



SERC DISCUSSION PAPER 62

In Search of the 'Economic Dividend' of Devolution: Spatial Disparities, Spatial Economic Policy and Decentralisation in the UK

Andy Pike (SERC, CURDS, Newcastle University)

Andres Rodríguez-Pose (SERC, London School of Economics, IMDEA Social Sciences Institute, Madrid)

John Tomaney (SERC, CURDS, Newcastle University, Institute for Regional Studies, Monash University, Australia)

Gianpiero Torrìsi (SERC, CURDS, Newcastle University)

Vassilis Tselios (SERC, CURDS, Newcastle University)

October 2010

This work was part of the research programme of the independent UK Spatial Economics Research Centre funded by the Economic and Social Research Council (ESRC), Department for Business, Enterprise and Regulatory Reform (BERR), the Department for Communities and Local Government (CLG), and the Welsh Assembly Government. The support of the funders is acknowledged. The views expressed are those of the authors and do not represent the views of the funders.

© A. Pike, A. Rodríguez-Pose, J. Tomaney, G. Torrasi and V. Tselios, submitted 2010

In Search of the ‘Economic Dividend’ of Devolution: Spatial Disparities, Spatial Economic Policy and Decentralisation in the UK

Andy Pike*

Andrés Rodríguez-Pose**

John Tomaney***

Gianpiero Torrasi*

Vassilis Tselios*

October 2010

* SERC, Centre for Urban and Regional Development Studies (CURDS), Newcastle University

** SERC, Department of Geography and Environment, London School of Economics and IMDEA Social Sciences Institute, Madrid, Spain

*** SERC, Centre for Urban and Regional Development Studies (CURDS), Newcastle University and Institute for Regional Studies, Monash University, Australia

Acknowledgement

Submitted paper for the Special Themed Issue of Environment and Planning C: Government and Policy ‘Devolution Ten Years On: Excavating the Political Economic Geographies of the United Kingdom’ (Guest Editors: Mike Danson, Gordon MacLeod and Gerry Mooney).

Abstract

After a decade of devolution and amid uncertainties about its effects, it is timely to assess and reflect upon the evidence and enduring meaning of any ‘economic dividend’ of devolution in the UK. Taking a multi-disciplinary approach utilising institutionalist and quantitative methods, this paper seeks to discern the nature and extent of any ‘economic dividend’ through a conceptual and empirical analysis of the relationships between spatial disparities, spatial economic policy and decentralisation. Situating the UK experience within the historical context of its evolving geographical political economy, we find: i) a varied and uneven nature of the relationships between regional disparities, spatial economic policy and decentralisation that change direction during specific time periods; ii) the role of national economic growth is pivotal in explaining spatial disparities and the nature and extent of their relationship with the particular forms of spatial economic policy and decentralisation deployed; and, iii) there is limited evidence that any ‘economic dividend’ of devolution has emerged but this remains difficult to discern because its likely effects are over-ridden by the role of national economic growth in decisively shaping the pattern of spatial disparities and in determining the scope and effects of spatial economic policy and decentralisation.

Keywords: Economic dividend, devolution, spatial disparities, spatial economic policy, decentralisation, UK

JEL Classifications: D53, R51

Introduction: in Search of the ‘Economic Dividend’ of Devolution

The idea of an ‘economic dividend’ has gained significant momentum in the UK and internationally as a powerful and persuasive argument in the politics and economics of decentralisation; reflecting a broader international shift from identity to economy rationales in contemporary forms of state modernisation and ‘rescaling’ (Lobao *et al.* 2009; Rodríguez-Pose and Sandall 2008). The ‘economic dividend’ is principally articulated in terms of generating allocative and productive efficiencies alongside the accountability and participation benefits of decentralisation for decision-making and co-ordinating collective action in support of economic development (Rodríguez-Pose and Gill 2005). In the UK in the late 1990s, for example, political advocates argued for devolution in Wales to improve its economic performance and productivity to create more and better jobs (Davies 1999). Regional government in the English regions too was promoted as an ‘economic imperative’ to address the ‘economic deficit’ of persistent spatial disparities between London, the Greater South East region and the rest (Murphy and Caborn 1996).

Yet, despite its often active political promotion, assessments of the ‘economic dividend’ are unclear. In the UK, the ESRC’s 6-year research programme on *Devolution and Constitutional Change* concluded that:

There is little evidence to suggest that an ‘economic dividend’ should be expected from devolution, or has yet appeared. There is much to suggest that devolution – even administrative devolution in England – will lead to a widening of regional economic disparities, and that there is only a limited capacity on the part of UK government to intervene to secure UK wide economic balance (Jeffery 2006: 1).

More than a decade on from the main constitutional and devolutionary reforms in the UK, it is timely to assess and reflect upon the evidence and enduring meaning of the ‘economic dividend’ of devolution in the UK. Little research has been undertaken on this issue to date because it is a far from straightforward task, given the view that its impacts are “likely to be complex, subtle and difficult to measure” (Jeffery 2006: 1). Problems include: the development of appropriate proxies relevant to particular national contexts; assembling available data of appropriate quality, historical coverage and international comparability; disentangling and isolating the effects of decentralisation; and, attributing causation amongst decentralisation’s myriad relationships with broader economic and institutional change (Ashcroft *et al.* 2005; McGregor and Swales 2005). Despite such challenges, the need to examine the evidence is pressing because it is recognised that “weakly supported” and “optimistic claims” for any ‘economic dividend’:

...drew heavily on academic research on a ‘new’ economic regionalism which was perhaps too quick to draw generalisations from a combination of ambitious theory and a narrow range of case studies. More recently researchers have been more sanguine, balancing their initial optimism with a fuller consideration of the constraints on improved economic performance and on the negative economic impacts that devolution could bring (Jeffery 2006: 1).

The situation in Wales is illustrative of the resonance and inconclusive status of the issue. Accepting that it was the “dirty little secret” of devolution debates, the former Chair of the Yes Campaign in Wales acknowledged the lack of a necessary and directly causal

connection between decentralisation and economic development and its geographical unevenness: “In fact...all the important economic indicators in Wales are going the wrong way. You could say there has been an economic dividend for Cardiff, but not beyond that...The Labour Government has assumed that devolution is the recipe for economic development, but in fact it’s just one of the ingredients” (Kevin Morgan, Cardiff University, cited in Hayman 2008: 1). Further studies are required, then, especially given that while the economic benefits of decentralisation are “widely accepted amongst governments and international organisations alike, the empirical proof for this proposition remains scant” (Rodríguez-Pose *et al.* 2009: 2041; see also Ballaguer-Coll *et al.* 2010).

The approach taken here is multi-disciplinary, encompassing Economic and Political Geography, Local and Regional Development and Political Science. It utilises a geographically political economy that seeks to embed its institutionalist and quantitative analysis in its appropriate context of the unfolding histories of institutional, political and economic change over time and space within the particularity of the UK state. The argument is that analysis of any ‘economic dividend’ of devolution in the present needs to be rooted in the past evolutions of spatial disparities, spatial economic policy and decentralisation within the political-economies of particular nation states. The historical dimension of the analysis is critical in understanding the path dependencies that shape the evolution of institutional structures and policy approaches over time and space, reflecting legacies of political choices, strategies and struggles.

With the aim of assessing and reflecting upon the evidence and enduring meaning of the ‘economic dividend’ of devolution in the UK over a decade after the institutional and political reforms introduced from 1997, the paper first addresses some conceptual issues in considering the relationships between spatial disparities, spatial economic policy and decentralisation. Second, the historical context and unfolding of the UK experience is outlined. Third, given the constraints of comparable data availability, the analysis focuses upon the period 1984-2007 in an attempt to discern the existence (or otherwise), extent and nature of any ‘economic dividend’ arising from the inter-relation of spatial disparities, spatial economic policy and devolution in the UK. Last, some conclusions and reflections are provided.

Spatial Disparities, Spatial Economic Policy and Decentralisation

Given its complex and unclear inter-relationships, one approach is to situate the consideration of any ‘economic dividend’ arising from devolution within an understanding of the changing relations between spatial disparities, spatial economic policy and decentralisation. An evolution is evident in the ways in which spatial disparities are understood and explained with implications for how spatial economic policy and decentralisation are formulated and unfolded. We discern stylised kinds of approaches – redistributive, free-market and growth-oriented – with different characteristics concerning their economic theory, causal explanation of spatial disparities, adjustment process, policy rationales and instruments, institutional organisation, geographical focus and scope, political-economic project and language (Table 1) (see also OECD 2009). Spatial economic policy is seen as forms of economic policy with spatial intent – such as regional or urban policy. We recognise the need and difficulty of disentangling this from economic policy without explicit spatial intent but with spatial implications – such as macro-economic, welfare or defence policy. We acknowledge too the more recent debates about ‘spatially neutral’ or ‘blind’ policy that is focused upon ‘people’ rather than ‘place’ and explains spatial disparity as the compositional outcome of sorting processes driven by rational economic agents (see, for example, Overman 2010).

Such transitions in spatial economic policy and its organisation reflect developments within economic theory and their differing causal explanations for spatial disparities and views of adjustment processes. Such conceptual and theoretical ideas are then mediated and translated into policy rationales and instruments within the institutional structures of particular national political economies (Pike and Tomaney 2009). Uneven, partial and messy transitions, overlaps and struggles undoubtedly mark the political economy of such shifts that play out in different ways in different national contexts. Indeed, part of the aim of this paper is to outline how this process has unfolded in the particular context of the UK.

Integrally related to the changes in how spatial disparities are interpreted and spatial economic policy formulated is a marked shift in the geographical scale and level of institutional organisation, delivery and governance from centralisation toward varied forms of decentralisation. Indeed, it is critical to recognise that devolution is only one particular form of decentralisation and itself comes in different shapes and sizes, driven top-down and/or bottom-up by different levels of state and non-state actors, and with differing motivations and expectations (Rodríguez-Pose and Gill 2005; Torrasi *et al.* 2010). Table 2 outlines the main types which vary in their degree of autonomy in fiscal and functional terms, balance of reserved and decentralised powers and responsibilities, and administrative and/or democratic accountability. In emphasising the importance of historical context and evolution of national political economies, it is evident that as a ‘new state spatiality’ decentralisation will be highly variegated in different nation states (Peck and Theodore 2007).

In considering whether and what any ‘economic dividend’ might mean, conceptualising the potential economic benefits and costs of decentralisation is central. Informed by the key arguments from fiscal federalism that focuses upon the vertical structure of the public sector and the existence of allocative and productive efficiencies and accountability and participation, Table 3 summarises some of the main issues. Several other concerns are also important to the analytical task. First, decentralisation is widely acknowledged as a process rather than a one-off event; there is little sense in splitting the analytical frame into ‘pre-’ and ‘post-’devolution periods. Indeed, understanding and capturing the timing and lag of any potential benefits and costs flowing from decentralisation has bedevilled studies to date (McGregor and Swales 2005). Second, it is important to distinguish the expected or likely benefits and costs of specific forms of decentralisation such as devolution from what are considered the unexpected, unlikely and/or somehow additional bonus or windfall economic implications implied by the term ‘dividend’. Last, given that much of the discussion of the ‘economic dividend’ to date has focused upon potential efficiency benefits, attention is required to the equity concerns of the distributional impacts of decentralisation in economic, social and geographical terms.

While the aspiration might be to produce some kind of assessment of the overall net balance of economic outcomes generated from both positive and negative effects of devolution, the inter-relatedness of spatial disparities, spatial economic policy and decentralisation involved means a more finely grained and nuanced account is required. Analysts searching for the ‘economic dividend’ need to accept that it may or may not exist and that its extent and nature over time and space are likely to be highly variable and differentiated; reflecting potentially strong, weak and indifferent degrees of both positive and negative impacts as well as place-specific spill-overs from the economic into different kinds of political, social and cultural domains in the political economies of particular nation states and territories.

