

Diversity in leading and laggard regions: living standards, residual income and regional policy¹

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Abstract

This article develops a foundational economy contribution to debate about regional inequalities by presenting new calculations of household income after the costs of three essential items (housing, transport and utilities). These residual income measures illustrate the diversity of living standards within and between English and Welsh regions. The analysis shows a mosaic of variation in residual income and wealth accumulation driven by the variability of housing costs in four different tenure groups (outright owners, mortgage payers, private renters, social renters). The article argues that GVA averages and descriptors like 'left behind' are a poor guide to differences within and between regions; they also misdirect policy towards 'levelling up' the apparently unsuccessful places without directly addressing the quality of and access to essential services. From a foundational point of view, regional policy needs to focus on access to housing at reasonable cost for all income and tenure groups in every region.

Keywords

residual income; foundational economy; regions; liveability; living standards; regional policy

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Introduction

This article draws on the foundational economy approach to provide new perspectives on inequality within and between regions. The foundational economy concept was introduced originally to emphasise the importance of citizen access to the collectively provided basic services that are the precondition of well-being (Bentham et al., 2013; Froud et al. 2018). Practically, the focus was on what we would now call foundational economy 1.0, the ensemble of material and providential technologies from sanitation to social insurance which in the 1880-1950 period addressed public health problems and made urban life civilised and safe for all. The argument has since become more nuanced as new lines of inquiry have opened up and in recognition of the need to address the nature and climate emergency. Therefore, foundational economy research is now also concerned with what matters to citizens in ordinary places, where social infrastructure like youth clubs, libraries and parks are important alongside utility supply, broadband and transport (Calafati et al., 2019). Foundational economy also increasingly emphasises the importance of the well-being of future generations so that the renewal of foundational reliance systems (foundational economy 2.0) depends on a new ensemble of experiments and innovations, in activities like reforestation as well as in the upgrading of housing, transport and food systems (Calafati et al., 2020).

The foundational economy approach is thus about the triangulation of seemingly incommensurable necessities; we must at the same time address complex issues to address carbon emissions and ensure fair and sustainable use of natural resources, while also tackling the revealed shortcomings of health and care systems under pressure of Covid-19 in most countries (Froud et al., 2020). This requires a concern not only with the objectives of policy but also with how policy is done, including an engagement with specifics and experiment with transition. This article addresses another complication, the role of income. The foundational economy approach has emphasised the importance of collectively provided essential goods and services, distributed through systems of networks and branches. However, many of these systems - like food distribution, utility supply, transport infrastructure, transport, and most housing kinds of housing - do not provide goods and services which are free at point of use. This means that an individual's access to these essentials depends partly on income from employment or state income maintenance programmes. Insofar as we live in an income-based society, how does income figure in the foundational approach and specifically what measures of income are relevant?

Our interest has been stimulated by growing concerns in many countries about the affordability of housing, especially for young people in cities and regions which are apparently successful regions when measured by per capita GVA (gross value added) (Ryan-Collins, 2019). Across Europe, private renting has increased from 18.1% in 2007 to 31.5% in 2017 and some 26.3% of households in private (market) rented accommodation are described as 'over-burdened' by housing costs (i.e. they spend more than one third of their income on housing) (Housing Europe, 2019). Concerns about housing affordability direct us towards household living standards and the relation between incomes and inescapable expenditures for different tenures in places and regions, rather than per capita average output measures like GVA (gross value added) which are commonly used to compare places and regions; while rising property prices have clear implications for the distribution of wealth as much as incomes.

Hence this article is primarily concerned with a new measure of residual household income after expenditure on three essentials (housing, utilities and transport) and this is contextualised by relating this residual income measure to gross income and disposable income after tax. These expenditures can be considered as foundational, in that access to them is essential for everyday life (Froud et al.,

2018). We then consider how residual income after the cost of these foundational services varies in different English regions for the mean household in four tenure groups (owned outright, mortgage paying, privately rented or socially rented) drawing on specially commissioned data on household expenditure. The analysis is rounded out with a consideration of wealth effects because houses are an appreciating asset for some households.

Analysis using the residual income measure changes what we see in regions and how we see regional success and failure. A region cannot be epitomised in one per capita average figure, whether output or income based, to allow a binary distinction between 'successful' and 'unsuccessful'. Rather, we can observe a diversity of living standards with a mosaic of variation in household (residual) income and wealth accumulation *within and between* regions. Variation in house prices by region and by cost of housing according to tenure creates relative winners and losers in terms of living standards. Many ordinary places which could be stereotyped as 'left behind' on the basis of low GVA per head can work well enough for households that can set low housing charges against modest wages, just as high GVA cities like London can be purgatory for private renters paying one third or more of disposable income as rent.

While the analysis in this paper is based on UK data, the question of how essential expenditures - especially housing - can shape intra as much as inter-regional differences is relevant elsewhere, particularly where housing costs have risen much faster than incomes and where there is limited provision of social housing. The implication of the analysis is that regional policy needs to engage leading as well as lagging regions to consider how the cost, quality and availability of housing and other foundational services drive living standards directly. Moreover, it supports calls to disconnect housing from the circuits of wealth accumulation (Aalbers, 2016; Ryan-Collins et al., 2017).

The article develops these arguments as follows. The first section presents a literature review which considers the range of metrics used to measure and understand differences between regions before turning to survey the extensive literature on household incomes and living standards which has limited consideration of place. The following two sections explain the method and assumptions of our residual income calculation and then present the empirical findings on residual income and wealth effects according to housing tenure within and between regions. A final section provides a discussion and conclusion.

Literature review

A range of metrics can be used to identify and understand differences between regions: these include GVA indicators to measure output and productivity, income-based measures to assess household or individual level experience, and human development related measures or indices which generally combine social as well as economic factors. The task then is to choose metrics that provide meaningful information in relation to the issues of concern. In this section we outline some of the most significant approaches to understanding how different measures can be used for place-based comparisons.

As a standard measure of output and productivity (per hour), GVA has long been used to compare regions and is now being used to frame an argument for new kinds of place-based policy. For example, Rodriguez-Pose (2018) explores 'territorial imbalance related problems', arguing that place-based policy should be refocused to defeat populism which is read as the electoral revenge of 'places that don't matter' in declining areas. The underlying problem is a deficiency of growth and jobs: 'persistently low levels of regional growth are at the root of an increasing economic and political instability' (2018, p.193). It is assumed that productive deficiency is a driver of discontent and

empirical support is provided by statistical series on long run gross domestic product (GDP) and employment growth in EU regions and US metropolitan statistical areas (MSAs). What is implicit in Rodriguez-Pose becomes explicit in McCann's analysis of whether the UK is more unequal than other high-income countries. Thus 'the links between peoples' lived experience and political responses depend crucially on local productivity as the key driver of local prosperity' (McCann, 2019, 2). For McCann, 'the standard approach' is to measure regional progress using per capita GDP and GVA measures (where GVA is GDP minus taxes plus subsidies).

