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**REGIONAL SUCCESS  
AFTER BREXIT:  
THE NEED FOR NEW  
MEASURES**

**DAVID HEARNE  
AND ALEX DE RUYTER**

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**BREXIT STUDIES SERIES**

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# REGIONAL SUCCESS AFTER BREXIT

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# REGIONAL SUCCESS AFTER BREXIT: THE NEED FOR NEW MEASURES

BY

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# THINKING INSIDE THE BOX: DEFINING THE PROBLEM

## 1.1 OVERVIEW

This chapter offers a brief overview of the present state of evidence on regional disparities across Britain. We discuss the importance of different measures of regional economic performance before going on to challenge and extend conventional measures. The post-Brexit environment will pose notable challenges for regional policy, but also offers the opportunity to reassess regional needs and appropriate funding formulae. The chapter is laid out as follows:

- *Introduction* – Brexit forces us to reconsider regional inequalities and the introduction outlines the key issues that need to be addressed.
- *Defining the region* – The shifting sands of British regional policy have seen regions successively redefined from the top down. Here the authors reconsider various regional designations.

- *Existing measures* – This portion of the chapter outlines the main measures used to assess regional economic performance, most notably gross value added (GVA).
- *Commuting* – The chapter then describes how commuting has a major distortionary effect on GVA per capita – a measure used by the European Union (EU) in decisions about structural funding.
- *Demographics* – In this section, we consider the ways in which demographic factors can also have an impact on estimates of regional economic performance and deprivation.
- *Towards a better measure* – The chapter concludes by putting forward preferred measures of regional economic performance, whilst noting that all can be suffer from some crucial weaknesses that we address throughout the rest of the book.

## 1.2 INTRODUCTION

The Brexit vote has shone a harsh light on something that academics and practitioners have known for years: regional differences matter. In the West Midlands, almost 60% of votes were to leave the EU. In London, almost 60% of votes were to remain. Indeed, some have argued that the vote should be seen as the ‘revenge of places that don’t matter’ (Rodríguez-Pose, 2018). This has occurred in spite of the fact that EU structural funding has been concentrated in many of these regions and that a number of them are particularly exposed to EU trade (Los, McCann, Springford, & Thissen, 2017).

One of the most interesting findings from our recent ‘Brexit Roadshow’ has been a pervasive sense of inequity and abandonment across a diverse range of communities.

Comments such as ‘they [London] get everything’ (De Ruyter, Hearne, Guy, Semmens-Wheeler, & Goodwin, Forthcoming) and ‘nobody cares’ alongside disparaging remarks about the local area (De Ruyter et al., Forthcoming) illustrate communities that often seethe with resentment at perceived iniquities in the allocation of services.

Certainly, the extent of spatial inequality within the UK across some measures is striking (McCann, 2016). A man born in Blackpool can expect a lifespan shorter than his Albanian equivalent (Office for National Statistics (ONS), 2016a; World Health Organisation, 2016). A woman born in Kensington, in contrast, can expect to live past her 86th birthday, rivalling Japan for the world’s longest life expectancy. These differences are stark – if Blackpool could halve the gap between itself and Barnet in North London then the effects would be transformative. We also note that there is at least *prima facie* evidence of a link between some of them and the Brexit vote (Bell & Machin, 2016; Pidd, 2016).

This book makes a fundamental contribution to our understanding of these regional disparities in the light of Brexit, by introducing new measures that can help us further our understanding of those areas that have been ‘left-behind’. In doing so, it is necessary to tackle the fundamental issues in a systematic and logical way. As the infographic below demonstrates, the first is the question is what policy makers and practitioners are ultimately seeking to answer. In order to do this, however, the latter two questions must be addressed. After all, the appropriate policy response is likely to be very different depending on the answer to the second question, and much academic ink has been spilled trying to resolve it. In many ways, however, it is the third question that is most fundamental of all. In order to judge potential policy actions, we need to understand what regional success and failure look like.

What can and should be done about these disparities in light of Brexit?

Are these disparities due to the places people live...  
...or the people who live there?

What do we need to measure to answer this?

Although we know that regional imbalances in the UK span almost every domain, good policy requires more knowledge than this. In particular, it is necessary to quantify ‘success’ both in terms of living standards and the functional economic geography of an area. Existing measures fail to capture important aspects of both of these and the proposed ‘deflated’ measures can extend our understanding of these.

This book therefore builds upon official data and international best practice to develop a series of measures with which to assess regional living standards and economic performance before exploring the ramifications of these in light of the UK’s vote to leave the EU. We begin by critiquing what has become the *de facto* measure of regional economic performance – GVA per capita – and draw upon existing research to do so.

The main body of the book is concerned with deriving measures to best capture the true differences in both living standards and productivity across regions, particularly given that both academic evidence (Los et al., 2017) and a majority of experts believe that Brexit threatens to exacerbate these (De Ruyter, Hearne, & Tsiligiris, in prep.). Regional statistics in the UK do not take into account differences in the cost of living across the country.



This impacts a wide variety of measures including GVA, household incomes and wages. Happily, methodological developments over recent decades and the emergence of a greater variety of official data sources enable us to make an initial attempt to develop deflators to adjust for these issues. Although some of the methodological distinctions between different deflators are subtle, the overall issue and direction of adjustment is clear.

This is key to developing appropriate policy measures, both to mitigate the impact of Brexit on more vulnerable regions and household and to address many of the insecurities and inequalities that played a factor in the vote to leave the EU. The final portion of the book therefore discusses the policy questions raised by these issues. Brexit affords an opportunity to reassess funding formulae and we argue that this must take the findings of this book into account. Particular attention needs to be paid to the likely evolution of regional policy and funding in the light of Brexit.

### 1.3 DEFINING THE REGION

Recent years have seen a growing awareness of the importance of regional differences within the UK. Indeed, even the Chief Economist of the Bank of England has recently acknowledged the importance of regional differences across the UK economy (Haldane, 2018). It is clear that not only is the UK spatially unbalanced in an economic and social sense, but as continued interest in the so-called ‘West Lothian question’ shows, there is also a clear political imbalance between the devolved administrations in Scotland, Wales and Northern Ireland and the English regions.

As noted by Benneworth (2006), there are historical antecedents to the present devolution agenda. Added to this is the

need for a distinction between the region as an economic unit and the region as a facet of identity (Roberts & Baker, 2006). Indeed, the rise of a more assertive *English* identity that the Brexit vote has made clear (Henderson et al., 2016) could be seen as threatening this nascent regionalisation of politics. The overwhelming vote against a regional assembly in the North East of England in 2004 (Wood, Valler, Phelps, Raco, & Shirlow, 2006) might be seen in the same vein. Brexit itself exhibits a significant regional dimension with some recent research finding that regional differences in measured (psychological) character traits might have been important in the referendum (Garretsen, Stoker, Soudis, Martin, & Rentfrow, 2018).

Nevertheless, in spite of the fact that regional identity in Britain remains somewhat inchoate, the fact remains that the region is often the more sensible level on which to carry out economic policy. In fact, identity in the UK is often local more than regional – witness the fierce rivalry between underland and Newcastle (those who ‘mackem’ vs. those who ‘tackem’) or Birmingham and the Black Country. This may, in part, be a result of the historic political centralisation of the UK which has seen regional boundaries adjusted numerous times over the past century without adequate study as to what the functional economic geography looks like (Roberts & Baker, 2006).

We are left with three potential ways in which to ‘regionalise’ the UK.

In practical terms, it is not feasible to use TTWAs as they presently stand. Their major attraction is that they potentially capture the economic geography of an area better than any alternative. Unfortunately, for our purposes the 75% threshold is probably not appropriate, particularly given that mean values can be significantly affected by the commuting patterns of a relatively modest number of high income individuals. Given this, their failure to align with any administrative or political boundary is also a disadvantage.

Table 1. Types of Region.

Type of Region	Definition	Strengths	Weaknesses
Travel to Work Area (TTWA)	Defined by the ONS as regions in which 75% of the economically active population work within the area and, simultaneously, 75% of the working population are also resident in the area.	Captures areas with large commuting flows (such as Bromsgrove, Redditch and Tamworth into Birmingham). An official attempt to capture the functional economic geography of an area.	Potentially understates the importance of commuting, particularly for high-income individuals. A 90% figure might be more appropriate. Watford, St. Albans, Basildon and Stevenage are all London commuter towns but are not within the London TTWA. TTWAs also have no political significance (unlike city-regions or even Local Enterprise Partnerships (LEPs)), not least because commuter flows change over time.
City-Regions	Those areas which have become a 'Combined Authority'. Many have elected a 'metro-mayor' plus London, Scotland, Wales and Northern Ireland.	Areas of political significance with some powers over policy making. They also have an interest in local economic performance. This appears to be the level at which further devolution of powers is likely to occur.	Leaves large swathes of the country unaccounted for. London and the devolved nations are different in size and nature to the city-regions. Ignores the impact of substantial inward commuting in most of these areas (and the potential for more of this). Some have sought to mitigate this (e.g. by having 'observer' councils from the surrounding areas).
'Standard' Regions (e.g. NUTS2)	Standard statistical regions used by the EU when determining regional funding. Nowadays largely coterminous with official regions within the UK.	A wider range of data is typically available, particularly for larger regions. As a result, practitioners are typically familiar with the units of analysis.	The regions in question rarely overlap neatly with the economic geography of an area. These regions do not always overlap with the relevant political units (most notably Combined Authorities) either. Regional identity is often lacking (in contrast to, say, German <i>Länder</i> ).

Fundamentally, however, there is a relative paucity of data (particularly price data) on these areas, making them unusable for our purposes.

The attraction of using city-regions lies in their political salience. The emphasis of the so-called ‘New Economic Geography’ on agglomeration chimes nicely with this political *zeitgeist*, even though this may be more relevant to present-day developing countries than the UK (Krugman, 2011). Indeed, although the benefits of agglomeration are considered axiomatic by some in the policy community (Swinney, 2016), the empirical evidence is far from incontrovertible.

For example, Frick and Rodriguez-Pose (2018) find that small cities (up to 3 million inhabitants) are most conducive to rapid economic growth and some French data suggest that agglomeration effects are likely to be modest on a plant-level (Martin, Mayer, & Mayneris, 2011). Indeed, although some have found that agglomeration might support productivity growth (Rice, Venables, & Patacchini, 2006), recent work suggests that historical development paths are crucial (Beugelsdijk, Klasing, & Milionis, 2018).

Research suggests that, in the UK at least, the performance of cities and urban areas is intimately linked to the regions in which they are located (McCann, 2016). In addition, choice of residential location within a region (and the associated differences in cost) may in large part be due to differences in amenities offered. This, together with consumer preferences may partly explain differences between urban centres and their associated peri-urban areas and rural fringes. As a result, we initially consider differences at the level of nomenclature of territorial units for statistics (NUTS) Regions, before reconsidering the impact of our results at a more granular level. In doing so, we find some significant differences from published figures and suggest that this has salience for post-Brexit funding.

#### 1.4 EXISTING MEASURES – GDP AND GVA

Gross domestic product (GDP) per capita (and its sister measure GVA per capita) has come to be widely used by academics and policy makers as a crude proxy for both living standards and economic performance. It has been widely criticised, not least because it ignores environmental degradation and resource use (Dasgupta, 2008). If used as a measure of welfare, GDP is not value free: it assumes that an additional £1 of income is worth the same whether it accrues to a multi-millionaire or someone who is starving. Nevertheless it remains widely used, in part because it is a well-defined measure and is highly correlated with other measures of wellbeing and progress (e.g. the human development index). Indeed, some have even argued that GDP per capita is a better measure of happiness than most alternatives (Dipietro & Anoruo, 2006), although this is far from a majority view.

GVA (formerly known as GDP at basic prices), is equal to GDP but excludes taxes and subsidies. In spite of its problems, regional GVA per capita remains used in the policy community. The first part of this book draws upon the work of the ONS (Dunnell, 2009) and Gripaios and Bishop (2006), amongst others, arguing that GVA per capita is not a suitable measure of either regional productivity or regional wellbeing. The second part of the book develops official figures (including both regional GVA and regional gross disposable household income (GDHI) by assessing how subnational variations in purchasing power affect them. It investigates how this alters our perspective on relative regional performance. All of this has direct policy relevance for regional and national policy makers, particularly in light of Brexit.

Areas with GVA per capita of below 90% of the EU average are eligible for higher levels of funding from the EU's structural funds than those above this threshold (Department

for Communities and Local Government, 2014). In the UK, this includes a total of 13 regions (including Shropshire & Staffordshire in the West Midlands). Moreover, the present devolution agenda has meant that a number of local bodies have used GVA per capita as a yardstick against which they should be judged. As such, several LEPs have used it as a key performance metric in recent years (Greater Birmingham and Solihull Local Enterprise Partnership, 2016; Leicester and Leicestershire Local Economic Partnership, 2014).

Similarly, the West Midlands Combined Authority (WMCA) uses GVA in its vision for 2030 – aiming for GVA per head of 5% above the national average. Indeed, the WMCA strategic economic plan explicitly states, ‘increased GVA provides evidence for real growth in the West Midlands’ economy’ (WMCA, 2016). GVA per capita was quoted in the Government’s Industrial Strategy Green Paper as a measure of productivity and thus as justification for the ‘essential’ process of rebalancing growth across the country (Department for Business Energy & Industrial Strategy, 2017).

In the academic literature, spatial imbalances in the UK economy are widely commented on (Gardiner, Martin, Sunley, & Tyler, 2013; Martin, Pike, Tyler, & Gardiner, 2016; Rice & Venables, 2003), particularly in the fields of economic geography and regional studies. Even within the academic community, GVA per capita continues to be used as a shorthand for regional economic performance (see e.g. Huggins & Thompson, 2017; Ivanov & Webster, 2007; Lee, 2017).

## 1.5 COMMUTING AND ITS IMPACT

Whatever its merits and demerits as a statistic when applied nationwide, GVA per capita is not well suited to regional analysis, particularly for geographically small regions. For

this reason, the ONS explicitly counsels against using GVA per capita (Dunnell, 2009). To see why, note that it divides the amount produced by those *working* in an area by the number of people *living* in an area. For somewhere like the UK with large flows of commuters, this can produce a seriously biased picture.

A clear example of this relates to the comparison of strongly remain-voting Tower Hamlets in London and leave-voting Essex Thames Gateway (home to Basildon, Castle Point and Rochford). The former enjoys a GVA per capita almost 350% of the national average compared to the latter at just 72%. A superficial examination might, on this basis, suggest a relationship between incomes and the vote for Brexit. However, careful reflection of the data suggests that this might not be the case: residents in Tower Hamlets are only 18% better off than their counterparts in Essex Thames Gateway, suggesting that this effect is primarily due to commuter flows.

This objection is not new: for over a decade, researchers have noted that commuter flows seriously impact GVA measures, particularly in London (Roberts, 2004). It is this that leads to GVA per capita in Westminster to be almost 800% above the UK average. In fact, GVA per capita is higher in Islington (represented by the constituencies of Jeremy Corbyn and Emily Thornberry) than in Kensington and Chelsea. Taken to its extreme, GVA per capita in the City of London is £5.2 million (with a population of circa 8,000 and a workforce of some 483,000). Previously measures of so-called 'residence-based GVA' were produced (ONS, 2017g). This attempted to allocate that portion of GVA attributable to wage earners to their region of residence rather than their region of work. The calculation as it stood led to regional output being apportioned on the basis of neither residency nor workplace but some conceptually unclear hybrid measure of the two. As a result, it is no longer produced by the ONS.

An obvious corollary of this is that these distortions have a real impact on EU funding flows. GVA per capita in parts of Outer London is far below the national average as a large number of residents commute into Inner London each day. Perversely, therefore, were EU structural funding to be reassessed now, some of the wealthiest parts of Europe (North and East London) would receive higher levels of structural funding than other (much poorer) regions. An attenuated version of this phenomenon is visible in the West Midlands: one of the reasons Shropshire and Staffordshire have such low GVA per capita is due to an outflow of commuters into the metropolitan area (and to a much lesser extent north into Cheshire). The UK's exit from the EU potentially provides an opportunity to reassess some of these funding flows to ensure that they are targeted at the places (and people) that need them most.

## 1.6 DEMOGRAPHICS AND THE LABOUR MARKET

Demographic factors can also have a notable effect on any figures compiled on a per-capita basis. Most obviously, economic output is generated by those in work. The presence of children and the retired in an area will thus increase the denominator without affecting the numerator. This will be true even if they carry out activity that is socially useful, for example, volunteering, that is, not captured by official economic statistics.

Part of the confusion comes about because this is an acceptable practice on a national level. Germany and Japan, for example, struggle with rapidly ageing populations and pensions need to be paid by those still working. This may take the form of the return on assets acquired over a working lifetime or direct transfers but, in either case, effectively entails a transfer from the employed to the retired (Barr,



2002). Crucially, in the absence of a large net balance of foreign assets, most of this transfer comes within countries.

In contrast, on a regional basis, it is possible (indeed normal) for transfers to take place between regions. The Government may choose to tax workers in London in order to pay the pensions of those living in the South West. Alternatively, the workforce may use part of their income to purchase assets (a house, future pension investments, etc.) from those retirees who are moving to the South West. In either event, this involves a transfer of resources produced in London to be consumed in the South West. This process is both normal and healthy, but it has the effect of flattering the figures for London and depressing those for the South West. As such, whilst it is not true that GVA ‘excludes’ certain categories of income such as pensions as argued by Gripaos and Bishop (2006), it does measure economic output where it is generated rather than where the income flows to and is thus not a reliable measure of regional welfare.

This effect is quantitatively significant: London has a considerably higher proportion of its population of working age than other parts of the country. Similar effects are visible in other cities. Moreover, this effect has intensified over the past two decades, accounting for a non-trivial portion of the growing disparity between London and the rest of the UK. In 1997, for example, 66.2% of London’s population was of working age, compared to 62% in the South West. By 2016, these figures had diverged to 67.9% and 60.9%, respectively. This has a non-trivial impact: it accounts for 17.8% of the disparity in GVA per head between these two regions (authors’ calculations based on ONS, 2017f, 2018a).

