordance to distance travelled, based on telematics systems. The exclusivity of the toll for road haulage results in new distortions, such as discrimination in favour of rail freight, more traffic on county or municipal roads with entailed pollution, longer journeys and higher final prices for consumers, as the new toll does not replace vehicle, fuel or environmental taxes already in existence. In contrast, the government imposed an additional burden to actively discourage road haulage and promote rail freight with the revenues from the new charge.

Commenting on similar British phenomena Roth noted, “...if used, as currently envisaged, as a ‘highly effective restraint measure’, congestion pricing could become an instrument of tyranny enabling governments to increase their powers by extracting rents from the use of monopolised infrastructure.”⁷⁶⁹ Rather than using road pricing to efficiently allocate scarce resources, transport policy is still subject to the conventional wisdom of protectionism.⁷⁷⁰ The obvious solution to this problem is the privatisation of existing roads and the private provision of new infrastructure according to market demand in a model similar to the competing ROCs. However, the implementation will be easier in road than in rail traffic, due to the higher flexibility of individual drivers and a huge supply of alternative connecting routes. Here, more research must be undertaken during the implementation phase of the German pricing scheme for roads to allow for an upgrade to general road pricing and the abolition of road-related taxes.

⁷⁶⁷ Hibbs (1993), pp. 73-74

⁷⁶⁸ Hibbs (1982), p. 67 envisaged a two-part tariff of a licence fee and an additional charge related to the varying demands of road space.

⁷⁶⁹ Roth (1998), p. 13

⁷⁷⁰ Day (1998), p. 5

Section VII

Bibliography

- Abbott, J.* (2001): London looks forward to OrbiRail and CrossRail, in: *Modern Railways*, Vol. 58, No. 633, June 2001, pp. 37-39
- Aberle, G. and Brenner, A.* (1996): Bahnstrukturreform in Deutschland. Ziele und Umsetzungsprobleme, Köln (Deutscher Instituts-Verlag)
- Aberle, G. and Brookshire, K.* (1990): Ausländische Modelle einer Trennung von Fahrweg und Betrieb bei den Eisenbahnen, Untersuchung im Auftrage der Regierungskommission Bundesbahn, Universität Gießen, 30 October 1990
- Aberle, G.* (1998): Von der Bahnstrukturreform zum Trassenpreissystem '98, in: *Internationales Verkehrswesen Special*, pp. 471-475
- Aldcroft, D.H.* (1968): British Railways in Transition. The Economic Problems of Britain's Railways since 1914., London (Macmillan)
- Aldcroft, D.H.* (1970): The Inter-War Economy: Britain, 1919-1939, London (BT Batsford)
- Aldridge, L.* (1998): Media man on the rails. The story of Sir John Elliot, in: *Global Transport*, The Chartered Institute of Transport in the UK, Summer 1998, pp. 104-106
- Alexandersson, G.* (2000): Competitive Tendering of Railway Services in Sweden, 3rd KFB Research Conference
- Allemeyer, W.* (1991): Das Trennungs- und das Regionalisierungsmodell der schwedischen Eisenbahnen, Beiträge zur Tagung des Verkehrswissenschaftlicher Arbeitskreises, St. Pölten, pp. 143-163
- Allemeyer, W.* (1993): Europäische Modelle für eine Privatisierung der Eisenbahnen, in: Ewers, H.J. ed.: *Privatisierung des Schienenverkehrs. Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen* (Vandenhoeck & Ruprecht), Heft 130, pp. 7-36
- Anderson, T.L. and Leal, D.R.* (2001): Free Market Environmentalism, New York and Basingstoke (palgrave)
- Ashmore, D.P. and Harris, N.G.* (1997): Using risk analysis when determining urban mass transit whole life costs, Study for the Department of the Environment, Transport and the Regions, London
- Bagwell, P.S.* (1984): End of the Line? The Fate of Public Transport Under Thatcher, London (Verso Editions)
- Bain, J.S.* (1956): Barriers to New Competition. Their Character and Consequences in Manufacturing Industries, Cambridge (Harvard University Press)

- Baker, G.P.* (1940): The Possibilities of Economies by Railroad Consolidation and Co-ordination, in: *The American Economic Review*, Vol. 30, Issue 1, pp. 140-157
- Banister, D.* (1990): Privatisation in transport: from the company state to the contract state, in: Simmie, J. and King, R., eds.: *The State in Action. Public Policy and Politics*, London (Pinter Publishers), pp. 95-116
- Banverket* (2001): IKEA leads the way on deregulated European railways, 29 June 2001, www.banverket.de
- Barker, T. and Gerhold, D.* (1995): The rise and rise of road transport, 1700-1990, Prepared for the Economic History Society, Cambridge (Cambridge University Press)
- Barry, N. et al* (1984): Hayek's Serfdom revisited, Hobart Paperback 18, London (IEA)
- Bartholomew, J.* (2000): A tragedy yes – but trains look to be safer in future, in: *The Daily Telegraph*, 19.10.2000, p. 28
- Basedow, J.* (1996): Wettbewerbsrechtliche Folgeprobleme der Deregulierung im Verkehr, in: Wettbewerbspolitik in deregulierten Verkehrsmärkten. Interventionismus oder Laissez Faire?, 29. Verkehrswissenschaftliches Seminar, Hinterzarten, Deutsche Verkehrswissenschaftliche Gesellschaft, pp. 22-37
- Baum, H.* (1983): Possibilities and Limits of Regulation in Transport Policy, in: *European Conference of Ministers of Transport, Round Table 62, Paris*, pp. 5-106
- Baumol, W.J., Panzar, J.C. and Willig, R.D.* (1982): Contestable Markets and The Theory of Industry Structure, Chicago and New York (Harcourt Brace Jovanovich)
- Baumol, W.J. and Sidak, J.G.* (1994): The Pricing of Inputs Sold to Competitors, *Yale Journal on Regulation*, pp.171-201
- Bechthold, R.* (1999): Kartellgesetz. Gesetz gegen Wettbewerbsbeschränkungen (GWB), 2nd edition, München (C.H.Beck)
- Beesley, M.E. and Littlechild, S.C.* (1997): Privatization: principles, problems and priorities, in: Beesley, M.E., ed.: *Privatization, Regulation and Deregulation*, 2nd edition, London and New York (Routledge and IEA), pp 26-42
- Berg, S.v. and Tschirhart, J.* (1988): Natural monopoly regulation. Principles and practice, Cambridge (Cambridge University Press)
- Blankart, C.B.* (1987): Stabilität und Wechselhaftigkeit politischer Entscheidungen. Eine Fallstudie zur preußisch-deutschen Eisenbahnpolitik von ihren Anfängen bis zum Zweiten Weltkrieg, in: *Jahrbuch für Neue Politische Ökonomie*, Tübingen (J.C.B.Mohr), pp. 74-92
- Blankart, C.B. and Knieps, G.* (1991): Netzökonomik, Diskussionspapier der Technischen Universität Berlin

- Blankart, C.B.* (1994): Öffentliche Finanzen in der Demokratie, München (Verlag Franz Vahlen)
- Blankart, C.B.* (1998): What Can Markets Do in Transports and Telecommunications?, Paper presented at the 1998 Forum Engelberg: The Future of Mobility and Transport in a Moving World, Engelberg
- Blundell, J., Robinson, C.* (2000): Regulation Without the State, in: Blundell, J. and Robinson, C., eds.: Regulation Without The State...The Debate Continues, IEA Readings 52, London (IEA), pp. 1-30
- Boettke, P.J.* (2000): Towards a History of the Theory of Socialist Planning, in: Socialism and the Market. The Socialist Calculation Debate Revisited, Vol. I-IX, London (Routledge), pp. 1-39
- Boettke, P.J.* (2001): Putting the 'political' back into political economy, in: Biddle, J.E. et al.: Economics Broadly Considered. Essays in honor of Warren J. Samuels, London and New York (Routledge)
- Böhmer, R. and Delhaes, D.* (2000): Endstation Milliardenloch, in: Wirtschaftswoche, No. 46, November 9th, pp. 88-95
- Bolt, C.* (1997): The Restructured Railway in Great Britain: Performance and Prospects, in: Proceedings of Seminar H held at the European Transport Forum Annual Meeting, Brunel University, England, 1-5 September 1997, pp. 7-17
- Bonavia, M.R.* (1946): The State and the Railways. An Alternative to Nationalisation, Memorandum by the Board of the London and North Eastern Railway Company
- Bonavia, M.R.* (1981): Railway policy between the wars, Manchester (Manchester University Press)
- Bonavia, M.R.* (1987): The Nationalisation of British Transport. The Early History of the British Transport Commission, 1948-53, London (Macmillan)
- Booz, Allen & Hamilton Ltd.* (2000): Usage Costs: Issues Raised in the Regulator's Consultation, Report to Office of the Rail Regulator, October 2000
- Bradshaw, W.P.* (1998): The Rail Industry, in: Helm, D. and Jenkinson, T., eds.: Competition in Regulated Industries, Oxford (Oxford University Press), pp. 175-192
- Bradshaw, W.P.* (2000): New Directions for Britain's Railways, in: Freeman, R. and Shaw, J., eds.: All Change: British Railway Privatisation, Maidenhead (McGrawHill), pp. 229-242
- Bradshaw, W.P. and Lawton Smith, H., eds.* (2000): Privatization and deregulation of transport, Basingstoke (Macmillan)