However, GVA is not one measure but a changing suite of measures, methods of calculation, adjustments and reconciliations, such as those produced for the UK by the Office of National Statistics (ONS). For example, in 2016 GVA (B), which balances income and production approaches to calculating the market value of output, was introduced (ONS, 2017a). Until 2014, the ONS published separate GVA (I) income measures and GVA (P) measures which had both previously been calculated on the basis of workplace (allocated to the location where the economic activity takes place). The GVA (B) series continues to be compiled on a workplace basis and it can only be related to a resident regional population after adjustment for long distance commuting: this was estimated to boost London GVA by between 10% and 20% in the period 1997-2011 (ONS, 2013¹; ONS, 2019a). The ONS no longer publishes residence-based measures of GVA: workplace data is both now of better quality and deemed more conceptually meaningful as GVA is 'produced' in a workplace (ONS, 2017b).

Even if numerator and denominator could be aligned on the basis of residence, regional comparisons of living standards using GVA are fraught with difficulty because of the need to adjust by excluding major items which are routinely included in output under national income accounting conventions but have the effect of increasing the apparent gap between London and the regions (see Beatty and Fothergill, 2019, for an attempt to 'correct' for such differences). Thus, GVA includes imputed rents (the benefit to home-owners of not having to pay rent) which are more important in London but do not boost disposable income available as consumption or saving (ONS, 2019a). Any adjustments are also necessarily imprecise; thus, the ONS allocates corporate surplus booked in London corporate headquarters to regions on the basis of employment.

More broadly, many authors challenge the assumption that GDP or GVA can easily or precisely measure living standards or well-being (see for example, Lequiller and Blades, 2014, pp.452-3). For some authors this has led to attempts to develop measures that capture a broader set of outcomes that better reflect well-being, while others have advocated use of income (not output) measures of living standards, not least because it is recognised that recognised that 'in left behind places... growth has not translated into rising living standards' as real household incomes have declined (Tomaney and Pike, 2019, 20). These different approaches are explored below.

Calls for use of metrics that go beyond GDP or GVA have grown since the report of Stiglitz et al. (2009) which argued for use of well-being measures rather than GDP or GVA to assess development. As noted by Tomaney (2017), most efforts here have focused on national level measures and comparisons, especially by organisations such as the EU and OECD, which have developed programmes for measuring well-being. More recently, several important studies have explored the potential for inter-regional comparisons. For example, Betti et al. (2012) explore how indicators of deprivation and poverty can be used at the regional level, drawing on the national well-being measurement projects of many national governments.

Perrons (2012) goes a step further in constructing a regional development index based on the United Nations Development Programme (UNDP) (2010) Human Development Index and intended to explore spatial inequality in a high income country. In her results for the UK, Perrons finds that places that are

lower ranked in conventional GVA terms perform relatively better on the basis of this index which includes social and economic variables; while London is relatively less successful. In subsequent work that incorporate gender explicitly, Perrons and Dunford (2013) find London performs even less well in relation to other regions. Higgins et al. (2014) makes a further valuable contribution in analysing spatial inequalities on quality of life within London. Here, using quality of life metrics - encompassing indicators of health, community safety, transport, culture and leisure, education and so on - produces a set of spatial distinctions that is more complex than inner/outer London differences.

While the UK's statistics office also now prepares both 'objective' and 'subjective' measures of well-being (Randall et al., 2019), these new measures do not displace long established income related economic measures of living standards at national and regional level. To this end, the ONS produces regional figures for gross disposable household income (GDHI) (Prothero, 2018). Stiglitz et al. (2009, 39-40) concur with the ONS in preferring household - not per capita - income because most multi-households pool income and share costs to some extent. In 2018, 19.6m of the total 27.6m UK households have more than one person; and nearly 17m of these have more than one adult.ⁱⁱ Household size then becomes relevant (for example multi-family households or adult children living with parents) so that income per person in the household also needs to be taken into consideration (and is likely to be different to an average per capita disposable income across the region as households have unequal income and are of different sizes).

Regular and substantial reports on income based living standards in the UK are currently produced by both the Institute for Fiscal Studies (IFS) and the Resolution Foundation, using disposable household income after taxes and benefitsⁱⁱⁱ and this is the starting point for further analysis of income before and after housing costs (see, for example, Bourquin et al., 2019). The IFS uses equivalised household income after taxes (income tax, national insurance and council tax) and benefits; the equivalisation adjusts for differences in household size based on an OECD formula where children are entered as fractions of adults (Bourquin et al., 2019, 78). Income based studies have been complemented by studies of the wealth effects of property ownership (Crawford et al., 2016). Some researchers approach living standards through household expenditure data because there is good consumption data available for those on low incomes (Brewer and O'Dea, 2012)^{iv}. And, as part of its measuring economic well-being objective, the ONS now reports on 'the amount of expenditure by households to meet their everyday needs, adjusted for the prices of goods and services' (ONS, 2019b).

These income and expenditure studies bring out the importance of housing costs and housing wealth. In 2018, the ONS produced an experimental series on spending per person living in each of the UK regions. Spending per person of £24,454 in London was almost £10k higher than in Wales (£15,965); but most of that was accounted for by spending on housing, which was £7k per person higher in London than in Wales (ONS, 2018, section 6). A study of Scottish housing wealth produces several striking findings about how inequalities in housing wealth are greater than inequalities in income and have been widening: there are a larger number of citizens with no housing wealth (35%), compared with no pensions (23%) or savings (20%); while a significant number of households have more than one property (Bangham and Judge, 2019, 20). Consequently, there has been continuing interest in measuring residual income, simply defined as disposable (post tax and benefits) income minus housing costs.

Such analysis has a relatively long history in the UK: the classic, pre-1950 discussion of working-class income and living standards made the connection between housing costs, living standards and urban place or regional space. This starts with the treatment of rents and other 'necessaries of a healthy life' in Rowntree's (1901) survey of the city of York which calculated the percentage of the population in

primary poverty because their income did not cover minimum expenditure on food, clothing and heating and actual rents paid. Rowntree's strong assumption was that working-class living standards could only be meaningfully discussed after modelling necessary expenditure on food, clothing and heating and then adding actual housing costs incurred as rent.