Spatial Disparities, Spatial Economic Policy and Decentralisation: The UK Experience

Entrenched and persistent spatial disparities have marked the UK, especially since the 1930s, and continue to exert an enduring influence upon the national political economy, politics and policy (Figure 1). Significantly, traditional interpretations of spatial disparities emphasised the economic inefficiency (rather than benefit or dividend) of the geographic over-concentration and centralisation of economic activities in London and the Greater South East (Martin 2008), hampering national economic growth because of the rapid generation of inflationary bottlenecks in factor markets during periods of expansion that were stymied by macro-economic policy before their benefits could trickle down to the peripheral regions (Armstrong and Taylor 2000). Informed by the new economic geography (e.g. Krugman, 1991), more recent explanatory narratives emphasise the economic benefits and even dividends of spatial disparities in the UK based upon the powerful growth enhancing benefits of localised agglomeration in London and the Greater South East. This analysis argues that any spatial policy should aim to correct market failures in support of this geographic concentration because dilution or redistribution of its effects would be detrimental to overall growth and welfare (see, for example, Leunig and Swaffield 2008).

The UK's experience of persistent spatial disparities has configured a long history of spatial economic policy focused upon the regional scale, punctuated by 'policy on' and policy off' episodes alongside ongoing, periodic scrutiny and reflection upon its principles and purpose (see, for example, Barlow 1940; Harrison and Hart 1993; House of Commons 1995; 2003). Inter-war efforts focused upon addressing localised concentrations of high unemployment and poverty generated by industrial decline in South Wales, northern England and west central Scotland (Martin 1988). After 1945, post-war consensus and persistent cross-party support for regional policy was predicated on traditional efficiency and equity rationales as well as the desire for class-based national parties to avoid the emergence of separate territorial politics (Gordon 1990). 'Spatial Keynesianism' (Martin and Sunley 1997) marked state intervention through regional policy, focused upon investment and stimulation of cumulative causation and the management of aggregate demand and employment in the regions (Kaldor 1970). Interpreting what the influential Barlow Report (1940) called 'over-development' in the South and 'under-development' in the North as inextricably connected, it relied upon a contained version of the national economy within the territorial boundaries of which investment and growth could be redirected from growing, richer to lagging, poorer regions to alleviate spatial disparities. The initial economic case for regional policy – focused upon correcting the inefficiencies of under-utilised resources and lack of economic modernisation – evolved to connect to the social case based upon ensuring economic equity between regions and ameliorating the hardship generated by geographically localised job losses especially in places acutely affected by de-industrialisation (Morgan 2006).

Using the 'carrots' and 'sticks' of investment and labour subsidies and controls, spatial economic policy had a regional focus on different tiers of Assisted Areas and was directed 'top-down' by national civil servants in central government. Bound to the 'One Nation' politics of the post-war settlement, this era of strong regional policy in the 1960s was marked by periods of fluctuating expenditure under both Conservative and Labour administrations prior to its high water mark in the mid-1970s (Morgan 1985; Wren 2005) (Figure 2). Even during the heyday of regional policy degrees of variegation in institutional forms were evident shaped by the particularity of the UK state and politics. Notably, for example, territorial development agencies were established for Wales and Scotland by the Labour Government to head off the nationalist electoral challenge in the mid-1970s (Halkier *et al.* 1998) and largely limited institutional change occurred outside the responsible national

central government department beyond the short-lived Regional Planning Councils in England established by the Wilson Government in 1964.

Despite some success in job creation and economic diversification in the Assisted Areas (Taylor and Wren 1997), the political-economic tide turned away from Keynesianism and its redistributive spatial policy toward neo-liberalism following the crisis of stagflation, industrial strife and public fiscal imbalances during the 1970s. Characterised by deregulation, liberalisation and the attempted ‘rolling-back’ of the state, the UK variant led by Margaret Thatcher’s Conservative administrations from 1979 emphasised individual responsibility, free markets and enterprise which underpinned the critique and dismantling of regional policy during the 1980s. The turn toward neo-classical economics and the free market interpreted Keynesianism and regional policy as distortions and impediments to rational and efficient decision-making amongst economic actors. Subsidies were seen as economically inefficient and wasteful, causing ‘deadweight’ effects in supporting activities that would have occurred anyway and unable to tackle structural problems including lack of enterprise and innovation (Wren 2005).

In contrast to the Keynesian emphasis upon demand, neo-classical theory emphasised intervention to enhance the flexibility and upgrading of the supply-side of factor markets such as labour skills. Structural change toward services in the UK economy favoured regions and localities around London and the Greater South East, sharpening the North-South Divide in spatial disparities (Martin 1988). Spatial economic policy under Thatcherism reduced spending, shrunk the map of eligible Assisted Areas, changed support from automatic to discretionary selectively to encourage small enterprise and the attraction of international inward investment flows in the context of the Single European Market (see Figure 2). Formerly state-owned industries such as coal, steel and shipbuilding were privatised and rationalised with highly damaging localised impacts (Hudson 1989). The geographical focus of spatial policy shifted to the urban and the institutional lead and resources were transferred from local government to new special purpose bodies such as Urban Development Corporations and Local Enterprise Agencies (Martin and Tyler 1992). Despite its liberalizing ethos, though, Thatcherism retained its reliance upon the highly centralised apparatus of the UK state – what Andrew Gamble (1994) called ‘the free economy and the strong state’ – with tight control over spatial policy and local government following widespread reform in 1974. John Major’s successor Conservative administrations continued working within the national central government framework and with the urban focus of spatial policy, introducing more competition for resources and beginning the regionalisation within England with the establishment of Government Offices for the Regions in 1994.

Highly significant in considering the recent context of any ‘economic dividend’ of devolution, beginning with the Regional Policy Commission’s (1996) report *Renewing the Regions* produced for Labour in opposition, the UK has been in the vanguard of replacing what has been termed the ‘old regional policy’ with the ‘new regional policy’ (Balls and Healey 2001). The ‘old regional policy’ was characterized as based upon the assumption of a less open national economy within which growth could be redirected by state incentives from relatively more prosperous donor regions to disadvantaged recipient regions. This founding premise was supplanted by the encouragement of a more open and permeable economy where mobile investment operates with international horizons. Reflecting the tenets of growth-oriented spatial economic policy, a ‘new regional policy’ emerged based upon stimulating endogenous productivity growth within each region through stimulating ‘5 drivers’ of investment, innovation, skills, enterprise and competition (HM Treasury and Department of Trade and Industry 2001). The ‘economic dividend’ argument has been central to this shift as “Centralised regional policy, the aim of which was to promote economic equity between the regions, has been replaced by a devolved regional policy which aims to promote an *economic dividend* within each region” (Morgan 2006: 3; emphasis added).

Rather than the ‘top-down’ centralism of previous ‘old regional policy’, the ‘new regional policy’ was ‘bottom-up’ with the Regional Development Agencies (RDAs) as new devolved institutions established in all regions (not just those that were lagging) entrusted with leading and enhancing the productivity of their regions and localities to deliver their own growth and prosperity and to contribute to the national economy (Fothergill 2005). The ‘economic dividend’ of devolution was seen as the means of redressing spatial disparities through a ‘levelling-up’ not ‘levelling-down’ process.

The UK’s long history as a highly centralised, multi-national ‘union state’ has shaped the evolution of its institutional structures in formulating and delivering spatial economic policy with only limited and conditional decentralisation. Variegation is evident in the UK state’s institutional forms, powers and resources within its nations and regions through cumulative administrative decentralisation to the Scottish Office (from 1885), Wales Office (1964), Stormont Parliament (1921) and Government Offices in the English regions (1994). Despite the short-lived experiment with Regional Planning Councils in England during the 1960s and the establishment of the Welsh Development Agency (WDA) and Scottish Development Agency (SDA) in the mid-1970s, centralisation has marked the institutional arrangements for addressing spatial disparities through spatial economic policy.

Following the programme of devolution and constitutional change from 1997, the geographically differentiated institutional and political legacy was effectively built upon by further but highly uneven democratic decentralisation, creating a multi-level, polycentric UK state working across several geographical scales and representing a more distributed landscape of political power (Morgan 2007). Despite such reforms, the UK remains highly centralised in comparison to other western European states (Marks *et al.* 2008). The new arrangements comprised an asymmetrical hierarchy of powers and resources ranging from the Parliament in Scotland, through the National Assemblies in Wales and Northern Ireland, to the Mayoralty and Assembly in London and, until their abolition in 2010, the Regional Development Agencies and indirectly elected Regional Chambers in the English regions (Tomaney 2000). Territorial politics have subsequently been reinvigorated and become evident in varying degrees of differentiation in spatial economic policy and varieties of institutional organisation divergent from national, largely English-regions focused frameworks (Adams *et al.* 2003). Indeed, within the devolution debates the ‘economic dividend’ argument was a more prominent factor in Wales and the English regions compared to Northern Ireland and, until 1999, Scotland (Morgan 2006). Cooke and Clifton (2005) identify ‘varieties of devolution’ comprising ‘visionary’ in Scotland, ‘precautionary’ in Wales and ‘constrained’ in Northern Ireland, evident in different approaches, strategies, policy programmes and institutional arrangements (see also Goodwin *et al.* 2002). Examples include the recent incorporation of the WDA into the Welsh Assembly Government, the reassignment of Local Enterprise Company responsibilities to local authorities within the Scottish Enterprise network.

England’s size and weight within the UK – constituting some 80% of the total population and nearly 90% of GDP – renders considerations of governing its uneven development and growth important and difficult for the UK state (Morgan 2001). The political and institutional settlement for the English regions remained ‘unfinished business’ (Tomaney 2000). Given a central economic leadership role, the RDAs were established in 1998 as “an essential first step to provide for effective, properly co-ordinated regional economic development... and to enable the English regions to improve their competitiveness” (Department of Environment 1997: 1), accountable nationally through their sponsoring Department and Minister and regionally through indirectly elected Regional Chambers.

This modest set of changes failed to satisfy regionalist interests in the centre and regions, stimulating and culminating in proposals predicated upon the bolstering of the

existing Government Offices and, where sufficient public support was demonstrated, referenda on the creation of Elected Regional Assemblies (ERAs) to address the spatial disparities ('the economic deficit') and lack of accountability ('the democratic deficit') within England:

The Government's central economic objective is to achieve high and stable levels of growth and employment throughout the UK. Our overall goal of creating an inclusive society means that all regions and communities should have the opportunity to share in the nation's prosperity. Improving the economic performance of the English regions and enabling them to reach their full potential will increase social justice and drive forward the UK economy as a whole. To achieve this goal, productivity and employment need to improve in every part of the country – including some under-performing areas of those regions which have historically had the highest growth (Cabinet Office and DTLR 2002: 17-18).

The widely touted and anticipated 'economic dividend' predicated upon heightened autonomy, resources and political voice at the national centre was seen as a potential route to a step-change in economic performance capable of closing the prosperity gap with London and the Greater South East on a sustainable basis. Echoing the concepts we outlined earlier, the potential 'economic dividend' attached to such devolution was to be delivered through enhanced autonomy to design and implement policies tailored to regional and local needs (allocative efficiencies) and more responsive, effective and accountable governance systems providing decentralised institutional capacity to mobilise and shape collective action for developmental ends (productive efficiencies). Amidst its weak powers, the uneven enthusiasm as well as hostility in central government, the lack of faith in national government late in its second term and the broader currents of distrust in politicians and political institutions, the particular form of ERAs proposed were rejected 3:1 in the sole referendum in North East England in late 2004 (Rallings and Thrasher 2005).