- Braeutigam, R.R.* (1989): Optimal Policies for Natural Monopolies, in: Schmalensee, R. and Willig, R.D.: Handbook of Industrial Organization, Vol. II, pp. 1290-1345
- Braeutigam, R.R., Daughety, A.F. and Turnquist, M.A.* (1984): A Firm Specific Analysis of Economies of Density in the U.S. Railroad Industry, in: Journal of Industrial Economics, Vol. 33, Issue 1, pp. 3-20
- Branden, N.* (1967): Common Fallacies About Capitalism, in: Rand, A. ed.: Capitalism: The Unknown Ideal, New York (Signet), pp. 72-95
- Brandenburger, A.M. and Nalebuff, B.J.* (1996): Co-opetition, London (HarperCollins-Business)
- Brenck, A.* (1993): Privatisierungsmodelle für die Deutsche Bundesbahn, Ewers, H.J. ed.: Privatisierung des Schienenverkehrs. Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen (Vandenhoeck & Ruprecht), Heft 130, pp. 37-184
- British Railways Board* (1963): The Reshaping of British Railways, Part I: Report, London (Her Majesty's Stationery Office)
- British Railways Board* (1965): The Development of the Major Railway Trunk Routes
- British Transport Commission* (1955): Modernisation and Re-equipment of British Railways
- Broadbridge, S.* (1970): Studies in Railway Expansion and the Capital Market in England 1825-1873, (Frank Cass)
- Buchanan, J.M. and Tullock, G.* (1999): The Calculus of Consent. Logical Foundations of Constitutional Democracy, Liberty Fund, Inc. 1999, Library of Economics and Liberty, www.econlib.org/library/Buchanan/buchCv3c1.html
- Buerger, E.* (1846): Deutschlands Eisenbahnen im Jahr 1846. Nach officiellen Berichten der respectiven Eisenbahn-Directionen und andern zuverlässigen Quellen, Karlsruhe (Macklot)
- Bundesgesetzblatt* (1993): Gesetz zur Neuordnung des Eisenbahnwesens. Eisenbahnneuordnungsgesetz – ENeuOG, in: Bundesgesetzblatt I, No. 73, December 30th, 1993, pp. 2378-2405
- Bundesministerium für Verkehr, Bau- und Wohnungswesen* (1997): Verordnung über die diskriminierungsfreie Benutzung der Eisenbahninfrastruktur und über die Grundsätze zur Erhebung von Entgelt für die Benutzung der Eisenbahninfrastruktur (Eisenbahninfrastruktur-Benutzungsverordnung – EIBV), December 17th, www.wedebruch.de
- Bundesministerium für Verkehr, Bau- und Wohnungswesen* (2000): Verkehr in Zahlen 2000, No. 29, Hamburg (Deutscher Verkehrs-Verlag)

- Bundesministerium für Verkehr, Bau- und Wohnungswesen* (2001): Bericht der Task Force "Zukunft der Schiene", March 2001, www.bmvi.de
- Burchell, A.* (1997): Economic Regulation of Transport: An Overview, ESRC Regulatory Policy Seminar Group: Privatisation and deregulation in transport, Hertford College, Oxford, 2-4 July 1997
- Burrows, P.* (1977): 'Efficient' pricing and government interference, in: Posner, M. ed.: Public Expenditure. Allocation between Competing Ends, Cambridge (Cambridge University Press)
- Butterfield, P.* (1986): Grouping, pooling and competition. The passenger policy of the London & North Eastern Railway, 1923-39, in: Journal of Transport History, Vol. 7, No. 2, pp. 21-47
- Byatt, I.* (1995): Water: The Periodic Review Process, in: Beesley, M.E.: Utility regulation: Challenge and Response, IEA Readings 42, pp. 21-30
- Caplan, C. and Stringham, E.* (2001): Networks, Anarcho-Capitalism, and the Paradox of Cooperation, George Mason University, May 2001
- Cave, M.* (1994): Interconnection issues in UK telecommunications, Utilities Policy, pp. 215-222
- Cave, M. and Doyle, C.* (1994): Access pricing in network utilities in theory and practice, Utilities Policy, pp.181-189
- Cave, M. and Mills, R.* (1992): Cost Allocation in Regulated Industries, Public Finance Foundation
- Chadwick, E.* (1859): Results of Different Principles of Legislation and Administration in Europe: of Competition for the Field, as compared with Competition within the Field, of Service, in Journal of the Royal Statistical Society, London (formerly: Statistical Society of London), pp. 381-420
- Chandler, A.D.* (1997): The Visible Hand. The Managerial Revolution in American Business, Cambridge, Massachusetts and London (The Belknap Press of Harvard University Press)
- Channon, G.* (1996): A.D. Chandler's 'visible hand' in transport history: a review article, in: Gourvish, T.R, ed.: Railways, Vol. I, Aldershot (Scolar Press), pp. 153-164
- Channon, G.* (2001): Railways in Britain and the United States, 1830-1940, Burlington, USA (Ashgate)
- Charlton, C.* (2000). The Structure of the New Railway, in: Freeman and Shaw, eds.: All Change: British Railway Privatisation, Maidenhead (McGrawHill), pp. 31-56

- Clapham, J.H.* (1967): An Economic History of Modern Britain. The Early Railway Age 1820-1850, Cambridge (Cambridge University Press)
- Clarke, J.* (2000): Selling the Freight Railway, in: Freeman, R. and Shaw, J., eds.: All Change: British Railway Privatisation, Maidenhead (McGrawHill), pp. 179-204
- Cleveland-Stevens, E.* (1915): English Railways. Their Development and their Relation to the State, London (George Routledge and Sons)
- Coase, R.H.* (1960): The Problem of Social Cost, in: The Journal of Law and Economics, Vol. III, pp. 1-44
- Coase, R.H.* (1988): The Nature of the Firm, in: The Firm, the Market and the Law, Chicago and London (University of Chicago Press), pp. 33-55
- Crompton, G.W.* (1985): Efficient and economical working? The performance of the railway companies 1923-33, in: Business History, Vol. 27, No. 2, pp. 222-237
- Crompton, G.W.* (1989): Squeezing the pulpless orange: Labour and capital on the railways in the inter-war years, Business History, Vol. 31, No. 2, pp. 66-83
- Crompton, G.W.* (1995): The railway companies and the nationalisation issue 1920-50, in: Millward, R. and Singleton, J., eds.: The political economy of nationalisation in Britain 1920-1950, Cambridge (Cambridge University Press), pp. 116-143
- Crompton, G.W.* (1999a): Good business for the nation. The railway nationalisation issue, 1921-47, in: Journal of Transport History 20, 2, pp. 141-158
- Crompton, G.W.* (1999b): Railway Nationalization in the United Kingdom, in: Andersson-Skog, L. and Krantz, O. eds.: Institutions in the Transport and Communications Industries, USA (Science History Publications), pp. 133-151
- Cunningham, W.J.* (1922): American Railroads: Government Control and Reconstruction Policies, Chicago, New York, London (A.W. Shaw)
- Davies, D.* (2000): Automatic Train Protection for the Railway Network in Britain, The Royal Academy of Engineering, London, R2.16, www.raeng.org.uk
- Day, A.* (1998): The case for road pricing, in: IEA Economic Affairs, Vol. 18, No. 4, December 1998, London (IEA), pp. 5-8
- Demsetz, H.* (1968): Why regulate utilities?, in: Journal of Law and Economics, Vol. 11, pp. 55-66
- Demsetz, H.* (1988): Ownership, Control, and the Firm. The Organization of Economic Activity, Vol. I, Oxford and New York (Basil Blackwell)
- Demsetz, H.* (1989): Efficiency, Competition, and Policy. The Organization of Economic Activity, Vol. II, Oxford and New York (Basil Blackwell)

- Dennis, N. (1999): Low Cost Airlines and Scheduled Airline Operations, in: The Transport Economist, Vol. 27, No. 2, Summer 2000, pp. 1-8
- Department of the Environment, Transport and the Regions (1997): Rail Freight Grants, 3 December 1997, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (1998): The Flotation of Railtrack, Report by the Comptroller and Auditor General, London (The Stationery Office), 10 December 1998
- Department of the Environment, Transport and the Regions (1999a): Prescott sets out ten-year plan for investment. Press Notice, 13 December 1999, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (1999b): The Government's Response to the Environment, Transport and Regional Affairs Committee's Report, 17 December 1999, Cm.4538, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (2000a): Railtrack's Safety and Standards Directorate. Review of main functions and their locations, 22 February 2000, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (2000b): £180bn Ten year investment plan to deliver top class transport system. News Release, 20 July 2000, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (2000c): Transport 2010. The 10 Year Plan. Statement to Parliament, 20 July 2000, www.detr.gov.uk
- Department of the Environment, Transport and the Regions (2000d): Bulletin of Rail Statistics: Quarter 1 2000/2001, August 2000
- Department of the Environment, Transport and the Regions (2000e): Regulator proposes that Railtrack establish a separate safety company. Press Notice, 31 October 2000, www.detr.gov.uk
- Department of Transport (2001): Network Licence granted to Railtrack plc, including Modifications up to 1 January 2001
- Deutsche Bahn AG (1997): Die britische Bahnreform, internal study
- Deutsche Bahn AG (1998): Mehr Verkehr auf die Schiene. Das neue Trassenpreissystem TPS '98. Frankfurt am Main
- Deutsche Bahn AG (2000a): Daten und Fakten 2000, Berlin
- Deutsche Bahn AG (2000b): Geschäftsbericht 2000, Berlin
- Deutsche Bahn AG (2001): DB Netz AG unterzeichnet gemeinsam mit Schwedischer Banverket und Dänischer Banestyrelsen Trassennutzungsvertrag mit IKEA AB, 29 June 2001, www.bahn.de