This assumption is carried over through successive local urban poverty studies of the inter war period into the analysis of regional living standard differences in Beveridge's *Social Insurance* report of 1942. This report reworked Rowntree's calculation with the aim of setting a national benefit level that would abolish 'poverty'. After consideration of the large variation in actual rents paid in different regions, Beveridge accepted that it was not possible to pay one standard national benefit to social insurance claimants whose benefit should include a national element cost of necessities plus a regional element of actual rent paid.

The variation of housing costs in the UK either by tenure or by region has been explored in more recent research, though generally not in combination. As Hills et al. (2019, 20) note, comparing income before and after housing costs can be revealing, especially as housing costs for renters and owner occupiers have moved very differently since the great financial crisis. On regions, Clarke (2019) presents geographical differences in household income per person before and after housing costs and finds that the geographical variation in income after housing costs has more than halved since 1990. Likewise, Cribb et al. (2017, 39) show that, after housing costs are taken into consideration, the income gap between the UK median and low housing costs regions (the North, Midlands and Wales) is reduced; while in high housing cost London the effect is to reduce income from more than 10% above the median to just under. Some economists have argued that housing cost: earnings differentials across different regions reflect levels of amenities that are valued by those who choose to work in such areas (Gibbons et al., 2011), though these amenities may be hard to measure and, of course, not all residents in an area are actively making labour market choices to guide location decisions. Tantalisingly, Cribb et al. (2017) also note that most of the housing cost driven differences in income are within rather than between regions; but these authors do not explore such differences.

The literatures on income and living standards are extensive and the role of housing costs has been considered in different ways. The connection with living standards in urban place and regional space has been made but the implications of tenure-related housing costs within and between regions have not been explored. The next section outlines our approach to understanding how living standards vary within as well as between regions, using a residual income approach.

Method and data

Housing, living standards and place are now connected through the general recognition that 'successful' cities and regions can be places with great inequalities of income and wealth which are partly housing related. In city regions like London the cost of housing is described by the current mayor as 'the biggest threat to London's future' (Mayor of London, 2018). At the same time, housing barely figures in characterisations of 'left behind places' which are generally presented as productively-collapsed districts, with poor transport infrastructure and too many low-skilled and poorly-educated workers (e.g. Goodwin and Heath, 2016). In all places, the impact of low or high incomes on living standards is partly mediated through the cost of housing; and this section outlines the measures, methods and sources we have used to explore these relations.

If we take income, what measures of household income should be considered and how should the different measures be related? Disposable household income is a readily available measure which is

relevant to living standards because it gives a net income measure calculated after tax and social charges on gross income. The taxes which reduce gross to disposable income are not of course simply a deduction because there is a living standards payback in tax-funded collective services like health and education, as well as cash benefits. There are also other inescapable deductions and this analysis focuses on three of these foundational essentials – direct housing cost in terms of rent or mortgage, utility bills and cost of (private and/or public) transport. These are all marketised services so that most users must pay all or most of the cost.

In this article we define household residual income as disposable income minus the cost of these three foundational essentials. Housing, utilities and transport are placed in a category of their own because expenditure on these items is, in the short term, fixed and inescapable. Food and clothing are also essential but there is some scope for adjusting expenditure week by week by economising or postponement; growth in use of food banks is one indicator of extreme economising on food (Human Rights Watch, 2019), while much of what is spent on clothing goes beyond basic provisioning. In focusing on housing, utilities and transport, the aim is to make a pragmatic and preliminary calculation about how disposable income is reduced if we subtract some inescapable and semi-fixed major items, but without claiming that all ‘essentials’ have been taken into account.

Measures of residual income are important because they show what margin is left over for household discretionary spend. But our aim is not to replace one per capita output measure with one household income-based measure of living standards. As noted by Froud et al. (2018), standards of living depend on collective provision of providential and material infrastructures, as well as on individual income; this requires investment in infrastructure as well as a current revenue stream. Fieldwork by Calafati et al. (2019) has highlighted the importance of various kinds of social infrastructure such as green space or libraries for well-being (see also Marmot, 2010; Klinenberg, 2018). More clarity about place-based variation in income is only an intermediate step towards a foundational economy based approach. Broader measures of liveability which encompass a wider set of social, cultural and other factors is a necessary alternative to avoid imposing narrow, economic preconceptions of what matters. Perrons’ (2012) analysis based on an index which incorporates health and education related factors as well as employment and economic standard of living provides important insights into spatial inequalities.

Nonetheless the narrower focus on household income in this paper, makes a contribution because it shows the relationship between different measures of income (gross, disposable and residual) within as much as between regions and demonstrates the importance of housing expenditure as a driver of living standards. The subtractive method used in the paper is useful not simply in producing a new ‘bottom line’ but because it makes a series of deductions that show the importance of different variables and highlights new possibilities of regional policy intervention.

Residual income for a household is easy to understand as a concept - disposable income minus deductions for housing, utilities and transport - though in practical terms it is more difficult to calculate it by place or region. In UK official statistics, analysis of variation in housing costs according to tenure and discussion of place-based differences have been kept in separate boxes because it is difficult to bring them together. Adjacent households living in identical houses can have very different housing costs: for example, the same street can include outright owners, those paying off mortgages and private renters. We need also to consider housing as a source of wealth, especially when and where house prices increase. And this applies not just to owner occupiers but to an increasing number of buy-to-let landlords where the private renter is funding somebody else’s wealth accumulation.

The analysis in this paper is based on several UK datasets for 2017 (the latest year available when this paper was initially drafted). Expenditure on housing costs comes from the ONS dataset 'Housing expenditure by countries and regions': a special run of data was provided to provide the detailed breakdown of spend by region and by housing tenure. For example, the published data includes a figure for rent by region but does not split this into private and social rent; likewise, it is not possible from the standard data to distinguish gross and disposable income for each housing type in each region.

The special run data on housing allows us to determine the significance of each of the tenure groups for each region; it also covered the average age of household members by tenure group and region. The data provides weekly gross and disposable incomes by housing tenure as well as mortgage and rent payments^v; the weekly totals are annualised by multiplying them by 52 weeks. Mortgage payments relate solely to primary residence and exclude spending on moving to a new house, alterations and general maintenance. Rent refers to net rent which is calculated after deducting all subventions intended to reduce the rent paid by households. Distinguishing income and expenditure by different kinds of households – mortgage payers, outright owners, private renters and social renters – allows analysis of patterns both between and within regions.

