

PIN – D1

Discussion Paper

## **Perceptions of Regional Inequality and the Geography of Discontent: Insights from the UK**

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# Perceptions of Regional Inequality and the Geography of Discontent: Insights from the UK<sup>1</sup>

## Abstract

This paper examines the issue of whether the UK displays high levels of interregional inequality or only average levels of inequality. Following on from recent UK public debates the UK evidence is examined in the context of 28 different indicators and 30 different OECD countries. The result is clear. The UK is one of the most regionally unbalanced countries in the industrialised world.

## Introduction and Background to the Problem

As Paul Krugman (1994) famously remarked “*Productivity isn't everything, but, in the long run, it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.*” In the UK and other countries severely hit by the 2008 Global Financial Crisis, this pithy comment has taken on enormous significance in recent years as productivity growth has fallen to close to zero. In the UK enhancing our understanding of the so-called ‘productivity puzzle’ is now central to government efforts to re-galvanise the economy in the post-crisis era. Yet, what is becoming clear in many countries is the fact that the Krugman observation is just as applicable to regions as it is to countries. The patterns of regional productivity underpin national productivity and the links between people’s lived experiences and political responses depend crucially on local productivity as the key driver of local prosperity (McCann 2018a). Social surveys demonstrate that people whose life is primarily in prosperous regions tend to have a profoundly different view of the world, themselves and their opportunities for self-enhancement, than people who live in low productivity regions. Moreover, most people’s perceptions of their prosperity and quality of life depend crucially not only on the productivity of the region in which they live and work but also their awareness of the experiences of other regions. Such awareness obviously comes in part via different electronic, social and public media but the most profound awareness comes from personal experience, something which is enhanced by geographical proximity. The resulting ‘geography of discontent’<sup>2</sup> (Los et al. 2017; McCann 2018b; Brookings 2018) associated with large interregional inequalities in productivity have profound, and often dangerous, political economy implications for national governance and institutional systems (McCann 2016; Chen et al. 2016; Rodriguez-Pose 2018). Indeed, within an individual country the geography of inequality is at least as important as interpersonal inequality as the source of political shocks because our democratic political systems are fundamentally geographical in nature (Rodriguez-Pose 2018), in the form of electoral districts and wards. It is well known that intra-regional or intra-urban inequality is typically greater than interregional inequality (OECD 2018). Indeed, intra-regional and intra-city inequality still exists even in countries with very low interregional inequality. However, higher interregional inequality is associated with higher nationwide interpersonal inequality (McCann 2016) so these two dimensions of inequality cannot be separated. Moreover, it is interregional inequality which is now fundamentally challenging many of our national institutional and governance systems. Yet, in spite of earlier warnings (Barca et al. 2012) this has been an issue which until very recently many people living and working in wealthy regions,

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<sup>1</sup> I would like to thank Paolo Veneri and Eric Gonnard at the OECD and Lewis Dijkstra, Philippe Monfort and Julien Genet at the European Commission for all of the data and calculations.

<sup>2</sup> The ‘Geography of Discontent’ was a term I first coined and used in seminars and meetings at the OECD Paris, the European Commission and the EU Committee of the Regions during the summer of 2016 in the immediate aftermath of the UK’s EU Referendum. My term was first used in the academic literature in our 2017 paper (Los et al. 2018) and then in McCann (2018) on the regional causes and consequences of Brexit. The term has subsequently been used in OECD meetings, EU meetings and other publications (e.g. Brookings 2018). See:

<https://www.oecd-forum.org/users/50593-oecd/posts/20331-geography-of-discontent>

<https://www.the-american-interest.com/2018/11/19/fighting-the-geography-of-discontent/>

<https://www.brookings.edu/research/countering-the-geography-of-discontent-strategies-for-left-behind-places/>

business and media elites, as well as many scholars working in urban economics (Rodriguez-Pose 2018) have tended to overlook entirely. In contrast, there is now a flurry of efforts aimed at urgently trying to understand, articulate (Florida 2017; Collier 2018; Brookings 2018) and wherever possible to identify possible responses to these shocks, even by scholars who previously would have eschewed such lines of thinking (Austin et al. 2018).