- Deutsche Bahn Netz AG* (2001): Trassenpreissystem 2001, Mai 2001, Frankfurt, www.db-netz.de
- Doll, R.* (1998): Zugang zu wesentlichen Leistungen in der Telekommunikation, Beitrag zur Tagung der Deutschen Verkehrswissenschaftlichen Gesellschaft: Diskriminierungsfreier Zugang zu (Verkehrs-)Infrastrukturen, Freiburg
- Domergue, P. and Quinet, E.* (2001): Situation and Problems of Railway Industry in Europe, in: *Japan Railway & Transport Review*, Vol. 26, February 2001, pp. 4-7
- Douglas, D.C.*, ed. (1977): English Historical Documents, Volumes: XI: 1783-1832, XII(1): 1833-1874, XII(2): 1874-1914, London (Eyre and Spottiswoode)
- Dürr, H.* (1993): Development of Railway Transport in Germany, in: *Proceedings of The Chartered Institute of Transport*, Vol. 2, No. 2, May 1993, London, pp. 3-11
- Economides, N. and White, L.J.* (1995): Access and interconnection pricing: how efficient is the "efficient component pricing rule" ?, *The Antitrust Bulletin*, pp. 557-579
- Economist* (2000a): How not to run a railway, in: *The Economist*, November 25th, pp. 35-36
- Economist* (2000b): No excuses now, in *The Economist*, October 28th, p. 36
- Economist* (2000c): The price of safety, in: *The Economist*, November 25th, p. 23
- Economist* (2001a): A better way to run a railway, in: *The Economist*, March 17th, p. 39
- Economist* (2001b): Blood on the tracks, in *The Economist*, October 13th, www.economist.com
- Ellig, J.* (2001): Railroad Deregulation and Consumer Welfare, Mercatus Center and Institute for Humane Studies
- Ellis, H.* (1956): British Railway History. An outline from the accession of William IV. to the nationalisation of railways, London (George Allen and Unwin)
- Endres, A.* (1994): Umweltökonomie, Darmstadt (Wissenschaftliche Buchgesellschaft)
- English Welsh & Scottish Railway Limited* (2000): Review of Freight Charging Policy. A Consultation Document, July 7th
- Ergas, H. and Ralph, E.* (1994): Pricing Network Interconnection: Is the Baumol-Willig Rule the Answer ?, Melbourne
- European Commission* (1996): White Paper. A Strategy for Revitalising the Community's Railways, www.europa.eu.int/eur-lex/en
- European Commission* (1998a): Railways: Structure, Regulation and Competition Policy, Competition Policy Roundtables No. 15, www.oecd.org
- European Commission* (1998b): White Paper. Fair Payment for Infrastructure Use: A Phased Approach to a Common Transport Infrastructure Charging Framework in the EU, Directorate-General VII Transport, Directorate B – Inland Transport

- European Community* (1995a): Directive 95/18/EC of 19 June 1995 on the licensing of railway undertakings, www.europa.eu.int/eur-lex/en
- European Community* (1995b): Directive 95/19/EC of 19 June 1995 on the allocation of railway infrastructure capacity and the charging of infrastructure fees
- European Community* (1996a): Directive 96/19/EC of 13 March 1996 amending Directive 90/388/EEC with regard to the implementation of full competition in telecommunications markets, www.europa.eu.int/eur-lex/en
- European Community* (1996b): Directive 96/92/EC of 19 December 1996 concerning common rules for the internal market in electricity, www.europa.eu.int/eur-lex/en
- European Community* (2001): Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification, www.europa.eu.int/eur-lex/en
- European Economic Community* (1990): Directive 90/377/EEC of 29 June 1990 concerning a Community procedure to improve the transparency of gas and electricity prices charged to industrial end-users, www.europa.eu.int/eur-lex/en
- European Economic Community* (1990): Directive 90/388/EEC of 28 June 1990 on competition in the markets for telecommunication services, www.europa.eu.int/eur-lex/en
- European Economic Community* (1991): Directive 91/440/EEC of 29 July 1991 on the development of the Community's railways, www.europa.eu.int/eur-lex/en
- European Union* (1997): Treaty of Amsterdam, www.europa.eu.int/abc/treaties_en.htm
- Ewers, H.-J.* (1995): Wettbewerbliche Defizite bei der Privatisierung von Monopolunternehmen, in: Umbruch der Wettbewerbsordnung in Europa. Referate des XXVIII. FIW-Symposiums, Köln and Berlin (Carl Heymanns Verlag KG), pp. 113-126
- Ewers, H.-J. and Meyer, H.* (1993): Privatisierung und Deregulierung bei den Eisenbahnen – Das Beispiel der Deutschen Bundesbahn und der Deutschen Reichsbahn, Institut für Verkehrswissenschaft an der Universität Münster
- Ewers, H.-J. and Rodi, H.* (1995): Privatisierung der Bundesautobahnen, Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen (Vandenhoeck & Ruprecht), Heft 134
- Fenelon, K.G.* (1932): Railway Economics, London (Methuen & Co.)
- Financial Times* (2000a): Rail regulator won't be swayed from tough line, in: The Financial Times, March 14th

- Financial Times* (2000b): Opinion: The government's 10-year plan for transport. By Lord Macdonald, Minister for Transport, in: *The Financial Times*, July 20th
- Financial Times* (2000c): Blood on tracks, in: *The Financial Times*, October 25th, p. 26
- Financial Times* (2000d): Prescott holds back on rail revamp, in: *The Financial Times*, October 25th, p. 1
- Financial Times* (2000e): Rail authority pledged a clean sweep but has settled for a modest tidy-up, in: *The Financial Times*, October 25th, p.4
- Financial Times* (2000f): The demands of safety, in: *The Financial Times*, October 25th, p. 21
- Financial Times* (2000g): Europe on the slow track to railway liberalisation, November 24th, p. 12
- Financial Times* (2000h): Regulator warns Railtrack over 'dictatorship', in: *The Financial Times*, December 07th
- Financial Times* (2001a): Railways face huge safety bill, Inquiry into Paddington crash hits out at Railtrack, in: *The Financial Times*, June 20th, www.ft.com, front page
- Financial Times* (2001b): Investors may sue over collapse of Railtrack, in: *The Financial Times*, October 8th, www.ft.com
- Financial Times* (2001c): Engineering groups may bid to run railway, in: *The Financial Times*, November 1st, p. 3
- Financial Times* (2001d): Railtrack chief confronts Byers in conference floor ambush, in: *The Financial Times*, November 7th, p. 3
- Financial Times* (2001e): Train tag, in: *The Financial Times*, p. 21
- Fleisig, H. (1975): The Central Pacific Railroad and the Railroad Land Grant Controversy, in: *Journal of Economic History*, Vol. 35, Issue 3, pp. 552-566
- Ford, R. (2001a): Byers blitzes Railtrack, in: *Modern Railways*, Vol. 58, No. 638, November 2001, pp. 17-20
- Ford, R. (2001b): Railtrack 'investment' – money into a black hole?, in: *Modern Railways*, Vol. 58, No. 634, July 2001, pp. 19-21
- Foster, C.D. (1975): The Transport Problem, London (Croom Helm)
- Foster, C.D. (1992): Privatization, public ownership and the regulation of natural monopoly, Oxford, UK and Cambridge, USA (Blackwell)
- Francis, J. (1851): A History of the English Railway; its social relations and revelations. 1820-1845, London (Longman, Brown, Green & Longmans), Volumes 1 and 2
- Frankfurter Allgemeine Zeitung* (2001a): Minister Bodewig lenkt im Streit mit Bahn-Chef Mehdom ein, in: *Frankfurter Allgemeine Zeitung*, March 15th, p. 17