Spending on transport and utilities is taken from the ONS dataset 'Housing expenditure by countries and regions'. The data is derived from two separate but interconnected ONS tables in the Family Spending series^{vi}. The data on regional total spend by category is summated and then allocated into decile income groups. The estimated spend by each tenure group is arrived at by selecting the closest decile spend group in each spend category to income by tenure. This method is used as there are regional variations in expenditures and difference in spend depending on total household income. ONS' presentation of income deciles is based on the UK and we calculate income by summing in each decile group all expenditure plus all 'other recorded items' such as savings, national insurance, life insurance and pensions. Other data has been used to adjust expenditure and income per household to a per capita level, using a weighted average household size by housing tenure for each region and nation.

The data that is produced from these different sources is summarised in tables 1 to 4, where each table considers a different housing tenure type by region. For each of these household types, the table shows how deductions for housing costs, and then for transport and utilities from household disposable household (after taxes and direct benefits) lead to a 'residual' income. The one observation of the housing tenure group at the mean is of course not a comprehensive description of household experience; but it does provide us with an initial observation which can start an empirically informed debate about income, tenure, place and living standards.

Differentiation according to housing tenure group is also practically attractive because it distinguishes between four large groups of household types in every region. The extent of different tenure types varies according to region and there have also been changes over time. For example, the sale of social housing to tenants (introduced initially in 1980 as a 'right to buy' at a substantial discount to the market price and subsequently extended by successive UK governments) along with the limited extent of any rebuilding to replace the stock that was sold means that the percentage renting privately has more or less doubled in the twenty years since the mid-1990s, while the significance of social housing has fallen. Across the different UK regions, mortgage holders currently account for 28-36% of households and outright owners for 31-41% while private renters account for 11-25% of households and social renters for 11-24% (source: ONS, specially commissioned data). There are also some significant variations in average size of household; those owning outright consistently have smaller

households of around 2 persons as against household size of around 2.5 persons in other tenure groups^{vii}.

Findings

This section sets out the findings, drawing on tables 1 to 4 which presents the residual income calculations by housing tenure and region. The tenure groups start from different gross income points on the household income scale whether we consider the mean gross income of households by tenure or by region. In all regions mortgage paying and social tenant households are the high and low outliers in terms of income: low income households struggle to obtain mortgages and the shortage of social renting means that it has become the preserve of low-income groups. Mortgage holding households have gross incomes between a low of £46,000 in Wales and £76,000 in London, while the gross income of social renters varies from a low of £16,000 in Wales to a high of £27,000 in the South East, with London households having a gross income of just £22,000.

[insert tables 1 to 4 about here]

If we consider the three essential items (housing, utilities, transport), the largest and most variable item of expenditure is cost of housing. Even if we exclude outright owners, across the different tenure groups in all the regions direct housing cost claims between 11 and 34% of disposable income. The share of income spent on transport (public and private) is smaller and relatively stable across all tenures and regardless of region at 11-16% of disposable income; except in London where it is lower because 40% of London households lack a car (RAC Foundation, 2012) and Londoners are not charged the full economic cost of their hugely complicated infrastructure (Equality Trust, 2015, 16). Utility bills generally account for 3-6.5% of income in all tenure groups except for social renters whose low incomes are such that fuel poverty is an issue because utilities are a significant cost item for this group. For example, in the South West and Wales utilities account for 8.8% and 9.6% of disposable income respectively; this might immediately suggest an area for policy interventions to ensure that energy costs are manageable for such households. Overall, housing costs are the major driver of variability in the ratio between residual and disposable income for households within and between regions.

How do variable housing costs complicate and change household income gaps for different tenure groups between and within regions; and what are the secondary effects on wealth? To understand the effects of different tenures, it is best to begin with analysis of differences *within regions*. Because this shows how outright ownership and social renting are respectively the boosters and stabilisers of residual income, while private renting is an accelerator of income and wealth inequalities which disproportionately benefits owner occupiers and absentee owners in some regions.

Outright ownership is a great booster of residual household income for a quarter to a third of households within each region. For these households, their ratio of residual income retained is raised by the absence of mortgage payments which account for 11% or more of disposable income for the mean mortgage-paying household in all other regions. Thus, outright owners in all regions currently start well behind mortgage holders in terms of gross or disposable income and then more or less close the gap in residual income. In high income London, mean household outright owners have around £25,000 less gross income, £14,000 less disposable income, and just £1,000 less residual income than

London mortgage holders (tables 1 and 2). In low income Wales, mean household outright owners have around £14,000 less gross income, £10,000 less disposable income and £3,000 less residual income, compared with mortgage holders. This equalising effect is reinforced at individual level because outright owner households are older with consistently fewer members.^{viii}

Social renting (from local authorities and housing associations) is a stabiliser within all regions. Labour market deregulation has proliferated casual, low wage employment right across the UK and social housing is a scarce resource that can help to compensate (some of) those disadvantaged by precarity. Social renting households in different regions all have low incomes by absolute and relative standards. The top to bottom range of variation by region for the mean social renting household is from £27,000 gross and £25,000 disposable in the South East down to £17,000 gross and £16,000 disposable in the North East, while London household gross income is no more than £22,000 (table 4). However, with regulated rents and housing benefit for some, net rents are in a narrow range of 11-14% of disposable income outside London and no more than 18% in London.

By way of contrast, private renting is an accelerator of income and wealth inequality within regions because the rent is a gouging loss for private renters, especially in high income areas where increasing house prices drive higher market rents for tenants and contribute to wealth accumulation by landlords. In all regions, the rent deduction from disposable income is in the range 15-34% for the mean private renting household (table 3). At 15% in the North East and above 18% in all other regions, the percentage deductions from disposable income for mean private renting households start at the upper end of the level of deductions for housing paid by other tenure groups. For mortgage payers, for example, the average deduction is in a range of 12-20% of disposable income (table 1). The deduction from disposable income for private renters runs to 34% in London and is around 25% in the East, South East and South West of England (table 3). This issue is acute in the whole of the South of England and especially in London where house prices have always been higher; they also rose continuously from 2008 to 2018, while they flatlined in other regions.^{ix}

Private renters pay a higher share of gross or disposable income and get no social protection in return. Private rents are geared to local house prices, but renters gain no asset in the later stages of working life because they are paying off somebody else's mortgage and benefiting a landlord (inside or outside the region). The effects of house prices on wealth accumulation are relevant to a growing number of households in the UK: in 2014-16, an estimated 10% of British adults (4.3 million) now own property in addition to their usual residence: the largest number is buy-to-let (1.9m), second home in the UK (1.4m) and second home overseas (1m) (Bangham, 2019). There is also a more important linkage to wealth accumulation through the much larger number of owner occupiers (outright and mortgage paying) who account for more than 40% of households in all regions. The wealth effects vary both between regions, according to differential regional house price movements, and within regions, because lower income groups in all regions own very little property.