The UK is a particular case in point. The UK is one of the most interregionally unequal countries in the industrialised world and on many levels the UK economy is internally decoupling, dislocating and disconnecting. This is a reality which the UK's highly-centralised, top-down, largely space-blind and sectorally-dominated governance system is almost uniquely ill-equipped to address (McCann 2016). Indeed, mainstream governance responses and policy debates barely address these issues (McCann 2016) and they rarely ever appear as headlines in the mainstream London-centric UK media, and yet the paucity of national media coverage of these issues is dwarfed by the problematic scale of the issue.

A recent high profile example of this disconnection between realities on the ground and public and media perceptions was highlighted in a recent series of very high profile tweets. Between the 3<sup>rd</sup> and 6<sup>th</sup> November 2018 a debate has arisen initiated by British TV, radio and print-media commentators Jeremy Vine and Andrew Neil, amongst others, which contests whether the UK really does have high levels of interregional inequality in comparison to other countries<sup>3</sup>. This was sparked by Jeremy Vine's reading and commenting on a diagram which first appeared in an article entitled "Left in the Lurch: Globalisation has Marginalised Many Regions in the Rich World" originally published in *The Economist* on 21 October 2017 in which the differences in productivity (measured in terms of GDP per capita) between UK regions (defined as OECD TL3 regions) were compared with the equivalent (OECD TL3) differences in other countries. What was presented was the fact that these differences in the UK are vastly bigger than in other countries, and *The Economist* therefore concluded that interregional inequalities in the UK are very high by the standards of industrialised countries.

*The Economist* analysis was severely criticised as being misleading and giving the wrong impression by an article which was originally published on 26<sup>th</sup> September 2018 by the website *FullFact*<sup>4</sup>. The basis of the *FullFact* claim was that *The Economist* was in effect comparing apples with oranges rather than like-for-like. The *FullFact* article then went on to purportedly demonstrate (i) the GDP per capita measures/indices that *The Economist* was using are inappropriate for this type of analysis because they are workplace-based rather than residence-based, and as such over-inflate the apparent prosperity of places facing inward commuting and under-value the prosperity of places facing significant outward-commuting; (ii) the TL3 spatial units involved were meaningless in that they were comparing small areas such as Camden & City of London with places such as Stockholm<sup>5</sup>, Washington DC and Tokyo, whereas a more appropriate comparison unit for the UK data would have been somewhere like Manhattan<sup>6</sup>; (iii) as a result of (i) and (ii) *FullFact* therefore argued that only regions of similar size should be compared. On the basis of these three points, *FullFact* argued that when data is used and interpreted appropriately, the UK displays only average levels of interregional inequality.

Both Jeremy Vine and Andrew Neil were happy to accept, and even advocate via their subsequent tweeted comments, that the *FullFact* argument that the UK has only average levels of interregional inequality was correct. Moreover, while their views were in part shaped by a

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<sup>3</sup> <https://twitter.com/i/moments/1059741476387778560?lang=en>

<sup>4</sup> <https://fullfact.org/economy/regional-inequality-figures-misleading/>

<sup>5</sup> Technically Stockholm County 2017 population 2,269,090

<sup>6</sup> The population of Manhattan at 1.67 million represents 0.51% of the US population of 326 million. In relative terms, the equivalent population for the UK would be 339,000, or almost exactly the same size as the TL3 area of Kensington & Chelsea (338,960) and slightly larger than the TL3 area of Camden & City of London (258,655).

*FullFact* article, the impression given by the language used in their tweets, suggests that the views of both Vine and Neil also pre-dated the publication of their tweets, and that the *FullFact* article simply confirmed what they already had assumed to be the case, namely that the levels of interregional inequality in the UK are largely typical of other countries.