As the territorial politics of devolution shaped the particular developments in Northern Ireland, Scotland and Wales, the vacuum left by the faltering regionalism and regionalisation projects in the English regions was filled by a range of emergent spatial imaginaries claiming to offer an institutional fix for the persistent problem of governing spatially uneven development: resurgent cities and/or city-regions as motors of their regional economies enhancing their economic performance; localism led by local authorities capable of decentralised approaches to economic development; and pan-regionalisms focused upon cross-regional issues including housing, jobs and infrastructure in newly designated 'Growth Areas', housing market renewal areas in northern cities and the Northern Way linking RDA activity to close the productivity gap with London and the Greater South East across the three northern regions (Pike and Tomaney 2009). Following the election of the coalition government in 2010, debate has raged about the shift in focus toward 'decentralisation' and 'localism' and the dismantling of the regional tier through the winding-up of the RDAs and the abolition of Government Offices for the Regions. While the language of 'economic dividend' and regionalism and regionalisation has been discarded, the economic rationale is evident to varying degrees amongst each of these emergent forms of territorial governance. Economic arguments too infuse the Richard (2004) and Calman Commissions (2009) examining the decentralisation of greater powers and resources in Wales and Scotland, reinforcing the evolutionary process of institutional change and emphasising its historical roots in the particular political economy of the UK and its territories. We can discern the imprint of three distinct configurations and approaches to spatial disparities, spatial economic policy and decentralisation – redistributive, free-market and growth-oriented – that shape the particular history of the evolution of the UK political economy and set the historical context for assessing any 'economic dividend' emerging from the devolution reforms introduced in 1997.

An ‘Economic Dividend’ of Devolution in the UK?

That ‘devolution is a process not an event’ (Davies 1999) in the words of the former Secretary of State for Wales has become a well worn descriptor that nonetheless characterizes the evolutionary and unfolding nature of decentralisation. Hence, while the analysis here is focused upon discerning the existence or otherwise of a ‘economic dividend’ in the UK following the substantive institutional changes introduced through devolution and constitutional change from 1997, the argument is that such changes need to be situated in the context of relationships between spatial disparities, spatial economic policy and decentralisation and reflect deep seated currents and legacies from previous eras of change. Our approach is based on the combined historical paths of three key elements – spatial disparities, spatial economic policy and decentralisation – during a period ranging from 1984 to 2007 (local revenue data are only available for a shorter period from 1987). Building upon Rodríguez-Pose and Gill (2004), we simultaneously consider the historical evolution of spatial disparities and decentralisation but introduce a new dimension by augmenting the analysis with a quantitative measure of spatial economic policy. Further, given our emphasis upon the importance of economic growth in shaping the dynamics of the key variables, we investigate the implications of including the system's overall national economic performance in our analysis (i.e. national economic growth and national economic development). This issue has been identified as important in the fiscal federalism literature, for example, Oates (1999: 1142) suggests “it may well be that fiscal decentralisation itself has a real contribution to make to improved economic and political performance at different stages of development”. In addition, aggregate economic growth may also be considered as a proxy for allocative and productive efficiency (Rodríguez-Pose *et al.* 2009). As far as data availability allows, the analysis has gone back to situate more recent changes in their appropriate historical and economic context.

We use the Gini index (*Gini*) of regional Gross Disposable Household Income (GDHI) per head (data from Office for National Statistics) as the proxy for spatial disparities¹. Although the aggregate nature of data does not allow us to correct for differences in household composition at the single household level, we adopted a modified OECD equivalence scale in order to take into account regional differences in household composition and size generating different economies of scale. More precisely, the following formula consisting of the ratio between aggregate income earned by households resident in region *j* (Y_t^j) and a measure of aggregate population taking into account, as mentioned, differences in household size and composition across regions (S_t^j)

$$H_t^j = \frac{Y_t^j}{S_t^j} \quad \text{eq.(1)}$$

has been applied in order to compute per head values of GDHI in region “*j*” (H_t^j). The final step consisted of computing the Gini index of H_t^j across the “*R*” regions, by year, according to the formula

¹ The choice of GDHI per head as our dependent variable is not trivial and has important implications. The choice of regional gross disposable income per capita over the Gini index of GDP per capita has the advantage of including transfers of income from individuals, companies and government in the form, for example, of social benefits (European Commission, 1999). But, on the other hand, “a region that has a low level of production might have a relatively high level of income due to large social security transfers, but it would still be a less favoured region” (European Commission 2004: 25-26).

$$G(H^j) = \frac{\sum_{j=1}^{R-1}(\rho_j - q_j)}{\sum_{j=1}^{R-1}(\rho_j)} \quad \text{eq. (2)}$$

where $\rho_j = \frac{j}{R}$ and $q_j = \frac{H^1+H^2+\dots+H^j}{\sum_{j=1}^R H^j}$, with $H^j \leq H^{j+1}$ (i.e. H is non-decreasing ordered). The complete procedure, including GDHI components and computation, as well as the following measure of policy, is described in detail in Appendix 1.

Given that all measures of fiscal policy have their own regional bias (Short 1981; Armstrong and Taylor 2000), for spatial economic policy we use a proxy of policy (*Policy*) reflecting direct intervention on income. This consists of the difference between the Gini index calculated on *primary* household income per head – therefore *before* direct policy intervention on income – and the same index calculated on GDHI per head². The latter takes into account direct policy intervention on income by means of positive elements such as social benefits received and other current transfers received (total secondary resources) and negative elements such as current taxes on income and wealth (e.g. income tax, council tax), social contributions paid (e.g. employees pension/social security contributions) and other current transfers paid (total secondary uses). Therefore, *Policy* is intended as a broad and regional version (by considering policy measures other than taxes) of the Reynolds and Smolensky (1977) index usually calculated to measure the progressiveness of tax systems. Clearly, this measure theoretically ranges between zero (reflecting total ineffectiveness of state intervention in reducing spatial disparities) and the value of the Gini index relative to primary income³ (reflecting the effectiveness of state intervention in reducing *all* spatial disparities characterising the distribution of primary income).

Challenging methodological issues are involved in calculating measures able to capture the real degree of *autonomy* enjoyed by sub-national, regional and local levels of government (Martinez-Vazquez and Timofeev 2009; Torrisi *et al.* 2010). Therefore, due to data constraints and the need for international comparability within a larger study, for decentralisation we adopted a standard and widely used measure of fiscal decentralization based on the local to total general government revenue ratio (*Fiscal devolution*) using data from Eurostat (Government Finance Statistics). This is a proxy for the devolution of fiscal powers and responsibilities to sub-national governments. We would stress that since our main intent (only partially pursued in this paper focusing on the UK case) is the *international* comparison of the simultaneous *historical* paths of spatial policy, spatial inequalities and devolution, our proxy for the latter represents an imperfect choice with respect to other alternative measures developed in the literature. Indeed, the alternative measure based on the expenditure side, even if available for *all* EU member states, is not relevant for our analysis given that the “share of local expenditure to total expenditure” is not statistically correlated with (our measure of) spatial disparities⁴. As for alternative measures explicitly taking into account institutional factors, such as Regional Authority Index developed by Marks *et al.* (2008) and different decentralisation factor scores proposed by Schneider (2003), although they try to capture devolution of policy and law making powers, they are time-invariant or at least they are characterised by a step chart and as a consequence are rather inappropriate for analysing historical paths. Therefore, given these data, measurement and commensurability constraints as well as the particular context of the UK’s highly centralised institutional

² Per head values computed using S_t^j in both cases.

³ This would imply a Gini index after state intervention equal to zero.

⁴ The Spearman correlation index between *Gini* and the share of sub-national expenditure in total expenditure is equal to 0.3727 with a p-value of 0.0961.

setting, we are confident that our measure is the preferable one to the case at hand. Figure 3 displays the historical evolution of the three variables introduced above in the UK.

The evolution of the line representing the Gini coefficient in Figure 3 shows that regional disparities have tended to rise during the period of analysis and that their behaviour has been clearly affected by national business cycles. The period of the end of the 1980s Lawson boom witnessed a relatively steady increase in territorial inequality. But, as boom turned to bust in the early 1990s, regional disparities in the UK fell sharply, reaching their nadir in 1992. The economic recovery that ensued signalled a return to the growth in spatial disparities, which was particularly pronounced during the last two years of the Major government and during the first Blair term, peaking in 2001. Since then, and coinciding with the greater investment in public services of the second and third Labour administrations, spatial disparities have marginally declined (Table 3). This business-cycle-led evolution of disparities fits well with the sheltered-economy evolution of spatial disparity proposed by Rodríguez-Pose and Fratesi (2007): while the wealthier and more open regions of the South East of England experience to a greater extent than the rest of the UK the vagaries of the market, the increasing dependence of the poorer northern and western regions on non-market oriented services – as a consequence of the relative decline of their traditional industrial base – has made them more impervious to changes in market circumstances. This explains the tendency for UK nations and regions to diverge in periods of boom and to converge in periods of economic crisis (Martin 1993), as well as the longer-term trend towards rising spatial disparities.

But, having established that the evolution of spatial disparities in the UK seems to be the result of the combination of market exposure and business cycles, to what extent has devolution played a role in this process? The *fiscal devolution* variable in Figure 3 illustrates the association between devolution and the evolution of spatial disparities may have been more than testimonial. Decreases in sub-national government autonomy in the late 1980s and in the mid- to late 1990s due to the abolition of Metropolitan Councils and the cutting of the rate support grant (Duncan and Goodwin 1988), coincide with significant increases in spatial disparity. By contrast, the apparent rise in fiscal devolution between 1989 and 1992 is associated with the biggest decline in spatial disparities (Figure 3)⁵. While establishing a cause-effect relationship between both phenomena is impossible just by looking at Figure 3, their coincidence in time may mean that even the limited fiscal devolution policies pursued by successive British governments in periods of boom and bust may have played a non-negligible role in shaping spatial disparities.

Regarding the relationship between the evolution of spatial economic policy and the evolution of regional disparities, the interaction of the lines points towards a situation whereby until 2003, at least, spatial economic policy reacts to – rather than shapes – changes in spatial disparity. The rise in disparities of 1988-1989 is followed by a rise in spatial policy intervention in subsequent years, while the decline in disparities of the early 1990s signals the effects of the national automatic stabilizers and a declining involvement in spatial policies. This policy trend is only redressed after 1996, when the evidence of spatial disparities rising anew becomes clear (Figure 3). Only after 2003 there seems to be a possibility of spatial economic policies shaping territorial disparities and not vice versa (Figure 3). But to what extent can we say that changes in spatial disparity are the result of a combination of national business cycles and variations in fiscal devolution and spatial policies? In order to investigate further the changing relations between spatial disparities, spatial economic policy and

⁵ We address the issue of the *reliability* of the devolution measure utilised in this analysis further in this section. At this stage both the “decrease in sub-national government autonomy” and the “massive rise in fiscal devolution” should be interpreted as if (our measure of) Fiscal Devolution would be able to reflect real change in the central-local relationship.

decentralisation for the UK introduced above and to better discern which factors may be related to shifts in growth patterns, on the one hand, and to changes in policies, on the other, we also consider changes in national economic performance (*Growth*). The rationale here is that all the variables considered are linked with the economic performance of the system as a whole and that the relation between each and economic performance is not clear *ex ante*. As mentioned earlier, shifts in national economic growth – or changes in national business cycles – may be the primary force behind the trajectory of spatial disparities in the UK. Figure 4 compares the evolution of economic performance and regional disparities for the UK for 1984-2007.