In the decade after 2008, nominal house prices increased steadily in London and surrounding areas but more or less flat lined in most of northern and western Britain. In this period, the wealth accumulation effect worked for owners of London property (as occupiers or landlords) but against owners of property in the regions of the North and West and against non-property owners in all regions. By 2018, the market was turning with house prices falling in London and only slowly increasing in other housing markets, according to the Land Registry^x. But the decade of differential regional trends in house prices has had dramatic effects on wealth accumulation; these effects are important in themselves, and because similar effects will most likely be produced as and when the housing market recovers cyclically.

From 2008-17 the median house price in London dramatically increased from £265,000 to £460,000, whereas in the North and West of Britain median house prices were initially much lower and rose very gently (in nominal terms) from £122 to £135k in the North East and £138 to £150k in Wales (table 5). High and rising property prices in London and the South East generated an unearned and untaxed capital gain of £20,000 a year for the average London property owner. As table 5 shows, this capital gain for the average property owner in London is more or less equal to median individual gross earnings in North and West Britain at the beginning of the decade. By way of contrast, most owners of property outside London and the South East made no capital gains (nor did Londoners in lower income groups who cannot take out a mortgage).

[insert table 5 about here]

The substantial beneficiaries include ordinary middle-income households who gain £286,000 on average in London from 2002-2017, compared with £75,500 in the North East or £82,500 in Wales. Of course, low income households in the first income quintile make no or negligible gains in all regions; while rising property prices in some regions are a burden for private renters because these are factored into rents and make it all the more difficult for renters to take out a mortgage to buy their own property. Mobility between tenure groups is much more difficult in London, compared with English regions like the North and West.

In 2018, first time buyers in London had a declared income of £81,000 which meant that most individuals had to couple up to buy a house or flat; first time buyer's property in London cost £435,000 on average in 2018;^{xi} and with average individual gross earnings of £35,000 in London, couples can only become first time buyers if both members are in the top half of the income distribution with a substantial deposit. By way of contrast, in Wales an averagely priced first time buyer property costs £143,000, with the buyer's gross income of £37,000 against median individual gross earnings of £26,000 so that a couple who were both earning modest wages could afford to buy (Calafati et al., 2019).

If we turn to differences *between regions*, as table 6 shows, London and the South East start with a large advantage in terms of the gross income of all households and lead the league table against other regions. If we then subdivide the households by tenure, the shift to residual income does not radically change the ordinal rank order of high and low regions in any housing tenure group: comparing gross and residual income, London and the South East of England are in two of the top three positions in all tenure groups. The successive adjustments to income produce less of a radical reordering of the regions than is the case in the work of Perrons (2012) and Perrons and Dunford (2013), where an index that composites a range of economic and social factors does radically change the regional rank order so that London and the South East do not lead as they do on per capita GVA or household income measures.

[insert table 6 about here]

We would argue that the overall rank order is not the only or main point of interest because rankings fail to capture inter-regional effects which are important to households. These effects can be approached through analysis of whether and how the income gaps between high and low regions are closed or widened for different tenure groups. When high income areas generally have high housing costs, we would expect that housing costs would act to reduce initial regional differences in household gross or disposable income for the two tenure groups - mortgage payers and private renters - who are directly exposed to house prices in the current or recent housing market. And this gap reduction after

housing cost deduction is what we do find empirically for mortgage payers and private renters as well as for social renters; but in the case of owner occupiers we have the opposite effect and the size of the gap reduction effect varies considerably between tenure groups who separately account for large numbers of households .

For mortgage payers and social renters, the inter-regional differences shrink gently as we move from gross to residual income: the income ratio of highest to lowest, declines from 1.65 gross to 1.56 residual for mortgage payers and from 1.71 gross to 1.62 residual for social renters; with a corresponding reduction in the co-efficient of variation from 0.13 to 0.12 and from 0.15 to 0.13. In these two cases, there is a positive relationship between regional variation in housing costs and incomes; this reflects house prices in the one case and social adjustment in the other (Wilson, 2019). But in the case of outright owner occupiers the effect is gently in the opposite direction. For outright owners, the highest to lowest ratio and the coefficient of variation both increase when necessary expenses are deducted to arrive at residual income. As a result, inter-regional differences for those who have no rent or mortgage are exacerbated. And in the case of private renters, the gap reduction is large as we move from gross to residual, because (as was evident in the intra-regional analysis) a substantial part of higher London gross incomes are skimmed off in higher rents. Comparing gross and residual income, the highest to lowest ratio for private renters declines by almost a quarter from 1.97 to 1.52 and the coefficient of variation by around one third from 0.196 to 0.13.

Inter-regional comparisons in terms of ratios and coefficients of variation are all rather abstract. Their practical importance is brought out if we consider how household incomes are reduced in successive steps for owner occupiers and private renters as we move from gross to disposable to residual. For example, outright owners in low income Wales have no direct housing cost so an average gross income of £32,000 turns into £29,000 disposable and £25,000 residual income. In contrast, private renting households pay an average of 34% of disposable income as rent in London: for this household, a gross of £52,000 turns into £42,000 disposable and £21,606 residual income. In this example, housing costs more or less equalise initially unequal household income in the two groups. One further important point is that ordinal rankings of residual income for different tenure groups generate limited insights and can be misleading unless we also factor in differences in household size.

[insert table 7 about here]

This is crucial here because there are significant differences in household size between the two outlier tenure groups i.e. outright owners with no direct housing costs in the North and West of Britain and private renters who lose a large proportion of income in London and the South East. Differences in average household size are summarised in table 7: for example, Welsh owned outright households average 1.9 persons and London private rented households average 2.9 persons. Overall, taking household size into account reduces some of the regional differences in household residual income. And the effects are spectacular if we compare private renters with outright owners in high and low income regions. The higher initial household gross and disposable incomes of private renters in London and the South East translate into lower per person residual incomes than those of outright owners in the North and West. For example, the mean London private renting household starts with a gross income nearly twice as high as the Welsh outright owner (£52,000 vs £32,000) but the London private renter ends up with a per person residual income and discretionary spend which is about 60% of that of the Welsh outright owner (£7,450 vs £11,972) (tables 2 and 3).