A few days later on 9 November 2018 Alex Selby-Boothroyd, Head of Data Journalism at *The Economist* also published a response<sup>7</sup> to the *FullFact* article where he explained the logic of the approach that *The Economist* had used in its article. In response to some of the issues raised by *FullFact*, he reiterated some of difficulties of using and interpreting these types of data, and acknowledged that using TL2 measures might solve some of the problems. He also suggested that to address the commuting problems inherent in using GDP per capita measures it might be useful to use GDP per person working in an area.

Before we proceed to discuss the details of UK interregional inequality in the light of international evidence, and also to avoid any further misunderstanding, at this point it is important to state clearly the position which the rest of this paper explains below:

(1) *The Economist* article was basically correct in its claim that interregional inequality in the UK is very high by international standards. This can also be demonstrated more broadly by using an wider range of indicators and countries. Meanwhile, the *FullFact* article was basically incorrect in its arguments and interpretation and its claim that UK interregional inequality was only average in comparison to other countries, as were the views of both Jeremy Vine and Andrew Neil .

(2) While in terms of data usage *The Economist* article is precise and correct (but requires careful interpretation), ironically the *FullFact* article makes exactly the same types of errors which it claims undermines *The Economist* article.

The rest of the paper is organised as follows. The next section discusses the usefulness and interpretation of different measures of inequality. The third section explains the logic, construction and use of the various OECD regional and urban datasets. The fourth section revisits the debate between *The Economist* and *FullFact* in the light of the broader OECD datasets, and then the fifth section expands these comparisons and discussions from 9 to 30 OECD countries and to 28 measures of inequality. As will be demonstrated, the UK is indeed one of the most interregionally unequal countries in the industrialised world. The final section provides some conclusions.

### **The Measures and Indices of Interregional Inequality**

The Gross Domestic Product (GDP) per capita index - and its related index Gross Value Added (GVA) per capita – are calculated at the workplace location, and GDP per capita is the index reported by *The Economist*. This is the standard approach used internationally for measuring the prosperity of the economy of different places. Measures such as GDP per capita not only include wage-incomes in their construction but also include payments to capital and land owners and investors and as such, they therefore reflect the overall performance of the local economies in terms of incomes, profits, rents and wealth. As such they are the best overall measure of the value and dynamism of a local economy, and are the best proxy for a range of different issues, including the level of wages, opportunities for high value employment and career progression, opportunities for business investment, entrepreneurship and innovation. Assessing differences in the prosperity of regional economies within an individual country is therefore generally undertaken by calculating various measures of inequality in regional GDP per capita or regional GVA per capita.

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<sup>7</sup> <https://medium.economist.com/the-challenges-of-charting-regional-inequality-a9376718348>

A third index of prosperity which can also be used to assess regional inequality is that of per capita Regional Disposable Income (RDI). This measures the value of people wage-salary-incomes, and these are measured at the residence location rather than the workplace location, as was the case with GDP and GVA. In a large region which is bigger than a typical travel-to-work area, the difference between the regional GDP (or GVA) per capita and Regional Disposable Income per capita values (relative to the national average) is an index of the interregional income-redistribution mechanisms operating within the national economy via the tax and benefits system, whereas in areas which are smaller than travel-to-work areas, these differences also reflect commuting patterns. As the *FullFact* article explains, in places facing huge inward employment commuting, the per capita GDP (and GVA) measures (when compared with national average values) will be significantly larger than the RDI measures, whereas in areas facing significant outward commuting, the reverse will be true.