Even accounting for these factors, however, important facets of labour market performance have a distinct impact on GVA. Lower employment in an area will, *ceteris paribus*, depress regional GVA. What’s less clear, however, is the extent to which this can be mitigated and whether attempting to do

so is a desirable policy option. By definition, those who are not employed are not generating measured economic output (although they are almost certainly generating *un*measured economic output – childcare, for example). GVA is affected by both employment and productivity, which may partly explain its popularity. As shown previously, employment can also vary due to demographic factors as well as due to commuting.

Whilst there is almost universal agreement that high unemployment rates are undesirable, GVA per capita is virtually uncorrelated with unemployment,<sup>1</sup> although there does appear to be some relationship between GVA growth and unemployment rates (see Revoredo-Giha, Leat, & Renwick, 2012, in relation to Scotland; and Kangasharju, Tavera, and Nijkamp, 2012, for evidence from Finland). Tower Hamlets, for example, enjoyed both the fourth-highest GVA per capita of any local authority and had the joint highest unemployment rate of any local authority. Whilst the boroughs of Inner London are undoubtedly somewhat exceptional in this regard, the more general point stands: on a subregional level, GVA per capita relates poorly to several macroeconomic variables of interest.

More broadly, unemployment today represents just a small fraction of the total number of working-age individuals who are not employed. Part of this is relatively easy to correct for: official statistics view the working age population as being between 16 and 65 even though it is now a legal requirement for those aged between 16 and 18 in England to remain in education or undertake training. Whilst, in theory, it is possible to begin an apprenticeship (or work at least 20 hours per week if one is in part-time education), the scarcity of places means that most continue in full-time education until 18 or 19.

The presence of a large university student population can have a very similar effect on an area as many students choose not to work (or work very few hours). This may be one reason why Oxford, for example, has a GVA per capita below that of Milton Keynes (although both are well above the national

average). At the other end of the scale, early retirement, whilst not as prominent as it once was, has a very substantial effect on employment amongst those aged over 50. In truth, therefore, these are demographic factors impacting on employment masquerading under the guise of ‘economic inactivity’. Whilst they constitute another reason not to use GVA per capita as a measure of economic performance, they also have important consequences for welfare that we shall return to.

All of these issues take on additional salience in light of the vote to leave the EU. In particular, the use of alternative metrics (including those we highlight below) to direct funding flows should be considered. Indeed, it is arguable that use of existing measures has been one of several factors that might have driven some of the imbalances in regional spending identified in Chapter 4. As such, there are notable policy ramifications that the UK should consider, especially in light of the vote to leave the EU, whatever form the UK’s future relationship with that body takes.

### 1.7 TOWARDS A BETTER MEASURE: GDHI PER CAPITA AND GVA PER WORKER

GVA per capita is therefore a poor measure of regional economic performance. In light of this, we urge that greater attention be paid to two alternatives: GVA per hour worked and GDHI per capita. The first of these is a measure of productivity and the second measures household incomes (the relevant metric for assessing regional welfare, at least on a monetary basis; a full definition is given in Appendix 1). We believe that this is a better solution than merely reshaping the relevant statistical areas, although the broader argument that statistical areas should take account of the underlying economic geography of an area as argued by Gripiaios and Bishop (2006) remains valid.

Crucially, these two measures maintain the distinction between those who *work* in an area and those who *live* in the area. As such, GVA per hour worked measures the amount produced by each member of the workforce per hour in a given region. In practical terms, it gives similar results to GVA per worker but accounts for the fact that hours worked vary across regions (Londoners in particular work slightly longer hours than those living elsewhere). Nevertheless, total hours worked can be difficult to measure accurately, particularly in cases where unpaid overtime is common. As a result, regional GVA per hour worked (which is reported by the ONS) can be somewhat erratic: smoothing the series (e.g. by taking a moving average) is likely to ameliorate this somewhat.

The effect of this is dramatic: pushed up by net-inflows of commuters, a long-hours culture and a high working age population, London's GVA per capita is 76.5% higher than the national average. Its labour productivity, as measured by its GVA per hour worked (ONS, 2018e), however, is only 33.3% above the national average. The same is true in reverse for other regions: Yorkshire moves from being 21.5% below the UK average to 15.2% below. It is therefore positive that a number of LEAs are now using GVA per worker or GVA per hour as a more effective measure of economic performance (Greater Birmingham and Solihull Local Enterprise Partnership, 2018; North East Local Enterprise Partnership, 2018).

Fig. 1 gives a sense of the magnitude of the distortion. Whilst GVA per capita fails to measure *either* productivity *or* living standards, GVA per hour is a measure of the former whilst GDHI per capita is a measure of the latter. Although London stands out as a region where such distortions are particularly prevalent, very noticeable differences between GVA per capita and the other measures also appear in Wales and the North East of England.

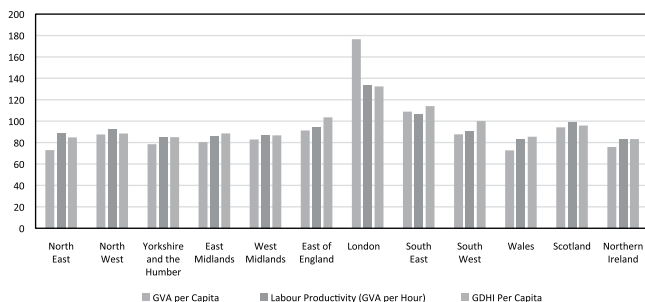


Fig. 1. Comparative Economic Performance.

*Source:* ONS (2017f, 2018e, 2018f).

The fact that these figures do not take into account differences in prices across regions, together with the difficulty of measuring the size of the financial services and real estate sectors mean that official figures can reasonably be assumed to be an upper bound on regional productivity disparities. The fundamental methodological issue at play here (the absence of subnational price parities) is not unique to the UK – indeed there is an emerging literature on the subject. As such, over the past 20 years a variety of attempts have been made in a number of countries to calculate regional price levels. Due to data limitations these have often been partial but a nascent research agenda is, in fact, developing on the subject.

As in a number of areas regarding economic and social statistics, the United States is in the vanguard of these developments with an official price index and attempts to deflate regional earnings (Aten, Figueroa, Mbu, & Vengelen, 2017). The Australian Bureau of Statistics produced an experimental set of spatial price indices (Waschka, Milne, Khoo, Quirey, & Zhao, 2003) although like the work of the ONS, these excluded housing costs (ONS, 2011, 2018g). The methodological approach of the Australian work was broadly similar to that of the ONS' later works (although not earlier attempts

to compare regional prices (Ball & Fenwick, 2004; Wingfield, Fenwick, & Smith, 2005) and our own, with the exception of excluding housing costs.

There have been several pieces of work considering regional price differences within China (Gong & Meng, 2008; Jiang & Li, 2006; Li & Gibson, 2014), although some more recent work has suggested that the ‘Law of One Price’ holds for some regions (Liu, Su, Chang, & Xiong, 2018). Within Europe work has been somewhat more limited, although there have been a number of promising studies with regard to Czechia (see e.g. Cadil, Mazouch, Musil, & Kramulova, 2014), whilst Roos (2006) used an econometric model to estimate regional prices in Germany, showing that East–West differentials are reduced when price differences are accounted for. In Italy, there is now official interest in calculating subnational purchasing power parities (Biggeri, Laureti, & Polidoro, 2017).

The following chapters are devoted to a discussion of these issues in the UK case and, critically, how new estimates can be used to better understand regional disparities. These regional disparities are the context within which the vote to leave the EU occurred. The Brexit vote did not cause these fissures, but it has exposed them and, if inappropriate policies are pursued, threatens to exaggerate them (Los et al., 2017). As such, a fuller understanding is needed of those regions that have been ‘left behind’ and this book is a contribution to that wider debate.

## NOTE

1. At NUTS2 level, the correlation between Jan. and Dec. unemployment rate, as measured by the Annual Population Survey (ONS, 2017a) and GVA per capita, as measured by the Regional Accounts (ONS, 2017f) was  $-0.01$  in 2016.

## 2

# THINKING OUTSIDE THE BOX (PART 1): REAL LIVING STANDARDS

### 2.1 OVERVIEW

When comparing regional living standards, we're typically most interested in the welfare of residents of an area (rather than its workforce). This chapter discusses the preferred welfare measure of many in the Office for National Statistics (ONS) (Dunnell, 2009) – gross disposable household income (GDHI) – before touching on a measure of deprivation, namely the Index of Multiple Deprivation (IMD). This has critical salience for those 'left-behind' (Goodwin & Heath, 2016) in the 'places that don't matter' who voted most strongly to leave the European Union (EU) (Rodríguez-Pose, 2018). The chapter is structured as follows:

- *Introduction* – This section gives a brief discussion of GDHI per capita, its component parts and the regionalisation process adopted by the ONS.
- *Price levels* – Here we introduce a more detailed discussion of the primary weakness of the GDHI measure: its failure to account for different living costs across

regions. We draw on the latest data to develop and appropriate correction for this and demonstrate its impact.

- *Operating surplus* – This addresses a further relatively minor technical issue in the regionalisation process used to account for imputed rent.
- *Inequality* – GDHI takes no account of inequality and this section discusses the possible scale of the issue.
- *IMD* – Here we briefly discuss the IMD, noting its advantages and disadvantages, and show that it requires similar corrections to GDHI in order to take account differences in the cost of living across Britain.

## 2.2 INTRODUCTION

GDHI per capita is a measure of average regional living standards. It includes household income from all sources and, unlike GVA, is calculated on the basis of residency. Thus, if a pensioner living in Devon receives investment income that is ultimately generated by profits from a company in London then it is counted as disposable income in the South West. As such, it is a superior measure of average living standards, but should not be used to measure productivity, regional output or to describe the economic geography of an area.

GDHI is defined by the ONS as being ‘the amount of money that individuals in the household sector have available for spending or saving [...] after expenditure associated with income, for example taxes and social contributions’ (West et al., 2016, p. 34). The regional GDHI figures published by the ONS are compiled on a ‘top-down’ basis. In practical terms, this means that the ONS begins with national aggregates for each component part of GDHI and then uses a variety of indicators to apportion them in turn to each region.



GDHI does not map neatly to the ‘cash income’ of individuals as it includes implicit income, such as the implicit rent earned by owner–occupiers. In fact, this is a strength rather than a weakness – the fact that no money physically changes hands should not blind us to the fact that owner–occupiers receive ‘income’ in the form of not having to pay rent. In effect, they pay rent to themselves. A further major strength of GDHI per capita is that, unlike measures of deprivation, it includes the entire population in its scope. Whilst attention is rightly focussed on the very poor, a true measure of overall regional welfare should include those ‘just about managing’ (Parkinson, 2016), the middle classes and the well-off. Indeed, Sayer (2017) sees the focus on income and the ‘left behind’ as overdone (although the evidence of Becker, Fetzer, & Novy, 2017) seems to contradict this.

GDHI does have major weaknesses. Firstly, like gross domestic product per capita, it tells us nothing about inequality. Most importantly of all, it measures income in purely nominal terms. Whilst it may appear sensible to measure income in terms of pounds and pence, the reality is that the cost of living varies enormously across regions. In many ways this is intuitively obvious: anyone who has spent time in both London and other parts of the country will be well aware of how much further your money goes in the latter. A classic example of this is the cost of an average pint of beer – in London this is £4.20, whereas in Herefordshire it’s just £3.31.<sup>1</sup>

### 2.3 PRICE LEVELS

An accurate measure of regional living standards must adjust for these differences in regional price levels. In this chapter, we build on the methodology introduced in Hearne (Forthcoming-b) and use the very latest data to show that accounting

for different regional price levels more than halves the disparity between London and Yorkshire in 2016. This has very obvious ramifications for regional policy and particularly for post-Brexit funding flows. It also refines our existing perceptions of the UK's 'regional problem' (Hardill, Benneworth, Baker, & Budd, 2006) and spatial imbalances and suggests both challenges to, and further scope to develop, the Government's 'Northern Powerhouse', 'Midlands Engine' and 'Industrial Strategy' agendas.

Interestingly, whilst the UK practice of using nominal data is standard within Europe, it is by no means universal internationally. The Bureau of Economic Analysis in the United States, for example, publishes estimates of regional price parities and finds that prices in the state of New York are 34% higher than those of Mississippi. The effects are dramatic: instead of New Yorkers being 69% better off than Mississippians, in real terms the gap is a less extreme 26% (Aten, Figueroa, Mbu, & Vengelen, 2017). Our work seeks to develop figures for the UK in line with this international best practice.

The pattern of areas with high nominal incomes also experiencing higher than average price levels is well established, particularly within the academic literature on international economics (see Asea & Corden, 1994, for an overview). There is growing evidence that the same is true on a regional level, with examples as diverse as Italy (Nenna, 2001) and China (Jiang & Li, 2006), amongst others. It's thus likely, *prima facie*, that the same is true within the UK. There is now a mature, high quality academic literature investigating regional differences and inequalities both within the UK and internationally (see McCann, 2016, for an in-depth treatment of the UK case, work from Beugelsdijk, Klasing, & Milionis, 2018, for an example of the Europe-wide debate and Lemoine, Poncet, & Ünal, 2015, for a discussion of the Chinese case).

Nevertheless, in spite of its importance, only a modest portion of this work has focussed on regional prices. This has not been lost on many observers: as Blien, Gartner, Stüber, and Wolf (2009, p. 17) note, '[T]hrough the value of information on regional prices is obvious, there is a lack of empirical data in many countries'. Official interest in regional prices in the UK initially surfaced in the 1960s (Retail Prices Index Advisory Committee, 1971), but little was done. In fact, only with the advent of Eurostat's need for Spatial Adjustment Factors did official attention return to the matter.

In the interim, and particularly during the 1990s, academic attention was paid to the development of regional price indices. Regional prices diverged significantly over the course of the 1980s (Borooah, McGregor, McKee, & Mulholland, 1996), and this had a noteworthy effect on the spatial distribution real wages for both manual and non-manual workers (Martin & Tyler, 1994). Indeed, Johnston, McKinney, and Stark (1996) found that the cost of living in London went from being 5% greater than the UK average to 7.5% between the beginning and end of the 1980s. Hayes (2005) attempted to create a pure 'price index' and found that from 1979 to 1996, inflation across regions was highly correlated but that there was some regional heterogeneity.

All of these authors made use of the regional price data collected by the Croner-Reward Cost of Living Surveys, which were the only data available on regional prices during the period in question. Today, we have the luxury of using official data, which whilst only collected every six years do have considerably larger sample sizes. The Croner-Reward data in question were discontinued and all the academic articles in question refer to prices in the mid-1990s or earlier.

A second change over the past two decades is methodological. Much previous work (see e.g. Borooah et al., 1996; Rienzo, 2017) drew on the methodology used by the retail

price index (RPI), which was at the time the gold standard measure of inflation in the UK. Today, the ONS has moved away from using the RPI as new, internationally comparable, measures of inflation have been developed which incorporate the latest developments and techniques.

Deciding on the most appropriate method to compare prices across regions is unfortunately not as straightforward as it might at first appear. This is primarily due to the fact that not all prices differ by the same amount: the cost of broadband is broadly similar in London or Newcastle, but the cost of putting a roof over one's head definitely isn't. Londoners typically spend a greater proportion of their income on housing and live in smaller properties than those in the North East. This problem is compounded by the fact that consumption patterns can differ across regions. For example, the presence of a high quality mass transit network in London combined with high levels of congestion means that transport spending differs in both amount and composition (ONS, 2017d).

We use the same methodology and data sources outlined in Hearne (Forthcoming-b). Since that work, however, the ONS have released relative regional consumer price levels (RRCPLs) for 2016 allowing us to provide an up-to-date assessment of relative regional living standards. The 2016 ONS RRCPLs are used as the base for our calculations. The ONS do not include housing costs in the RRCPLs, so our work needs to appropriately incorporate housing costs in order to assess the true cost of living in each region.

Additionally, as outlined in Hearne (Forthcoming-b), our figures are compiled on the basis of the spending of residents of a region, whereas the ONS' RRCPLs are compiled on the basis of what is spent in a region rather than on the basis of what is spent by residents of a region. As a result, they do not include money spent by residents outside of the region but they do include that spent by non-residents inside the region (e.g. by tourists). Whilst this is conceptually correct for their

purposes, it is not appropriate for assessing living standards. As a result, we adjust for both factors.

As in 2010, a detailed breakdown of regional prices is not available at the division level (ONS, 2011). Two options are available at this point in order to operationalise our calculation of relative regional prices. The first is to assume that prices for all goods except housing are identical in English regions outside London (allowing one to use the detailed breakdowns available for Scotland, Wales, London and 'Rest of England'). The second alternative is to use the aggregated figures available by region, but accept that division-level results are not available. As non-housing costs inside England (excluding the capital) appear to differ by over 5% the second approach seems the most sensible.

We therefore break up each region's total spending into five constituent parts:

- (1) Expenditure categories accounted for by the RRCPLs (this represented the majority of total consumer spending in every region – typically around 65%).
- (2) Expenditure on things whose prices were assumed not to vary across regions (primarily holiday expenditure).
- (3) Expenditure on privately rented housing.
- (4) Expenditure on socially rented housing.
- (5) Owner occupiers housing costs.

Health and (private) education spending by consumers fell into the second category – prescription charges are uniform across England and prices for items such as glasses and contact lenses are unlikely to vary much. In the absence of any further data, private education and health care is assumed to be equally costly irrespective of location. This is unlikely to have a major effect on the total price index as both items combined account for around 2.5% of total spending in the UK.

Two main data sources are used. The living costs and food (LCF) survey is used to ascertain what proportion of total spending is accounted for by each category.<sup>2</sup> In order to do so, two transformations are needed. The LCF survey gives an inventory of average total expenditure per household in each region. Unfortunately, not all forms of expenditure are relevant for the calculation of price levels. As a result, we exclude those things that are not relevant to a price index (specifically, mortgage interest payments, savings and cash transfers and gifts). Similarly, the housing services enjoyed by owner-occupiers are implicit rather than explicit.

This is important: estimates of incomes and price levels need to be constructed on a systematic and consistent basis. In order to do so, it is necessary to distinguish the cost of putting a roof over one's head (what we're interested in) from the cost of buying a house as an asset. In essence, we need to split the 'owner' from the 'occupier'. The conceptually correct way to do this is as follows: the occupant pays rent to the owner. As both are the same person in this case no money actually changes hands – the transaction is implicit.