The analysis illustrates the close relationship between *national* economic performance and spatial disparities (Figure 4). With the exception of the most recent period (2005-2007), both lines tend to mimic one another, with rises and declines in national growth tending to be followed by similar rises and declines – albeit with different time lags depending on the period – in spatial disparities at the regional level (Figure 4). The dynamic of the relation between spatial disparities and national economic growth sheds some light on the varied and uneven nature of the relationship between spatial disparities and devolution and how it changes direction during specific time periods. Decomposing *Fiscal devolution* into its two main components, namely local revenue (*Local revenue*) and general government revenue (*General revenue*), there seems to be a mechanism linking spatial disparities and devolution with the national economic cycle. By including a one-year lagged growth rate (*Lagged growth*), Table 4 shows: (i) the presence of a *negative* correlation⁶, though statistically neutral at 5% significance level, between economic performance (*Growth* and *Lagged growth*), on the one hand, and the annual change in the local revenue (*Change local revenue*), on the other; and, (ii) a *positive* correlation between the former and the annual rate of total revenue change (*Revenue change*). This underlines that, in times of economic expansion with *increased* spatial disparities, the index of devolution – their ratio – has *decreased* and vice versa. This evidence could be explained in terms of the traditional automatic stabilising effect of central taxation with increases during the upturn (*via* income tax, VAT etc) and decline during recession, and the (statistically) neutral correlation between economic performance and local revenue generally protected during recession (see point (i) above).

This analysis suggests that the critical causal relationship is between spatial disparities and national economic performance. Moreover, given the temporal lag in the relation between economic performance and other variables emerging from the analysis above, especially *via* total revenue (considering also that the correlation between its change and *past* change in economic performance is higher than the one with *present* economic performance, respectively 0.7370 and 0.5218), we hypothesise that economic performance could be the *initiating* factor and that other variables *follow* its movement with opposite dynamics and explanations. In other words, the interpretation of the empirical evidence of the relation between economic performance and spatial disparities is that – if not wholly driven by the business cycle – the evolution of regional disparities is strongly related to *national economic performance*, rather than the result of any ‘economic dividend’ of devolution. This analysis is based upon our chosen proxy for decentralisation which, while commonly used in the literature (Oates, 1985; Woller and Phillips, 1998; Akai and Sakata, 2002), is – as we have acknowledged – not without its weaknesses (Martinez-Vazquez and Timofeev 2009). The direction of causality will, however, require further investigation and cross-national comparative study. Put differently, our analysis suggests that spatial disparities heavily depend upon national economic performance which, in turn, is strongly driven by

⁶ The results reported in Table 4 and 5 refer to the Pearson correlation index. However, when resorting to alternative indices, such as the Spearman's rank correlation coefficients, which allow for non-linear correlation, the magnitude and significance of the coefficients is, by and large, unchanged.

geographical concentration of economic activity in London and the Greater South East so that an eventual ‘dividend’ in terms of spatial disparities seems to be searched in the *national economic performance as delivered by London*. In order to further investigate these arguments, we perform an analysis on *income polarisation* across UK regions. Indeed, since Esteban and Ray (1994)’s seminal paper, it is well known that income inequality measures could be low even in the presence of a strong polarisation so it is worth analysing them separately. Although different indices of polarisation have been developed in the literature (Wolfson, 1994; Wang and Tsui, 2000 ; Chakravarty and Majumder, 2001), we adopt the widely used Generalised Esteban, Gardin and Ray (2007) (EGR) polarisation index. Therefore, we apply to following formula to regional GDHI per head as defined above

$$P^{EGR}(f, \alpha, \rho^*, \beta) = \frac{1}{2} \left(\sum_{j=1}^m \sum_{k=1}^m p_j^{1+\alpha} p_k |\mu'_j - \mu'_k| - \beta (G(f) - G(\rho^*)) \right) \quad \text{eq.(3)}$$

where $\mu'_j = \frac{\mu_j}{\mu_j}$ and p_j denote respectively the (corrected) average income and the numerical weight of group j ; $\alpha \in [1, 1.6]$ is the parameter that captures the degree of sensitivity of our measure of polarisation, and $\beta \geq 0$ is the parameter used to express the weight assigned to the error term $(G(f) - G(\rho^*))$ in determining group composition (see Appendix 1 for details).

Empirical results in the four-groups case – this choice being supported by previous studies on regional clusters (Rodríguez-Pose and Vilalta-Bufi 2005, Ezcurra 2009) – are shown in Figure 5. This figure, even with exceptions characterised by increasing spatial disparities linked with decreasing polarisation (in 1984-1985, to some extent in 1987-1988 and during the economic recovery of 1992-1993) and vice versa (1986-1987, 1991-1992 and the relatively recent period 2004-2005), empirically confirms the positive correlation between spatial disparities and polarisation at the regional level in the UK during the whole period 1994-2003 and the more recent upturn of both measures in 2005-2006 and downturn relative to 2006-2007. We interpret this close path involving regional disparities and regional polarisation, combined with the strong relation between the former and national economic performance discussed above, as a preliminary confirmation of the role played by the ‘winning’ (Ezcurra 2009) region of London and the Greater South East in driving national economic performance and in determining its consequences on spatial disparities.

A final step, building upon the analysis of economic growth and *Fiscal devolution* components, considers the correlations between variables in order to capture the whole set of overall relations between each other. Table 5 shows this correlation matrix. The correlations confirm and support the analysis above. Nonetheless, some points are worth stressing here. First, a rather counterintuitive positive overall correlation between spatial policy and spatial inequality (0.6201) is found. Indeed, given the formula used to calculate our measure of spatial economic policy (see Appendix 1), *ceteris paribus*, an increase in regional disparities (Gini index relative to GDHI) will result in a decrease in the measure of spatial economic policy. This is what empirically registered, for example, during the biennium 1984-1986 with, as mentioned, increasing spatial disparities linked with a decrease in the measure of regional policy. However, our analysis confirms that, overall, disparities in (primary) income *before* state intervention rose more than disparities involving GDHI – i.e. once measures of policy operated – generating a positive correlation between the spatial policy and spatial disparities. Second, a negative overall correlation between decentralisation and spatial disparities (-0.4807) is confirmed. Fiscal decentralisation is likely to increase the degree of

efficiency in the allocation of resources which may give rise to a spatially even distribution of income. However, further consideration of national economic performance and spatial polarisation indicators – combined with the analysis of correlations reported in Table 4 – shows that this interpretation could be misleading. Indeed, considering the level and growth rate of national GDP, a strong correlation between spatial disparities, spatial polarisation and economic performance arises (for the former and *GDP*, *Growth*, and *Lagged growth* respectively 0.7844, 0.3905 and 0.4522, while, regarding polarisation, a correlation of 0.7165, 0.331 and 0.4801 is registered with *GDP*, *Growth* and *Lagged growth* respectively). It is important too that the coefficient for *Lagged growth* is – statistically significant at 5% level – and slightly higher than the one for *Growth* (although not statistically significant at 5%) in both cases confirming the existence of a temporal lag between both spatial disparities and polarisation and their correlation with national economic performance. Overall, the interpretation here sees the negative correlation between regional disparities and devolution as a *spurious* one that could be explained in terms of the positive correlation between spatial disparities, spatial polarisation, and national economic performance combined with the negative correlation between economic performance and the share of local revenue (-0.3538 and -0.7517 respectively for *Growth* and *Lagged growth*). This evidence challenges the argument in favour of a “strong positive correlation between this measure of devolution and the downturn in regional per capita differentials” (Calamai 2009: 1140). In particular, the argument developed from analysis of the Italian case that “the upsurge in the devolutionary trend clearly precedes the reduction of regional disparities with a one-year time lag, shedding some light on the apparent direction of such (partial) association” (Calamai 2009: 1139), highlights the need for further investigation of the dynamic of the role played by economic growth and national growth poles.

As a final robustness check, we test the hypothesis that the measures of devolution and spatial policy used in this paper, rather than being *independent from*, have some potential mechanical *dependence on* the measure of spatial disparity. In other words, (i) since we are correlating the Gini index for GDHI with a proxy of regional policy that also *contains* the Gini, one can doubt that a relationship between the two measure arises in the sense that, formally, for some $\alpha_1 \neq 0$ in the regression

$$POLICY_t = \alpha_0 + \alpha_1 GINI_t + u_t \quad \text{eq.(4)}$$

the variable $s_t = POLICY_t - \alpha_1 GINI_t$ is a process integrated of order zero (i.e. a I(0) process) meaning that the two series are cointegrated (Wooldridge, 2002). Furthermore, (ii) comparing the GINI index for GDHI with FISCDEV (i.e. an index of the ratio of local to central government fiscal revenues), it might be that the latter itself is dependent directly on inter-regional income inequalities. Therefore, if this would be the case, for some $\beta_1 \neq 0$, in the following regression

$$FISCDEV_t = \beta_0 + \beta_1 GINI_t + e_t \quad \text{eq. (5)}$$

the variable $r_t = FISCDEV_t - \beta_1 GINI_t$ is I(0) meaning, also in this case, that the two series are cointegrated. If so, in our analysis, rather than comparing three distinct measures over time, we would – indirectly be observing simply the long-run relationship between one variable (GINI) and the remaining two. In order to address this issue we perform a cointegration test taking into consideration that the (potential) cointegration parameter is

unknown in both cases. Therefore, we apply augmented Dickey-Fuller (ADF) test to the residuals of both regressions (\hat{u}_t, \hat{e}_t) adopting critical values taken from Davidson and MacKinnon (1993). Table 6 shows results relative to this test where also lags of $\Delta\hat{u}_t$ and $\Delta\hat{e}_t$ are added to account for serial correlation.

The results reported in Table 6 indicate that the unit root hypothesis can not be rejected in both regressions at 5% significance level. Hence, it can be argued that no statistically significant long-run relationship arises between GINI and other proxies of policy and devolution. Put differently, the relation between *GINI* and *POLICY* as well as the relation between GINI and FISCDEV “tell us nothing meaningful” (Wooldridge, 2002:588). More precisely, in terms of our analysis, these results have to be interpreted in the sense that the simultaneous consideration of the historical path of spatial disparity, spatial economic policy and devolution as separate variables is meaningful given that both spatial economic policy and fiscal devolution measures incorporate distinct information that can not be properly inferred from the simple consideration of regional inequality only. This evidence gives further empirical strength to results reported in this paper.

Conclusions

More than a decade after the constitutional reforms of the late 1990s which brought devolution to parts of the UK, this article has sought to assess and reflect upon the evidence and enduring meaning of the ‘economic dividend’ of devolution in the UK. Acknowledging the difficulties and methodological challenges involved in seeking to discern such a complex, subtle and difficult to measure entity (Jeffery 2006), a multi-disciplinary and geographical political economy approach has been adopted. This study has sought to embed any relationships between decentralisation, spatial economic policy and changes in spatial disparities in their appropriate context of the unfolding histories of institutional, political and economic change over time and space within the particularity of the UK state. The UK’s highly centralised system has marked its particular evolution and established a constrained context for any ‘economic dividend’ to emerge. This contrasts the more substantive and extensive fiscal decentralisation in other countries which have experienced stronger, more widespread, positive effects under certain conditions (Rodríguez-Pose and Ezcurra 2010).

The analysis has revealed a number of interesting points. First is the varied and uneven nature of the relationship between spatial disparities, spatial economic policy and fiscal devolution in the UK, with important changes in direction during the period under analysis. Second, the role of national economic growth is pivotal in explaining the evolution of spatial disparities and the nature and extent of their relationship with the particular forms of spatial economic policy and decentralisation deployed. The dominance of national economic growth within the current forms of more growth-oriented forms of spatial economic policy has reinforced its decisive explanatory role, underlining the emergent trade-off between national economic growth and politically tolerable levels of spatial disparities (Martin 2008).