- Frankfurter Allgemeine Zeitung* (2001b): Neue Trassenpreise sollen kleine Anbieter begünstigen, in: *Frankfurter Allgemeine Zeitung*, March 21st, p. 17
- Frankfurter Allgemeine Zeitung* (2001c): Bund schafft Bahnregulierungsbehörde, in: *Frankfurter Allgemeine Zeitung*, April 26th, p. 19
- Frankfurter Allgemeine Zeitung* (2001d): Der Bahn steht Ärger mit dem Kartellamt bevor, in: *Frankfurter Allgemeine Zeitung*, May 14th, p. 17
- Frankfurter Allgemeine Zeitung* (2001e): Frankreich sperrt sich weiter gegen Zugang zum Bahnnetz, in: *Frankfurter Allgemeine Zeitung*, May 21st, p. 17
- Frankfurter Allgemeine Zeitung* (2001f): Privatbahn will Interregios übernehmen, in: *Frankfurter Allgemeine Zeitung*, August 15th, p. 16
- Frankfurter Allgemeine Zeitung* (2001g): Die Bahn soll ihr Netz nicht verlieren, in: *Frankfurter Allgemeine Zeitung*, August 27th, p. 13
- Frankfurter Allgemeine Zeitung* (2001h): Railtrack-Aktionären droht Totalverlust, in: *Frankfurter Allgemeine Zeitung*, October 9th
- Fremdling, R.* (1983): Germany, in: Patrick O'Brien, ed.: *Railways and the Economic Development of Western Europe 1830-1914*, London (Macmillan Press), pp. 121-147
- Fremdling, R. and Knieps, G.* (1993): Competition, Regulation and Nationalization: The Prussian Railway System in the Nineteenth Century, *Scandinavian Economic History Review*, Vol. XLI
- Fremdling, R.* (1999): The Prussian and Dutch Railway Regulations in the Nineteenth Century, in: Andersson-Skog, L. and Krantz, O. eds.: *Institutions in the Transport and Communications Industries, USA* (Science History Publications), pp. 61-92
- Freeman, R.* (1992): The UK Government Perspective, presentation at the PTRC Summer Annual Meeting, 14-18 September 1992, University of Manchester
- Friedman, M.* (1962): Capitalism and Freedom, Chicago and London (University of Chicago Press)
- Gabel, D.* (1994): Competition in a Network Industry. The Telephone Industry, 1894-1910, in: *Journal of Economic History*, Vol. 54, pp. 543-572
- Gable, W. and Ellig, J.* (1993): Introduction to Market-Based Management, Fairfax, Virginia (Center for Market Processes)
- Gates, P.W.* (1954): The Railroad Land-Grant Legend, in: *Journal of Economic History*, Vol. 14, Issue 2, pp. 143-146
- Gebert, D. and Boerner, S.* (1995): Manager im Dilemma - Abschied von der offenen Gesellschaft?, Frankfurt (Campus)

- Geddes, R.* (2000): Public Utilities, in: Encyclopedia of Law and Economics, Vol. III, Cheltenham, UK (Edward Elgar), pp. 1162-1205
- Gerondeau, C.* (1997): Transport in Europe, Boston and London (Artech House)
- Gesellschaft für öffentliche Wirtschaft*, ed. (1991): Die öffentlichen Eisenbahnen in der Bundesrepublik Deutschland angesichts der Vollendung des EG-Binnenmarktes. Stellungnahme des Wissenschaftlichen Beirats der Gesellschaft für öffentliche Wirtschaft, in: Beiträge zur öffentlichen Wirtschaft, Heft 7, Berlin
- Gernau, G.* (1995): Innovationen müssen Vorfahrt haben, mobil 5/1995, pp. 19-22
- Glaister, J.* (1981): Fundamentals of Transport Economics, Oxford (Basil Blackwell)
- Glaister, J.* (1994): The Regulation of Britain's Privatised Railways, in: Beesley, M.E. ed.: Regulating Utilities: The Way Forward, London (IEA and London Business School), pp. 115-135
- Glaister, J. and Travers, T.* (1993): New Directions for British Railways? The Political Economy of Privatisation and Regulation, in: IEA Current Controversies No. 5, London (IEA)
- Gourvish, T.R.* (1980): Railways and the British Economy 1830-1914, The Economic History Society
- Gourvish, T.R.* (1986): British Railways 1948-1973. A Business History, Cambridge (Cambridge University Press)
- Gourvish, T.R.* (1999): The Regulation of Britain's Railways: Past, Present and Future, in: Andersson-Skog, L. and Krantz, O. eds.: Institutions in the Transport and Communications Industries, USA (Science History Publications), pp. 117-132
- Grant, J.* (2001): Life after Railtrack, in: Modern Railways, Vol. 58, No. 638, November 2001, pp. 26-27
- Grantham, A.* (1998): Privatisation and reorganisation. Case studies in rail policy implementation, PhD thesis, University of East Anglia
- Greenspan, A.* (1967): Antitrust, in: Rand, A. ed.: Capitalism: The Unknown Ideal, New York (Signet), pp. 63-71
- Grimm, C. and Winston, C.* (2000): Competition in the Deregulated Railroad Industry: Sources, Effects, and Policy Issues, in: Peltzman, S. and Winston, S. eds.: Deregulation of Network Industries. What's Next?, Washington, D.C. (Brookings Institution Press), pp. 41-72
- Grundgesetz für die Bundesrepublik Deutschland, 54th edition, 1999, München (C.H.Beck)
- Haase, D.* (1998): Das neue Trassenpreissystem der Deutschen Bahn AG, in: Internationales Verkehrswesen Special, pp. 460-465

- Hadley, A.T.* (1889): Railroad Business Under the Interstate Commerce Act, in: Quarterly Journal of Economics, vol. 3, Issue 2, pp. 170-187
- Hadley, A.T.* (1890): The Prohibition of Railroad Pools, in: Quarterly Journal of Economics, Vol. 4, Issue 2, pp. 158-171
- Hall, P.G.* (1969): Non-Plan: An Experiment in Freedom, in: New Society, 20 March 1969, pp. 435-442
- Hall, P.G. and Smith, E.* (1976): Better Use of Rail Ways, Reading (Geographical Papers)
- Hall, P.G.* (1977): Planning's museum of disasters, in: New Society, 22 September 1977, pp. 593-594
- Hamm, W.* (1988): Effizienzorientierte Verkehrspolitik. Chancen für die Bahn, Aktionsgemeinschaft Rationeller Verkehr, Frankfurt am Main
- Hansard, T.C.* (1836): Hansard's Parliamentary Debates: Third Series: Commencing with the accession of William IV., London, Vol. XXXIII
- Hansard, T.C.* (1839): Hansard's Parliamentary Debates: Third Series: Commencing with the accession of William IV., London, Vol. XLVI
- Hansemann, D.* (1837): Die Eisenbahnen und deren Aktionäre in ihrem Verhältnis zum Staat, Leipzig und Halle (Renger'sche Verlagsbuchhandlung)
- Hansemann, D.* (1841): Kritik des preußischen Eisenbahn-Gesetzes vom 3. November 1838, Aachen und Leipzig (J.A. Mayer)
- Harbaugh, C.* (1997): Congestion pricing prospects, in: Traffic Technology International, Dec. 97/Jan. 98, pp. 19-20
- Harman, R.* (1998): Britain's new trains – do we need more?, in: Global Transport, The Chartered Institute of Transport in the UK, Summer 1998, pp. 86-89
- Hawke, G.R.* (1970): Railways and Economic Growth in England and Wales 1840-1870, Oxford (Clarendon Press)
- Hawke, G. and Higgins, J.* (1983): Britain, in: Patrick O'Brien, ed.: Railways and the Economic Development of Western Europe 1830-1914, London (Macmillan Press), pp. 170-202
- Hayek, F.A.v.* (1946): The Road to Serfdom, 7th Edition, London (Routledge & Sons)
- Hayek, F.A.v.* (1996): Die Anmaßung von Wissen, Nobel Memorial Prize Lecture, Stockholm, in: Kerber, W., ed.: Die Anmaßung von Wissen. Neue Freiburger Studien, Tübingen (J.C.B. Mohr)
- Hayek, F.A.v.* (1999): The Road to Serfdom, Reader's Digest condensed version, Rediscovered Riches No. 5, London (IEA)

- Health and Safety Commission* (2001): The Southall and Ladbroke Grove Joint Inquiry into Train Protection Systems, Norwich (HMSO)
- Heimerl, G., Dobeschinsky, H, Gerhardt, P.H.* (1991): Privatisierung und Internationalisierung von Leistungsbereichen der europäischen Eisenbahnen, Beiträge zur Tagung des Verkehrswissenschaftlichen Arbeitskreises, St. Pölten.
- Henderson, W.O.* (1958): The State and the Industrial Revolution in Prussia 1740-1870, (Liverpool University Press), pp. 150-193
- Henry, C. and Quinet, E.* (1999): Which Railways Policy and Organisation for France?, in: *Journal of Transport Economics and Policy*, Vol. 33, Part 1, pp. 119-126
- Hibbs, J.* (1982): Transport without Politics...? A study of the scope for competitive markets in road, rail and air, London (IEA)
- Hibbs, J.* (1989): Privatisation and Competition in Road Passenger Transport, in: *Veljanovski, C. ed.: Privatisation and Competition. A Market Prospectus*, IEA Hobart Paperback 28, London (IEA), pp. 161-177
- Hibbs, J. and Roth, G.* (1992): Tomorrow's Way. Managing roads in free society, London (ASI)
- Hibbs, J.* (1993): On the Move...A Market for Mobility on the Roads, London (IEA)
- Hibbs, J. and Bradley, M.* (1997): Deregulated Decade. Ten Years of Bus Deregulation, London (ASI)
- Hibbs, J.* (2000): Transport Policy: The Myth of Integrated Planning, IEA Hobart Paper 140, London (IEA)
- His Majesty's Stationery Office* (1907): The Railway and Canal Traffic Acts, 1854, 1873, 1888 and 1894, and other Statutes; with the General Rules of the Railway and Canal Commission, London (HMSO)
- Holbrook, S.H.* (1947): The Story of American Railroads, New York (Crown Publishers)
- Holder, S.* (1999): Recent Developments in Rail Infrastructure Charging in The European Union, in: *Journal of Transport Economics and Policy*, Vol. 33, Part 1, pp. 111-118
- House of Commons* (1993a): Railways Bill
- House of Commons* (1993b): Railways Bill. Explanatory and Financial Memorandum
- House of Commons* (1999): Transport Bill, 1 December 1999
- House of Lords* (1990): A New Structure for Community Railways, Third Report of the Select Committee on the European Communities, 18 December 1990
- Interstate Commerce Commission* (1887): Interstate Commerce Reports: Decisions and Proceedings of the Interstate Commerce Commission, Rochester, N.Y. (The Lawyers' Co-operative Publishing Company), Vol. 1