From the perspective of the occupant, the implicit rent *paid* can be thought of as the true cost of putting a roof over one's head. As this is a service, it needs to be included in any measure of the cost of living. From the perspective of the owner, the rent *received* is part of the return earned from owning the asset (i.e. the property). This can be thought of as similar to the dividend from a share or coupon on a bond.<sup>3</sup> The remainder of the return is the capital gain or loss realised upon the sale of the property.

How much should this 'implicit' rental payment actually be? The obvious solution is also the correct one: the price of renting an identical property on the private market. Whilst, in practical terms, this is likely to be almost impossible for certain types of properties in some areas (e.g. the rental market for

four bedroom houses in most areas is rather thin), when comparing across larger regions this does not present a problem.

The proportion of total expenditure accounted for by imputed rents can be estimated by multiplying total spending on gross rents in the LCF survey by:

$$\frac{\text{Proportion of owner occupiers in region} \div}{\text{Proportion of renters in region}}$$

The proportion of owner-occupiers by region can be ascertained from the Family Resources Survey (FRS). This also allows one to break down rents into the private and social renting sectors. The FRS was also used to estimate relative rental prices for both sectors (private and social rents). Private rents are the appropriate yardstick to use for the cost of owner-occupied housing.

## 2.4 OPERATING SURPLUS

One additional, relatively minor, issue relates to the method used by the ONS for apportioning imputed rents. Gross operating surplus represents around 10% of primary resources in the UK as a whole (typically rather more in London and the South East) and ‘relates to the household sector’s rental income from buildings, including the imputed rental of owner-occupier dwellings’ (West et al., 2016, p. 36).

As noted previously, regional GDHI is calculated on a top-down basis by allocating a proportion of each national component (operating surplus, mixed income, compensation of employees, etc.) to regions and then summing them. As the ONS points out, ‘[t]he national operating surplus total is regionalised using estimates of median property prices by region’. This approach implicitly assumes that regional rents are perfectly correlated with median regional property prices.

In theory this should be the case: property is an asset and if the returns on that asset are greater in one region than in another then there is a clear incentive to purchase property in the region which offers greater returns. Several factors, however, suggest that this may not be the case in practice. Firstly, rents from a property form only part of the expected returns – they are the running yield, with the remainder of the expected returns accounted for by anticipated capital appreciation. This speculation appears to have played a significant part in divergent trends in property prices in recent years.

Secondly, imperfections in capital markets and frictions associated with buying and selling property may mean that any equilibrating forces act only slowly. Experimental statistics from the ONS suggest that house prices have diverged to a much greater extent than rents since 2010. In particular, between January 2011 and January 2018, rents in the North East increased by 4.3% compared to 23% in London (ONS, 2018c). In contrast, house prices increased by 5.1% in the North East and 69% in London over the same period (ONS, 2018h).

As a result, using house prices rather than rents will lead to GDHI overstating improvements in living standards in London relative to those in the North East. Whilst the effects are modest relative to the changes induced by accounting for price differences, they compress the gap between London and the North still further. After recalculating the figures using the relative rents in the FRS, we find that Londoners are only 20% better off than their counterparts in the North East and those in the South East around 16% better off than the inhabitants of Yorkshire.

Naturally, the FRS is not an infallible data source either: sample sizes are relatively small and relative regional rents vary substantially from year to year. Moreover, data from the Valuations Office Agency (2017) and Unison (2017) suggest that regional disparities in rents are significantly greater than the FRS would



indicate. As a result we are faced with an alternative – the ‘Operating Surplus’ portion of GDHI contains an implicit measure of relative regional housing costs. If we follow the regionalisation procedure outlined by the ONS (West et al., 2016) in reverse (by using data on housing stock by region) then we can calculate the relative regional housing costs implied by the GDHI.

## 2.5 THE RESULTS

This completes work to find a set of appropriate expenditure weights for each region. We can then use the relative prices provided by the FRS or those ‘back calculated’ from the GDHI for housing costs and the RRCPLs for everything else. The Èltetö-Köves-Szulc procedure (explained in greater depth in Appendix 2) can then be used to calculate relative prices, based upon the five categories.<sup>4</sup> Whilst in theory the slightly different aggregation procedure we use relative to the OECD (as a result of data limitations) could have an impact on the price levels we calculate, in practice the difference is likely to be tiny (and in all probability dwarfed by measurement error in the ONS surveys used).

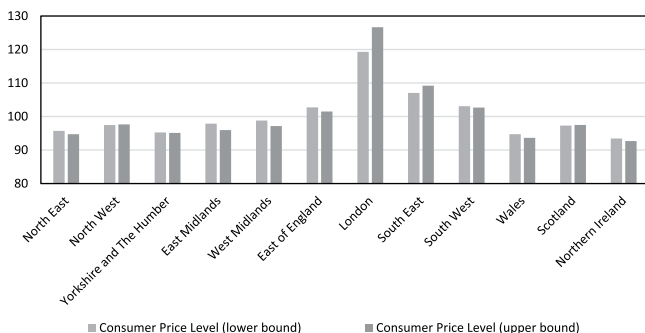


Fig. 2. Estimated Regional Consumer Price Levels.

Source: authors' calculations.

As can be seen in Fig. 2, whilst the choice of measure for housing costs does indeed make a difference, the overall pattern of results is clear in either case. London is, by far, the most expensive region in the UK in which to live. This is followed by other southern parts of the UK with the northern regions of England and Wales proving to be the cheapest parts of the country to live. This fits rather well with common perceptions of prices in different parts of the country.

## 2.6 REAL REGIONAL GDHI

The next graph (Fig. 3) shows the impact of regional price variations on household incomes across Great Britain. ‘Method 1’ in the graph refers to using the FRS data on housing costs but re-allocating households operating surplus across regions on this basis of these. ‘Method 2’ uses the nominal regional GDHI figures as-is but the deflator uses the estimates of housing-costs derived directly from the GDHI itself. Both figures ultimately deliver extremely close results.

The principal impact is to greatly narrow the divide between North and South. The impact on London is particularly striking: the average Londoner falls from being 71% better off than their Welsh counterpart to being ‘only’ 27% better off. Whilst this remains a substantial difference, it is not the veritable chasm that official data make it look. Moreover, although London is an outlier, an attenuated version of the same phenomenon is visible across the UK: the gap between Yorkshire and the South East falls from 37% to 19%, for example.

Moreover, this analysis alters the ranking of regions within the UK. The North East, Yorkshire & Humberside and Wales all overtake the West Midlands due to their lower cost of living. Scotland appears as well off as the ‘East of England’ (comprising Hertfordshire, Essex and Bedfordshire as well as East Anglia) and at least as well off as the South West.

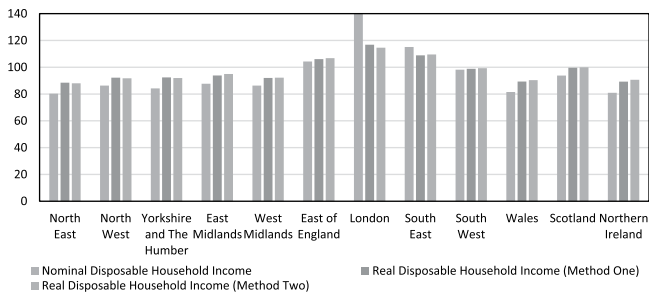


Fig. 3. Real Regional Incomes in the UK.

*Sources:* Nominal Gross Disposable Household Income (ONS, 2018f). Real Gross Disposable Household Income (authors' calculations – both methods).

The same fundamental point will apply to any regional data regarding incomes. Wages are proportionately affected, for example. Moreover, the phenomenon is equally visible at the level of urban subregions. If we assume that price levels differ across regions but are broadly constant within them,<sup>5</sup> then some indicative comparisons are possible. In Fig. 4 below, we consider the case of the Combined Authorities (plus London). As can be seen, the broad pattern exhibited by the nominal data remains unchanged, although the gaps between regions are smaller. The clear exception to this rule is the West Midlands, which falls further behind its peers as the poorest Combined Authority in the UK. Again, this is interesting in light of the Brexit vote – a number of local authorities in this area had an exceptionally large vote in favour of leaving the EU. The other notable feature is that London stands out far less: this is particularly true when one considers that London itself contains a handful of standout boroughs (most notably Kensington & Chelsea, Hammersmith & Fulham, Westminster, the City of London & Camden) that drive its anomalous performance.

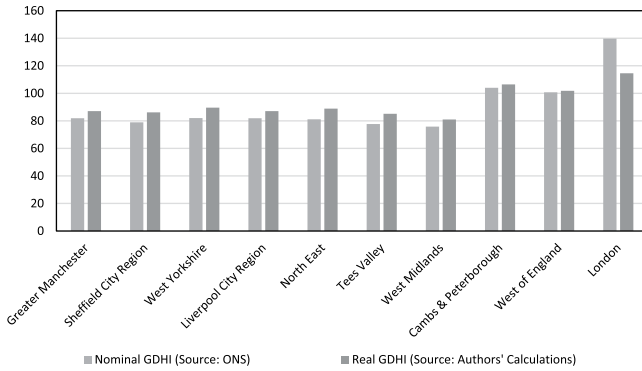


Fig. 4. GDHI Per Capita in Combined Authorities (UK = 100). Sources: (ONS, 2018f) and authors' calculation as specified.

## 2.7 INEQUALITY

As GDHI is based upon mean incomes, it can be skewed by a relatively small number of extremely high earners. Similar issues clearly arise in the case where wealth is concentrated or where there is an unusually wide spread of rents in the property market. It should be noted that this only poses a problem for regional analysis when there are marked differences in structure between regions. In practical terms, this effect is visible but only in London, the South East and East of England.

The single largest contributor to GDHI is wages and salaries, with employers' social contributions also likely to be broadly proportional to these. High quality data in the form of the Annual Survey of Hours and Earnings (ASHE) (ONS, 2017b) exist on both mean and median wages in the UK. Considering the delta between these can give a crude measure of the impact of extremely high earners on average earnings. In all regions outside the Greater South East, median full-time earnings are between 83% and 87% of mean full-time earnings. These figures are 80.3%, 80.2% and 76.4% for the East of England, the South East and London, respectively.

In fact, if one uses the upper-bound price levels calculated previously and the ASHE dataset, median real full-time wages of Londoners are the second-lowest in the UK (after the South West). By this measure, *there is no North–South divide in the UK*. In fact, regional differences in median full-time earnings almost vanish and there is very little geographical pattern to them. Mean wages are, of course, another matter entirely since they are skewed by the earnings of the very wealthy and it is here that the traditional North–South divide reasserts itself.

This implies that it is the wages of those towards the top of the income distribution that show notable divergence between regions. For those on low or medium incomes (around 75% of the population), the difference in regional incomes is approximately equal to the difference in prices. Indeed, tentative evidence suggests that 99th percentile wages for employees working in London are 6.9 times median wages, compared to just 4.7 times in the rest of the country (ONS, 2016b). The upshot of this is that there is no systematic wage incentive for workers around the middle of the income distribution to relocate, which accords with what economic theory would predict.

Meanwhile, non-wage income (particularly from property) is considerably higher in the South of England than elsewhere, reflecting the concentration of wealth in that area. Analysis suggests that the spread in rents (which determine the imputed housing services ascribed to owner–occupiers) is much greater in London and the South East than elsewhere. Median rents are over 90% of mean rents in every region outside the Greater South East (in London the equivalent figure is 85.5% according to the Valuation Office Agency, 2018). To the extent that income of the bottom 80% (or even 90%) of the population distribution might be considered a better measure of aggregate welfare, it may be worth seeking to develop ways in which to take this into account.

One additional issue that regional policy makers may face when using GDHI is that it measures income after taxes and benefits have been paid. As a measure of the income that people ultimately have to spend, this is conceptually the correct thing to do. Many regional policy makers, however, may be interested in income before Government intervention. This is also reported by the ONS in the GDHI statistics, albeit under the guise of 'primary income' (in both cases, per capita measurements should be used). When comparing tax and spending policies, the nominal data (as published) should be used, whereas if one is interested in assessing real incomes (excluding taxes and benefits) then an adjustment needs to be made for differing relative consumer price levels.

## 2.8 THE INDEX OF MULTIPLE DEPRIVATION

The prospect of Brexit may afford the opportunity to move away from traditional funding formulae based upon GVA per capita. One alternative measure that has attracted attention from policy makers in the local government sphere is the IMD. This official statistic acknowledges that there are multiple facets of deprivation and has been produced for England (Ministry of Housing Communities & Local Government, 2015), Scotland (Scottish Government, 2016) and Wales (Welsh Government, 2015). A similar index is also produced by the Northern Ireland Statistics and Research Agency (2017). This official statistic has been used as a measure of deprivation by recent work on well-being (Abreu, Oner, Brouwer, & van Leeuwen, 2018). The IMD focusses particularly heavily on identifying areas where deprivation is particularly heavily concentrated. Whilst this might be considered a strength, it also poses certain challenges for regional policy makers.

Firstly, it only focusses on a subset of the total community. This is both a strength and a weakness – there is clearly value in considering the most deprived households. It is important to identify those areas where deprivation is particularly concentrated. Nevertheless, it does not necessarily allow us to identify the extent to which deprivation is due to inter-area inequality (in which case the focus is rightly on spatial disparities) as opposed to intra-area inequality (as is the case in certain parts of London).

Moreover, the presence of deprived communities does not necessarily indicate weakness or absence of opportunity in the regional economy. Tower Hamlets remains one of the most deprived areas of the country, but this is not due to an absence of economic activity in the borough (which boasts a surfeit of highly paid jobs due to the presence of Canary Wharf). Rather, factors such as a lack of skills, social capital and networks lead to the inhabitants being unable to access opportunities that are there. The result is a clearly bifurcated local labour market.

Furthermore, the IMD does not avoid the ‘cost of living’ issues identified above. In the English IMD, the overall rank of an area is extremely highly correlated with its rank on the income portion (Ministry of Housing Communities & Local Government, 2015). In fact, a correlation coefficient of 0.95 means that we can almost perfectly predict an area’s relative overall deprivation from its deprivation on an income score. The problem here is that the incomes in question are *nominal* – once again they fail to adjust for differences in prices across the country. Indeed, our evidence suggests that there is a strong rationale for adopting a more holistic view of regional disparities, such as that proposed by Perrons and Dunford (2013) with the clear caveat that any part of the index that is based upon income should adjust for price differences across regions (and particularly in London).

## 2.9 CONCLUSION

This chapter has shown that relative regional price levels have a considerable impact on regional incomes. This has important consequences given that local authorities with lower nominal per capita household disposable income tended to vote in favour of Brexit. The same pattern is visible for wages. It should also be absolutely critical in any future decision regarding funding flows, which is a theme we will return to in our policy chapter. This will certainly be true in a post-Brexit environment, but we argue that our evidence, combined with known flaws in the GVA per capita measure, should *also* cause the EU to fundamentally reassess its own structural fund and cohesion fund. The issues that exist in the UK are also visible across Europe, and many of the policy recommendations we make in Chapter 4 are likely to be applicable in a variety of European states. As such, although these recommendations are framed in terms of Brexit, they have a pan-European (and, indeed, international) dimension.

Our evidence suggests that present allocation mechanisms are poor. However, given the present state of the data it is not possible to reliably determine if such funds are making a difference at the macrolevel. In the British context, London's GDHI per capita has risen from 22% above the UK average in 1997 to 40% above the UK average in 2016. Is this due to improved economic performance (and can the rest of the country learn from it?) or does it merely reflect a rise in average prices (especially housing)? These questions matter, and they matter more than ever in a post-Brexit context. Improving measurement to the point of being able to offer longer-term solutions is a key area for future research and a major policy recommendation of this book.

Moreover, returning to the theme of Rodríguez-Pose (2018) and others (Goodwin & Heath, 2016; Kriesi & Papapas, 2015): is the current wave of populism spanning the



globe, of which Brexit is just an example, a manifestation of regional policy gone wrong? Is the problem not so much one of individuals being ‘left behind’ but rather regions becoming ‘places that don’t matter’ (Goodwin & Heath, 2016; Kriesi & Pappas, 2015)? Data on household incomes can only partially answer this question: incomes may be related to where individuals live, but they also fundamentally reflect the characteristics of those who choose (or are compelled by either policy or a lack of wherewithal) to live there. The next chapter seeks to address this question more directly: how productive are different regions in the light of subnational price variations? The subsequent chapter then asks the crucial question: in light of both Brexit and this new evidence, what policy options can we take to enhance regional economic performance?

## NOTES

1. <https://www.telegraph.co.uk/news/2017/09/07/london-no-longer-uks-expensive-place-buy-pint-beer/>
2. As is standard in such analysis (Deaton & Dupriez, 2013; Ley, 2005; OECD, 2012), we used plutocratic rather than democratic weights here (see Fisher & Fisher, 2005, for a discussion of the value-judgements implicit in the choice of weights). The resultant price levels are thus well suited to deflating GDHI per capita. The trade-off is that the weights may not mirror the experience of a ‘typical’ individual as they give more weight to those with higher expenditure (typically high-income individuals).
3. Obviously there are some stark differences – dividends can be altered or suspended at the directors’ discretion, whilst coupon payments are unchanging. Rent typically falls somewhere in-between, with infrequent changes. The running yield on property is often higher than many other assets due to the costs and difficulties associated with purchase or sale of property as well as maintenance costs and the risk of non-occupancy, rent arrears, etc.

4. Bilateral Laspeyres and Paasche indices are calculated for each region-pair (with the former being a weighted arithmetic mean and the latter a weighted harmonic mean), before computing a bilateral Fisher index (the geometric average of Laspeyres and Paasche indices) and using the modified Eurostat-OECD EKS procedure to obtain a series of transitive relative price levels.

5. This is admittedly a strong assumption, but is not unsupportable: local price variations mostly reflect differences in the quality of amenities. In contrast, price differences over larger areas mostly reflect differences in the cost of living. The litmus test is whether the labour market is largely self-contained: can one live in place A and work in place B? Groceries in town A may be more costly than in town B due to the fact that town A has a preponderance of Waitrose stores whilst town B is served by Lidl. As the two are proximate, those living in town A can shop at Lidl in town B (and vice versa). Although measured prices appear different, they are in fact identical. In contrast, a pint of (the same) beer is significantly more costly in London than in Yorkshire, even if the pub is otherwise identical due to differences in the cost of providing the service (staff costs, rents, etc.). It is not feasible to travel from London to Yorkshire simply to enjoy a cheaper pint! Measured price differences do indeed reflect real price differences in this case. The same logic applies for housing costs, etc.