Last, there was limited evidence that any ‘economic dividend’ of devolution has emerged yet but this remains difficult to discern because its likely effects are over-ridden by the role of national economic growth in decisively shaping the pattern of spatial disparities and in determining the scope and effects of spatial economic policy and decentralisation. Given the central importance of the geographical concentration of growth in London and the Greater South East to national economic growth and the role of state policy and investment in seeking to accommodate its contradictions (Pike and Tomaney 2010), this ‘super-region’ (Birch *et al.* 2009) could be interpreted as the principal beneficiary of the turn to a more

growth-oriented spatial economic policy and the modest decentralisation evident within the devolved arrangements in the English regions. The advancement of the interests of an already prosperous albeit highly unequal region sits uneasily with the ways in which the 'economic dividend' of devolution was promoted as a means to address the 'economic deficit' and ameliorate the marked spatial disparities between the nations and regions within the UK. This concern chimes with anxiety amongst commentators and government evident in the mid-2000s: "In the unlikely event that devolution yields a uniform economic dividend in each region, the result does nothing to redress the territorial inequalities at the heart of the North-South divide. Treating unequals equally is not a recipe for territorial justice" (Morgan 2006: 3; see also House of Commons 2003).

Our findings lead us to conclude that even when it might be discerned, any 'economic dividend' of devolution is likely to be highly variable, taking different forms and degrees, and may be episodic or fleeting in its duration. It appears highly contingent upon particular paths of state institutional change across a range of scales and to be strongly shaped by national economic growth, the nature of fiscal autonomy and capacity and willingness for redistribution on the part of national central states. We acknowledge, however, that it might be that the timescale of our assessment may be too foreshortened and that much more than a decade needs to elapse before the effects of any 'economic dividend' become more apparent. In addition, improvements are needed in data availability and methodological development to help create further proxies and indicators.

Amidst the territorial politics of the UK's nations and regions, contestation over the existence, nature and scale of any 'dividends' associated with devolution continue to unfold, further stoked by the emergence of a Conservative-Liberal Democrat coalition government in 2010. The uneven ways in which devolution has been unfurled across the UK's polycentric political economy continues to generate political controversy. In 2010, for example, a Scotland Office review found that 1999 public expenditure in Scotland by both the central and devolved administration exceeded the total revenue raised from across Scotland by £75.8bn. This led the then Scottish Secretary Jim Murphy to claim that "Scotland has two governments spending billions of pounds of public money and there is a clear and quantifiable 'devolution dividend'. Scotland gets the best of both worlds from devolution" amidst protests from the Scottish National Party that the figures were inaccurate. The continued relevance of this concern with the economic and indeed other dividends of devolution warrants further studies, especially international comparative work.

References

- Adams, J., Robinson, P. and Vigor, A. (2003) *A New Regional Policy for the UK*, Institute for Public Policy Research: London.
- Aghevli, B. and Mehran, F. (1981) 'Optimal grouping of income distribution data', Journal of the American Statistical Association, 76: 22-26.
- Akai, N. and Sakata, M. (2002) 'Fiscal decentralization contributes to economic growth: evidence from state-level cross-section data for the United States', Journal of Urban Economics, 52: 93-108.
- Armstrong, H. and Taylor, J. (2000) *Regional Economics and Policy*, Blackwell: Oxford.
- Ashcroft, B., Swales, J. K. and McGregor, P. G. (2005) 'Is devolution good for the Scottish economy? A framework for analysis', *Devolution Briefings No. 26*, March, ESRC Devolution and Constitutional Change Programme, http://www.devolution.ac.uk/Briefing_papers.htm; Accessed: 28 April 2010.
- Balaguer-Coll, M. T., Prior, D. and Tortosa-Ausina, E. (2010) *Devolution Dynamics of Spanish Local Government*, WP-EC 2010-01, Instituto Valenciano de Investigaciones Económicas (IVIE): Spain.
- Balls, E. and Healey, J. (2001) *Towards a New Regional Policy*, The Smith Institute: London.
- Barlow, Sir M. (1940) *Report of the Royal Commission on the Distribution of Industrial Population*, HMSO: London.
- Birch, M., Harding, A. and Rees, J. (2009) 'Having it both ways: explaining the contradiction in English spatial development policy', International Journal of Public Sector Management, 22, 7, 587-604.
- Cabinet Office and DTLR (2002) *Your Region, Your Choice: Revitalising the English Regions*, Cm5511, HMSO: Norwich.
- Chakravarty, S. R. and Majumder, A. (2001) 'Inequality, polarization and welfare: theory and applications', Australian Economic Papers, 40: 1-13.
- Cooke, P. and Clifton, N. (2005) 'Visionary, precautionary and constrained 'varieties of devolution in the economic governance of the devolved UK territories', Regional Studies, 6, 39, 4, 437-451.
- Davidson, R. and MacKinnon, G. (Eds.) (1993) *Estimation and Inference in Econometrics*, New York, Oxford University Press.
- Davies, J. B. and Shorrocks, A. F. (1989) 'Optimal grouping of income and wealth data', Journal of Econometrics, 42: 97-108.
- Davies, R. (1999) *Devolution: A Process Not An Event*, Institute of Welsh Affairs: Cardiff.

- Duncan, S. and Goodwin, M. (1988) *The Local State and Uneven Development*, Polity: Cambridge.
- Duro, J. A. (2005) 'International income polarization: a note', Applied Economics Letters 12, 12: 759-762.
- Esteban, J-M. and Ray, D. (1994) 'On the measurement of polarization', Econometrica, 62: 819-851.
- Esteban, J-M., Gradin, C., *et al.* (2007) 'Extension of a measure of polarization with an application to the income distributions of five OECD countries', Journal of Income Inequality, 5: 1-19.
- Ezcurra, R. (2009) 'Does income polarization affect economic growth? The case of the European regions', Regional Studies, 43(2): 267-285.
- Department of Environment (1997) 'Regions invited to have their say', Press Release 214, 11 June, DoE: London.
- Fothergill, S. (2005) 'A new regional policy for Britain', Regional Studies, 39, 5, 659-667.
- Gamble, A. (1994) *The Free Economy and the Strong State: The Politics of Thatcherism (2nd Edition)*, Palgrave MacMillan: London.
- Goodwin, M., Jones, M., Jones, R., Pett, K. and Simpson, G. (2002) 'Devolution and economic governance in the UK: Uneven geographies, uneven capacities?', Local Economy, 17, 200-215.
- Gordon, I. (1990) 'Regional policy and national politics in Britain', Environment and Planning C: Government and Policy, 8, 427-438.
- Halkier, H., Danson, M. and Damborg, C. (1998) *Regional Development Agencies in Europe*, Jessica Kingsley: London.
- Harrison, R. T. and Hart, M. (1993) (Eds.) *Spatial Policy in a Divided Nation*, Jessica Kingsley: London.
- Hayman, A. (2008) 'Welsh devolution has "little economic impact"', Regeneration and Renewal, 10 October, Haymarket: London.
- HM Treasury and Department of Trade and Industry (2001) *Productivity in the UK: 3 – The Regional Dimension*, HMSO: London.
- House of Commons (1995) *Regional Policy*, Trade and Industry Committee, Fourth Report, Session 1994-1995, HMSO: London.
- House of Commons (2003) *Reducing Regional Disparities in Prosperity*, ODPM Committee: Housing, Planning, Local Government and the Regions Committee, Ninth Report of Session 2002-03, Vol. 1 Report, HC 492-I, TSO: Norwich.
- Hudson, R. (1989) *Wrecking a Region: State Policies, Party Politics and Regional Change in North East England*, Pion: London.

- Jeffery, C. (2006) *Final Report of the Devolution and Constitutional Change Programme*, School of Social and Political Studies: University of Edinburgh.
- Kaldor, N (1970) 'The case for regional policies', Scottish Journal of Political Economy, 17, 3, 337-348.
- Krugman, P. (1991) 'Increasing returns and economic geography', Journal of Political Economy, 99: 483-499
- Leuning, T. and Swaffield, J. (2008) *Cities Unlimited. Making Urban Regeneration Work*, Policy Exchange: London.
- Lobao, L., Martin, R. and Rodríguez-Pose, A. (2009) 'Editorial: Rescaling the state: new modes of institutional-territorial organization', Cambridge Journal of Regions, Economy and Society, 2, 1, 3-12.
- Marks, G., Hooghe, L. and Schakel, A. H. (2008) 'Patterns of regional authority', Regional and Federal Studies, 18, 2 and 3, 167-181.
- Martin, R. (1988) 'The political economy of Britain's North-South divide', Transactions of the Institute of British Geographers, 13, 389-418.
- Martin, R. (1993) 'Remapping British regional policy: the end of the North-South divide?', Regional Studies, 27, 8: 797-805.
- Martin, R. (2008) 'National growth versus spatial equality? A cautionary note on the new 'trade-off' thinking in regional policy discourse', Regional Science Policy and Practice, 1, 1, 3-13.
- Martin, R. and Sunley, P. (1997) 'The post-Keynesian state and the space economy', in R. Lee and J. Wills (Eds.), *Geographies of Economies*, Arnold: London, 278-289.
- Martin, R. and Tyler, P. (1992) 'The regional legacy' in J. Michie (Ed.), *The Economic Legacy, 1979-92*, Academic Press: London, 140-167.
- Martinez-Vazquez, J. and Timofeev, A. (2009) 'A fiscal perspective of state rescaling', Cambridge Journal of Regions, Economy and Society, 2, 85-105.
- McGregor, P. G. and Swales, K. (2005) 'Economics of devolution/decentralization in the UK: Some questions and answers', Regional Studies, 39, 4, 477-494.
- Morgan, K. (1985) 'Regional regeneration in Britain: the 'territorial imperative' and Conservative state', Political Studies, 4, 560-577
- Morgan, K. (2001) 'The New Territorial Politics: Rivalry and Justice in Post-devolution Britain', Regional Studies, 35, 4, 343-348.
- Morgan, K. (2006) 'Devolution and development: Territorial justice and the North-South divide', Publius: Journal of Federal Studies, 36, 1, 189-206.

- Morgan, K. (2007) 'The polycentric state: New spaces of empowerment and engagement?', Regional Studies, 41, 9, 1237-1251.
- Murphy, P. and Caborn, R. (1996) 'Regional government: An economic imperative' in S. Tindale (Ed.), *The State and the Nations*, IPPR: London, 184-221.
- Oates, W. E. (1985) 'Searching for leviathan: an empirical study', American Economic Review, 75: 748-757.
- Oates, W.E. (1999) 'An essay on fiscal federalism', Journal of Economic Literature, 37, 3, 1120-1149.
- OECD (2009) *Regions Matter: Economic Recovery, Innovation and Sustainable Growth*, OECD: Paris.
- Overman, H. (2010) 'Urban Renewal and Regional Growth: Muddle Objectives and Mixed Progress', Centre for Economic Performance Election Analysis, CEP, LSE: London. <http://cep.lse.ac.uk/pubs/download/ea014.pdf>
- Peck, J. and Theodore, N. (2007) 'Variegated capitalism', Progress in Human Geography, 31, 6, 731-772.
- Pike, A. and Tomaney, J. (2009) 'The state and uneven development: The governance of economic development in the post-devolution UK', Cambridge Journal of Regions, Economy and Society, 2, 1, 13-34.
- Pike, A. and Tomaney, J. (2010) 'State and economy: governing uneven development in the UK' in N. M. Coe and A. Jones (Eds.), *The Economic Geography of the UK*, Sage: London, 91-109.
- Rallings C. and Thrasher M. (2006) 'Just another expensive talking shop': Public and the 2004 Regional Assembly Referendum in the North East of England', Regional Studies, 40, 927-936.
- Regional Policy Commission (1996) *Renewing the Regions*, Policy Research Centre, Sheffield Hallam University: Sheffield.
- Reynolds, M. and Smolensky, E. (1977) *Public Expenditures, Taxes, and the Distribution of Income: The United States, 1950, 1961, 1970*, Academic Press: New York.
- Rodríguez-Pose, A. and Ezcurra, R. (2010) 'Does decentralization matter for regional disparities? A cross-country analysis', Journal of Economic Geography, 10.
- Rodríguez-Pose, A. and Fratesi, U. (2007) 'Regional business cycles and the emergence of sheltered economies in the southern periphery of Europe', Growth and Change, 38, 4, 621-648.
- Rodríguez-Pose, A. and Gill, N. (2004) 'Is there a global link between regional disparities and devolution?', Environment and Planning A, 36, 12, 2097-2117.
- Rodríguez-Pose, A. and Gill, N. (2005) 'On the 'economic dividend' of devolution', Regional Studies, 39, 4, 405-420.