While the RDI index is useful for understanding certain aspects of people's standards of living – such as their ability to buy a house and household consumer goods - it is much less useful for understanding the prosperity and dynamism of the economy for two reasons. Firstly, while RDI is heavily contingent on GDP or GVA it also ignores all of the investment, profit and wealth-related aspects of the economy which are included in GDP and GVA measures. In the UK this is especially important because interregional inequalities in wealth are greater than purely income inequalities (D'Arcy 2018). As such, it cannot be a comprehensive proxy for the dynamism and prosperity of the local economy. Secondly, RDI is heavily dependent on government policy and political priorities as well as the underlying dynamism of the local economy. A more progressive and (interregionally) redistributive tax system will generally narrow the relative gap in RDI between high per capita GDP or GVA regions and low per capita GDP and GVA regions, whereas a less redistributive fiscal system will do the opposite. Yet, the structure of the fiscal system is something that can also change with shifting political and governance priorities; while a more progressive tax system ought to narrow the regional RDI gap relative to GDP or GVA any movement towards fiscal devolution can also have the opposite effect, depending on the scale and structure of the underlying fiscal stabiliser system<sup>8</sup>. The per capita RDI index is therefore dependent on a combination of both the per capita GDP (or GVA) indices and also political priorities.

In general, therefore GDP per capita and GVA per capita indices are much more encompassing than purely measures of either per capita Regional Disposable Income RDI for understanding the prosperity of places.<sup>9</sup> Each of these issues is well understood in economic geography and GDP (or GVA) per capita are almost always the preferred measure of local economic prosperity used all over the world in economic analyses. What *The Economist* did was simply standard accepted practice.

### **The Regional and Urban Data**

Within an individual country the differing sizes, shapes and definitions of cities and regions makes comparisons complicated because we need to find broadly comparable units of measurement in order to try to compare like with like. Moreover, the appropriate definitional unit also depends on exactly what it is we are trying to measure and why. When comparing cities and regions across countries the situation becomes even more complex because data are collected and reported in different ways in different countries, depending on their administrative and governance structures. These points were raised in the *FullFact* article although there is

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<sup>8</sup> which in the UK is known as the Barnett Formula

<sup>9</sup> Measuring output per hour worked is also an option, but this ignored all of the labour market participation features. Using such a measure at standardized geographical units we still find that the UK is more interregionally unequal than half a dozen other EU comparator countries. See: <https://blog.ons.gov.uk/2018/11/23/mind-the-gap-why-the-uk-might-not-be-the-most-regionally-unequal-country/>

nothing new in these points. The problem was first raised more than eighty years ago although the statistical properties of these issues have been well understood in economic geography for more than four decades under umbrella term MAUP, or the Modifiable Aerial Unit Problem (Openshaw and Taylor 1979).

Precisely because of these caveats, the work of the OECD over more than a decade has been explicitly to develop economic and social indicators of regions and cities which are broadly comparable across countries. This is done by developing a standardised classification system which allows for different types of sub-national data from different countries to be grouped into categories which allow for meaningful cross-country comparisons. For our purposes, the OECD standardised classification system has three different dimensions to it namely: the OECD Territorial Level 2 classification; the OECD Territorial Level 3 classification; and the OECD Metropolitan Urban Data. These datasets are for the most part also standardised and consistent with the EU Eurostat Regional datasets, and are all publicly available.<sup>10</sup>

The OECD Territorial Level 2 (TL2) classification, is the highest level of sub-national national data dis-aggregation available, for large regions within countries. For example, in the case of the UK there are 12 such regions, with an average population of 5.45 million; for US TL2 regions the average population size is 6.3 million; for French TL2 regions it is 4.97 million; in Germany it is 5.15 million, in South Korea it is 7.32 million, in Australia it is 3.1 million, in Canada it is 2.79 million, in Mexico it is 3.9 million, and in Belgium it is 3.7 million. At the upper and lower extremes, we have Japanese TL2 regions with an average population of 12.2 million and New Zealand regions with an average population of 335,000. Of the 33 countries in the OECD database, there are just four countries whose average TL2 population size is less than 1 million, 3 whose population is over 6 million, and 24 whose TL2 population sizes are between 1 and 4 million. The average size of the UK TL2 regions ranks as 4<sup>th</sup> in the OECD, after Japan, Korea, and the USA, and the third largest relative to the national population after Korea and Japan.