# 3

## THINKING OUTSIDE THE BOX (PART 2): REAL LABOUR PRODUCTIVITY

### 3.1 OVERVIEW

In this chapter, we consider the impact of regional price differences on gross value added (GVA). We attempt to develop regional purchasing power parities (PPPs), focussing on the creation of both lower-bound and central estimates thereof. We conclude that nominal figures understate the size of the real economy in northern regions and commensurately overestimate the size of the economy in London. This has important ramifications for regional policy, particularly in a post-Brexit environment. Moreover, similar patterns are likely to be visible across Europe, suggesting that future European Union (EU) policy will also want to take subnational price-differences into account. There are strong policy implications from this chapter, which we explore in more depth in Chapter 4.

- *Introduction* – This section outlines the importance and appropriate uses of GVA and briefly discusses the regionalisation process adopted by the Office for National Statistics (ONS).
- *Price levels*: As with other measures, GVA fails to adequately account for price differences across regions.
  - The theory of price-level comparisons: outlining the Eurostat-OECD methodology
  - From GVA to gross domestic product (GDP)...
    - A discussion of taxation and methods of apportionment
    - Setting upper and lower bounds...
  - Price comparisons in the household sector
    - Methods of apportioning household final consumption expenditure (HHFCE)
    - Calculating relative price levels (RRCPLs + rents – challenges re: national and domestic)
  - Price comparisons in the Government sector
    - Apportionment (easier?)
    - Calculating relative price levels (straightforward outside London but depends on London weighting and importance of wages)
  - Price comparisons for investment
    - Gross capital formation (GCC) and Gross fixed capital formation (GFCF): assume prices are constant for all industries except construction
    - Apportionment = data on construction AND remainder can use one of several methods (ONS data or DIY by industry?)

- How to treat non-profit institutions serving households (NPISH)?
- Net exports
- *Technical Issues*: Two further technical issues remain to be discussed – Financial intermediation services indirectly measured (FISIM) and imputed rents
  - *FISIM* – In Appendix 3, we outline why the size of the financial services sector is overstated and how this affects regional GVA
  - *Imputed rents* – Here we reprise the discussion of the previous chapter regarding the regionalisation of imputed rents and their implications for regional GVA
- *Putting it all together*: Establishing credible upper and lower bounds for price levels and GDP.
- Showing the impact on productivity.
- *Conclusion*: Time to reassess regional success?

### 3.2 INTRODUCTION

GVA can be thought of as a ‘pure’ measure of economic output<sup>1</sup> and is also sometimes referred to as GDP at basic prices. Like GDP, it is a measure of the value added within an economy. However, whereas GDP measures value added *at market prices* (i.e. the price paid by the end user), GVA measures value added at the prices received by the producer. The difference between the two is therefore equal to the value of taxes less subsidies on goods. In the UK, the majority of this is accounted for by value-added tax (VAT) with a lesser portion being accounted for by various duties (predominantly on fuel, alcohol and tobacco).

The importance of GVA should thus be clear. On an official level, GVA per capita is used to determine eligibility for

EU structural funding. The UK Government's Industrial Strategy Green Paper uses regional GVA per capita to illustrate the need for an industrial strategy with a spatial dimension (Department for Business Energy & Industrial Strategy, 2017). By the time of the publication of the White Paper, the UK Government was discussing regional differences in labour productivity directly – GVA per hour worked (HM Government, 2017).

More broadly, GVA is used as a key performance indicator for many Local Enterprise Partnerships and is being used as one of several internal targets by some combined authorities (see e.g. WMCA, 2016). Similarly, in the academic literature, GVA growth disparities and differences in labour productivity (GVA per hour) are widely used (and conceptually correct) both as justifications and objects of research in their own right. Indeed, within the economic profession, productivity is widely regarded as *the* key determinant of long-run living standards (Krugman, 1997).

Why does this matter beyond academic debate? Simply put, policy is made on the basis of these figures. As already discussed, they matter for funding allocations (particularly at an EU level) but they also influence policy in other subtle but important ways. If London's price-adjusted productivity is lower than official figures suggest then it becomes extremely difficult to justify the comparatively high levels of spending on transport and education that the capital enjoys. Our calculations suggest that such monies might give a better 'bang for buck' (at least in productivity terms) if invested in the 'Brexit heartlands' of the Midlands and North of England – a theme we investigate in greater detail in Chapter 4. Figs. 5–7 also add nuance to the argument that the vote for Brexit was driven by relative prosperity, as can be seen in the results of the previous chapters. Here, we consider the most appropriate and feasible strategies for deflating regional GDP.

GDP can be calculated in three different ways, namely on the basis of income, output and expenditure. Whilst in theory all three should be equal, it is clearly impossible to measure every single aspect of the economy with perfect accuracy. As a result, the ONS uses a ‘balancing’ framework in which all three are constrained to be equal. This process takes the most robust elements of each of the three in order to ascertain the most accurate figures possible. At the time of writing, the balancing process typically takes place two years in arrears.

Prior to this, the ONS uses information from each approach as it becomes available (one of the reasons why GDP figures are typically revised). Naturally, less information is available on a regional level. Accurately apportioning taxation to UK regions is extremely challenging. We also lack information on intra-UK exports and imports (e.g. goods or services produced in the North West but sold in the South East and vice versa). As a result, figures on regional GDP are not produced by the ONS.

$GDP(I) = \text{Income from all sources}$

+ Taxes on production & imports – Subsidies

$GDP(O) = \text{Output of all industries} + \text{VAT} + \text{Other taxes} - \text{Subsidies}$

$GDP(E) = \text{Household consumption} + \text{Government consumption}$

+ Other consumption + Investment + Exports – Imports

What *are* available, however, are figures that exclude taxes and subsidies, that is, GVA. As can be surmised, GVA can be calculated either on the basis of the income method or on the basis of measured output (at basic prices). The Regional Accounts team use a ‘top down’ methodology to apportion GVA to each region (West et al., 2016). This is done for both the income and output methods and takes place by component, industry and region (West et al., 2016). In essence, the national totals are ‘regionalised’ using appropriate ‘regional indicators’ (West

et al., 2016). These include a variety of measures, although the majority of indicators come from direct surveys of businesses (particularly the Annual Business Survey, the Business Register and Employment Survey and the Annual Survey of Hours and Earnings). The results then undergo a complex balancing procedure in order to ensure the resulting figures are as accurate and robust as possible (West et al., 2016).

### 3.3 PRICE LEVELS

The ONS therefore produce the best possible measure of nominal GVA given the constraints they face (both in terms of resources and due to the need to satisfy international and European standards). For many purposes, nominal GVA is indeed the appropriate measurement to use. Nevertheless, when assessing relative regional economic success, or relative productivity levels, it is *real* GVA (deflated by an appropriate PPP) that is needed. Crucially, whilst the ONS now produce estimates of real (as opposed to nominal) GVA growth over time, these are based on *national* deflators at an industry level rather than regional ones.

The upshot of this is that, given that industry inflation levels don't vary dramatically by region<sup>2</sup> the real GVA estimates produced by the ONS are likely to be a robust way of comparing a given region's economic performance over time. Unfortunately, they are not suitable for comparing the level of GVA across a set of regions at a given point. Given the absence of true regional industry-level price levels, it appears that calculating regional productivity adjusted for regional price differences is impossible. We argue that this is not the case. On the contrary, given appropriate assumptions, it is possible to develop a credible estimate of the *lower bound* for the impact of price differences on relative regional productivity levels.



One of the key empirical contributions of this book is to do precisely that. We then suggest a further set of assumptions to derive a preferred estimate of real regional productivity. It should be stressed at this point that these estimates should be seen as the beginning of a broader discussion of the issue rather than the final word. Further debate over the precise magnitude of the effect identified is to be welcomed and encouraged and future methodological innovations will hopefully enable researchers to capture it more fully. Nevertheless, our estimates undoubtedly represent a dramatic adjustment relative to the *status quo*, which does not adjust for prices at all.

As mentioned above, given the absence of regional price levels by industry it is not possible to calculate real GVA directly. What can be done, however, is to use a variety of data sources to calculate estimates of PPPs for regional GDP. This is the approach used to compare real GDP across countries and has proved a rich source of information for macroeconomists concerned with differences across countries and over time. In this chapter, we build on the approach adopted by Eurostat and the OECD, although due to differences in the data that are available our results are not precisely comparable to theirs.

On a cross-country basis, these effects are highly significant (even for countries that share a common currency). As an example, in pure Euro terms, France's GDP per capita is a full 38% higher than Spain's. In PPP terms, however, the gap falls to below 14%. In other words, most of the nominal disparity between French and Spanish GDP is purely due to price differences in the two countries. Since, for most purposes,<sup>3</sup> when comparing areas we are interested in the amount produced rather than its price – it is the PPP-adjusted figures that should be of interest to us.

As outlined in the previous chapter, we adopt the Eurostat-OECD Èltetö-Köves-Szulc (EKS) method to calculate PPPs for each Government Office Region. In order to do so, we

need regional GDPs calculated on the basis of the expenditure method. Two theoretical approaches suggest themselves: the first is to estimate a complete set of regional supply and use tables building on the work done by Thissen, Lankhuizen, Los, Oort, and Diodato (2017). Such an approach would enable us to estimate regional trade directly and thus calculate estimates of regional net exports.

Accurate calculation of regional imports and exports is one of the most challenging elements of any such analysis. Traditional methods based upon location quotients have tended to underestimate regional imports (Flegg & Tohmo, 2013). Cross-hauling is a further issue in the production of regional supply and use tables, although modern approaches seek to deal with this. Traditional methods have relied upon data on transport flows, particularly of heavy goods vehicles, to add data to location quotient-based estimates.<sup>4</sup>

Service ‘exports’ from one region to another present a particular challenge as very often no physical trace is left. If a company (or individual) based in the North East uses an accountancy firm based in the North West then no obvious trace is left of the transaction, although for our purposes it should be classed as an export from the North West to the North East. Transactions within companies or involving individuals visiting different regions for leisure purposes are likewise almost impossible to accurately map and might be thought of as an extension to the cross-hauling problem.

Given that only a small subset of the total data available is of interest to us, an alternative route is available. Namely, following a similar top-down process to that adopted by the ONS, we can regionalise various elements of regional GDP via the expenditure method. This presents its own difficulties, but if all components (including GDP itself) can be regionalised then it does avoid the need to estimate regional exports at all.

### 3.4 REGIONALISATION

Regionalisation of each component of GDP(E) is done on a nominal basis and then deflated using the relative price level. In the following subsections we deal with regionalisation of each element in turn, before examining measures of relative price levels in each sector.

#### 3.4.1 From GVA to GDP...

Given that  $GDP = GVA + \text{taxes less subsidies on products}$  and we know regional GVA in nominal terms, the challenge is to apportion taxes less subsidies on products. Nationally, GVA accounts for over 89% of total GDP (ONS, 2017h). Of the remainder, almost two-thirds are accounted for by VAT and the remainder are accounted for by other taxes less subsidies (predominantly duties on fuel, alcohol, tobacco etc., ONS, 2017h) No (UK) VAT or duty is applicable to products and services extra-regio (taxes on production, which are applicable to the continental shelf, are already included in GVA at basic prices), rendering GDP for this region strictly equal to its GVA. In any event, its total contribution (primarily offshore oil and gas) is modest.

For the other (onshore) UK regions, two options stand out. The first is simply to assume that VAT and duties are proportional to GVA (excluding extra-regio). This is superficially attractive – it makes intuitive sense to ascribe a VAT proportionally to the regions where value is added. It also has the advantage of matching the approach used by Eurostat (2018a). This approach forms a useful baseline and can be thought of as an extreme against which to compare other estimates. Indeed, we use this approach in our ‘absolute lower bound’ estimates for this very reason.

The second approach is somewhat more involved but ascribes to the principles on which VAT (and duties) are actually levied – namely at the point of consumption. In other words, this conceptual approach treats regions in the same fashion as countries for GDP purposes. On a European level, if a French company exports goods to Germany, the VAT is paid to the German government (by German consumers) and not France (and is thus part of German GDP rather than French GDP).<sup>5</sup> The same is not true for most services (broadcasting, telecoms and electronic services levy VAT at the point of consumption), where VAT is levied at the point of sale rather than at the point of consumption.

Of course, for most services, the place of sale *is* the place of consumption. Where things become complex is in the treatment of non-residents. Although cross-region commuters are unlikely to purchase a great number of VAT-able items (most supermarket sales of food and those of takeaways served cold are zero-rated), many tourists will. This is true of both domestic and international tourists. Given London's attraction as a national and international tourist destination, any estimates based upon the consumption of residents will probably underestimate the amount of VAT that should be ascribed to the region. In practice, all activities likely to be affected by this (namely transport, accommodation and food, and arts and recreation) account for less than 10% of the UK economy meaning that any distortion from the 'London tourist effect' is likely to be very small indeed.

Ultimately, therefore, we would argue that the most appropriate procedure to apportion VAT to the regions is to use the VAT proportions calculated by the ONS in their experimental statistics on country and regional public finances (ONS, 2017c). A similar procedure can be used to apportion other taxes less subsidies on products, generating an estimate of regional GDP. Ultimately, the overall proportions accounted

for by different regions change little: whether one uses the Eurostat apportionment procedure or our alternative will therefore make little difference to estimates of regional prices. The impact on measured (nominal) productivity is somewhat greater, with relative productivity increasing by 2.1% in Wales and falling by 2.6% in London. The remaining regions in Great Britain fall between these two extremes. These results (i.e. both those based on assuming regional GDP is exactly proportional to GVA and our preferred procedure) effectively bound nominal regional GDP from above and below.

### 3.4.2 The Household Sector

HHFCE represents direct spending by households as consumers and is by far the largest component of total GDP in the UK. Spending relates to that amount spent by residents (irrespective of the region in which it is spent). Given that GDP is a *domestic* concept, this at first seems paradoxical (as residency fundamentally relates to the *national* concept – or in our case the regional one). The answer lies in imports and exports: spending by tourists from region A in region B is counted as part of region A's HHFCE. The same amount is then subtracted from region A's GDP in the form of an import. Meanwhile, it does *not* count as part of region B's HHFCE but is rather an *export* from region B to region A. The net result is that the tourist spending is counted as adding to region B's GDP but not region A's. As can be imagined, regions which are net recipients of domestic tourists and commuters should enjoy a boost in exports relative to those who are net suppliers of tourists and commuters.

There are several ways of apportioning nominal consumer expenditure. The first is by population – simply assuming that the average person in each region spends the same amount.

This will systematically understate (nominal) consumption in areas where (nominal) income is higher. In other words, it will understate consumption in London and the South East and overstate consumption in the North. The other extreme is simply to assume that HHFCE is proportional to GVA. This will, naturally, overstate consumption in regions that see an inflow of commuters and that have higher nominal incomes as evidence suggests that saving is greater amongst higher-income individuals (Larrimore, Dodini, & Thomas, 2016).

A preferable approach to both of these is to apportion nominal spending by the nominal incomes of those actually resident in an area. In practice, this means apportioning spending on the basis of the ONS' estimates of nominal regional gross disposable household income (GDHI). This should be close to total consumption spending. Given the evidence of the previous chapter that real household incomes per capita are somewhat higher in London and the South East, one would expect individuals in these regions to save a larger proportion of their total incomes (Huggett & Ventura, 2000), suggesting that this will overestimate consumption in these regions.

Indeed, the fact that what limited data we have suggests that wealth in London and the South East is significantly higher than elsewhere in the country adds credence to this. Nevertheless, it is likely that the divergence in wealth across the UK is being driven by both differences in initial capital endowments (wealthy individuals are concentrated near London), high growth rates in asset values and the fact that real estate values in London and the South East have risen more rapidly than elsewhere. In any event, as price levels are based on *consumption* (a flow) rather than *wealth* (a stock), the ultimate effect of wealth divergences on the proportion of income consumed is unlikely to be large meaning that the net impact should be close to zero.

An alternative is to use the ONS' estimates of the proportion of VAT attributable to regions (ONS, 2017c).<sup>6</sup> This uses

data from the living costs and food (LCF) survey. Since VAT and consumption should be broadly proportionate to one another, this is likely to be an effective estimate of regional HHFCE. A particular weakness of this approach is the fact that VAT is not charged on rents (including imputed rents), suggesting that it is underestimating nominal consumption in regions where rents are more costly. Once again, this is likely to underestimate the proportion of total expenditure in London and the South East. It is reassuring that both the GDHI and VAT approaches give extremely similar figures for the proportion of HHFCE accounted for by each region.

As a result, we feel confident in asserting that the ONS' VAT estimates are excellent candidates for calculating a lower bound for the proportion of total HHFCE in London and the South East (and a commensurate upper bound in the North). The ONS estimates of the proportion of VAT attributable to regions exhibit some year to year variability, and for Scotland using GDHI as the basis of apportionment appears to match official figures better (Scottish Government, 2018). As a result, we use the GDHI figures for our central estimates.

Indeed, the final results are relatively insensitive to the method used to apportion HHFCE with the difference between the VAT-based lower bound and the GVA-based upper bound amounting to less than a one percentage point difference in the PPP for any region (the extremes being London, whose PPP increases by 0.8% and the South West, whose PPP falls by 0.5%). As a result, we are confident in the robustness of our approach and results.

### 3.4.3 Non-profit Institutions Serving Households

These comprise non-profit institutions that are not mainly financed and controlled by government. They provide goods

and services to households at prices that are not economically significant (or free). Examples include religious societies, clubs (including sports clubs), trade unions, political parties or organisations, etc. Charities tend to belong in this sector. Regionalising the spending of NPISH is extremely challenging. Given the absence of better data, we regionalise the nominal spending of NPISH by population, sourced from the ONS' official population statistics (ONS, 2018a). Given the small size of the sector and the fact that in our present estimates we assume zero cost differences across regions in the sector, this is an acceptable compromise. The NPISH sector is an area where future research may seek to refine these estimates.

#### 3.4.4 Gross Capital Consumption

Gross capital consumption is primarily comprised GFCF (97%), plus changes in inventories and acquisitions less disposals. Given the minimal importance of the latter, we focus on GFCF and assume that changes in inventories plus acquisitions less disposals are proportional to GFCF. This consists of transport equipment, other machinery and equipment (including information technology (IT) equipment), intellectual property, dwellings and other buildings.