- Irvine, K.* (1987): The Right Lines, London (ASD)
- Irving, R.J.* (1976): The North Eastern Railway Company 1870-1914: an economic history, (Leicester University Press)
- Jenkins, R.* (1995): Gladstone, London (Macmillan)
- Jenkins, S.* (2000): A privatisation that ran into the buffers, in: *The Times*, November 22nd, p. 22
- Johnson, E.R. and Huebner, G.G.* (1911): Railroad Traffic and Rates, New York and London (D. Appleton and Co.), Vol. 1
- Johnson, E.R. and Metre, T.W. van* (1916): Principles of Railroad Transportation, New York and London (Appleton and Co.)
- Jones, I.* (2000): Developments in Transport Policy. The Evolution of Policy Towards On-Rail Competition in Great Britain, in: *Journal of Transport Economics and Policy*, Vol. 34, Part 3, pp. 371-384
- Jones, M.* (1999): Are expectations too high?, in: *New Civil Engineer*, 21 January 1999, p. 17
- Joy, S.* (1973): The Train That Ran Away. The inside story of British railways' chronic financial failures since nationalisation, London (Ian Allan)
- Kaiserlich Statistisches Amt*, ed. (1881): Statistisches Jahrbuch für das Deutsche Reich, Berlin (Puttkammer & Mühlbrecht)
- Koy, J.* (1994): Regulating Networks, in: Beesley, M.E. ed.: *Regulating Utilities: The Way Forward*, IEA Readings 41, London (IEA)
- Kemper, M.* (1989): Das Umweltproblem in der Marktwirtschaft, Berlin (Duncker & Humblot)
- Kessides, I.N. and Willig, R.D.* (1995): Railways: Structure, Regulation and Competition Policy, www.oecd.org, 33p.
- Kim, W.C. and Mauborgne, R.* (1997): Value Innovation: The Strategic Logic of High Growth, in: *Harvard Business Review*, January-February 1997
- Kiriakidis, T.* (1994): *European Transport: Problems and Politics*, Aldershot, Brookfield USA (Avebury)
- Kirzner, I.M.* (1979): Perception, Opportunity, and Profit. Studies in the Theory of Entrepreneurship, Chicago and London (The University of Chicago Press)
- Kirzner, I.M.* (1985): Discovery and the Capitalist Process, Chicago and London (University of Chicago Press)
- Klee, W.* (1982): Preussische Eisenbahngeschichte, Stuttgart and Berlin (Kohlhammer)
- Knieps, G.* (1991): Konkurrenz auf den europäischen Eisenbahnnetzen, Rijksuniversiteit Groningen

- Knieps, G.* (1992): Wettbewerb im europäischen Verkehrssektor: Das Problem des Zuganges zu Wegeinfrastrukturen, in: IFO-Studien, Berlin (Duncker & Humblot), pp. 317-328
- Knieps, G.* (1993): Privatisierung und Deregulierung im öffentlichen Personennahverkehr. Zeitschrift für Verkehrswissenschaft, Heft 4, Düsseldorf (Verlag J. Fischer), pp. 249-259
- Knieps, G.* (1996a): Deregulierung auf Verkehrsmärkten als Herausforderung für die Wettbewerbspolitik, in: Wettbewerbspolitik in deregulierten Verkehrsmärkten. Interventionismus oder Laissez Faire?, 29. Verkehrswissenschaftliches Seminar, Hinterzarten, Deutsche Verkehrswissenschaftliche Gesellschaft, pp. 7-21
- Knieps, G.* (1996b): Wettbewerb in Netzen. Reformpotentiale in den Sektoren Eisenbahn und Luftverkehr, Tübingen (J.C.B. Mohr)
- Knieps, G.* (1998): Das neue Trassenpreissystem: Volkswirtschaftliche Vorteile eines zweistufigen Systems, in: Internationales Verkehrswesen Special, pp. 466-470
- Knill, C. and Lehmkuhl, D.* (1998): An Alternative Route of Legal Integration: The Community's Railways Policy, in: European Integration online Papers, Vol. 2, No. 3, <http://eiop.or.at/eiop/texte/1998-003a.htm>
- Knipping, O.* (1997): Eine Verfassung der Freiheit für Europa, unpublished thesis at the Humboldt University Berlin
- Knipping, O.* (1999): Transport Telematics and Road Pricing, in: Institute of Electrical and Electronics Engineers Conference Proceedings, ed.: Institute of Electrical and Electronics Engineers, africon '99, Vol. 1, Cape Town, pp. 13-14
- Das Königlich Preußische Eisenbahn-Gesetz vom 3. November 1838, Elberfeld (Bühlersche Verlagsbuchhandlung), 1838
- Kwasniewski, K.* (1993): Reform der Bahnpolitik, Wirtschaftsdienst, Vol. XII, pp. 610-611
- Laaser, C.-F.* (1988): Möglichkeiten der Deregulierung des Schienenverkehrs der Deutschen Bundesbahn: Die Option des Wettbewerbs im Schienennetz, Kiel Working Papers No. 314, Kiel Institute of World Economics
- Laffont, J.-J. and Tirole, J.* (1994): Access pricing and competition, in: European Economic Review, Vol. 38, pp. 1673-1710
- Lal, D.*: The Political Economy of the Predatory State, Discussion Paper 84-12
- Lal, D.* (1997): From Planning to Regulation: Toward a New Dirigisme?, in: The Cato Journal, Vol. 17, No. 2, www.cato.org, pp. 211-227

- Lenke, H.*: Die Notwendigkeit der Bahnreform zur Schaffung von Wettbewerbsgleichheit im Verkehrsmarkt, in: *Industriepolitik im Widerstreit mit der Wettbewerbspolitik*, Berlin (Duncker & Humblot), pp. 35-41
- Levin, R.C.* (1981): Railroad Regulation, Deregulation, and Workable Competition, in: *The American Economic Review*, Vol. 71, Issue 2, pp. 394-398
- Levin, R.C.* (1981): Regulation, Barriers to Exit, and the Investment Behavior of Railroads, in: *Fromm, G. ed.: Studies in Public Regulation*, Cambridge, MA and London, England (The MIT Press), pp. 182-224
- Lipsky, A.B. and Sidak, J.G.* (1999): Essential Facilities, in: *Stanford Law Review*, Vol. 51, No. 5, pp. 1187-1249
- Littlechild, S.C.* (1978): The Fallacy of the Mixed Economy. An 'Austrian' critique of recent economic thinking and policy, London (IEA)
- Littlechild, S.C.* (1995): Competition in Electricity: Retrospect and Prospect, in: *Beesley, M.E.: Utility regulation: Challenge and Response*, IEA Readings 42, pp. 101-114
- Locksley, G.* (1994): From exclusive rights to access charges, in: *Utilities Policy*, pp. 223-228
- Mahoney, J.T.* (1992): The Choice of Organizational Form: Vertical Financial Ownership versus other Methods of Vertical Integration, in: *Strategic Management Journal*, Vol. 13, pp. 559-584
- Marston, P.* (2000): Faulty rail found nine months ago, in: *The Daily Telegraph*, 19 October 2000, p. 1
- Mayer, A. von* (1891): Geschichte und Geographie der Deutschen Eisenbahnen von ihrer Entstehung bis auf die Gegenwart 1890, Berlin (Wilhelm Baensch Verlagshandlung)
- McTigue, M.* (1998): Alternative to Regulation. A Study of Reform in New Zealand, in: *Regulation. The Cato Review of Business and Government*, Vol. 21, No. 1, Winter 1998, www.cato.org
- Michaels, P.J.* (1992): Sound and Fury. The Science and Politics of Global Warming, Washington (Cato Institute)
- Mises, L.v.* (1952a): Planning for Freedom, Illinois (Libertarian Press)
- Mises, L.v.* (1952b): Socialism. An Economic and Sociological Analysis, New Edition, London (Jonathan Cape)
- Mises, L.v.* (1977): A Critique of Interventionism, New York (Arlington House)
- Mises, L.v.* (1997): Die Bürokratie, Sankt Augustin (Academia Verlag)
- Mitchell, B.R.* (1994): British Historical Statistics, Cambridge (Cambridge University Press)