The OECD Territorial Level 3 (TL3) classification is the next level below TL2 and describes smaller areas which are contained in groups inside the larger TL2 areas. In the case of the UK there are 173 TL3 regions, with an average population of 378,000 people; for French TL3 regions it is 672,000 people; for German TL3 regions it is 204,000, in Australia it is 494,000, in Mexico it is 585,000, and in Belgium it is 257,000. At the upper and lower extremes, we have Korean TL2 regions with an average population of 3 million and Canadian TL3 regions with an average population of 123,000. Of the 33 countries in the OECD database, there are just two countries whose average TL3 population size is less than 200,000, 4 whose average TL3 population is over 800,000 million, and 27 whose TL2 population sizes are between 200,000 and 799,000. In terms of average population size the UK TL3 areas rank as the 19<sup>th</sup> largest out of 33 countries, and are very close to both the OECD mean and median values for TL3 regions.

Not surprisingly, because the TL3 regions are very much smaller than the TL2 regions (typically TL3 regions are less than 10% of the size of TL2 regions), the interregional dispersion and variability in measures such as GDP per capita and RDI per capita is much greater for TL3 measures than for TL2 measures. Moreover, in general the smaller are the regions compared to national population, the greater will be the expected dispersion and variability in measures such as GDP per capita and RDI per capita. By OECD averages the UK has large TL2 regions (both in absolute and relative terms) and very typically-sized TL3 regions. This suggests that, if anything, the UK TL2 structure ought to *reduce* the UK's measured interregional inequality relative to other countries while the UK TL3 definitions will have no such effect. There is, however, just one exception to these broad principles, namely the fact that the UK is the only country in which London, as the UK's major urban area, is sub-divided into various TL3 regions, whereas in other countries the dominant cities are not sub-divided at the TL3 level. The only

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<sup>10</sup> <http://www.oecd.org/cfe/regional-policy/regionalstatisticsandindicators.htm>

other exception is the US, where the District of Columbia, a sub-division of the city of Washington appears at the TL2 level. The TL3 classification system is the one used in the original diagram published in *The Economist*.

Finally, the OECD Metropolitan Urban dataset which is based on a different classification system (see OECD 2012) defined according to both commuting flows and the contiguity of areas. This provides standardised data for urban areas of over 500,000, of which there are 15 such areas in the UK.<sup>11</sup> For example, the TL2 definition of Greater London is the one which is typically understood in the UK and which has a population of 8.1 million people, whereas the OECD Metro definition of London has a population of 12.1 million and includes towns such as Guildford, St Albans and Reading and many small-town, intermediate rural areas close to London which exhibit high levels of outward employment commuting to London. The GDP per capita of the OECD Metro definition of London is therefore, not surprisingly, much lower than the TL2 definition of London contained within the official London boundaries of the London built-up area.

However, moving from the TL2 to the Metro definition does not necessarily always imply increasing population. For example, the TL2 definition of Paris, which is the Isle de France definition which most people are accustomed to, has a population of 11.9 million while the OECD metro definition of Paris also has a population of 11.9 million (McCann 2016). Meanwhile, the OECD Metro populations of Birmingham and Manchester are 1.92 and 1.85 million people, respectively, both of which are markedly smaller than the standard UK understanding of the sizes of the West Midlands and Greater Manchester conurbations which are currently 2.83 million and 2.79 million, respectively. This is also the case for New York, which at 16.12 million is markedly smaller than the standard 20.3 million US Standard Metropolitan Statistical Area (SMSA) definition of the New York City metropolitan area, while in contrast the OECD Metro definition of Los Angeles has a population of 17.72 million whereas the SMSA definition of Los Angeles has a population of 12.8 million. For almost all cities, the defined OECD Metro Urban Areas are smaller than TL2 regions and larger than TL3 regions, but as with London, there are a very small number of exceptions.

The first point to make is that these three OECD datasets are by far the most detailed, accurate and representative datasets anywhere in the world for undertaking cross country comparisons of the internal economic geography of different countries. Precisely which dataset(s) will be used depends on the particular issue being addressed but what should not be done is using data from different datasets interchangeably or mixed together. TL2 data should almost always only be compared with other TL2 data, TL3 with other TL3 data, Metro Urban data with other Metro Urban data. The only exception here is when comparison data is not available within a particular classification system, in which case comparison may sometimes be made to other classifications of data, although this should always be clearly noted, and appropriate caution in interpretation exercised.