Thus, a nuanced and realistic approach to inter-regional comparisons shows relativities can change significantly when considering per person residual income in different household tenure groups. All this matters because each one of the four different tenure groups separately accounts for a large number of households in every region. Outright owners in Wales and private renters in London each account for about 25% of households in their regions; in London in 2017, 25.4% of households are private renters, with an average net rent of £14,247. Regional averages of household income are preferable here to regional GVA per capita averages figures; and (resident) income measures show a narrower gap between regions than do (workplace) output/ GVA measures (Corlett et al., 2019, 13). But intra and inter-regional analysis fit together to show how all kinds of regional averages and ordinal regional rankings are thin simplifications which give little idea of how income-related living standards vary systematically across large groups of households according to housing tenure. The snakes and ladders effects of housing tenure on regional living standards then have clear policy implications. Most obviously, these concern private renting, especially *within* high income regions where the level of private rents and the availability of social housing alternatives is a major driver of income related living standards.

Discussion and conclusion

Metric based knowledge at a distance is central to modern expertise, government economic and social planning, and the management of complex organisations. In *Seeing like a State*, James C Scott (1998) argued that knowledge at a distance deals in thin simplifications so that it targets metrics, instead of delivering what matters which requires metis or a more granular knowledge of local specifics. Scott undoubtedly overstates his case: if planning at scale and management of complexity are necessary then it is not possible to dispense with metric based knowledge. But it is certainly the case that experts and planners need to choose metrics with care, acknowledge the limits of any set of measures, understand the relation between different indicators and the diverse socio-economic contexts which give metrics meaning and policy relevance. The foundational approach here suggests changing the metrics in ways which will also change the ends and means of policy.

The GVA metric has many uses but our findings show per capita GVA is uninformative about differences of household living standard between and within regions; it can also misdirect policy by encouraging the idea that there are successful and laggard regions which have a unitary identity and can be ranked on one scale so that policy is directed at raising the average. The limits of this approach have been acknowledged by those who argue that raising GVA is not a living standards policy because increases in GVA or GDP do not necessarily improve household living standards (Betti et al., 2012). Some have already drawn the policy implication that regional policy should not simply be about rectifying the GVA deficiencies of laggard regions but should, as advocated by Pike et al. (2007) encompass the notion of 'development', which recognises the problems of successful as well as less successful regions. This paper builds on that insight and adds a broad focus on the essential services that underpin living standards.

From a foundational economy point of view, what living standard metrics should we use; and what do new metrics imply for the binary distinction between successful and failed regions? In this paper we have used income to understand living standards because income and its inequalities remains important to the household experience and choices about expenditures. Then, our analysis has distinguished between measures of household gross, disposable and residual income, with some attention also to household size and connection to wealth accumulation. Our snapshot analysis shows

how differences of household tenure complicate the picture of income inequalities within and between regions and thereby highlights the diversity usually disguised by averages.

Through the residual income lens, we see a mosaic of advantaged and disadvantaged tenure groups in terms of income and wealth within regions. Certainly, low GVA per capita regions can work to produce comfortable living for some tenure groups and high GVA per capita regions can be thoroughly uncomfortable for other tenure or income groups. This can be illustrated by the contrast between residual income of private renters in London and owner occupiers in Wales. And what works for one group like owner occupiers in London (through rising house prices) can contribute to increasing social inequity and exclusion of other groups like private renters. Social renting is the only form of tenure that is without ambiguity a social good.

Variation by tenure and regional property market differences complicates any generalisation about living standards within or between regions. At the same time, we would repeat our caution that income-based measures should be supplemented by a range of other metrics and indices, as illustrated by Perrons (2012). Covid-19 has emphasised that living standards depend on the availability and quality of foundational services like health and education (as well as social infrastructure) which are provided free or at low direct cost (Froud et al., 2018). The question of access to and quality of such services is important if we wish to understand differences within and between regions. And, there are many other factors that are relevant to subjective and objective well-being. Moreover, some households might expect their circumstances to improve or deteriorate over time, while others may see little prospect of improved residual income or a shift into a more comfortable tenure group.

This paper should thus be read as an initial, foundational economy contribution to understandings of regional diversity that will require the assembly of several different indicators. While the data used to develop our argument is British, our analysis and its implications will have relevance in other countries where headline regional income differences cover a more complex set of issues and where differences in housing costs disproportionately affect some tenure groups. All across Europe it is important to realise that it would be possible to hit the target of raising per capita GVA, but miss the point about income-related household living standards – as well as ecological damage and many of the other things that matter socially - and end up being surprised by growing wealth inequalities driven by property ownership

Meanwhile, our foundational analysis and the residual income metric has implications for regional policy objectives and forms of intervention. Uncritical use of the per capita GVA metric has promoted policies targeting economic growth (of output) distributed through wages; the result is 'levelling up' regional policy preoccupied with laggard regions where the aim is to close the GVA gap with successful regions. Narrow economic policies of upgrading infrastructure and skills are then the preferred instruments for rebuilding the (wage generating) productive economy. However, in the UK existing policies have not closed the gap between high and low GVA per capita places opened by the post-1979 collapse of high wage regional economies based on resource extraction and domestic manufacture in the North and West of the UK.

Instead, we would argue for a redefinition of the objects and instruments of regional policy so that it becomes more broadly socio-economic and engages the drivers of diversity in all regions not some imaginary average in laggard regions. To this end, it is important to tackle living standards from the housing tenure side with a range of policies which manage the cost, quality and availability of housing for all tenure groups across all regions. Central banks could sensibly pivot away from commodity price inflation and take halting the inflation of house prices as a target because such inflation accelerates wealth inequalities and traps households in private renting. The large-scale construction of social

housing provides both less expensive alternatives for lower income households and, in countries like the UK which subsidise expensive private rents, would reduce government spend on housing benefit which benefits private landlords and thus allows wealth accumulation for some and extraction from many.