- Mitchell, B.R.* (1998): International Historical Statistics: The Americas 1750-1993, Basingstoke and London (Macmillan)
- Mitchell, B.R.* (1998): International Historical Statistics: Europe 1750-1993, Basingstoke and London (Macmillan)
- Monami, E.* (2000a): European passenger rail reforms: a comparative assessment of the emerging models, in: *Transport Reviews*, Vol. 20, No. 1, pp. 91-112
- Monami, E.* (2000b): Quality Regulation in Passenger Rail Transport: An Assessment of Recent European Experiences, in: *International Journal of Transport Economics*, Vol. XXVII, No. 2, June 2000, pp. 173-197
- Monami, E.* (2000c): Quality Regulation in Passenger Rail Transport: The Way Forward, in: *International Journal of Transport Economics*, Vol. XXVII, No. 3, October 2000, pp. 355-379
- Moorhouse, J.C.* (1995): Competitive Markets for Electricity Generation, *The Cato Journal*, Vol. 14, No. 3, pp. 421-441
- Morton, A.* (1999): Growing the Rail Network, 15th Annual London Transport Lecture, 19 October 1999
- Mueller, D.C.* (1989): Public choice II, Cambridge (Cambridge University Press)
- Mueller, D.C.* (1996): Constitutional Democracy, New York and Oxford (Oxford University Press)
- Musgrave, R.A. and Musgrave, P.B.* (1989): Public Finance in Theory and Practice, New York (McGraw-Hill)
- National Audit Office* (1996): The Award of the First Three Passenger Rail Franchises, Report by the Comptroller and Auditor General, London (The Stationery Office), 23 October 1996
- Nash, C.A. et al.* (1991): Evaluation of Road and Rail Projects: Issues and New Developments,
- Nash, C.A. and Preston, J.M.* (1994): Competition in rail transport: a new opportunity for railways², in: *Berichte aus dem Institut für Verkehrswissenschaften an der Universität Münster*, Ausgabe Nr. 7, Schwerpunktthema: Reform der Eisenbahnen, pp. 19-37
- Nash, C.A. and Toner, J.P.* (1998): Railways: Structure, Regulation and Competition Policy. Background Note, Competition Policy Roundtables No. 15, www.oecd.org
- Nash, C.A.* (1997): Privatisation and deregulation in railways, ESRC Regulatory Policy Seminar Group: Privatisation and deregulation in transport, Hertford College, Oxford, 2-4 July 1997

- Nash, C.A.* (2001): Rail Regulation and Competition – Developments in Britain, Paper presented at the 7th International Conference on Competition and Ownership in Land Passenger Transport, Molde, June 2001
- Nelson, J.C.* (1960): Effects of Public Regulation on Railroad Performance, in: *The American Economic Review*, Vol. 50, Issue 2, pp. 495-505
- Nijkamp, P., et. al., ed.* (1994): Missing Transport Networks in Europe, Aldershot, Brookfield USA (Avebury)
- Nijkamp, P., Pepping, G. and Banister, D.* (1996): Telematics and Transport Behaviour, Berlin, New York (Springer)
- Norris, J.* (1998): Basking in an ideology free zone, in: *Transport Voice*, Issue No. 2, September 1998, pp. 10-11
- O'Brien, P.* (1977): The New Economic History of the Railways, London (Croom Helm)
- O'Brien, P.* (1983): Transport and Economic Development in Europe, 1789-1914, in: *O'Brien, P., ed.: Railways and the Economic Development of Western Europe 1830-1914*, London (Macmillan Press), pp. 1-27
- Office of the Rail Regulator* (2000a): Annual Report 1999-2000, July 2000
- Office of the Rail Regulator* (2000b): The Periodic Review of Railtrack's Access Charges: Final Conclusions, Vol. 1, October 2000
- Office of the Rail Regulator* (2001): Moderation of competition. An interim statement from the regulator, April 11th
- Overbey, D.L.* (1982): Railroads. The Free Enterprise Alternative, Westport, Connecticut and London (Quorum Books)
- Parliamentary Papers* (1839): Reports from committees, Vol. X: Second report from the Select Committee on Railways
- Parliamentary Papers* (1840): Reports from committees, Vol. XIII: Third report from the Select Committee on Railway Communication
- Parliamentary Papers* (1846): Reports from committees: Railway Bills; Railways; Railway Labourers, Vol. XIII: First and Second Report from the Select Committee on Railways and Canals Amalgamation
- Parliamentary Papers* (1872): Reports from committees: Railway Companies Amalgamation, Vol. XIII, Part I: Report from the Joint Select Committee of the House of Lords and the House of Commons on Railway Companies Amalgamation
- Parliamentary Papers* (1913): Railway Returns: Returns of the Capital, Traffic, Receipts and Working Expenditure of the Railway Companies of the United Kingdom for the Year 1912, Vol. LVIII, Cd. 6954

- Parliamentary Papers* (1921): Railway Returns: Returns of the Capital, Traffic, Receipts and Working Expenditure of the Railway Companies of the United Kingdom for the Year 1919, Vol. XXX, Cmd. 1160
- Parliamentary Papers* (1921): Railway Returns: Returns of the Capital, Traffic, Receipts and Working Expenditure of the Railway Companies of the United Kingdom for the Year 1920, Vol. XXX, Cmd. 1430
- Parliamentary Papers* (1931): Final Report of the Royal Commission on Transport: The Co-ordination and Development of Transport, Vol. XVII, Cmd. 3751
- Parliamentary Papers* (1940): Government Control of Railways: Outline of financial arrangements, Vol. X, Cmd. 6168
- Parliamentary Papers* (1941): Government Control of Railways: Outline of revised financial arrangements, Vol. VIII, Cmd. 6314
- Parliamentary Papers* (1956): Proposals for the Railways, British Transport Commission, Cmd. 9880
- Parliamentary Papers* (1959): Re-appraisal of the Plan for the Modernisation and Re-equipment of British Railways, British Transport Commission, Cmnd. 813
- Parliamentary Papers* (1966): Transport Policy, July 1966, Cmnd. 3057
- Parliamentary Papers* (1992): New Opportunities for the Railways. The Privatisation of British Railways, July 1992, Cm. 2012
- Parliamentary Papers* (1998): A New Deal for Transport: Better for Everyone. The Government's White Paper on the Future of Transport, July 1998, Cm. 3950
- Parris, H.* (1965): Government and the Railways in Nineteenth-Century Britain, London (Routledge & Kegan Paul)
- Pegrum, D.F.* (1957): Investment in the Railroad and Other Transportation Industries Under Regulation, in: *The American Economic Review*, Vol. 47, Issue 2, pp. 416-429
- Peltzman, S.* (1981): Current Developments in the Economics of Regulation, in: Fromm, G. ed.: *Studies in Public Regulation*, Cambridge, MA and London, England (The MIT Press), pp. 371-384
- Pienaar, W.J.* (1998): Tolling the heartland. ETC potential in South Africa, in: *Traffic Technology International*, Dec. 98/Jan. 99, pp. 51-54
- Pilsner, P.* (1999): Losing the battle but winning the war, in: *Pegasus, The Chartered Institute of Transport in the UK*, March 1999, p. 7
- Poole, R.W. and Orski, C.K.* (2000): HOT Lanes: A Better Way to Attack Urban Highway Congestion, in: *Regulation*, Vol. 23, No. 1, Washington D.C. (Cato Institute), www.cato.org

- Porter, M.E.* (1997): Nur Strategie sichert auf Dauer hohe Erträge, in: Harvard Business manager, No. 3, 1997, pp. 42-58
- Prahalad, C.K. and Hamel, G.* (1990): The Core Competence of the Corporation, in: Harvard Business Review, May-June 1990
- Pred, A.R.* (1980): Urban Growth and City-Systems in the United States, 1840-1860, Cambridge, Massachusetts and London, England (Harvard University Press)
- Preston, J.M., Nash, C.A., Wardman, M.R., et al.* (1997): The Privatisation of Passenger Rail Services: Analysis and Monitoring, Economic and Social Research Council – End of Award Report, March 1997
- Preston, J., Whelan, G. and Wardman, M.* (1999): An Analysis of the Potential for On-track Competition in the British Passenger Rail Industry, in: Journal of Transport Economics and Policy, Vol. 33, Part 1, pp. 77-94
- Preston, J., Whelan, G., Nash, C. and Wardman, M.* (2000): The Franchising of Passenger rail Services in Britain, in: International Review of Applied Economics, Vol. 14, No. 1, pp. 99-112
- Public General Acts* (1871): Regulation of the Forces Act, 34 & 35 Vict., ch. 86
- Public General Acts* (1921): Railways Act, 11 & 12, Geo. 5, ch. 55
- Public General Acts* (1930): Road Traffic Act, 20 & 21 Geo. 5, ch. 43
- Public General Acts* (1933): Road and Rail Traffic Act, 23 & 24 Geo. 5, ch. 53
- Public General Acts* (1947): Transport Act, 10, 11 & 12 Geo. 6, Vol. II, ch. 49
- Public General Acts* (1953): Transport Act, 1 & 2 Eliz. II, ch. 13
- Public General Acts* (1962): Transport Act, 10 & 11 Eliz. II, ch. 46
- Public General Acts* (1968): Transport Act, Elizabeth II, Part II, ch. 73
- Public General Acts* (1974): Railways Act, Elizabeth II, ch. 48
- Public General Acts* (1978): Transport Act, Elizabeth II, ch. 55
- Public General Acts* (1981): Transport Act, Elizabeth II, ch. 56
- Public General Acts* (1985): Transport Act, Elizabeth II, Part III, ch. 67
- Public General Acts* (1993): Railways Act, Elizabeth II, Part III, ch. 43
- Public General Acts* (2000): Transport Act, Elizabeth II, ch. 38
- Rae, J.B.* (1955): The Railroad Land-Grant Legend, in: Journal of Economic History, Vol. 15, Issue 1, pp. 112-113
- Rahmeyer, F.* (1996): Privatisierung und Deregulierung der Deutschen Bundesbahn, Referat auf der Jahrestagung des Ausschusses für Industneökonomik des Vereins für Socialpolitik, Bonn