### **An Analysis of *The Economist* versus *FullFact* Debate**

*The Economist* article used the simplest measure of interregional inequality which is the absolute difference between the richest and poorest regions defined in terms of GDP per capita, divided by national average GDP per capita. The countries *The Economist* compared with the UK were other large OECD countries, namely Spain, USA, France, Germany, Italy, South Korea, Japan and Sweden. In making the interregional inequality comparisons *The Economist* article was entirely correct in only using a single dataset classification scheme for its cross-country comparisons, and it chose to use the TL3 dataset classification, except for the case of the USA for which GDP per capita data are only available at the TL2 level, exactly as reported. *The Economist* demonstrated that when calculated at the TL3 level the UK is more unequal than any

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<sup>11</sup> See Appendix for Details

other industrialised country. The question here then, is whether the results and interpretation of *The Economist* were simply an artifact of choosing TL3 level as its particular comparison dataset rather than a more general description of the UK economy. On both counts the answer is no.

We can begin by undertaking more or less exactly same exercises as both *The Economist* using the same nine countries as comparators that both *The Economist* and *FullFact* used, but now we use the per capita GDP measures at both the TL2 and the TL3 classification. At each TL2 and TL3 level, data permitting, we can measure regional inequality in five different ways, namely: (i) we can calculate the ratio of the highest per capita GDP region divided by the lowest GDP per capita region; (ii) we can calculate the absolute difference between the GDP per capita of the highest and lowest regions and divide them by the average GDP per capita for the whole country; (iii) we can calculate the ratio of the highest 10% GDP per capita regions divided by the lowest 10% GDP per capita regions, (iv) we can calculate the ratio of the highest 20% GDP per capita regions divided by the lowest 20% GDP per capita regions, and: (v) we can calculate the Gini coefficient of inequality across all regions.

At the TL2 level using GDP per capita as our regional index, we see that the UK is ranked as: the 3<sup>rd</sup> most interregionally unequal country in the group according to method (i) after the USA and Italy; the second most unequal country according to method (ii) after the USA; the most interregionally unequal country according methods (iii); the second most unequal country according to methods (iv) and (v) after Italy. However, the US result according to method (ii) depends entirely on Washington DC being in the TL2 grouping.

With a population of only 681,170, the population of the District of Columbia is only 11% of the OECD Metro population of Washington and less than 7% of the standard Washington Metropolitan definition (Washington DC-Baltimore-Maryland-Nth Virginia) which is used in the USA, and using this particular aerial measure alongside other TL2 data risks making exactly the same mistake that the *FullFact* article claims *The Economist* was doing by using the Camden & City of London TL3 region in their article. If we therefore remove DC and use the rest of the US TL2 areas, the UK now becomes interregionally the most unequal country in this particular OECD grouping according to method (ii). As such, amongst this nine-country grouping the UK emerges as the second most interregionally unequal country .

As above with GDP per capita, if we consider Regional Disposable Income, we can measure interregional inequality again in the same five different ways, namely: (i) we can calculate the ratio of the highest RDI region divided by the lowest RDI region; (ii) we can calculate the absolute difference between the RDI of the highest and lowest regions and divide them by the average DI for the whole country; (iii) we can calculate the ratio of the highest 10% RDI regions divided by the lowest 10% RDI regions, (iv) we can calculate the ratio of the highest 20% RDI regions divided by the lowest 20% RDI regions, and: (v) we can calculate the Gini coefficient of inequality across all regions.

At the TL2 level amongst this particular group of countries, when using the RDI index, the UK is the 4<sup>th</sup> most interregionally unequal country after the Italy, USA and Spain according to methods (i), (ii) and (v), while according to methods (iii) and (iv) the UK is the 3<sup>rd</sup> most interregionally unequal country after Italy and Spain.