The ONS provide regional estimates of GFCF to Eurostat, although the ONS has serious concerns about the quality of data (ONS, 2017i). It is noteworthy that, for Scotland at least, these estimates differ substantially from those used in the Scottish National Accounts (Scottish Government, 2018). Nevertheless, they remain the best estimates that we have available at present.

Of total UK GFCF, some £72,945m was on dwellings. Since total UK GFCF in the real estate sector was £91,536m, it's clear that dwellings represent some 79.7% of total real



estate investment. In the absence of any indication to the contrary, we assume that this proportion is the same for each region. Transfer costs (which represent the bulk of the rest of real estate GFCF) and investment in equipment are likely to be proportional to spending on dwellings so this seems an eminently reasonable assumption to make.<sup>7</sup>

For all other industries, we use data from the supply and use tables (ONS, 2017e) to ascertain on a national level what proportion of GFCF was spent on inputs from the construction industry. This varies from 4% in the professional services and support industries to some 52% in ‘other services’ (which includes creative arts, libraries and museums, sports organisations, etc.). Once again, in the absence of any further information we assume that these proportions are equal in every region.

Doing so we can divide capital expenditure into two parts for each region: the first being one in which prices vary (namely dwellings plus that proportion of GFCF spent on construction by industries other than real estate). The second part of capital expenditure is one for which prices do not vary. The relative weights for each region will differ due to differences in the industrial composition of regional GFCF. As a result, these weights can be used as an input into the EKS method.

### 3.4.5 Government Expenditure

Government expenditure is regionalised by using figures from the Country and Regional Public Sector Finances (ONS, 2017c). This estimates UK government expenditure by sector for each country and region for the 2016/17 tax year (which is closest to the 2016 calendar year). As we are solely interested in government final expenditure, we exclude those categories of expenditure that pertain to transfers or intermediate consumption.

Doing so yields estimates for the entire UK that are extremely close to the ONS Blue Book estimate of government spending (ONS, 2017h). Similarly our estimates for Scotland are extremely close to the official figures given by the Scottish Government (2018), which gives a degree of confidence in the robustness of our estimates. At present, we lack comprehensive data on relative regional prices in the government sector and so there are no benefits to regionalising components of government spending at present. In future, the same source data are likely to prove useful in seeking to regionalise the various components of government spending.

#### 3.4.6 Apportioning Regional GDP

The table overleaf presents the results of this apportionment. To reiterate:

$$\text{GDP} = \text{GVA} + \text{Taxes on production} - \text{Subsidies of production}$$

To recap, GVA is regionalised using the Regional Accounts data, whilst VAT (which comprises the bulk of relevant taxes) is apportioned from ONS estimates of regional VAT payments (ONS, 2017c) and the remainder from estimates of other taxes and subsidies on production (ONS, 2017c)

HHFCE can be apportioned from either nominal GDHI data (ONS, 2018f) or the aforementioned VAT statistics. In either case the results are similar, but we prefer the former due to the greater stability of estimates over time. Output of the non-profit sector is regionalised using an estimate of population (ONS, 2018a), although this sector is small.

Gross capital consumption is regionalised using data from Eurostat (2018b) on regional gross fixed capital formation (which forms around 97% of total gross capital consumption), whilst government expenditure is regionalised using data from the Country and Regional Analysis (HM Treasury, 2018; ONS, 2017c). Net exports are thus the residual

Table 2. Estimated Regional GDP Proportions.

	HHFCE	NPISH	Gross Capital Consumption	Government	Net Exports
North East	73.1%	4.0%	20.8%	26.5%	-24.4%
North West	64.0%	3.4%	16.3%	21.7%	-5.4%
Yorkshire and the Humber	67.8%	3.7%	16.6%	22.8%	-11.0%
East Midlands	68.9%	3.7%	19.2%	21.0%	-12.8%
West Midlands	66.1%	3.6%	18.0%	22.0%	-9.7%
East	71.3%	3.2%	18.9%	18.3%	-11.8%
London	48.7%	1.7%	13.2%	13.0%	23.4%
South East	66.8%	2.8%	17.5%	15.5%	-2.5%
South West	71.9%	3.4%	20.9%	19.7%	-15.9%
Wales	73.4%	4.0%	18.3%	27.8%	-23.5%
Scotland	64.3%	2.4%	18.4%	23.3%	-8.5%
Northern Ireland	67.5%	3.8%	17.7%	29.0%	-18.1%

See note<sup>8</sup>.

left over after completing this process. [Table 2](#) shows what proportion of each region's nominal GDP is accounted for by each sector. These weights are important inputs into the EKS process used to estimate real regional GDP later.

### 3.5 REGIONAL PRICES

#### 3.5.1 The Household Sector

This is both the most important and the easiest sector to derive prices for. We first note that, unlike for household incomes, GDP is calculated on a 'domestic' basis. In the absence of information on exactly how much is spent by consumers in each region, we use the data from the LCF survey to ascertain the proportion of total spending accounted for by each category. We adopt the same procedure as the previous chapter and utilise the same data sources. Indeed, the ONS RRCPLs are, if anything, more suited to this use (with the same methods and sources as we have). We then calculate the proportion of total spending accounted for by housing in the same manner as the previous chapter.

Housing costs can be derived in one of three ways. Firstly, the costs of social housing are estimated directly from the Family Resources Survey (FRS). This is true across approaches. Private sector and imputed rents then both use the figures given in the FRS covering the 2016/17 financial year, which aligns most closely to the 2016 calendar year. These are the most conservative estimates of rental cost differences, showing that rents in London are 111% higher than those in the North East of England.

There are good reasons to consider this a highly conservative estimate of London rents. Firstly, due to its comparatively small sample size, the figures for the FRS tend to

fluctuate quite significantly year-by-year. In the previous year, for example, renting in London appeared 140% more costly than in the North East. Indeed, the FRS data imply that rents in London fell by almost 7% between 2015 and 2016, contradicting evidence from the ONS' own Index of Private Housing Rental Prices (ONS, 2018c). In addition, the FRS data apply to *median* rents, whereas for the purposes of deflating GVA, *mean* rents are the more relevant measure.

The other potential option is to directly use GVA itself. This contains an implicit deflator because rental income (including imputed rent) is estimated for the real estate sector for each region as a component of regional GVA. Specifically, a component of GVA is the 'rental income of households and NPISH', which includes imputed rents. As is pointed out in the GVA methodology guides, these are regionalised

*using estimates of median property prices by region from ONS and the devolved administrations, these are multiplied by regional dwelling stock obtained from DCLG, the Welsh Government, the Scottish Government and the Department of Finance and Personnel Northern Ireland. (West et al., 2016, p. 15)*

Since the figures for regional dwelling stock are readily available from the Ministry of Housing, Communities and Local Government (formerly the Department for Communities and Local Government – DCLG), it is straightforward to derive implicit estimates of relative regional rents from the Regional Accounts. These show a rather wider spread of regional rents than the FRS survey (with implicit rents in London being around 3.4 times those in the North East). Interestingly, this is a broadly similar order of magnitude to figures from the Valuation Office Agency (2018) on regional rents in England.

### 3.5.2 NPISH

In the absence of further information, we assume that there are zero price regional price differences for NPISH. The NPISH sector comprises around 3% of GDP and principally contains institutions of higher and further education (universities and colleges), charities, trade unions, religious organisations and political parties. Given that these organisations do not charge market prices for their services, their output has traditionally been valued at cost (ONS, 2014), although the ONS is currently reassessing the classification of universities as a result of changes to the tuition fee regime (ONS, 2018b).

It is likely that costs in London and the South East are at least as high as elsewhere since wages and salaries are higher in London and the South East than elsewhere (ONS, 2017b) and there is some evidence that commercial rents may also be higher in these regions (Colliers International, 2017). As such, we can be confident that our assumption of zero regional price differences for the NPISH sector is conservative.

### 3.5.3 Gross Capital Consumption

We assume that there are no regional price differences for GFCF comprised transport equipment, other machinery and equipment (including IT equipment) and intellectual property. The law-of-one-price can be expected to apply to these, which collectively comprise around 44.1% of GFCF for the UK as a whole. A further 5.2% of national GFCF consists of ‘costs of transferring ownership on non-produced assets’ (overwhelmingly buildings), which again are unlikely to vary much by region. The remainder of GFCF represents buildings.

The data we have indicate that the costs of construction are typically higher in London and the South East than elsewhere

in the country (Building Cost Information Service (BCIS), 2015). Specifically, we take the figures of the BCIS for 2015 (BCIS, 2015) as estimates of the relative cost of fixed capital in the form of buildings (whether residential or otherwise), with the exception of Northern Ireland where an unusually small sample size leads to estimates that are implausibly low (around half of the UK average). Estimates of relative construction costs range from 91% of the UK average in the North West to 112% of the UK average in London. Given known data on salaries (ONS, 2017b), these estimates are plausible and are the best data we have available to us at the present time.

We use the EKS procedure as outlined above using the weights derived in the previous section together with the BCIS cost data for construction. As can be seen, costs vary relatively little across regions (partly by design). Nevertheless, there is a trend for higher prices in the South and East of the country (particularly in London and the South East). More puzzling are the above average prices of construction reported in the North East and East Midlands. It is unclear what might be driving this – it is entirely possible that measurement error in the source dataset is to blame, particularly as they are not official statistics. Nevertheless, the figures suggesting that investment is on average around 10% cheaper in Wales, Yorkshire or the West Midlands relative to the capital and surrounding areas is certainly plausible. This is one area that future work on regional prices may want to concentrate on, although the ultimate impact is likely to be modest (at least in the UK where gross capital consumption accounts for under 20% of GDP).

#### 3.5.4 Government Expenditure

Although major strides have been made to evaluate the output of government, this remains challenging (Pont, 2008).

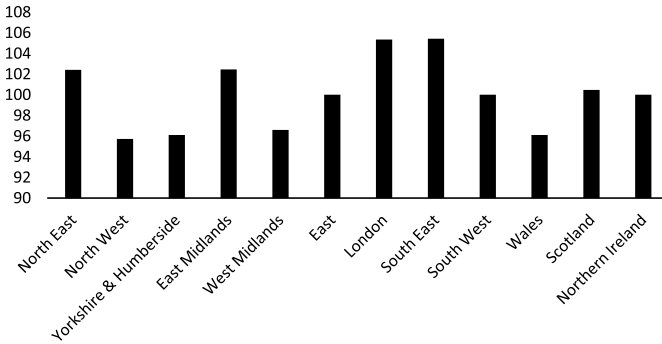


Fig. 5. Relative Costs of Gross Fixed Capital Formation.

In any event, national data are regionalised by the ONS using input costs – predominantly wages (West et al., 2016), suggesting that the appropriate measure of relative regional prices would be relative input costs. Outside of London, most public sector salaries are set on a national salary scale. Indeed, there are few data on relative prices in the government sector. Nevertheless, there exists a patchwork of rather partial information on prices of certain elements of government expenditure.

In particular, large parts of the public sector have negotiated a ‘London weighting’, whereby employees are paid more if they are located in the capital. This applies to staff in the NHS and education (Unison, 2017). Similarly, the Annual Survey of Hours and Earnings (ONS, 2017b) suggests that public sector employees in London earn some 30–40% more than their counterparts elsewhere in the country. It is difficult to assess the extent to which this is due to the London weighting rather than the fact that higher managerial functions are more prevalent in London than elsewhere (particularly in the civil service).

Equally, salaries in those parts of the economy that are dominated by public sector employees (notably health and education)



Table 3. Median Full-time Salaries (£) by Sector in 2016.

Region	Public Sector	Public Admin and Defence	Education	Health Care
North East	27,341	27,140	28,389	27,126
North West	29,326	30,554	28,810	26,824
Yorkshire and Humberside	27,878	29,888	28,061	26,791
East Midlands	28,011	27,962	28,775	27,028
West Midlands	28,462	32,124	27,409	26,336
East of England	30,748	31,781	30,778	27,972
London	36,632	37,630	35,000	34,334
South East	29,896	31,020	30,824	28,177
South West	29,588	30,044	29,591	26,911
Wales	28,490	29,923	27,664	28,180
Scotland	30,886	31,062	30,992	30,372
UK	30,540	31,914	30,347	28,408

*Source:* Annual Survey of Hours and Earnings (ONS, 2017b).

are around 20–30% higher in London than elsewhere in the country (ONS, 2017b). Outside of London, salaries for equivalent jobs are largely equal across the country (with a handful of minor exceptions in the East and South East in places that make up the so-called ‘fringe’ of Greater London).

Given these very limited data, the best course of action open to us is to assess how robust our results are to a variety of different assumptions about the cost of providing government services. In particular, in our central scenario we assume that costs are identical across the country. For all regions apart from London this is a sensible assumption. Given the preponderance of ‘current expenditure’ in government spending (ONS, 2018d) and the fact that most public sector salaries are subject to a national pay scale, this is logical.

The presence of the London weighting effectively guarantees that assuming equal costs will underestimate price levels in London. Median full-time public sector salaries in the UK are around £30,500, whilst those in London are £37,500 giving a difference of around 20%. London weightings differ substantially across the public sector – the NHS pay a 20% supplement for workers in Inner London, a 15% supplement for workers in Outer London and a 5% supplement for workers in the ‘fringe’ (Unison, 2017). Each of these is also subject to minimum and maximum thresholds (Unison, 2017) In contrast, Sixth Form Colleges typically pay a set £3,764 supplement (irrespective of salary or position) in Inner London and £2,508 in Outer London. Teachers have variable thresholds but these are typically more generous (e.g. £5,631–£8,579 in Inner London). For reference, Inner London was traditionally defined as being within four miles of Charing Cross (Unison, 2017).

According to the Regional Accounts, compensation of employees accounts for around 80% of total GVA in the three parts of the economy (education, health and public administration – the latter including fire services, policing, the courts and civil service functions) that are dominated by the public sector (ONS, 2017f). Moreover, apart from Northern Ireland, this varies little across regions (from 77% in the East of England to 81% in London). National Accounts data (ONS, 2017h) indicate that some 85.6% of total resources in the government sector are spent on wages and salaries or employers’ social contributions (generally pensions and employer’s National Insurance contributions). Since the latter are broadly proportional to wages (both are typically calculated as a percentage of gross pay) their costs are also proportionate to salaries.

As a result, we argue that a weight of 80% for wages and salaries as a proportion of total government output is conservative. We can thus investigate the sensitivity of our results to different

plausible assumptions about relative prices in the government sector. Specifically, we consider the following scenarios:

- Constant prices across the UK (our most conservative scenario) in the sector.
- A constant £3,000 London weighting for all public sector employees (equivalent to an 8.8% increase in employee costs in London, or a 7% increase in costs overall).
- A 20% increase in public sector London salaries vis-à-vis the rest of the UK, equivalent to a 16% in overall public sector costs.

### 3.5.5 Net Exports

Net exports are the simplest sector to estimate relative prices for. The OECD (2012) use exchange rates as proxies for the PPPs of exports and imports. Given that all regions use a common currency, the exchange rate in question is unity, that is, there are zero price differences across regions. Such a procedure is adopted in international price comparisons and is equally applicable here. In any case, it makes conceptual sense and is good economics – any price difference would imply that consumers and businesses were making systematic mistakes in how they source goods and services across regional boundaries.

## 3.6 REGIONAL PPPS: SOME INITIAL ESTIMATES

In this section, we combine our estimates for prices by expenditure sector with the weights derived previously in order to generate initial estimates of regional PPPs. This is important because it will enable us to assess the extent to which extant regional flows are justifiable on the basis of relative regional

productivity. We find that this is not the case and therefore there is strong evidence that funding flows should be redirected towards ‘poorer’ regions in the Midlands and North of England. Potential policy choices are discussed further in Chapter 4. We also find that the Scottish economy is larger than hitherto believed.

Although these are imperfect, we present a spectrum of different results and show that even the most conservative estimates significantly increase measured regional productivity in poorer parts of the UK. This is of particular importance when combined with the results of Chen et al. (2018): those regions of the UK which are most exposed to Brexit carry greater economic weight than hitherto believed. As such, any national policy vis-à-vis the UK’s future relationship with continental Europe should give greater weight to the economic performance of these regions than it does at present. Moreover, this has interesting ramifications for academic studies combining both regional and national estimates of the potential economic impact of Brexit. Here, we consider a variety of different PPPs, all of which alter the balance of relative economic size and productivity within the UK.

### 3.6.1 The Lower Bound

At this point we are in a position to derive a lower bound for the size of the PPP effect. In effect, we deliberately design results that are biased towards zero price differences across regions. To do so, we apportion HHFCE to regions using the VAT estimates of the ONS. Regional GDP is assumed to be proportional to regional GVA (excluding the continental shelf). We use the first set of regional domestic price levels (using the RRCPLs and FRS data with its narrower regional differences). All other components of expenditure (Non-Profit Institutes Serving Households,

government expenditure, gross capital formation, net exports, etc.) are assumed to have zero price differences across regions.<sup>9</sup>

We are confident that this underestimates the true difference in relative prices. As noted in the previous section, all estimates of regional prices for gross capital formation and government consumption indicate that prices in the south of the UK are *at least as high* as those further North. As such, we can be confident that we are indeed establishing a lower bound for price differences across the UK. Using the same EKS procedure as previously (again following the OECD, 2012) we aggregate these different levels of expenditure using the weights and price levels outlined here:

As can be seen, price levels (in PPP terms) do appear to systematically differ across the UK. Even our lower bound figures indicate that prices in London are *at least 10%* above the national average (with those in the South East around 5% above the national average). Conversely, prices across the devolved administrations as well as the North and Midlands, are below the national average. As such, whilst London remains (by far) the largest and most productive region in the UK, its dominance is significantly attenuated.