- Rand, A.* (1967): Notes on the History of American Free Enterprise, in: Rand, A., ed.: *Capitalism: The Unknown Ideal*, New York (Signet), pp. 63-71
- Reed, M.C.* (1969): Railways and the Growth of the Capital Market, in: Reed, M.C., ed.: *Railways in the Victorian Economy*, Newton Abbot (David & Charles), pp. 162-183
- Rees, R.* (1994): Economic Aspects of Privatisation in Britain, in: Wright, V., ed.: *Privatisation in Western Europe*, London (Frank Cass), pp. 44-56
- Regierungskommission Bundesbahn* (1991): Bericht der Regierungskommission Bundesbahn, Bonn
- Reid, B.* (1992): Personal Reflections on a Year with British Rail, in: Proceedings of The Chartered Institute of Transport, Vol. 1, No. 2, Winter 1991, London, pp. 3-12
- Richardson, J.J.* (1994): The Politics and Practice of Privatisation in Britain, in: Wright, V., ed.: *Privatisation in Western Europe*, London (Frank Cass.), pp. 57-82
- Roberts, M.J. and Spence, M.* (1976): Effluent Charges and Licenses under Uncertainty, in: *Journal of Public Economics*, Vol. 5, pp. 193-208
- Rodriguez, C.R. de* (1998): Pushing the Envelope, in: *Regulation. The Cato Review of Business and Government*, Vol. 21, No. 1, Winter 1998, pp. 41-48
- Rolt, L.T.C.* (1960): George and Robert Stephenson. The Railway Revolution, London (Longmans)
- Roth, G.* (1998): Road pricing in a free society, in: *IEA Economic Affairs*, Vol. 18, No. 4, December 1998, London (IEA), pp. 9-14
- Rothengatter, W.* (1991): Deregulating the European Railway Industry: Theoretical Background and Practical Consequences, in: *Journal of Transportation Research*, Volume 25, pp. 181-191
- Savage, C.I.* (1957): Inland Transport, London (HMSO and Longmans, Green and Co.)
- Sax, E.* (1871): Die Oekonomik der Eisenbahnen. Begründung einer systematischen Lehre vom Eisenbahnwesen in wirtschaftlicher Hinsicht, Wien (Lehmann &Wentzel)
- Schaafsma, A.A.M.* (1997): Competition and innovation have not been improved as a result of the reform of the Netherlands Railways, Proceedings of Seminar H held at the European Transport Forum Annual Meeting, Brunel University, England, Vol. P417
- Schabas, M.* (1997): Competitive Behaviour In Britain's Privatised Rail Industry, ESRC Regulatory Policy Seminar Group: Privatisation and deregulation in transport, Hertford College, Oxford, 2-4 July 1997

- Scheele, U.* (1991): Privatisierung der britischen Wasserwirtschaft, in: Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, pp. 346-362
- Scheele, U.* (1997): Aktuelle Entwicklungen in der englischen Wasserwirtschaft. Ergebnisse der Privatisierung und Probleme der Regulierung, in: Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen
- Schmalensee, R.* (1979): The Control of Natural Monopolies, Lexington, MA and Toronto (Lexington Books)
- Schmidt, I.* (1993): Wettbewerbspolitik und Kartellrecht, Stuttgart and New York (Gustav Fischer Verlag)
- Schmitz, M.* (1997): Die Privatisierung der Eisenbahnen in Großbritannien, Vorträge und Studien aus dem Institut für Verkehrswissenschaften an der Universität Münster, Heft 31
- Schnell, M.C.A.* (2001): Competition for the German regional rail passenger market five years after regionalisation, to be published in: Transport Reviews (2001), London (Taylor & Francis)
- Schröder, J.* (1994): Die Vorschläge zur Sanierung der Bahn in Deutschland. Geschichte, Synopse und Quintessenz, Netzwerke: Reform der Eisenbahnen, Institut für Verkehrswissenschaft an der Universität Münster, pp. 3-13
- Schumpeter, J.A.* (1939): Business Cycles. A Theoretical, Historical and Statistical Analysis of the Capitalist Process, Vol.1, New York and London (McGraw-Hill)
- Schumpeter, J.A.* (1943): Capitalism, Socialism and Democracy, London (George Allen and Unwin)
- Schumpeter, J.A.* (1995): Der methodologische Individualismus, in: Leube, K., ed.: Die Österreichische Schule der Nationalökonomie. Texte Band 1 von Menger bis Mises, The International Library of Austrian Economics, Wien (Manz'sche Universitätsbuchhandlung), pp. 333-340
- Schwalbach, J.* (1986): Markteintrittsverhalten industrieller Unternehmen, in: Zeitschrift für Betriebswirtschaft, 56. Jahrgang, Heft 8, pp. 712-727
- Schwalbach, M.* (1998): Die Trassenpreissysteme in Europa, in: Internationales Verkehrswesen Special, pp. 476-481
- Schwandt, F.* (1995): Die rekursive und direkte Baumol-Regel für Inputpreise, Diskussionspapier der Humboldt-Universität zu Berlin
- Schwanhäußer, W. and Heimerl, H.* (1991): Überlegungen zur Trennung der Bereiche Fahrweg und Transport bei den Deutschen Eisenbahnen, Verkehrsforum Bahn, Bonn

- Schwenn, K.* (2001a): Eine Bahn ohne Netz, in: Frankfurter Allgemeine Zeitung, March 31st, p. 1
- Schwenn, K.* (2001b): Wettbewerb auf der Schiene, in: Frankfurter Allgemeine Zeitung, June 23rd, p. 13
- Schwenn, K.* (2001c): Der Wettbewerb braucht Anwälte, in: Frankfurter Allgemeine Zeitung, October 11th, p. 17
- Seidenfus, H.S.* (1983): §2 Eisenbahnwesen, in: Jeserich, K.G.A., Pohl, H., Unruh, G.-C.v. eds.: Deutsche Verwaltungsgeschichte. Vom Reichsdeputations-hauptschluß bis zur Auflösung des Deutschen Bundes, Band II, Stuttgart (Deutsche Verlags-Anstalt)
- Seldon, A.* (1998): The Dilemma of Democracy: The Political Economics of Over-Government, Hobart Paper 136, London (IEA)
- Shadow Strategic Rail Authority* (2000a): Annual Report 1999-2000, London, www.sra.gov.uk
- Shadow Strategic Rail Authority* (2000b): National Rail Trends. 2000-01 Quarter 2, London
- Shadow Strategic Rail Authority* (2000c): On Track. Rail Performance Trends, October 14th, London
- Sharkey, W.W.* (1982): The theory of natural monopoly, Cambridge and London (Cambridge University Press)
- Shaw, J.* (2000): Competition, Regulation and the Privatisation of British Rail, Aldershot (Ashgate)
- Shaw, J.* (2001): The SRA's Refranchising programme, Robert Gordon University Aberdeen, London (Transport Salaried Staffs' Association)
- Shelanski, H.A. and Klein, P.G. et al.* (1995): Empirical Research in Transaction Cost Economics: A Review and Assessment, in: The Journal of Law, Economics and Organization, Vol. 11, No. 2, pp. 335-357
- Simmons, J.* (1961): The Railways of Britain, London (Routledge & Kegan Paul)
- Simmons, J.* (1978): The Railway in England and Wales 1830-1914, Leicester (Leicester University Press)
- Siraut, J.* (1997): Regulation of the Railways Post Privatisation, in: Proceedings of Seminar H held at the European Transport Forum Annual Meeting, Brunel University, England, 1-5 September 1997, pp. 47-56
- Smith, E.A.* (1946): The Interstate Commerce Commission, the Department of Justice, and the Supreme Court, in: The American Economic Review, Vol. 36, Issue 2, pp. 479-493
- Sondhof, H. and Theurer, M.* (1996): Wettbewerb in den lokalen Fernmeldemärkten - dargestellt am Beispiel der USA, in: Wirtschaft und Wettbewerb, pp. 175-187