- Rodríguez-Pose, A. and Sandall, R. (2008) 'From identity to the economy: analysing the evolution of the decentralisation discourse', Environment and Planning C: Government and Policy, 26, 1, 54-72.
- Rodríguez-Pose, Tijmstra, S. J. R. and Bwire, A. (2009) 'Fiscal decentralisation, efficiency and growth', Environment and Planning A, 41, 9, 2041-2062.
- Rodríguez-Pose, A. and Vilalta-Bufi, M. (2005) 'Education, migration, and job satisfaction: the regional returns of human capital in the EU', Journal of Economic Geography, 5: 545-566.
- Short, J. (Ed.) (1981) *Public Expenditure and Taxation in UK Regions*, Gower: Farnborough, Hants.
- Taylor, J. and Wren, C. (1997) 'UK regional policy: an assessment', Regional Studies, 31, 9, 835-848.
- The Calman Commission (2009) *Serving Scotland Better: Scotland and the United Kingdom in the 21st Century*, Final Report of the Commission on Scottish Devolution, Commission Secretariat: Edinburgh.
- The Richard Commission (2004) *Report of the Richard Commission on the Powers and Electoral Arrangements for the National Assembly for Wales*, National Assembly for Wales: Cardiff.
- Tomaney, J. (2000) 'End of the Empire State? New Labour and devolution in the United Kingdom', International Journal of Urban and Regional Research, 24, 3, 677-690.
- Torrise, G., Pike, A., Rodríguez-Pose, A., Tomaney, J. and Tselios, V. (2010) 'Defining and measuring decentralisation: a critical review', Unpublished Paper, CURDS: Newcastle Upon Tyne.
- Wang, Y. and Tsui, K. (2000) 'Polarization orderings and new classes of polarization indices', Journal of Public Economic Theory, 2: 349-363.
- Wolfson, M. (1994) 'Divergent inequalities: theory and empirical results', The Review of Income and Wealth, 43: 401-22.
- Woller, G. M. and Phillips, K. (1998) 'Fiscal decentralisation and LDC economic growth: an empirical investigation', Journal of Development Studies, 34: 139-148.
- Wooldridge, J. M. (Ed.) (2002) *Introductory Econometrics A Modern Approach*, South-Western Publishing Group.
- Wren, C. (2005) 'Regional grants: Are they worth it?', Fiscal Studies, 26, 2, 245-275.

Table 1: Redistributive, free-market and growth-oriented spatial economic policy

Characteristic	Redistributive	Free-market	Growth-oriented
Economic theory	Keynesian growth theory	Neo-classical (exogenous) growth theory	New (endogenous) growth theory
Causal explanation of spatial disparities	Low aggregate demand and investment, structural weaknesses	Inherited factor endowments and quality, inflexibility and immobility in factor markets	Constructed factor endowments and increasing returns generating productivity and innovation differentials
Adjustment process	Spatial disparities persist through cumulative causation, multiplier, spread and backwash effects	Factor market adjustment returns to equilibrium and convergence reduces spatial disparities	Agglomeration and spill-over effects, national growth and spatial disparity trade-off
Policy rationales	Redistribution for economic efficiency and spatial and social equity and balance	Improving factor market efficiency, flexibility and mobility	Market failures or equity
Policy instruments	Automatic capital and labour subsidies, industrial development controls, infrastructure investment	Regional Selective Assistance, enterprise grants for SMEs and new start-ups	Innovation grants, Venture capital funds
Institutional organisation	Centralised, national	Centralised, national	Decentralised, sub-national, regional, city(-regional) and/or local
Geographical focus and scope	Regional	Regional, local and urban	City(-regional)
Political-economic project	Social Democratic	New Right, Neo-liberal	Third Way, Neo-liberal
Language	Regional inequalities, redistribution	Regional and local divides, trickle-down	Spatial disparities, performance gaps spill-overs

Source: Authors' research.

Table 2: Types of decentralisation

Fiscal	Political	Administrative	Deconcentration	Delegation	Devolution
Central governments ceding fiscal autonomy to non-central government entities	Degree to which central government allows non-central government entities to undertake the political functions of governance; degree to which political actors and issues are significant at the local level and are at least partially independent from those at the national level	How much autonomy non-central government entities possess relative to central control	Central government that disperses responsibility for a policy to its field offices; powers are transferred to lower-level actors who are accountable to their superiors in a hierarchy	Transfer of policy responsibility to local government or semi autonomous organizations that are not controlled by the central government but remain accountable to it	Central government allows quasi-autonomous local units of government to exercise power and control over the transferred policy

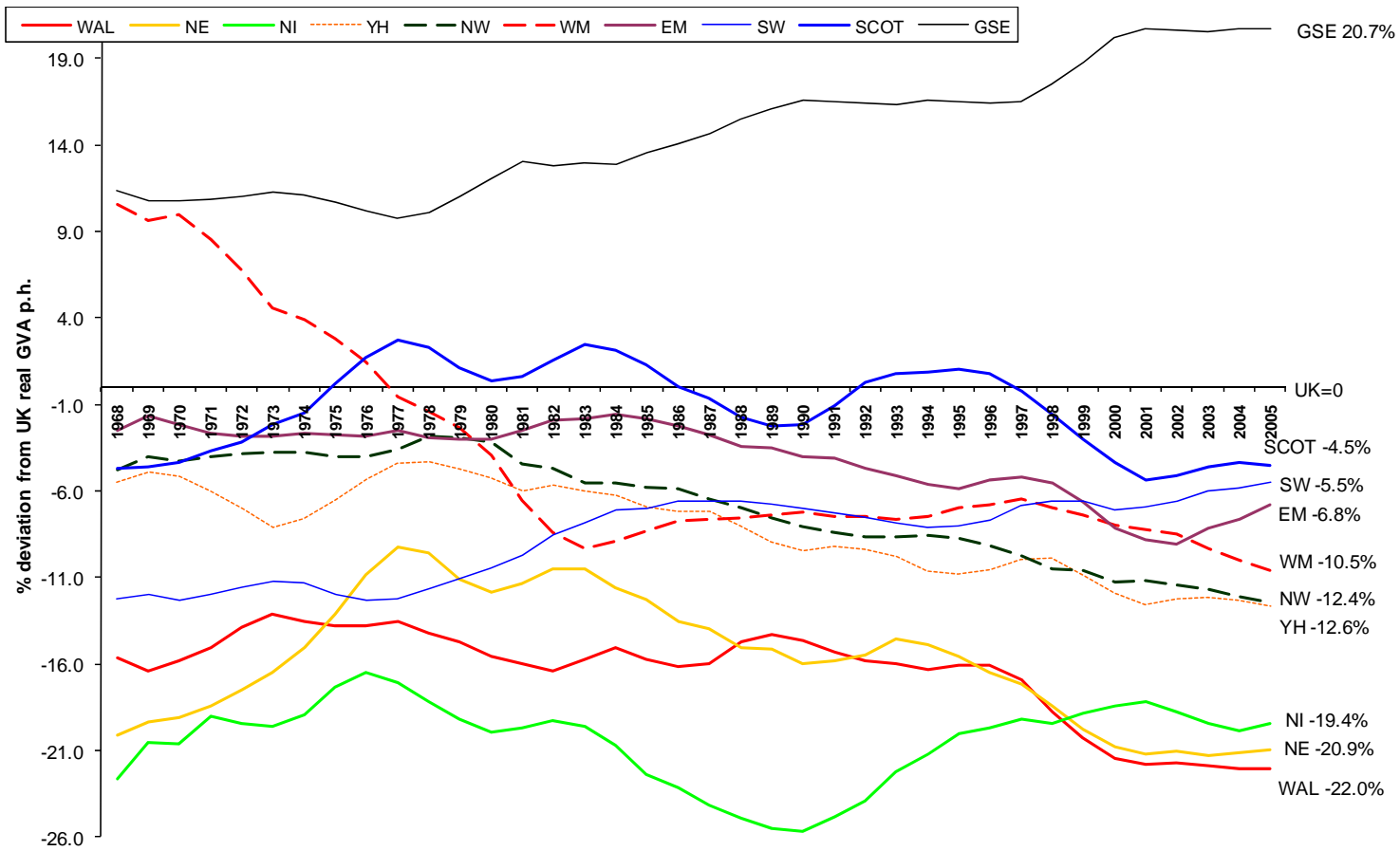
Source: Adapted from Torrisi *et al.* (2010).

Table 3: Potential economic benefits and costs of devolution

Potential Benefits	Potential Costs
Devolved policies better reflect territorial preferences (Allocative efficiencies)	Additional administrative costs of additional layers of government and/or governance institutions
Improved knowledge of territorial economic potential (Productive efficiencies)	Loss of scale economies in policy formulation and delivery Increased ‘rent-seeking’ by interest groups better able to influence sub-national territorial rather than national institutions
Democratic accountability improves efficiency of policy formulation and implementation, fosters innovation	Weaker disciplines of monitoring and evaluation (National finance ministries as tougher drivers of efficiency than territorial institutions)
Fiscal autonomy provides hard budget constraints and (where applicable) tax-varying power allows marginal changes to taxation and spending	Budget constraints increasingly tied to territorial fiscal capacity Weak incentives due to lack of mechanism linking public spending with tax revenues raised within sub-national territories
Lower coordination and compliance costs vis-à-vis rest of the national territory	Reduced coordination with the rest of the national territory with possible negative spill-over effects both on and from sub-national territories

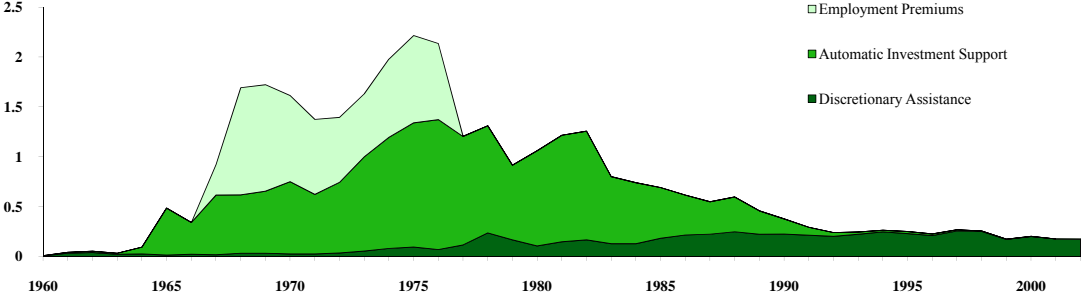
Source: Adapted from Ashcroft *et al.* (2005: 3).