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Table 1 Annual household income of mortgage holders and their spend on transport and utilities, 2017

	Annual income	gross Annual income	disposable Annual income	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments
	Total	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income
	£	%	£	%	£	%	£	%	£	%	£	%
North East	63,092	100.0%	51,355	81.4%	6,895	10.9%	6,483	10.3%	1,711	2.7%	36,266	57.5%
North West	59,717	100.0%	48,152	80.6%	7,519	12.6%	6,055	10.1%	1,677	2.8%	32,900	55.1%
Yorks & Humber	57,366	100.0%	45,755	79.8%	6,869	12.0%	5,839	10.2%	1,689	2.9%	31,358	54.7%
East Midlands	60,460	100.0%	48,334	79.9%	6,765	11.2%	6,878	11.4%	2,054	3.4%	32,636	54.0%
West Midlands	60,783	100.0%	49,769	81.9%	6,817	11.2%	5,648	9.3%	1,807	3.0%	35,497	58.4%
East	56,352	100.0%	45,334	80.4%	7,998	14.2%	6,261	11.1%	2,094	3.7%	28,981	51.4%
London	75,806	100.0%	57,564	75.9%	11,591	15.3%	6,229	8.2%	1,395	1.8%	38,350	50.6%
South East	75,535	100.0%	59,946	79.4%	9,542	12.6%	8,290	11.0%	2,319	3.1%	39,794	52.7%
South West	60,356	100.0%	49,369	81.8%	7,982	13.2%	6,610	11.0%	2,048	3.4%	32,729	54.2%
England	64,418	100.0%	51,355	79.7%	8,304	12.9%	6,631	10.3%	1,877	2.9%	34,543	53.6%
Scotland	64,761	100.0%	53,732	83.0%	6,609	10.2%	6,211	9.6%	1,642	2.5%	39,269	60.6%
Wales	45,869	100.0%	38,750	84.5%	6,594	14.4%	4,721	10.3%	1,850	4.0%	25,586	55.8%

Table 2 Household income of outright owners and their spend on transport and utilities, 2017

	Annual income	gross Annual income	disposable Annual income	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments	Annual mortgage payments
	Total	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income	Share of Total gross income
	£	%	£	%	£	%	£	%	£	%	£	%
North East	33,316	100.0%	30,311	91.0%	0	0.0%	3,714	11.1%	1,331	4.0%	25,266	75.8%
North West	34,180	100.0%	30,155	88.2%	0	0.0%	3,818	11.2%	1,506	4.4%	24,830	72.6%
Yorks & Humber	34,507	100.0%	30,025	87.0%	0	0.0%	4,286	12.4%	1,522	4.4%	24,216	70.2%
East Midlands	35,786	100.0%	30,144	84.2%	0	0.0%	4,337	12.1%	1,845	5.2%	23,963	67.0%
West Midlands	39,088	100.0%	33,665	86.1%	0	0.0%	4,146	10.6%	1,629	4.2%	27,890	71.4%
East	37,310	100.0%	31,221	83.7%	0	0.0%	4,774	12.8%	1,992	5.3%	24,454	65.5%
London	51,038	100.0%	43,061	84.4%	0	0.0%	4,572	9.0%	1,257	2.5%	37,232	72.9%
South East	42,032	100.0%	35,428	84.3%	0	0.0%	6,086	14.5%	2,090	5.0%	27,252	64.8%
South West	37,887	100.0%	33,379	88.1%	0	0.0%	4,168	11.0%	1,839	4.9%	27,372	72.2%
England	39,078	100.0%	33,540	85.8%	0	0.0%	4,181	10.7%	1,686	4.3%	27,673	70.8%
Scotland	39,785	100.0%	34,601	87.0%	0	0.0%	4,559	11.5%	1,480	3.7%	28,561	71.8%
Wales	32,214	100.0%	28,704	89.1%	0	0.0%	4,191	13.0%	1,766	5.5%	22,747	70.6%

Table 3 Household income of private renters and their spend on transport and utilities, 2017

	Annual gross income		Annual disposable income		Net rent		Annual spend on transport		Annual spend on electricity, gas, water and internet		Residual income	
	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income
	£	%	£	%	£	%	£	%	£	%	£	%
North East	34,128	100.0%	29,224	85.6%	4,285	12.6%	3,714	10.9%	1,331	3.9%	19,894	58.3%
North West	30,113	100.0%	26,837	89.1%	4,878	16.2%	3,818	12.7%	1,506	5.0%	16,635	55.2%
Yorks & Humber	26,198	100.0%	23,010	87.8%	4,820	18.4%	2,495	9.5%	1,444	5.5%	14,251	54.4%
East Midlands	38,636	100.0%	33,108	85.7%	6,672	17.3%	5,049	13.1%	1,851	4.8%	19,536	50.6%
West Midlands	36,572	100.0%	31,086	85.0%	6,386	17.5%	4,146	11.3%	1,629	4.5%	18,925	51.7%
East	36,686	100.0%	31,034	84.6%	7,415	20.2%	4,774	13.0%	1,992	5.4%	16,852	45.9%
London	51,574	100.0%	41,709	80.9%	14,274	27.7%	4,572	8.9%	1,257	2.4%	21,606	41.9%
South East	46,103	100.0%	37,877	82.2%	9,313	20.2%	5,227	11.3%	2,082	4.5%	21,254	46.1%
South West	29,900	100.0%	26,114	87.3%	6,604	22.1%	2,825	9.4%	1,750	5.9%	14,935	50.0%
England	39,021	100.0%	32,791	84.0%	8,356	21.4%	4,181	10.7%	1,686	4.3%	18,568	47.6%
Scotland	31,184	100.0%	26,853	86.1%	5,158	16.5%	3,916	12.6%	1,475	4.7%	16,303	52.3%
Wales	34,679	100.0%	30,462	87.8%	5,814	16.8%	4,191	12.1%	1,766	5.1%	18,691	53.9%

Table 4 Household income of social renters and their spend on transport and utilities, 2017

	Annual gross income		Annual disposable income		Net rent		Annual spend on transport		Annual spend on electricity, gas, water and internet		Residual income	
	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income	Total	Share of Total gross income
	£	%	£	%	£	%	£	%	£	%	£	%
North East	17,046	100.0%	16,297	95.6%	1,877	11.0%	1,492	8.8%	1,161	6.8%	11,767	69.0%
North West	21,871	100.0%	20,348	93.0%	2,647	12.1%	2,552	11.7%	1,434	6.6%	13,716	62.7%
Yorks & Humber	20,592	100.0%	19,094	92.7%	2,730	13.3%	2,460	11.9%	1,444	7.0%	12,461	60.5%
East Midlands	21,060	100.0%	19,594	93.0%	2,298	10.9%	2,029	9.6%	1,614	7.7%	13,652	64.8%
West Midlands	18,309	100.0%	17,321	94.6%	2,158	11.8%	1,666	9.1%	1,420	7.8%	12,078	66.0%
East	20,821	100.0%	19,188	92.2%	2,574	12.4%	2,233	10.7%	1,743	8.4%	12,637	60.7%
London	21,736	100.0%	20,103	92.5%	3,687	17.0%	1,373	6.3%	1,036	4.8%	14,008	64.4%
South East	27,362	100.0%	24,617	90.0%	3,271	12.0%	2,445	8.9%	1,822	6.7%	17,079	62.4%
South West	18,294	100.0%	17,373	95.0%	2,122	11.6%	1,950	10.7%	1,609	8.8%	11,693	63.9%
England	21,133	100.0%	19,604	92.8%	2,714	12.8%	1,956	9.3%	1,475	7.0%	13,459	63.7%
Scotland	18,507	100.0%	17,446	94.3%	1,867	10.1%	1,832	9.9%	1,290	7.0%	12,457	67.3%
Wales	15,964	100.0%	15,538	97.3%	1,752	11.0%	1,684	10.5%	1,540	9.6%	10,561	66.2%

Notes and sources for tables 1 to 4.