In fact, there is a further issue here. If we accept the FRS as our preferred measure of rents (and imputed rents) then

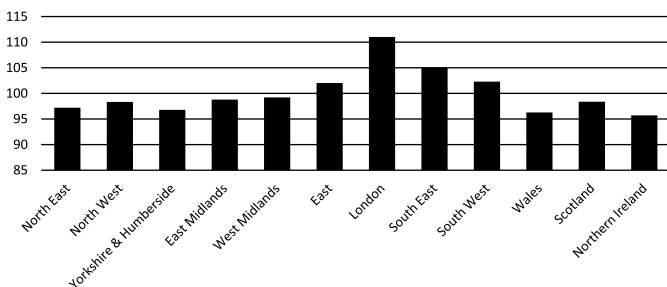


Fig. 6. Estimated Absolute Lower Bound PPPs by Region.

it should also be used to regionalise rents in the Regional Accounts. This has the effect of reducing (nominal) regional GVA in London by around 4% and increasing it in most other regions (the South West enjoys an uplift of some 3.2%). Ultimately the combined effect of both changes is rather similar to simply using the deflator implied in the Regional Accounts estimates of imputed rents directly, as we do below.

### 3.6.2 More Realistic Estimates

The most conservative of the four estimates below makes the same assumptions as our ‘lower bound’ – namely that the only prices that differ across regions are those of the household sector. All that is done differently is to use the measure of housing costs implied directly in the Regional Accounts’ estimates of GVA.

Our second estimate takes this and adds the price differences calculated above for gross capital consumption. All other sectors (government, NPISH, net exports, etc.) are assumed to have no price differences. The third estimate goes one step further and adds a wage premium of £3,000 for every public sector employee in London (as a proxy for the London weighting), which amounts to a 9.2% premium for the same work in the capital. The final estimate includes a public sector London wage premium of 20% for the same work, that is, it assumes that 75% the entire London public sector pay premium in the Annual Survey of Hours and Earnings dataset (ONS, 2017b) is due to the London weighting. This implies a public sector London weighting of just over £6,500, which is probably somewhat high.

As can be seen, the results are relatively impervious to a variety of different assumptions, largely reflecting the overwhelming importance of HHFCE in GDP, alongside the fact that most price variation occurs in consumer prices (particularly of housing).

Table 4. Estimated Regional PPPs.

Region	Conservative	Plus GFCF Price Differences	Central Scenario	Larger Government Difference
North East	96.5	96.9	96.8	96.7
North West	98.7	98.0	97.9	97.8
Yorkshire and Humberside	96.8	96.2	96.0	96.0
East Midlands	97.5	97.9	97.8	97.7
West Midlands	98.4	97.8	97.7	97.6
East	101.4	101.4	101.3	101.2
London	114.9	115.7	117.1	118.4
South East	106.2	107.2	107.1	107.0
South West	102.2	102.2	102.1	102.0
Wales	95.7	95.0	94.9	94.8
Scotland	98.6	98.7	98.6	98.5
Northern Ireland	94.8	94.8	94.7	94.6

Unsurprisingly, differences in price levels in the government sector only have a significant effect on the PPP of London and even then, a large London weighting of some £6,500 (or almost 20% of salary) only has a 2.5% impact overall.

### 3.7 ESTIMATING REAL REGIONAL GDP AND PRODUCTIVITY

We are now able to estimate real regional GDP. Whilst a final, definitive assessment remains elusive, we can certainly derive a range within which nominal and real regional GDP lie. Moreover, we can show that the regional disparity in real

productivity (GDP per hour worked) is smaller than that of nominal productivity.

### 3.7.1 Model 1: An Absolute Minimum

Here we deliberately seek to underestimate the size of the effect to derive an ‘absolute lower bound’. We thus assume that GDP is directly proportional to GVA and measure housing costs using the FRS. We further assume that there are no price differences in any sector apart from the household one.<sup>10</sup> It should be noted that if we are to deflate housing costs using the FRS then this should also be the measure used to estimate regional rents. For our absolute minimum we do not do this and therefore it should be noted that this model deliberately underestimates the price differences across regions.

Simply deflating regional GDP without adjusting the imputed rents portion of GVA already leads to an increase of some 6% in GDP in Yorkshire and an 8% fall in London’s GDP. Indeed, even using this ‘absolute lower bound’ estimate significantly attenuates the productivity gap between NUTS1 regions and sees Scotland overtake the South East as the second most productive region in the UK.

### 3.7.2 Model 2: A Conservative Estimate

This model uses the same formulation as above with one key difference that should make it a more accurate measure of real regional productivity. In particular, we continue to assume that prices are uniform across all parts of the economy apart from the household sector. The critical change pertains to the treatment of housing costs. Instead of using survey data from the FRS, we use the deflator directly implied from the GVA data on rents.

We then compare this to an alternative estimate that involves reallocating rental income (including imputed rental income) to



UK regions using the FRS survey data (and data on total dwelling stock) before deflating this by the ‘absolute lower bound’ measure of prices calculated above. If one is to use the ‘lower bound’ figures as a measure of prices then this is the conceptually correct thing to do. Interestingly, the impact of using the FRS-based deflator combined with using the same source to allocate real estate rental income in GVA is almost identical to simply using the deflator implied by the regional GVA figures directly. As a result, we feel confident in using the latter for our estimates.

### 3.7.3 Models 3 and 4: Our Central Scenarios

In model 3, we use the ‘conservative’ model above but add price differences in the gross capital consumption and government sectors. The methodology is outlined in the previous sections, but fundamentally, the difference between this and the more conservative ‘model 2’ are extremely modest.

Our fourth and final model is somewhat more ambitious. Rather than simply assuming that regional GDP is proportional to regional GVA, we attempt to apportion VAT and other taxes/subsidies on production to different regions. To do so, the ONS’ estimates of Country and Regional Public Sector Finances were used (ONS, 2017c). These contain direct estimates of the VAT attributable to regions together with estimates of a number of other taxes (from which taxes on products can be isolated and summed). It should be noted that all of these data are experimental estimates.

## 3.8 CONCLUSION: TIME TO RE-EVALUATE REGIONAL SUCCESS?

As can be seen, the overall impact is to significantly attenuate estimates of productivity differences across the UK. Even the

Table 5. The Impact of Different Rental Cost Deflators.

	GDP Impact (FRS Deflator Only)	GDP Impact (FRS Deflator & FRS-based Imputed Rents)	GDP Impact (GVA-based Housing Costs)
North East	5%	8%	8%
North West	5%	5%	5%
Yorkshire & Humberside	6%	7%	7%
East Midlands	5%	7%	6%
West Midlands	3%	5%	5%
East	1%	2%	2%
London	-8%	-12%	-11%
South East	-2%	-3%	-3%
South West	-1%	2%	1%
Wales	6%	9%	9%
Scotland	4%	5%	5%
Northern Ireland	8%	9%	10%

‘absolute lower bound’ with its deliberate underestimate of price differences accounts for about half of the total impact. Using a more realistic conservative estimate accounts for a further quarter of the total effect. As such, estimates of differences in the cost of government expenditure and gross capital consumption largely amount to little more than tinkering around the edges. Attempting to apportion VAT and other taxes to regions takes a further bite out of London’s dominance (largely because in the EU most VAT is assigned to the government of the place where consumption occurs rather than where production occurs), although the absence of good data means that any realistic attempt to do so entails a degree of guesswork.

Several other factors stand out. London remains the most productive region in the UK by a significant margin.

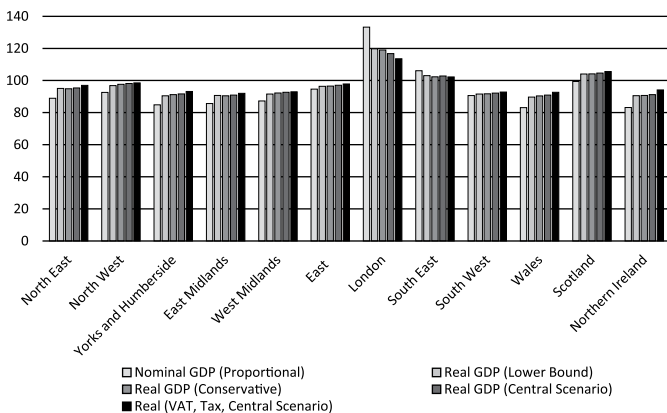


Fig. 7. Relative Regional Productivity in the UK.

The ranking of various regions also changes – Scotland overtakes the South East of England to become the second most productive region in the UK whilst Wales and Northern Ireland are within 2% of the South West in *any* sensible scenario. Indeed, even in our conservative scenario, the South East is just 5% more productive than the North West in real terms, as opposed to some 15% when measured in nominal terms.

This should cause us to fundamentally reassess our perceptions of regional economic differences in the UK. Rather than an unproductive North and a hyperproductive South, London and Scotland stand out. Indeed, in contrast to traditional perceptions the UK appears to have a ‘hollow middle’ alongside Wales and Northern Ireland. These are all areas that have been hit particularly hard by de-industrialisation. Indeed, this further reinforces the work of Beatty and Fothergill (2017) suggesting that not only do areas that experienced large-scale job loss in the 1980s and 1990s still have higher rates of worklessness, but that they might also pay a price in terms of productivity. We would tentatively suggest that

the strong performance of Scotland is possibly an indication that, done right, devolution can have a significant positive impact on productivity.

A considerable amount of space has been devoted to questions over the measurement of an issue that should prove important to all involved in regional policy post-Brexit. To reiterate the point made at the outset – we need price-adjusted measures in order to better assess what regions need to do in order to respond to the Brexit vote.

The record of the ONS in producing high-quality statistics is exemplary and in many areas they are world leading and their data underlies all of the estimates derived in this book. Unfortunately, nominal statistics on regional incomes and GVA, whilst very high quality and extremely useful for many tasks need to be complemented by real (price-adjusted) measures in order to assess regional success and failure.<sup>11</sup>

Now that we have considered two of the largest facets of regional economic performance, namely how much real disposable income residents have and how productive its workforce is (again in real rather than nominal terms), we are in a strong position to re-evaluate regional disparities. At this point, we are therefore able to consider the policy ramifications of our findings and what this means for regions in the light of Brexit. These crucial (and fascinating) issues are what the remainder of the book is devoted to.

## NOTES

1. It is 'gross' in the sense of not making any allowance for depreciation.
2. The notable exception to this is the real estate industry (SIC2007 code 68) where housing costs have increased more rapidly in some regions than others.

3. There are notable and important exceptions to this rule. When calculating government debt (or the deficit) as a proportion of GDP, for example, it is nominal figures that are of interest.
4. Nevertheless, a great deal of interesting research has been done recently on input–output models, from global models (Steen-Olsen et al., 2016) to subnational analyses (Kim, Kratena, & Hewings, 2015). The work of Los, Timmer, and de Vries (2016) is important in being able to use such tables to understand the value-added component of gross exports.
5. There are some interesting exceptions to this rule, particularly for businesses that sell only a small amount in the second country (below the VAT threshold, even if they are above the VAT threshold in terms of the goods they sell in their own country). In addition, selling to businesses in a second EU country that do not possess a valid VAT number typically involves levying VAT at the rate applicable in one's home country. The interested reader is referred to Your Europe (2018) for further details.
6. There is no evidence that individuals in and around London are running down their stock of wealth more rapidly than those elsewhere to finance a more lavish lifestyle.
7. It is possible that transfer and equipment costs are broadly constant on a per-dwelling basis rather than a total expenditure basis but this is likely to have almost zero impact on our final estimates in practice.
8. It should be noted that these proportions are heavily affected by the very same factors that make GVA per capita a problematic measure. They are thus heavily distorted by tourism (including domestic tourism) and commuting. Any money spent by commuters in their place of work counts as an 'export' from their work region and an 'import' to their home region. The result is that, for example, any tube fares purchased by a commuter from Watford count as an export from London to the East of England as would any meals, coffee, etc., purchased in their workplace. Pensioners have a similarly distorting effect: a region full of retirees will produce very little measured economic output, but its consumption will be substantial. The inevitable result is that net exports will be negative. A progressive tax and benefits system that redistributes

from high income earners to those on lower incomes will have a similar effect.

9. A corollary of this assumption is that the apportionment of other expenditure components across regions is irrelevant. They all have the same relative price levels and can therefore be treated as a homogenous 'lump' (whether comprised government expenditure, investment, net exports, etc.).

10. In other words, we *assume* that there are no regional price differences in the not-for-profit sector or for government spending or investment (including building). This generates a deliberate underestimate of price differences, suitable for calculating a lower bound.

11. The absence of rigorous, timely and complete measures of regional prices (plus the absence of any measure of regional imports and exports or, alternatively, regional price levels by industry) that would meet their exceptionally high standards is one probable reason why the ONS does not produce the statistics that we have attempted to. Freed of the need to be 100% accurate and produce a single reference estimate, together with a little ingenuity, we have been able to posit a range of numbers within which we can be relatively confident the actual answer lies between.

# 4

## POLICY IMPLICATIONS

### 4.1 OVERVIEW

It is clear that these findings have major policy implications and work will need to be done to understand these further. This chapter is a first attempt to tease some of those fundamental policy points out and to steer the emergent debate. Brexit (at the time of writing) is an omnipresent issue in this context.<sup>1</sup> We have argued that real (price-adjusted) figures, as calculated in the previous two chapters, are indispensable for policy makers who wish to address the regional divides so powerfully evident in the Brexit vote. Indeed, use of nominal figures can distort funding flows: London's high transport spending (covered later in this chapter) might be understandable in light of its high nominal productivity. If, however, we adjust for price differences (as economic theory and international comparisons suggest we ought) then this disparity becomes much harder to justify.

As such, our results have significant implications for the geography of productivity and incomes and this will affect funding flows and other appropriate policies. Brexit presents some opportunities to adjust some of these but also major industrial challenges (Bailey & De Propris, 2017; Chen et al., 2018).

As such, we also discuss the ‘geography of discontent’ linking regional economic development and the Brexit vote (Los, McCann, Springford, & Thissen, 2017). It is perhaps no accident that the NUTS1 regions that voted most heavily to leave the European Union (EU) are those where we find price-adjusted productivity to be lowest. In order to do this, the chapter is structured as follows:

- *Introduction and outline* – This section introduces the reader to some of the major policy implications of our work, noting the existing policy environment.
- *The current spending bias towards London and the South East* – Here we examine the extent to which London and its environs dominate national infrastructure spending, noting that our figures imply that rebalancing towards the regions would benefit the UK as a whole.
- *The Brexit overhang* – This section explicitly examines the likely post-Brexit funding environment and considers what an optimal funding mechanism might look like.
- *The case for ‘meaningful devolution’* – In this section, we examine the role of devolution in regional economic performance, making the case for greater devolution of powers.
- *Moving beyond ‘people versus place’* – Here we outline how the academic debate needs to move on in light of our revised figures.
- *Conclusion.*

## 4.2 RECAP

We commenced this book by noting the nature of regional disparities and how they are conventionally treated by



government bodies. In so doing, we noted how gross value added (GVA)-based measures (particularly GVA per capita) were (and continue to be) key metrics by which such disparities are calculated, and how the Government's Industry Strategy Green Paper made reference to them. Our research findings have highlighted that measures traditionally used in the allocation of regional funding may distort funding flows.

Particularly egregious is the ongoing use of GVA per capita, despite the fact that the ONS (Dunnell, 2009) and Gripaos and Bishop (2006), amongst others, have demonstrated that it is not a measure of either regional productivity or regional wellbeing. In addition, commuting and demographics both grossly distort GVA per capita when measured on a subregional level: GVA per capita is higher in Islington (represented by the constituencies of Jeremy Corbyn and Emily Thornberry) than in Kensington and Chelsea.

By using a variety of official data, we constructed a series of different regional price indices suited to different purposes in order to show that some of the gaps between different parts of the UK are narrower than hitherto believed. However, this was not to suggest that regional disparities are trivial or non-existent. Indeed, we also found that whilst the relative positions of different regions changed dramatically, gaps in living standards remain substantial. We found that the poorest region is not in the North of England, rather it lies in the old industrial heartlands of the Midlands. In contrast, we found that Scotland overtook the South East of England in terms of productivity (and was only marginally behind in terms of incomes). This is extremely noteworthy given the geography of the Brexit vote: Scotland voted heavily to remain whilst the West Midlands showed the highest leave vote in the country (closely followed by the East Midlands).

However, given the nature of the data that has been used in terms of assessing regional performance, it should not be surprising that funding has – we would argue – disproportionately

favoured those areas *seen* to be successful by successive UK governments and policy makers. Indeed, this is particularly evident in transport funding, but also education. Simply put, quite striking is the difference in per capita funding between London and the rest of the UK – with only Scotland coming close. In this context, should it be any surprise that, with greater state investment in physical and human capital, London and Scotland perform better in terms of productivity? That both these ‘regions’ have substantial devolved powers is also significant as a driving factor, with Scotland in particular having widely extant resourcing/ decision-making powers over public service and infrastructure provision (and a favourable funding settlement via the Barnett formula). These are points we return to in subsequent sections of this chapter.

Table 6. Per Capita Funding (£) for Transport and Education, UK Government Office Region (GORs).

GOR	Transport	Education
North East	291	1,272
North West	370	1,276
Yorkshire and The Humber	335	1,280
East Midlands	220	1,244
West Midlands	314	1,286
East	333	1,266
London	944	1,605
South East	370	1,205
South West	305	1,190
Scotland	620	1,512
Wales	377	1,345
Northern Ireland	307	1,459

Source: HM Treasury (2018). See ‘Country and Regional Analysis 2017: A Tables’.

In contrast, as seen from above, the East Midlands and West Midlands come out at – or near – the bottom in terms of these spending figures (having noted their relative income status above). It is perhaps no accident then that this ‘missing middle’ (Hearne, Forthcoming-a) of the UK voted most strongly for Brexit. In this context, it is of interest that the correlation between the regional Brexit vote (by GOR) is considerably stronger using our purchasing power parity (PPP) adjusted productivity data than the nominal original. Apparent here is that the Midlands has fared worst of all regions in the UK terms of foregone output over a long time period relative to the UK total (Hearne, Forthcoming-a).

In this final chapter, we hence wish to revisit the policy debate in light of our findings on the inadequacy of these measures and the implications for regional funding regimes in a post-Brexit environment. In the sections that follow, we examine why we think London in particular receives a disproportionate amount of public funding and the distortionary effects that this has on economic performance and well-being in the rest of the UK. We focus on the highly illustrative examples of ‘The City’ and Westminster and the emblematic transport projects of the Heathrow Third Runway,<sup>2</sup> Crossrail and HS2. In all of these cases, with London being the centre of both political and financial power in the UK, the underlying network of power relations between the UK Government and a handful of high-end businesses clustered in the ‘Square Mile’ (financial services, legal services and management consultancies) have been key in sequestering resources to these projects.