Figure 1: GVA per head by region and nation, 1968-2005



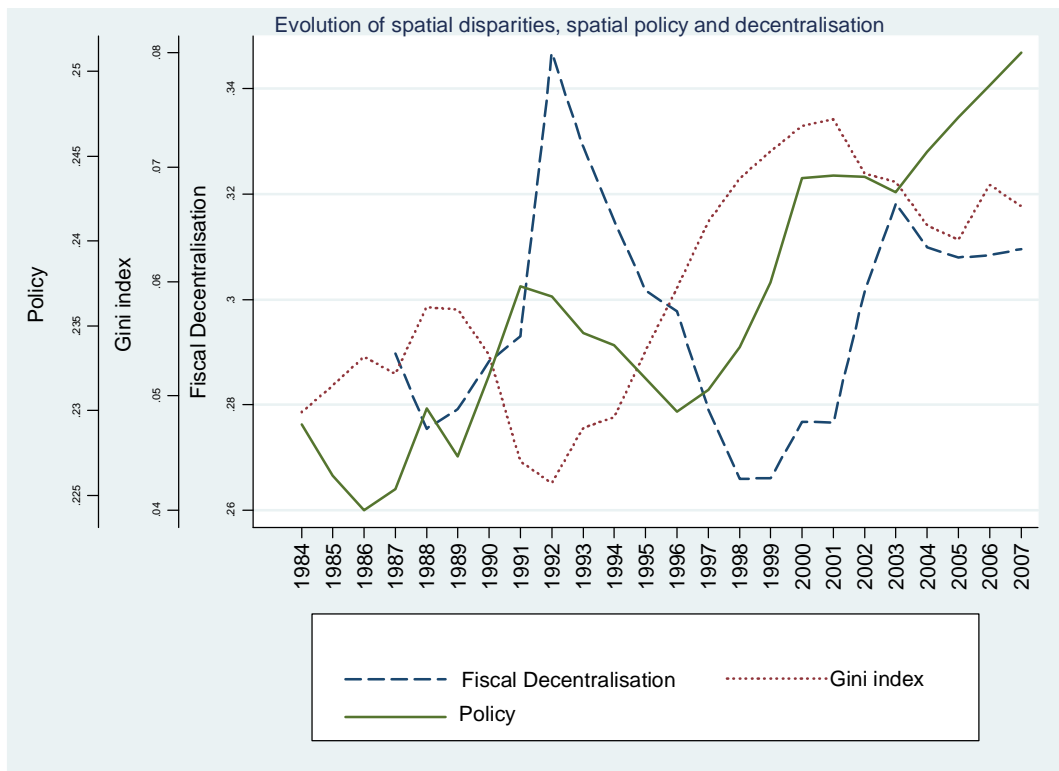
Source: Calculated from ONS.

Figure 2: Expenditure on Regional Industrial Assistance, 1960-2002



Source: Wren (2005) (Figures are for actual grant payments at constant prices for Great Britain).

Figure 3: Evolution of spatial disparities, spatial economic policy and decentralisation



Fiscal Decentralisation: share of local revenue on total government revenue; Gini index: Gini index of regional Gross Disposable Household Income per head (GDHI); Policy: Gini index of regional *primary* household income and Gini index of GDHI. For further details see Appendix. *Source:* Authors' elaboration on data from ONS.

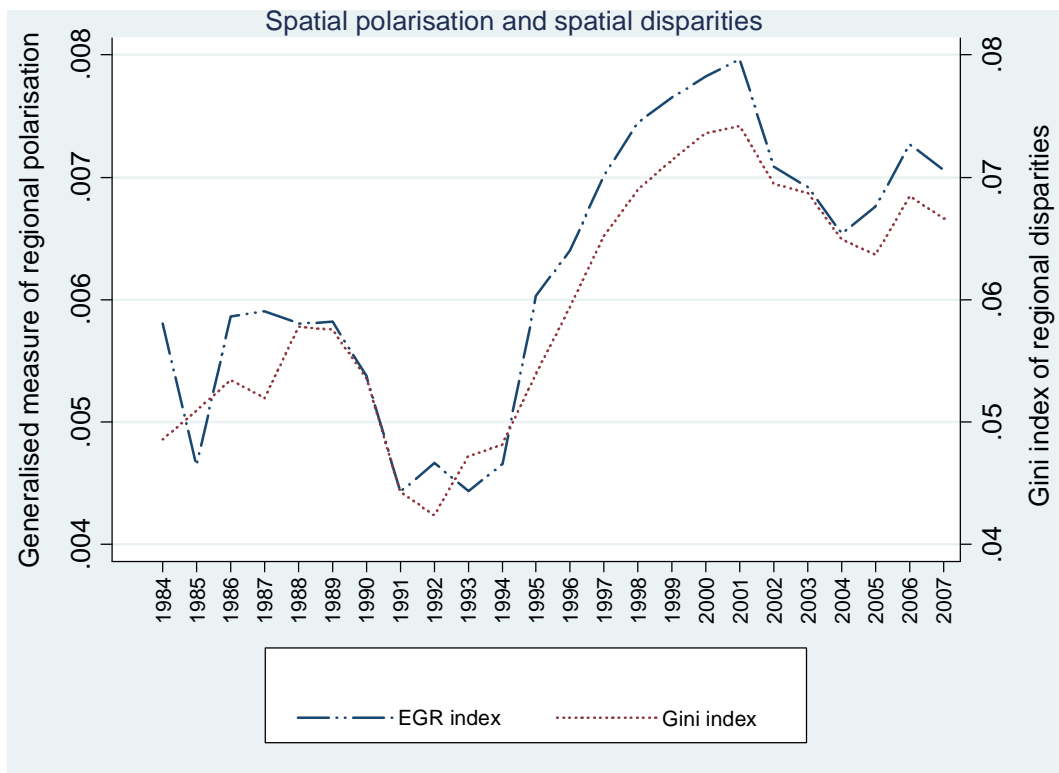
Figure 4: Evolution of spatial disparities and national economic performance



Gini index: Gini index of regional Gross Disposable Household Income per head (GDHI);
 Growth: annual growth rate of national Gross Domestic Product. For further details see
 Appendix.

Source: Authors' elaboration on data from ONS and Eurostat.

Figure 5: Evolution of spatial disparities and spatial polarisation



Gini index: Gini index of regional Gross Disposable Household Income per head (GDHI);
 EGR index: generalised measure of income polarization ($n=4$, $\delta=1.6$, $\lambda=1$). For further details see Appendix.

Source: Authors' elaboration on data from ONS.

Table 4: Pearson correlation between national economic performance and component of devolution index

	<i>Growth</i>	<i>Lagged growth</i>	<i>Revenue change</i>	<i>Change local revenue</i>
<i>Growth</i>	1			
<i>Lagged growth</i>	0.6382*	1		
<i>Revenue change</i>	0.4951*	0.7041*	1	
<i>Change local revenue</i>	-0.3614	-0.1728	-0.1751	1

* significant at 5%

Growth: annual growth rate of national Gross Domestic Product; Lagged Growth: one-year-lagged annual growth rate of national Gross Domestic Product; Revenue change: annual change rate of General Government revenue; Change local revenue: annual change rate of Local revenue.

Source: Authors' elaboration on data from ONS and Eurostat.

Table 5: Pearson correlation between regional disparities, national economic performance, devolution and spatial economic policy

	<i>Gini</i>	<i>GDP</i>	<i>Growth</i>	<i>Lagged growth</i>	<i>Fiscal decentralisation</i>	<i>Policy</i>
<i>Gini</i>	1					
<i>GDP</i>	0.7822*	1				
<i>Growth</i>	0.3226	0.0029	1			
<i>Lagged growth</i>	0.4581*	0.0303	0.6382*	1		
<i>Fiscal decentralisation</i>	0.4888*	0.0822	-0.3538	-0.7517*	1	
<i>Policy</i>	0.5865*	0.9148*	-0.2311	-0.2372	0.2767	1
<i>Polarisation index</i>	0.9561*	0.7165*	0.3301	0.4801*	-0.5197*	1

*significant at 5%

Gini index: Gini index of regional Gross Disposable Household Income per head (GDHI); GDP: Gross Domestic Product; Growth: annual growth rate of national Gross Domestic Product; Lagged Growth: one-year-lagged annual growth rate of national Gross Domestic Product; Fiscal Decentralisation: share of local revenue on total government revenue; Policy: Gini index of regional *primary* household income and Gini index of GDHI. For further details see Appendix.

Source: Authors' elaboration on data from ONS and Eurostat.

Table 6: Cointegration test between spatial inequality and measures of spatial policy and fiscal devolution.

	ADF				
	No Lags	Lag (1)	Lag (2)	Lag (3)	Lag (4)
<i>POLICY</i>	-1.538 (0.5148)	-2.294 (0.1739)	-1.970 (0.3000)	-2.610 (0.0910)	-2.027 (0.2750)
<i>FISCDEV</i>	-1.794 (0.3834)	-2.230 (0.1956)	-2.475 (0.1217)	-2.668 (0.0797)	-2.674 (0.0786)

Note: the Table reports results of Augmented Dickey-Fuller test on residuals of regression 4 and 5. Therefore, names of variables reported in the Table must be interpreted in the sense that relative results refer to the Augmented Dickey-Fuller (ADF) test on residuals generated by the regression having each variable as explicative variable. Davidson and MacKinnon (1993) approximate p-values are reported in parenthesis.

Source: Authors' elaboration.

Appendix

Welfare distribution can be measured and analysed according to several complementary perspectives. The simplest way to deal with this issue is represented by (i) *personal welfare distribution* which refers to analyses on individual welfare distribution considering the economy as a whole. A second perspective focuses on (ii) *functional welfare distribution* referring to welfare distribution among production factors such as “capital” and “labour”. Moreover, moving from the consideration that different “social classes” (e.g. workers and capitalist) could participate in different way to production (for example, workers can offer *also* capital), analyses could additionally refer to the (iii) *social distribution of welfare* in order to investigate how welfare is distributed among social classes. A further perspective is based on (iv) *sectorial welfare distribution*, i.e. on how welfare is distributed among economic sectors (e.g. agriculture and industry). Other analyses investigate, as this paper does, how welfare is distributed among geographical areas belonging to the economic system, concentrating their scope to the (v) *spatial welfare distribution*.

Regardless of the perspective(s) two preliminary issues involve the elaboration of distributive indices: the choice of the *variable* and the choice of the *unit of analysis*. Regarding the first issue (variable) should be noted that in addition to the widespread used “income” other indicators could be considered to analyse “welfare” distribution. For example, measures of *consumption* or *wealth* could be used achieving presumably contrasting results. Indeed, since the propensity to consume is decreasing with respect to income, it is reasonable that the distribution of consume will be, *ceteris paribus*, more equally distributed than the income’s one. In a rather specular way, wealth will be less equally distributed than income, given that “save” and “accumulation” are increasing with respect to income. As for the second issue, in addition to the simplest unit of analysis represented by “individuals” (generating income *per capita*), household income could be considered, basing the analysis on the argument that “households” are the *locus* where economic decisions take place according to *total* amount of resources available to each household as a whole. Although the household appears to be the most appropriate unit of analysis, it rise the need for taking into account *economies of scale in consumption* depending on *household size and composition*. In other words, the needs of a household grow with each additional member but not in a proportional way. For example, needs for heating and electricity will not be three times as high for a household with three members than for a single person. Equivalence scales (for a review see Atkinson et al. (1995)) are the statistical tool used to deal with this issue in order to obtain comparable units such as families made up of *equivalent-adults*.