- Stackelberg, F.v.* (1990): Zur Privatisierung staatlicher Unternehmen im Verkehrssektor, in: Seidenfus, H.S., ed.: Probleme des Wettbewerbs zwischen staatlichen und privaten Unternehmen im Verkehr, Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen (Vandenhoeck and Ruprecht), pp. 167-213
- Stackelberg, F. v.* (1993): Privatisierung im Schienengüterverkehr, Ewers, H.J. ed.: Privatisierung des Schienenverkehrs. Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen (Vandenhoeck & Ruprecht), Heft 130, pp. 243-275
- Stannard, B.* (1997): Regulation and Deregulation in a Subsidised Industry. Passenger Rail Franchising, Chief Economist, Office of Passenger Rail Franchising, June 1997
- Starke, D.* (1989): British Rail: Competition on the Network, in: Veljanovski, C. ed.: Privatisation and Competition. A Market Prospectus, IEA Hobart Paperback 28, pp. 178-188
- Stationery Office* (1997): Transport Year-book 1998, London (The Stationery Office)
- Stavins, R.N.* (1996): Correlated Uncertainty and Policy Instrument Choice, Journal of Environmental Economics and Management, Volume 30, pp. 218-232
- Stigler, G.J. and Friedland, C.* (1962): What can regulators regulate? The case of electricity, in: The Journal of Law and Economics, Vol. V, 1962
- Stigler, G.J.* (1968): The Organization of Industry, Homewood, Illinois (Richard D. Irwin)
- Stigler, G.J.* (1982): The Economists and the Problem of Monopoly, in: The American Economic Review, Vol. 72, Issue 2, pp. 1-11
- Stolper, G. et al.* (1967): The German Economy 1870 to the Present, London (Weidenfeld and Nicholson)
- Stover, J.F.* (1961): American Railroads, Chicago (The University of Chicago Press)
- Strategic Rail Authority* (2001a): Annual Report 2000-2001, London, www.sra.gov.uk
- Strategic Rail Authority* (2001b): Freight Strategy, May 2001, London, www.sra.gov.uk
- Strategic Rail Authority* (2001c): National Rail Trends. 2001-02 Quarter 1, September 2001, London
- Strategic Rail Authority* (2001d): On Track. Rail Performance Trends, June 2001, London
- Strategic Rail Authority* (2001e): Rail Demand Grows, Despite Problems, SRA Press Release, 29 June 2001, London, www.sra.gov.uk
- Strategic Rail Authority* (2001f): South Central Franchise Transferred, SRA Press Release, 20 August 2001, London, www.sra.gov.uk

- Swift, J.* (1995): Regulatory Relationships between Key Players in the Restructured Rail Industry, in: Beesley, M.E.: *Utility regulation: Challenge and Response*, IEA Readings 42, pp. 65-79
- Taylor, G.R. and Neu, I.D.* (1956): The American Railroad Network 1861-1890, Cambridge, Massachusetts (Harvard University Press)
- Tilly, R.* (1966): The Political Economy of Public Finance and the Industrialization of Prussia, 1815-1866, in: *The Journal of Economic History*, Vol. XXVI
- Train, K. E.* (1991): Optimal Regulation. The Economic Theory of Natural Monopoly, Cambridge, MA and London, England (The MIT Press)
- Tullock, G.* (2000): The Theory of Public Choice, in: Tullock, G., Seldon, A. and Brady, G.L.: *Government: Whose Obedient Servant?*, IEA Readings 51, London (IEA), pp. 1-83
- Tye, W.B.* (1994): The Pricing of Inputs Sold to Competitors: A Response, *Yale Journal on Regulation*, pp. 203-224
- Uhlmann, M. W.* (1998): Diskriminierungsfreier Zugang zu Flughäfen. Lösungsansätze aus praktischer Sicht, Beitrag zur Tagung der Deutschen Verkehrswissenschaftlichen Gesellschaft: *Diskriminierungsfreier Zugang zu (Verkehrs-)Infrastrukturen*, Freiburg
- U.S. Bureau of the Census* (1949): Historical Statistics of the United States, 1789-1945, Washington, D.C.
- U.S. Bureau of the Census* (1960): Historical Statistics of the United States, Colonial Times to 1957, Washington, D.C.
- U.S. Bureau of Statistics* (1894): Statistical Abstract of the United States, 1893, Washington, D.C.
- Vanberg, V.J.* (1998): The Impossibility of Rational Regulation? Regulation, Free-Market Liberalism and Constitutional Liberalism, Paper prepared for the Mont Pelerin Society, Washington D.C.
- Varian, H.R.* (1992): Microeconomic Analysis, New York and London (Norton)
- Varian, H.R.* (1995): Grundzüge der Mikroökonomik, München and Wien (Oldenbourg)
- Vaubel, R.* (1991): Privatisierung als wettbewerbspolitische Aufgabe, in: *ORDO, Jahrbuch für die Ordnung von Wirtschaft und Gesellschaft*, Stuttgart and New York (Gustav Fischer)
- Velde, D. van de* (2000): Dutch and Japanese Railway Reforms and Exchanges, in: *Japan Railway and Transport Review*, Vol. 24, July 2000, pp. 10- 16

- Veljanovski, C.*, (1989): Privatisation: Monopoly Money or Competition, in: Veljanovski, C. ed.: *Privatisation and Competition. A Market Prospectus*, IEA Hobart Paperback 28, pp. 26-51
- Vogelsang, I.* (1996): Kosten des Ortsnetzes, Verband der Telekommunikationsnetz- und Mehrwertdiensteanbieter
- Walker, G.* (1942): Road and Rail – an enquiry into the economics of competition and state control, London (George Allen and Unwin)
- Webb, R.* (1998): Competition and Regulation in Air Transport, in: Proceedings of The Chartered Institute of Transport, Vol. 7, No. 2, June 1998, London, pp. 16-25
- Weitzman, M.L.* (1974): Prices vs. Quantities, in: Review of Economic Studies, pp. 477-491
- Welsby, J.* (1991): Regions give Way to Businesses, in: Railway Gazette International, pp. 217-219
- Welsby, J.* (1998): The Railways: on Track for the Millenium, in: Proceedings of The Chartered Institute of Transport, Vol. 7, No. 2, June 1998, London, pp. 3-15
- Welsby, J.* (1998): What Next in UK Railways?, in: Beesley, M.E. ed.: *Regulating Utilities: Understanding the Issues*, London (IEA and London Business School), pp. 231-259
- Welsby, J. and Nichols, A.* (1999): The Privatisation of Britain's Railways. An Inside View, in: Journal of Transport Economics and Policy, Vol. 33, Part 1, pp. 55-76
- Whelan, G., Preston, J., Wardman, M. and Nash, C.* (1997): The Privatisation of Passenger Rail Services in Britain: An Assessment of the Impacts of on-the-track Competition, in: Proceedings of Seminar H held at the European Transport Forum Annual Meeting, Brunel University, England, 1-5 September 1997, pp. 87-97
- White, H.P.* (1982): A Regional History of the Railways of Great Britain. Southern England, London (David & Charles), Vol. II
- White, P.R.* (1997): Experience in the UK bus and coach industry, ESRC Regulatory Policy Seminar Group: *Privatisation and deregulation in transport*, Hertford College, Oxford, 2-4 July 1997
- White, P.R.* (1998): Impacts of rail privatisation in Britain, in: Transport Reviews, Vol. 18, No. 2, pp. 109-130
- White, P.R.* (2000): Outcomes of Rail Privatisation in Britain, University of Westminster, updated 15 November 2000
- Williamson, O.E.* (1991): Strategizing, Economizing, and Economic Organization, in: Strategic Management Journal, Vol. 12, pp. 75-94

- Winsor, T.* (2001): The case for independent regulation, in: *Modern Railways*, Vol. 58, No. 633, June 2001, pp. 33-34
- Wirtschaftswoche* (2001): Bahn: Kompromiss beim Schienennetz, in *Wirtschaftswoche*, 27.09.2001, www.wiwo.de
- Wittenbrink, P.* (1993): Privatisierung im Schienenpersonenverkehr, Ewers, H.J. ed.: *Privatisierung des Schienenverkehrs. Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Göttingen (Vandenhoeck & Ruprecht), Heft 130*, pp. 185-242
- Wolf, D.* (1996): Die zukünftige Rolle des Bundeskartellamtes auf deregulierten Verkehrsmärkten, in: *Wettbewerbspolitik in deregulierten Verkehrsmärkten. Interventionismus oder Laissez Faire?*, 29. Verkehrswissenschaftliches Seminar, Hinterzarten, Deutsche Verkehrswissenschaftliche Gesellschaft, pp. 117-132
- Wolmar, C.* (2001): Broken Rails. How Privatisation Wrecked Britain's Railways, London (Aurum Press)
- <http://eiop.or.at/eiop/texte>: European Integration online Papers
- www.bahn.de: Deutsche Bahn AG
- www.banverket.de: Swedish rail track operator Banverket
- www.bmfvbw.de: German Ministry of Transport
- www.cato.org: The Cato Institute
- www.comdirect.co.uk: General Stock Market Information
- www.corporateinformation.com: Detailed Information on Business
- www.db-netz.de: DB Netz AG
- www.destatis.de: Statistisches Bundesamt
- www.detr.gov.uk: Department of the Environment, Transport and the Regions
- www.dtlr.gov.uk: Department of Transport, Local Government and the Regions
- www.econlib.org: Liberty Fund online library
- www.economist.com: The Economist
- www.europa.eu.int/abc/treaties_en.htm: Treaties of the European Union
- www.europa.eu.int/eur-lex/en: Legislation of the EU (incl. EEC & EC)
- www.ews-railway.co.uk: English Welsh and Scottish Railways
- www.ft.com: The Financial Times
- www.freightliner.co.uk: Freightliner Ltd.
- www.hse.gov.uk: Health and Safety Executive
- www.jstor.org: Journal database
- www.offt.gov.uk: Office of Fair Trading

www.oecd.org: Organisation of Economic Co-operation and Development

www.pro-bahn.de: German railway legislation

www.rail-reg.gov.uk: Office of the Rail Regulator

www.railtrack.co.uk: Railtrack

www.scanways.com: Legislation of the European Union with regard to railways

www.sra.gov.uk: Strategic Rail Authority

www.wedebruch.de: German railway legislation

www.wiwo.de: Wirtschaftswoche