Having established the nature of London-centric approaches to public service and infrastructure spend in the UK, we then consider the threat that Brexit poses to the one genuine (albeit methodologically imperfect) means of redistributing wealth to poorer regions in the UK, European regional development

funds, and the lack of any substance to replacement proposals for a ‘Shared Prosperity Fund’ after 2020 when the UK will (at the time of writing) have left the EU. We find that such conversations are still embryonic and raise concerns of actually being honoured, given the uncertain (but in all likelihood negative) impact that Brexit will have on public finances (Dustmann & Frattini, 2014). Given this, the final section of the book discusses the implications for regional development, and what we argue is the need for greater devolution in the UK going forward.

#### 4.3 THE CURRENT SPENDING BIAS TOWARDS LONDON AND THE SOUTH EAST

A particular theme that we have sought to ‘tease out’ in this work has been the overarching dominance of London and the South East in terms of prioritisation for ‘national infrastructure’ spending.<sup>3</sup> In actuality, the area in question is even more precise in only constituting parts of London and the South East, that is, the financial services locales of inner London known as the ‘Square Mile’ or simply as ‘The City’, and certain corridors in the South East of England, notably Surrey and Brighton, Sevenoaks, Bishop’s Stortford/Saffron Walden and the Oxford–Cambridge nexus. In explaining this conflation of the well-being of these areas with the ‘national interest’ we have noted the concentration of political and financial power in these locales – a nexus of the political establishment, and associated firms in high-end legal and financial services. It is our contention that this concentration of sociopolitical power and attendant social capital networks has distorted funding priorities across the UK (and to the lasting detriment of most of the country). In the following section, we highlight some key examples of this.

#### 4.3.1. Heathrow's Third Runway

In spite of the fact that London is served by some six international airports, which according to Transport for London handle more passengers than any other city region on the planet, the government has approved plans to build a third runway at Heathrow (BBC, 2018a). Although the estimated £14bn cost of Heathrow expansion (BBC, 2017b) would be met by its private sector owners, it has been alleged that more than £10bn of rail and road spending would ultimately need to be met by the public sector to support the expansion (Topham, 2018). In addition, the proposed runway plans may involve major works to reroute the M25 motorway (BBC, 2018b). Given the complex corporate structure of Heathrow (Plimmer & Ford, 2018) and its highly leveraged balance sheet together with the possibility of substantial cost overruns (which are hardly uncommon for large infrastructure projects), it is difficult to avoid the conclusion that the state bears a substantial amount of risk. In this regard, it enjoys an implicit subsidy not dissimilar to that of major banks (Noss & Sowerbutts, 2012). To reiterate, the results of our previous chapters suggest that it is difficult to justify such investments on the basis of London's price-adjusted productivity.

#### 4.3.2. HS2

High-Speed 2 (otherwise known as HS2) is a flagship project on behalf of the UK Government to link London to the West Midlands and the North of England (Manchester and Leeds) by a rapid mass-transit rail means of travel. The underpinning logic here is to significantly reduce travel times between key cities in the UK and improve connectivity to London (and ostensibly proximate European destinations via a link to Eurostar).

However, there have been criticisms surrounding the overall connectivity of the earmarked route for HS2. Particularly problematic is that the route will not connect with key stations such as Birmingham New St or St Pancras (in this case necessitating a walk between stations, from Euston, for international travellers). In turn, the costs projected with the project have also seen significant inflation, with estimates suggesting an extra £43 billion needed beyond initial estimates (Kentish, 2018), prompting calls from within the UK Parliament to review the scheme (Kentish, 2018). For Jenkins (2018), the costs associated with this project have been particularly egregious, with a quarter of the 1,346 staff employed being paid more than £100,000 p.a. and that ‘the company’s soaring consultancy bill also doubled last year to a staggering £600m, including £21m in one year on environment consultants’ (Jenkins, 2018). Such costs do indeed raise severe questions over the actual value for money associated with this project, and to invite critical review of the justifications used to push the project forward in the first place. Jenkins (2018) further notes that

*[w]hen Labour’s then transport secretary, Andrew Adonis, embarked on HS2 in 2009, it was in defiance of the 2006 Eddington report, which dismissed high-speed as outdated, voracious of energy and with poor rates of return.*

Once again, it is telling that the northern parts of the line may now never be built.

#### 4.3.3. Crossrail

With a funding deal of some £16bn (House of Commons Select Committee on Crossrail, 2007) Crossrail will increase London’s total rail capacity by 10% (Glover, 2018). The line

will undoubtedly be of enormous benefit for busy commuters from the Royal County of Berkshire, as well as those further East in relatively ‘affordable’ parts of London and offers a convenient spur to Heathrow. Nevertheless, even before Crossrail has opened, there are plans for ‘Crossrail 2’, to connect Surrey to Hertfordshire via central London, with an estimated cost of some £31.2bn (Topham, Pidd, & Halliday, 2017). This would mark the fourth major rail project in London since 2000.

In addition to the fact that the project is being delivered late and over budget (which is, in fairness, not unusual in the world of large infrastructure projects), it is difficult to justify pouring further billions into the rail infrastructure of the Greater London area ahead of improving transport links in metropolitan areas of the rest of the country. Indeed, for the cost of Crossrail, it would be possible to build 1,000 stations such as Kirkstall Forge in Leeds (which exceeded its expected annual passenger numbers within five months of opening). This simple example is just one illustration of the ‘latent demand’ for better infrastructure in the regions exposed by such projects. Again, we refer back to the results of Chapters 2 and 3, suggesting that our adjusted figures imply that greater ‘bang-for-buck’ enhancements to productivity and living standards might occur were such capital to be redeployed to the poorly served commuter networks in the Midlands and North.

For example, it is unsurprising that there is no obvious extant demand for public transport services between Skegness and Grimsby when it takes almost three hours by train and 3½ by bus to cover little more than 30 miles. Similarly, it can take at least an hour to travel the 11 miles between parts of Dudley and central Birmingham at rush hour via any means of transport. Even worse, the only trains between Walsall and Wolverhampton (a distance of under 7.5 miles) travel via Birmingham and thus take over an hour, in spite of the existence of track between the two.

Our analysis has already shown that these regions outperform their ‘official’ productivity: how much better could they do with the kind of funding received by London and the South East (or even Scotland). Given this, it’s hardly surprising that such regions are both amongst the poorest in the country and those that voted most strongly for Brexit.

#### 4.4 THE BREXIT OVERHANG: WHAT MECHANISM FOR FUNDING ‘THE REGIONS’ AFTER BREXIT?

And it is to the immediate Brexit context that we now turn. There has been a lively debate in the literature over the effectiveness of EU structural funding in the UK and elsewhere (Becker, Egger, & von Ehrlich, 2010). Currently, the UK benefits from EU regional funding, under the premises of the European Structural and Investment Funds (ESIF). Under this regime, approximately half of the UK share of ESIF over 2014–2020 (approximately £24 billion) were allocated to areas that are identified as ‘less developed’ or ‘transitional’ (Bentley, 2018). In light of this, it is noteworthy that Bachtler (2017) argued that such EU Structural Funding has provided a long-term anchor for policy.

However, as noted, eligibility for structural funding correlates poorly with many measures of deprivation. Our analysis has argued that the measures underpinning this funding allocation are flawed. A key finding here was that regions such as Shropshire and Staffordshire qualify for higher levels of funding on the basis of their GVA per capita but this ignored the household income (gross disposable household income, GDHI) side of the story – to reiterate, what we regard as a better measure to calculate deprivation. In this context, poorer areas such as the Black Country in the West Midlands were eligible for less money on the basis of having a GVA per



capita that exceeded EU thresholds. Yet, Brexit premises that this funding regime will no longer be applicable to the UK and thus offers the opportunity to revisit funding formulas.

This is of particular importance in light of findings that the effectiveness of cohesion spending is critically dependent upon the proper identification of specific regional needs (Crescenzi, Fratesi, & Monastiriotis, 2017). Thus, whilst Brexit poses acute economic challenges, particularly in light of evidence suggesting that it might have starkly divergent regional impacts (Chen et al., 2018), it also presents opportunities for more appropriate targeting of regional policies (particularly in light of the devolution agenda).

With this in mind, the UK Government proposed a ‘Shared Prosperity Fund’ (BBC, 2017a) to substitute for the monies allocated under EU regional funding schemes. The Shared Prosperity Fund was first proposed by the Conservative Party in its 2017 Election manifesto (Conservative Party, 2017, p. 30) and described as a fund ‘taken from money coming back to the UK as we leave the EU, to reduce inequalities between communities in our four nations’. In particular, that:

*[t]he money that is spent will help deliver sustainable, inclusive growth based on our modern industrial strategy. We will consult widely on the design of the fund, including with the devolved administrations, local authorities, businesses and public bodies. The UK Shared Prosperity Fund will be cheap to administer, low in bureaucracy and targeted where it is needed most. (Conservative Party, 2017, p. 35; our emphasis)*

Inferred from the above is that somehow EU funds are expensive to administer and highly bureaucratic. This does raise the issue of how one would administer such monies in a ‘streamlined’ manner. However, the more substantive issue for

us is that of how areas with the most ‘need’ would be identified. Our analysis has suggested that measures such as real GDHI per capita (with our estimated regional price levels) would be better in this regard to a replacement ‘social fund’. However, the thresholds relative to mean earnings would be contingent on the monies available. The nature of targetting priority areas in itself might be influenced by other factors. Should ‘deprived’ areas be prioritised, wherever they are in the UK? Or, to reiterate, is there a case that the Core Cities outside of London, which our analysis suggests have performed better than conventional measures depict, be given favourable treatment as nascent ‘agglomeration economies’ in themselves?

The above notwithstanding, practical discussion on the implementation of a new funding regime to compensate for the loss of ESIF post-2020 has been muted (Huggins, 2018). As Huggins notes, the launch of the UK Government’s industry strategy paper in November 2017 provided an opportunity to substantiate the nature of the Shared Prosperity Fund, but very little detail was provided (Huggins, 2018, p. 144). Thus, even as late as August 2018 (at the time of writing) a high degree of uncertainty remains as to regional funding levels after Brexit.

In a sense, this should not be surprising. We would argue that this is so for a number of reasons. First, the obvious caveat is that any post-Brexit regional monies will be contingent on the size of the ‘divorce bill’ to be paid to the EU.<sup>4</sup> Second, given that the vast consensus of the economic impact of Brexit is that it will result in foregone revenue to the UK Treasury, there will be added impetus for Treasury to ‘claw back’ these monies (reinforcing long-standing practices in this regard). In addition, the thrust of regional policy in England in recent years having been for greater centralisation and control, we have little reason to expect that the fund will have any substance to it. Finally, there remains the question of how much money would

actually be ‘new’, rather than recycled from existing funding tranches. European regional funding takes place on a matched basis by the UK Government (Huggins, 2018) so in a very real sense, on current allocations, half of any incipient Shared prosperity fund (SPF) would consist of moneys already allocated.

The implication of the above is that there is a risk that any post-Brexit regional funding settlement will be distinctly lacking in any real semblance of ‘regional rebalancing’. Indeed, infrastructure concerns continue to be dominated by projects proposed for London and the South East (more narrowly defined here as a London–Cambridge–Oxford ‘golden triangle’), as HS2, Crossrail, Heathrow expansion, and the advocacy by the National Infrastructure Commission and the Highways Agency for a new expressway between Oxford and Cambridge to service a million additional homes (Monbiot, 2018) show. That such proposals appear a *fait accompli*, without any significant economic or social justification, or democratic debate (Monbiot, 2018), in turn only serves to reiterate the urgent need to address the regional balance of power, and resourcing in the UK. It is to this that we turn in the next section of the case for ‘meaningful devolution’ for the English regions, to match those of the devolved nations.

#### 4.5 THE CASE FOR ‘MEANINGFUL DEVOLUTION’

The creation of the Scottish Parliament and Welsh Assembly in 1998 arguably marked the most significant reconfiguration of powers in the UK since its creation in 1707, as a ‘historically centralized “union state”, [...] which recently has been transformed by processes of devolution’ (Pike & Tomaney, 2009, pp. 18–19). Scotland has a devolved administration in the form of the Scottish Government, which has a clearly defined role and is widely considered to be democratically

accountable to the public, as evidenced by steadily increasing voter turnout at Scottish elections since 2003 (Aiton et al., 2016).

In contrast, since the 1970s, domestic regional policy across the UK has been progressively reduced in its scope of operation (Bachtler, 2017). Over the past decade, regional governance arrangements in England in particular (excepting London) have become highly fragmented and particularly prone to the vagaries of policy changes. This has seen the abolition of Regional Development Agencies, the creation of Local Enterprise Partnerships (LEPs), Combined Authorities, various ‘enterprise zones’ and the emergence of the ‘Northern Powerhouse’ and ‘Midlands Engine’ brands (Bachtler, 2017; Bentley, Bailey, & Shutt, 2010). Unlike the Scottish Parliament, these opaque entities have struggled to secure legitimacy in the eyes of a sceptical public struggling to understand their functions and perceiving them primarily in terms being unelected and hence unaccountable.<sup>5</sup> This is of concern given that a wide and growing range of literature suggests that governance and institutional quality are crucial factors in regional development (Bachtler & Begg, 2018). However, as Bentley (2018) notes, the discussion of devolution for the English regions in Westminster policy circles has abated: ‘[w]ith all attention on Brexit, the drive for devolution has waned’ (Bentley, 2018).

There is thus a clear need to move beyond the current limited debate on devolution and ‘regional rebalancing’, and actually embrace a new constitutional settlement for the UK (Budd, 2018) with attendant transfer of resourcing decision-making ability. Indeed, if the UK is to survive as a political entity post-Brexit, we would argue that this is essential. For us, perceptions of social exclusion, or otherwise ‘being left behind’ – particularly in the ‘Missing Middle’ of the UK – could be related to a lack of suitably devolved governance

arrangements within England (and Wales, to a degree). As such, Brexit poses a challenge to traditional notions of governance (Stoker, 1998), in that governance ‘is ultimately concerned with creating the conditions for *ordered rule and collective action*’ (Stoker, 1998, p. 17, emphasis added). Collective action in itself though requires some semblance of community and solidarity in the pursuit of basic shared objectives (Ostrom & Ahn, 2009). Hence, if the inequalities brought into sharp focus by Brexit are to be addressed, then ‘meaningful’ devolution cannot be done in a ‘top-down’ or ‘dirigiste’ manner, but rather, must engage directly with voters in order to overcome a perceived democratic deficit.

What would ‘meaningful devolution’ look like, then? Ideally, we would suggest that such a devolution would be one characterised by governance arrangements whereby voters in a given (e.g. English) region directly elect representatives to make decisions on resourcing priorities for their area. Against this we would stress that the English experience with regional devolution has not given cause for optimism in this regard, having noted the failure of a referendum on the creation of an elected regional assembly in the North East of England in late 2004 (Pike & Tomaney, 2009, p. 24).<sup>6</sup> Indeed, English identities seem firmly rooted in local orientations, rather than regional ones, as our own focus group studies under the auspices of the ‘CBS Roadshow’ also have demonstrated (De Ruyter et al., Forthcoming).<sup>7</sup> As the experience with Metro Mayors has shown, local parochialism is difficult to overcome in trying to consolidate governance mechanisms at the regional level. We are then left with the somewhat problematic thought that some element of top-down imposition is required to enact such structures, rather than relying on the local ‘democratic will’. However, further research is needed in this regard to ascertain what the ideal form of regionally devolved governance in England would be.

However, the level of governance notwithstanding, given the manifest disparities in funding between London, Scotland and the English regions, a necessary reform would be an updated funding formula to equalise per capita funding across the UK at the GOR level of public services and infrastructure (see Forrest et al., 2017, for a discussion of this). Of course, the question remains as to which policies should be devolved to a regional level. For this we need to revisit the debate between ‘people versus place’ policies, in order to arrive at a better understanding of what the optimal scale (national/regional/local) for policy design and delivery should be.

#### 4.6 MOVING BEYOND ‘PEOPLE VERSUS PLACE’: PUTTING IT TOGETHER IN A POLICY FRAMEWORK

The argument over whether policies to help those living in lagging regions should be ‘place based’ or ‘people centred’ has a long academic pedigree (Barca, McCann, & Rodríguez-Pose, 2012). Divergent views are clear internationally, with some arguing of ‘the futility of providing economic incentives for staying and striving in lagging regions’ (Gill, 2010) and that institutions should be ‘space-blind’ (World Bank, 2009). Indeed, the World Bank (2009) goes so far as to argue that economic growth ‘will be unbalanced’ (World Bank, 2009). As such, this view has been criticised on the grounds it ignores sociospatial factors (Murphy, 2011).

In contrast to the ‘people-centred’ vision espoused by Gill (2010), others argue in favour of a ‘place-based’ approach to policy (Bentley & Pugalís, 2014). As noted by the latter researchers, in the post-war period, ‘local development policies veered between being targeted interventions intended to improve property (e.g. business accommodation, housing stock, etc.), and those intended to improve people

(e.g. workforce skills, education, etc.)' (Bentley & Pugalís, 2014, p. 286). Nevertheless, since the advent of the neoliberal consensus in economic policy from the premiership of Thatcher onwards, policy interventions in the UK have overwhelmingly been people-focussed. In recent years, even industrial policy has become more centralised (Peck, Connolly, Durnin, & Jackson, 2013).

Indeed, even many innovations that ostensibly have a regional focus, of which LEPs are probably the best example, have ultimately ended up being delivery vehicles for an increasingly centralised set of policies (Bailey, 2011; Bentley et al., 2010). It is clear from many of the 'strategic economic plans' adopted by LEPs that most focus on the same handful of sectors that happen to be 'in vogue', almost irrespective of their real local strengths (Swinney, Larkin, & Webber, 2010). Further academic critique has focussed on the 'missing middle' in terms of regional policy (Bentley et al., 2010), together with their lack of financial firepower (Bentley et al., 2010) and the absence of statutory 'teeth' (Pugalís, Shutt, & Bentley, 2012).