The sources for these tables are:

1. Table 2.5, Housing expenditure by UK Countries and regions, mortgage holders, financial year ending 2017', ONS –this includes spreadsheets for mortgage free, private renters and social renters. The data used in the table comes from a special run; a subset of this data is available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/housingexpenditurebycountriesandregionsuktable25>
2. The Family Spending series includes table 3.5 on 'Housing expenditure by countries and regions' which we use to identify regional spending in each category and table 3.1 Detailed household expenditure by disposable income decile group' which we use to allocate regional spend into income decile groups. These tables can be downloaded from: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebydisposableincomedecilegroupuktable31> and <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebycountriesandregionsuktablea35>

Table 5 Median earnings per individual and median house prices

	England & Wales		North East		London		Wales	
	Median gross earnings	Median house price	Median gross earnings	Median house price	Median gross earnings	Median house price	Median gross earnings	Median house price
	£	£	£	£	£	£	£	£
2002	20,596	104,000	18,075	59,500	25,235	174,000	18,411	67,500
2008	25,397	175,000	21,872	121,500	31,097	265,000	22,324	138,000
2017	28,952	225,000	26,061	135,000	34,752	460,000	26,327	150,000

Source: Ratio of house price to residence-based earnings (lower quartile and median), 2002 to 2017, ONS

Table 6 Changes to regional rank order and variation in income by tenure type, 2017

Ranking of regions/ nations	Mortgage holders ranking by:		Outright owners ranking by:		Private renters ranking by:		Social renters ranking by:	
	<i>Annual (gross) income</i>	<i>Residual income</i>	<i>Annual (gross) income</i>	<i>Residual income</i>	<i>Annual (gross) income</i>	<i>Residual income</i>	<i>Annual (gross) income</i>	<i>Residual income</i>
1	London	South East	London	London	London	London	South East	South East
2	South East	London	South East	Scotland	South East	South East	North West	London
3	Scotland	Scotland	Scotland	West Midlands	East Midlands	North East	London	North West
4	North East	North East	West Midlands	South West	West Midlands	East Midlands	East Midlands	East Midlands
5	West Midlands	West Midlands	South West	South East	East	West Midlands	East	East
6	East Midlands	North West	East Midlands	North East	Wales	Wales	Yorks & Humber	Yorks & Humber
7	South West	South West	East	North West	North East	East	Scotland	Scotland
8	North West	East Midlands	Yorks & Humber	East	Scotland	North West	West Midlands	West Midlands
9	Yorks & Humber	Yorks & Humber	North West	Yorks & Humber	North West	Scotland	South West	North East
10	East	East	North East	East Midlands	South West	South West	North East	South West
11	Wales	Wales	Wales	Wales	Yorks & Humber	Yorks & Humber	Wales	Wales
Range highest: lowest	£75,535: £45,869	£39,794: £25,586	£51,038: £32,214	£37,232: £22,747	£51,574: £26,198	£21,606: £14,251	£27,362: £15,964	£17,079: £10,561
Ratio of highest to lowest	1.65	1.56	1.58	1.64	1.97	1.52	1.71	1.62
Coefficient of variation	0.130	0.124	0.133	0.141	0.196	1.130	0.146	0.126

Note: Ratio of highest to lowest is the income in the highest ranked region divided by that in the lowest ranked region. The coefficient of variation is calculated as the standard deviation divided by the mean.

Table 7 Weighted average number of persons per household split by tenure and region 2017

	North East	North West	Yorks & Humber	East Midlands	West Midlands	East	London	South East	South West	England	England excluding London	Wales	Scotland
Mortgage owners	3.1	2.9	2.7	2.8	3	2.8	2.8	3	2.8	2.9	2.9	2.9	2.8
Owned outright	1.8	1.9	1.9	2	2.2	1.9	2.1	1.8	1.8	1.9	1.9	1.9	1.9
Private renters	2.4	2.7	2.1	2.7	2.5	2.1	2.9	2.4	2.1	2.5	2.4	2.5	2.3
Social renters	2.5	2.3	2.2	2.3	2.3	2.2	2.4	2.5	1.8	2.3	2.3	2.3	2.3

Source: Based on Table 2.5- Housing expenditure by UK countries and regions, 2017 (Bespoke. Specially commissioned data run) ONS

Note: England excluding London totals are the weighted summation of all the regions. The average number of persons per household is unequivalised (based on an unadjusted headcount).

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No funding was received in respect of the research reported in this paper.

Endnotes

ⁱ Table 2 in ONS (2013) shows the relative effects of commuting on regional GVA.

ⁱⁱ ONS Families and Households dataset 2018. Available at:

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/datasets/familiesandhouseholds>

ⁱⁱⁱ These calculations are based on the ONS income and wealth data series, available at:

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/theeffectsoftaxesandbenefitsonhouseholdincome/financialyearending2018>

^{iv} The Department for Work and Pensions produce income before and after housing costs for households below average income, available at: <https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718>

^v Some of the data used is available from the web link noted

here: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/housingexpenditurebycountriesandregionsuktable25>. The special run of data is available from the authors.

^{vi} This data set – tables 31 and 35 - is available at:

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebydisposableincomedecilegroupuktable31> and <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebycountriesandregionsuktablea35>

^{vii} Household size by housing tenure data can be found at (and a summary provided in table 6):

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/housingexpenditurebycountriesandregionsuktable25>

^{viii} Data on the age of household members by region and housing tenure was provided in the special data run.

^{ix} Data on house prices referred to in this section is from the UK Land Registry at:

<https://www.gov.uk/government/publications/about-the-uk-house-price-index/about-the-uk-house-price-index>

^x *ibid*

^{xi} Source: ONS live tables on housing market and house prices.