According to arguments mentioned above this paper considers *income* as variable of interest and *households* as unit of reference in order to analyse the *spatial income distribution* across UK regions. More precisely, the regional (NUTS 1 level) Gross Disposable Household Income (GDHI) is considered. More precisely: the “household sector” covers people living in traditional households as well as those living in institutions, such as retirement homes and prisons (this sector also includes sole trader enterprises and non-profit institutions serving households such as charities and most universities) and “gross disposable (household) income” is derived from the *balances of primary and secondary income*. In turn, the balance of primary income is the difference between *total primary resources* and *uses* while the balance of secondary income is derived from *total secondary resources* less *uses*. In short, household income represents the amount of money available to households after taxes, National Insurance, pension contributions and interest have been paid. Table A.1 below illustrates the computation of GDHI and details of its main components.

Table A.1 – Computation and main components of GDHI

Aggregate	Description
BALANCE OF PRIMARY INCOME	
Total Primary Resources	TPR: Compensation of employees (all income from employment), operating surplus mainly rental, imputed or otherwise, in the household sector), mixed income (income from self-employment) and property income received.
Total Primary Uses	TPU: property income paid.
Balance of Primary Income	BPI = TPR-TPU
BALANCE OF SECONDARY INCOME	
Total Secondary Resources	TSR: social benefits received, other current transfers received (financial gifts, non-life insurance claims etc.).
Total Secondary Uses	TSU: current taxes on income and wealth (income tax, council tax), social contributions paid (employees pension / social security contributions), other current transfers paid.
Balance of Secondary Income	BSI = TSR-TSU
GROSS DISPOSABLE HOUSEHOLD INCOME	
Gross Disposable Household Income	GDHI = BPI + BSI

Source: Authors' elaboration on ONS (2009, p. 9).

Given the aggregate nature of data regarding GDHI it is not possible disentangling data at single household level in order to correct for household composition¹. However, to take into account this issue, in computing per head values, a sort of modified “OECD equivalence scale” has been applied to original aggregate data on GDHI. The procedure has been implemented as follows. Total population of each region (N^j) has been divided into six different classes (N_{it}^j) according to their *composition* and *size*² applying the following formula in order to estimate the numeric weight of each class³

¹ This would involve dividing the income of each household by the number of household member corrected by scale factor. For example Coulter et al. (1992) proposed to divide household income by N_h^θ , where N_h is the number of household members and $\theta \in [0,1]$ is the parameter used to capture the scale economies.

² For classes description see following table A.2.

³ It is worth noticing that eq. A.1 leaves the total population unchanged, in the sense that the following equation holds $\sum_{i=1}^6 N_{it}^j = N^j, \forall t, j$.

$$N_{it}^j = \frac{N_t^j}{\sum_{i=1}^8 s_i p_i^j} s_i p_i^j \quad (A.1)$$

where, as already said, N_{it}^j represents the estimation of the number of people of region “j” living in families of type “i” at time “t”; N_t^j is the total population at time “t” in region “j”; s_i represents each of eight household sizes considered, and p_i^j represents the percentage of each type of household type in total household of region “j”⁴. Therefore, regional differences in families’ composition are captured mainly by mean of p_i^j .

Before describing next step, it is worth noticing that as a result of the application of any equivalence scale, only a fraction of the original number of household’s member (N_{it}) is considered. More precisely, only the fraction

$$\varphi = \frac{(\sum_{i=1}^M \alpha_i N_i)^\theta}{N_h} \leq 1 \quad (A.2)$$

is considered, where M represents the number of components’ types of the household (elderly people, adults, children...), α_i is the relative weight given to them and $\theta \in [0,1]$ represents the economies of scale within the household. Clearly, N_i represents the numerical weight of each member class inside the household

For example, let us consider the simple case in which per capita income is corrected applying the following formula (A.3) representing a sub-case of previous equation A.2 obtained posing $\alpha_i = 1$ for each type of household member

$$H = \frac{Y}{N_h^\theta} \quad (A.3)$$

where H represents per capita (corrected) household income, Y represents total household income, and N_h^θ , as mentioned, is the number of household members corrected by θ to capture the scale economies. In this case only the fraction

$$\varphi = \frac{N_h^\theta}{N_h} \leq 1 \quad (A.4)$$

of household’s member is considered. As further numeric example consider that - posing θ equal to 0,5 - in the case of a household composed by 3 members only the fraction $\varphi = \frac{\sqrt{3}}{3} = 0,58$ would be considered in order to compute its per capita income.

Clearly, the discourse could be extended to k families of the same type: of the total of kN_t people involved, only the fraction

⁴Data on p_i^j refers to 2008/2009 which, to the best of our knowledge, is the only datum available at present.

Rigorously the condition $\frac{N_{it}^j}{s_i} \in \mathbb{N}^+$, $\forall i, t$ should be verified. However, for computational difficulties, the more general condition $\frac{N_{it}^j}{s_i} \in \mathbb{R}^+$, $\forall i, t$ is assumed.

$$\varphi = \frac{k(\sum_{i=1}^M \alpha_i N_i)^\theta}{kN_h} \leq 1 \quad (A.5)$$

would be considered⁵.

Therefore, it is possible to calculate the fraction of household's member considered when the OECD equivalence scale is utilised according to different household composition. Indeed, this scale allows for three degrees of differentiation assigning, for each household, a value of 1 to the first household member, of 0.7 to each additional adult and of 0.5 to each child.

Table A.2 below reports the ratio between household members considered and effective number of people of the household – i.e. a different measure of φ in terms of framework developed above - for each of eight household types considered in this work.

Table A.2 – Household type and share of household size considered according to the OECD equivalence scale

Household type*	φ
1 adult without children	1
2 adults without children	0,85
3 or more adults without children	0,8
1 adult with children	0,75
2 adults with 1 child	0,73
2 adults with 2 children	0,68
2 adults with 3 or more children	0,62
3 or more adults with children	0,65

*for computational purpose open intervals have been set as follows: “3 or more adults without children” as 3 adults; “2 adults with 3 or more children” as 2 adults with 4 children; “3 or more adults with children” as 3 adults and 3 children.

Therefore, to each population class (N_{it}^j) can be applied the correspondent correction factor φ_i in order to obtain the respective household size corrected for household size and composition (S_{it}^j) by applying the formula

$$S_{it}^j = N_{it}^j \varphi_i \quad (A.6)$$

Once obtained measures of S_{it}^j , the aggregate datum computed according to the following formula

$$\sum_{i=1}^6 S_{it}^j = S_t^j \quad (A.7)$$

⁵ Clearly, the k values of H will depend also on the series of k values of Y.

can be used to compute GDHI per head values that – to same extent - take into account differences in household size and composition across regions. Hence, the following formula consisting in the ration between aggregate income earned by households resident in region j (Y_t^j)⁶ and a measure of aggregate population (S_t^j) taking into account, as said, differences in household size and composition across regions

$$H_t^j = \frac{Y_t^j}{S_t^j} \quad (A.8)$$

has been applied in order to compute per head values of GDHI in region “ j ” (H_t^j). The final step consisted in computing the Gini index of H_t^j across the “ R ” regions, by year, according to the formula

$$G(H^j) = \frac{\sum_{j=1}^{R-1} (\rho_j - q_j)}{\sum_{j=1}^{R-1} (\rho_j)} \quad (A.9)$$

where $\rho_j = \frac{j}{R}$ and $q_j = \frac{H^1 + H^2 + \dots + H^j}{\sum_{j=1}^R H^j}$, with $H^j \leq H^{j+1}$ (i.e. H is non-decreasing ordered)⁷.

As for the measure of “Spatial Policy”, it was obtained by calculating first per head values (PI) of BPI (see Table A.1) according to the formula

$$PI_t^j = \frac{BPI_t^j}{S_t^j} \quad (A.10)$$

Then calculating the Gini index of PI according to the formula

$$G^i(PI^j) = \frac{\sum_{j=1}^{R-1} (\rho_j - q_j^i)}{\sum_{j=1}^{R-1} (\rho_j)} \quad (A.11)$$

Where, with time indices omitted, $\rho_j = \frac{j}{R}$ and $q_j^i = \frac{PI^1 + PI^2 + \dots + PI^j}{\sum_{j=1}^R PI^j}$, with $PI^j \leq PI^{j+1}$.

Finally, the variable “spatial policy” has been obtained as

$$SP = G^i(PI^j) - G(H^j) \quad (A.12)$$

⁶ Data on single household’s income are not available for the period considered in this analysis, therefore using aggregate data, rather than being an analyst’s choice, represents an “external data constraint” of the analysis.

⁷ Time indices omitted for easier notation.

As for the measure of polarisation, it was used the Generalised Esteban, Gardin and Ray (2007) polarisation index (EGR). Indeed, this measure builds on the Esteban and Ray (1994) polarisation index that involves the division of the original population into a small number of significant *homogeneous* groups - ρ - (*within-homogeneity condition*) in order to achieve a high degree of *heterogeneity across* groups. Following the methodology proposed by Aghevli and Mehran (1981) and Davies and Shorrocks (1989) we determined the optimal partition of the distribution in a given number (m) of groups (ρ^*). However, in so doing an “error” term arise in the measurement of dispersion with respect to the original distribution of income ($G(f)$) because of the consideration only of the disparity *across* group - ($G(\rho^*)$). This circumstance raised the the opportunity to correct the original measure reported below

$$P^{ER}(f, \alpha, \rho^*, \beta) = \sum_{j=1}^m \sum_{k=1}^m p_j^{1+\alpha} p_k |\mu_j - \mu_k| \quad (A.13)$$

where μ_j and p_j denote respectively the average income and the numerical weight of group j ; $\alpha \in [1, 1.6]$ is the parameter that captures the degree of sensitivity of our measure of polarisation.

Therefore, the measure of generalised polarisation proposed by Esteban et al. (2007), is given by the following

$$P^{EGR}(f, \alpha, \rho^*, \beta) = \frac{1}{2} \left(\sum_{j=1}^m \sum_{k=1}^m p_j^{1+\alpha} p_k |\mu'_j - \mu'_k| - \beta (G(f) - G(\rho^*)) \right) \quad (A.14)$$

where $\beta \geq 0$ is the parameter used to express the weight assigned to the error term ($G(f) - G(\rho^*)$) coming from groups division. Furthermore, to respect the scale invariance principle, we divide beforehand all incomes by the average income - i.e. $\mu'_j = \frac{\mu_j}{\mu}$ - and we divide the index by the scalar 2 to make its interval between 0 and 1 when the parameter α is equal to 1.

In our empirical exercise, adopting a four groups division, we fixed parameters α and β as follows. The parameter α has been settled equal to its upper bound (1,6) in order to emphasise the conceptual difference between distribution measures (Gini) and the polarization measure we adopted; the parameter β has been settled equal to 1. Indeed given that the EGR indexes has the Gini coefficients as a reference in both its terms, It would be reasonable, in terms of scale, to set a statistical value equal to the unit (Duro, 2005).

Therefore the formula we used is

$$P^{EGR}(f, \rho^*) = \frac{1}{2} \left(\sum_{j=1}^4 \sum_{k=1}^4 p_j^{2,16} p_k |\mu'_j - \mu'_k| - (G(f) - G(\rho^*)) \right) \quad (A.15)$$

BERR

Department for Business
Enterprise & Regulatory Reform



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Spatial Economics Research Centre (SERC)

London School of Economics
Houghton Street
London WC2A 2AE

Tel: 020 7852 3565

Fax: 020 7955 6848

Web: www.spatial-economics.ac.uk

SERC is an independent research centre funded by the Economic and Social Research Council (ESRC), Department for Business, Enterprise and Regulatory Reform (BERR), the Department for Communities and Local Government (CLG) and the Welsh Assembly Government.