It is ironic that the intellectual underpinnings of this consensus stem from traditional economic orthodoxy: the primacy of the neoliberal agenda coincided with economic orthodoxy moving decisively away from many of the intellectual foundations that it formed. This was perhaps most obvious in the development of the new Keynesian school of macroeconomics, which has come to dominate modern DSGE<sup>8</sup> modelling (Stiglitz, 2018). In the same vein, there can be no doubt that the 'new economic geography' associated with Krugman (1991) and others is now firmly mainstream. Indeed, the tractable mathematical model of imperfect competition pioneered by Dixit and Stiglitz (1977) has become a workhorse of modern economics and is one of the 'bag of tricks' used by those economists seeking to understand why economic activities and certain industries 'cluster' in certain places (Krugman, 1998).

Our contention is that the debate over ‘people versus place’ has grown stale. What is instead needed is a realistic conceptual framework within which to evaluate where ‘space neutral’ policies are most appropriate, and where such policies can become damagingly ‘spatially-blind’ and engender ‘perverse spatial outcomes’ (Bentley & Pugalis, 2014, p. 289). We therefore posit the following policy framework within which to frame the discussion and avoid what Barca et al. (2012, p. 139) refer to as ‘explicit spatial effects, many of which will undermine the aims of the policy itself’.

Thus, in putting forward a framework, or recommendations, for regional policy in a post-Brexit landscape, we return to the dichotomy between incomes (measured by GDHI per capita), which are ultimately what define living standards, and productivity (measured by GVA per hour worked), which is a fundamental measure of economic performance.<sup>9</sup> In essence, to reiterate, regional policy must be characterised by meaningful devolution of powers, as well as resources, from central government. Hence, we capture this by putting forward the following very simple Bigger-Better-Bolder (or B-B-B) framework for devolution:

#### 4.6.1. Bigger and Better

Simply put, meaningful devolution means greater sums of money allocated to the regions. This can take place directly via increased UK Government funding of the regions; but also in enabling regions greater powers to secure resources themselves. In terms of central government funding, we propose that the ‘Shared Prosperity Fund’ consist of two key funding tranches:

- A ‘social fund’ to replace the current UK allocation of European social fund (ESF) monies (including matched UK government contribution) in order to tackle deprivation.



This fund would be allocated to areas on the basis of our identified metric of adjusted GDHI per capita at the local authority level. Crucially, this should be done on the basis of measures that account for differences in regional prices. For example, the London borough of Barking and Dagenham should not be penalised simply because it is in a high-cost region. Similarly, Portsmouth and Southampton (alongside large parts of the eastern reaches of the River Thames) are every bit as poor in real terms as more northerly regions in the UK. Finally, using such figures would acknowledge the fact that, in real terms after adjusting for purchasing power, many of the poorest parts of the UK lie in the Midlands rather than the North, and they have a commensurately large need for funding.

Whilst GDHI per capita is not perfect (as it still conceals inequalities within a given area), we argue that this would represent a dramatic improvement over doling out such monies on the basis of GVA per capita. As the methodology develops (an item we take up under ‘further research’ in our Conclusion section), we would suggest that the funding mechanism thereof could be further refined to consider household income deciles within a given local authority GDHI per capita average, as a means to ‘prioritise’, or target, locales for funding.

- An ‘infrastructure fund’ to replace the current UK European regional development funding (ERDF) allocation (including matched UK government contribution) to the regions. This fund would be allocated to areas on the basis of our estimated regional productivity figures. This infrastructure fund would include funding for infrastructure as broadly defined, which would include both physical transport and digital infrastructure. On this basis the current disparity in transport funding

levels between London and the English regions would be reduced from over 200% to only 20–30% (which whilst not ‘equalised’, provide a robust metric of economic performance of which to assess infrastructure needs against). Ideally, these monies would be allocated at the GOR level (i.e. NUTS1; coterminous with the now defunct regional development agencies (RDAs) in England). However, in the absence of this, the Mayoral Combined Authorities would be a good starting point, as the natural foci of city-regions within the UK, where the greatest ‘bang for buck’ for infrastructure spend could be demonstrated.

#### 4.6.2. Bolder

In addition to the two proposed funding streams identified above (and accompanying allocation mechanisms) we propose that further powers be transferred from central government down the regional level. Key here is that in addition to powers over spending decisions, should come the power to raise resources, that is, via taxation and borrowing powers above and beyond that of current levels as depicted in Council Tax and business rates. As inferred from our earlier material, transport, health and education would be obvious areas.

Of course, this then raises questions over what the ‘optimal scale’ of different interventions. What interventions should be undertaken on a national level, that is, be ‘space-blind’ – and what should be done at a subnational level? In general, access to quality education should not be contingent upon location. Existing policies contradict this: education spending per student varies widely across the UK and schools can find themselves disadvantaged by their particular situation with respect to aspects of their intake. Similar issues can manifest themselves depending on the age of the school infrastructure: older buildings are costly to maintain, particularly if the school has

shrunk. Although the government is in the process of introducing a new funding formula for schools, it is far from clear whether this will adequately tackle the historic regional divide. Whilst a detailed examination of education spending is beyond the scope of this book, one's life chances and opportunities should not be contingent upon one's location. Moreover, the spatial element to education is clear: for most schools, admission criteria are (at least in part) dependent upon location.

In contrast, funding to tackle deprivation and social exclusion should be as locally focussed as possible (at least within the confines of the data we have available to us). Deprivation is typically highly spatially concentrated: often at the ward level or below. In contrast, control over transport and infrastructure spending most naturally resides at the regional level. Beyond this, there is a clear necessity for greater control over decisions at a subnational level, representing a 'revolution in devolution' for the UK.

In this context, we argue that Scotland potentially provides a good model for such a 'devolution framework'. Again, we would suggest that such powers should operate at the GOR/NUTS1 level, but in the absence of such structures, the combined authorities seem a natural starting point (with the added advantage that they have some modicum of democratic accountability – in contrast to the former RDAs). However, the challenge would come in terms of engaging with local communities to assess (or try to engender) support for such measures. As noted, attempts to legitimise regional governance structures in England have been problematic at best and further work is needed in this regard.

#### 4.7 CONCLUSION

In this chapter, we have sought to tease out the policy implications of our analysis. We have argued that existing measures

used to allocate regional funding are fundamentally flawed and built upon previous chapters to comprehensively demonstrate why this is the case. Moreover, even when not explicitly used to allocate funding, such measures are at best unhelpful and more often actively damaging insofar as they shape perceptions of relative regional success and where the greatest economic need and returns are.

We have thus argued that Brexit presents British regional policy with a fundamental challenge, but also an opportunity. The challenge is that Brexit threatens to exacerbate existing spatial inequalities (Chen et al., 2018) and, worse, those areas that voted most strongly for Brexit appear most vulnerable (Los et al., 2017). As a result, a vote that may in part have stemmed from the problems of those areas left behind (Rodríguez-Pose, 2018), threatens to worsen them. The opportunity, however, lies in fact that Brexit challenges us to do better.

Brexit challenges us to ensure that the gains from globalisation are more equally spread and that no region is left behind. As such, post-Brexit regional policy (whether under the guise of a ‘shared prosperity fund’ or other vehicle), needs to take account of real regional disparities, rather than nominal ones. Our figures suggest that greater spending on education and transport infrastructure in London and Scotland have paid dividends in enhancing productivity and living standards. A truly coherent post-Brexit regional policy must also build on what works well in these regions – most notably real power over policies – to offer a devolution deal that works for the whole country.

## NOTES

1. Even if Brexit does not ultimately occur, the results of the referendum bear out in striking fashion the need to revisit these issues, and our recommendations have a pan-European dimension.

2. Strictly speaking, Heathrow airport expansion would constitute private sector expenditure. However, the money needed to re-route the M25 around (or under) the proposed development have been contested and the prospect remains that the state being the ultimate bearer of risk here would foot the bill should the owners of Heathrow not have sufficient money to undertake the work (Topham, 2018).
3. And with Edinburgh providing a microcosm of this phenomenon in Scotland; again because of its being a (relatively small-scale) concentration of political and financial power (BBC News, 2015).
4. See Clancy and De Ruyter (2018) for a critical analysis of the figures cited here for the 'divorce bill'.
5. Mirroring charges that have been levelled (not always entirely fairly) at the EU by many voters (Follesdal & Hix, 2006).
6. Significant factors here were what Pike and Tomaney (2009, p. 24) described as 'apparent disquiet concerning its weak and limited set of powers and financial capabilities, subregional tensions and rivalries, uneven enthusiasm as well as outright hostility amongst some elements of central government...' (Pike & Tomaney, 2009).
7. Examples here include residents of Sutton Coldfield resolutely refusing to identify themselves as 'Brummies', and the shared notion of being from the West Midlands stark in being absent from any conversation (Pike & Tomaney, 2009).
8. 'Dynamic Stochastic General Equilibrium'.
9. Of course the two are closely linked: an area with low real productivity cannot sustain a high standard of living for its workforce (and those who are dependent on their taxes and/or savings – including the elderly).

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# Appendices

## APPENDIX 1: GDHI

The major constituent parts of GDHI are:

- *Gross operating surplus*: Household income from the rental of buildings, including the imputed rent<sup>1</sup> of owner-occupied dwellings.
- *Mixed income*: This is primarily income from self-employment.
- *Compensation of employees*: This is the largest individual item and consists of remuneration paid to employees including gross wages and salaries and any benefits in kind. It also includes social security payments made by the employer on behalf of employees.
- *Property income*: Confusingly, this refers to investment income and *not* income from property rents. It includes interest income, share dividends, rents on agricultural land and investment income attributable to insurance policyholders and pension funds. The latter item is somewhat subtle and the interested reader is referred to the Office for National Statistics' (ONS) methodology guide for additional clarifications and details.

- *Social contributions and social benefits*: These include government welfare spending (including state pensions, maternity benefits, disability payment, unemployment benefits and housing benefit amongst others) and private pensions. This category also covers a variety of other minor items and the interested reader is again referred to the ONS' methodology guide.
- *Other current transfers*: This category lumps together a variety of income sources, including insurance settlements, grants, gifts, etc.

From these headings are subtracted:

- *Primary income paid*: This primarily consists of interest payments made by households including mortgage interest payments and the interest on other consumer loans. It does not include the capital repayment portion of any mortgages.
- *Taxes*: These include taxes on income, wealth and other taxes (for example council tax)
- *Social contributions/benefits paid*: This category includes payments by both employees and employers. These include pension contributions and national insurance contributions.
- *Other current transfers*: Once again, this category lumps together a variety of payments, including non-life insurance premiums and a variety of other smaller payments (including fines, transfers of money abroad etc.)

## APPENDIX 2: THE EKS METHOD

One solution is to choose a base region and construct a price index that evaluates the prices of each other region using the spending structure of the base region. This is a so-called



Laspeyres index. The relative price levels depend heavily on which region is chosen as a ‘base’ and there is no reason to choose one region above another. One way around this is to use the spending structure of the UK as a whole as a base. Unfortunately, this method does suffer from certain key weaknesses: it is not scale invariant (approaching a Laspeyres index with the largest region as a base) and is more vulnerable to (stochastic) measurement errors than our preferred method (Dikhanov, 1997).

Many (including the authors) would argue that the Fisher Ideal Index is an optimum measure of bilateral relative prices. It is the only homogeneous<sup>2</sup> symmetric<sup>3</sup> average of the Laspeyres and Paasche indices that is base-invariant<sup>4</sup> (Diewert, 2004). As such, in a certain sense it can be seen as dealing optimally with the substitution effect (where the Laspeyres and Paasche indices are extremes). Unfortunately the Fisher index is not transitive: the direct purchasing power parity (PPP) is not necessarily equal to the indirect PPP (derived via a third country).

Our preferred method is the Èltetö-Köves-Szulc (EKS) method used by Eurostat and the OECD in cross-country comparisons (OECD, 2012). It provides transitive price levels that are as close as possible to the bilateral Fisher relative price levels. This is the so-called property of characteristicity (see OECD, 2012, for further details) and is an important motivator in using the EKS method over alternatives.

As noted, no system of comparing regional prices is perfect and unlike some alternatives, the EKS procedure is not additive: PPPs for the constituent components of consumer spending or GDP do not add up to the PPP calculated for spending or GDP as a whole. Moreover, real incomes (or real GDP) do not sum to their nominal counterpart. In other words, the real GDP of each region (deflated by a PPP calculated according to the EKS method) does not add up to the GDP of the UK as a whole.

Nevertheless, the authors believe additivity to be a less important attribute than scale invariance. If all quantities in a

given region double but prices remain identical then the relative price levels shouldn't change. In addition, it is desirable that the index chosen should be base invariant (i.e. it should not matter which region is chosen as Region 1). A further major consideration here is the fact that the ONS RRCPLs that we use as a data source are compiled on this basis.

In practical terms, the precise method used does not appear to materially affect our results. The overall differences when using the GK method instead of EKS appear in the order of a single percentage point for most regions. Although this is significant, the overall trend of London being far more expensive than any other region (and northern England and Wales being particularly inexpensive) remains unchanged.

In practical terms, we calculate the EKS price levels by calculating Laspeyres, Paasche and (thus) Fisher indices for each region before applying the EKS procedure to the latter and standardising the results. Whilst we lack data on quantities consumed by region, the Living Costs and Food survey does allow us to calculate weights that can be used as an input via a trivial rearrangement as follows:

$$\begin{aligned} \text{Laspeyres}_{2/1} &= \frac{\sum (\text{price}_{\text{region 2}} \times \text{quantity}_{\text{region 1}})}{\sum (\text{price}_{\text{region 1}} \times \text{quantity}_{\text{region 1}})} \\ &= \frac{\sum \left( \frac{\text{price}_{\text{region 2}}}{\text{price}_{\text{region 1}}} * \text{weight}_{\text{region 1}} \right)}{\sum \text{weight}_{\text{region 1}}} \\ \text{Paasche}_{2/1} &= \frac{\sum \text{price}_{\text{region 2}} \times \text{quantity}_{\text{region 2}}}{\sum \text{price}_{\text{region 1}} \times \text{quantity}_{\text{region 2}}} \\ &= \frac{\sum \text{weight}_{\text{region 2}}}{\sum \left( \frac{\text{price}_{\text{region 1}}}{\text{price}_{\text{region 2}}} \times \text{weight}_{\text{region 2}} \right)} \end{aligned}$$

The Fisher index is the geometric average of the Laspeyres and Paasche indices and this is made transitive by applying the following formula:

$$\left( \prod_{k=1}^N \frac{\text{Fisher}_{k/lj}}{\text{Fisher}_{k/li}} \right)^{1/K} = \text{EKS}_{2/1}$$

Price levels are standardised by dividing each region's price level by the geometric average of all price levels.

### APPENDIX 3: FISIM

A further technical issue involves the calculation of the size of the financial services sector. Whilst this is a national issue, it has an exaggerated regional impact because the activities of the financial services sector are spatially concentrated. Regional GVA are calculated by 'regionalising' the output of each industry (as reported in the National Accounts).<sup>5</sup> Naturally, certain regions specialise in certain industries. Whilst the methodology for regionalisation employed by the ONS Regional Accounts team is robust, if the output of a particular industry is overstated or understated on a national level, any disparities will be magnified on a regional level. This is of particular concern in the case of financial services, both because FISIM<sup>6</sup> is known to overstate the output of the financial services sector and because the latter is overwhelmingly concentrated in London. As a result, this artificially inflates the GVA of London at the expense of the rest of the UK.

This problem comes about because, unlike most sectors of the economy, the financial services sector does not charge directly for the services that it provides. Instead, money is lent out at higher interest rates than it is borrowed. FISIM therefore works by multiplying the amount lent by the interest rate charged and subtracting the interest charged on borrowings.

The reason that this overstates financial services output is because it takes no account of risk (if a large proportion of debtors default then interest charged needs to be high just to cover these losses).

As a result, in times of financial stress it can produce particularly perverse results: official figures suggest that the financial services sector grew by over 16% in 2009 during the nadir of the financial crisis (at a time when banks were reporting enormous losses and receiving state aid). In reality, of course, this result is generated by the fact that the risk premium spiked dramatically, leading to a huge disparity between borrowing and lending rates.

The ONS is constrained by international and European conventions in how it calculates FISIM. Whilst attempts have been made to quantify the impact on GDP of adjusting FISIM for risk (Akritidis & Francis, 2017; Haldane, Brennan, & Madouros, 2010), doing so on the components of GVA is much more difficult. Nevertheless, adjustments can be made by users of statistics. One can exclude financial services entirely from regional output and thus estimate the size of the ‘non-financial economy’.

Obviously this is a conceptually different output to GVA for the whole economy and in areas with a large financial services sector it will not give an accurate view of the economy as a whole. To calculate regional productivity it is then necessary to estimate the number of workers (and ideally hours worked) in the financial services sector in each region before dividing non-financial output by the size of the non-financial workforce. The only figures available are from the Business Register and Employment Survey, which are not completely comparable to their counterparts in the ONS’ official regional productivity statistics. We also lack any viable measure of the number of hours worked per job in the non-financial sector of the economy.

Alternatively, one can seek to use the regional shares calculated by the ONS and input an alternative measure of financial services output, for which the experimental statistics compiled by the ONS are likely to prove extremely useful (Akritidis & Francis, 2017). These show that risk-adjusted FISIM output was around £10–12bn, potentially reducing nominal GDP by up to 0.7% (Akritidis & Francis, 2017). This reduces total financial services output by around one-sixth. Ultimately the impact of doing so is rather small reducing London's productivity advantage over the rest of the country by around one percentage point.

## NOTES

1. Imputed rent refers to the amount that owner-occupiers would have to pay in order to rent their homes on the open market. Strictly speaking, this is the 'income' associated with owning the housing asset. It is discussed in more detail below.
2. Doubling both the Laspeyres and Paasche indices should double the average.
3. Symmetric in the sense of giving both regions equal importance.
4. Meaning that it is irrelevant whether one chooses the West Midlands, North East or Great Britain overall as a 'home region'.
5. The technical details of how this is done are here: [https://consultations.ons.gov.uk/national-accounts/consultation-on-balanced-estimates-of-regional-gva/supporting\\_documents/Development%20of%20a%20balanced%20measure%20of%20regional%20gross%20value%20added.pdf](https://consultations.ons.gov.uk/national-accounts/consultation-on-balanced-estimates-of-regional-gva/supporting_documents/Development%20of%20a%20balanced%20measure%20of%20regional%20gross%20value%20added.pdf). When the ONS publish the figures on 13 December, there will hopefully be a fuller methodology document I can reference.
6. Financial Intermediation Services Indirectly Measured.

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