We can now repeat these exercises at the TL3 level, although there are no GDP or RDI data for the USA at the TL3 level and while GDP data are available for all of the eight remaining countries at the TL3 level, in contrast RDI data are only available at the TL3 level for the UK, Sweden, Japan and Korea.

In doing so we now see that when we use GDP per capita, at the TL3 level the UK is the most unequal country according to all five methods. Similarly, if we use RDI, then amongst the

reduced four-country grouping the UK is again the most interregionally unequal country on all five methods.

As such, in terms of the 9-country comparison group of countries used by both the *The Economist* and *FullFact*, the detailed evidence reported here therefore begs the question as to how the *FullFact* article could possibly come to the conclusion that the levels of interregional inequality in the UK were only average by international standards, and indeed rank only as the 7<sup>th</sup> out of the 9 countries in the comparison group? The reason that this entirely erroneous conclusion was arrived at was because *FullFact* made precisely the mistake of mixing up different TL2 and TL3 datasets, exactly as outlined above. Moreover, it only reported one side of the inequality range, namely the most productive region relative to the national average, without also examining the range including the least productive regions.

The Regional Inequality bar chart constructed by *FullFact* mixes up TL2 and TL3 areas. TL3 areas are reported for Germany (Ingolstadt), France (Hautes-Seine)<sup>12</sup>, South Korea<sup>13</sup>, Italy<sup>14</sup>, Japan, Spain and Sweden<sup>15</sup>, with TL2 areas reported for the USA (Washington DC) and the UK (Greater London). The highest GDP per capita value is reported for Ingolstadt, a small town in Germany with a population of 133,000<sup>16</sup>. The next smallest region in the *FullFact* figure is the Basque region of Alava in Spain with a population of 324,000 people, followed by Washington DC with a population of 680,000, through to Greater London with a population of 8.2 million and Tokyo with a population of 13.6 million. Yet, the *FullFact* mixing in the same figure of TL2 and TL3 populations of such variations makes no sense whatsoever for comparison purposes and exacerbates the problems that it claims *The Economist* figure originally faced. The population range in the original figure reported by *The Economist* ranged from 256,000<sup>17</sup> in the case of Camden & City of London to 13.6 million in the case of Tokyo, a ratio of 1:53, whereas in the *FullFact* article that range is now doubled to 1:102. If instead *FullFact* had followed their own logic, as is made clear in the response by Alex Selby-Boothroyd, they would have re-calibrated everything in TL2 terms, although this itself is not without difficulties as Alex Selby-Boothroyd also observed.

### **An OECD-Wide Comparative Examination of the UK's Interregional Inequalities**

We can now consider these same measures and also a much wider range of inequality measures across both the OECD and EU where we have up to 28 total possible alternative measures of interregional inequality.

If we begin with the absolute difference in GDP per capita between the highest and lowest TL2 regions within a country divided by the national GDP per capita we see that the UK ranks as the fifth highest out of 27 countries, behind Slovakia, the Czech Republic, Ireland, Canada and the USA. Canada's highest values are skewed by the oil and gas rich arctic regions. If we also examine the ratio of the highest and lowest GDP per capita regions again the UK ranks as the 5<sup>th</sup> highest, after USA, Italy, Ireland and Slovakia. As we have seen, both the USA results depend entirely on the inclusion of the District of Columbia as a TL2 region. Without this, the UK is more unequal on both measures than the USA at the TL2 level. At the TL3 level the UK ranks as the most unequal country on both measures, as *The Economist* observed.

<sup>12</sup> Hautes-Seine population of 1.61 million

<sup>13</sup> Ulsan population of 1.15 million

<sup>14</sup> Milan population of 3.2 million

<sup>15</sup> Stockholm County population 2.27 million

<sup>16</sup> A town which most regular visitors to Germany have never even heard of

<sup>17</sup> 2015 population data

In order to avoid the problem that individual observations may skew the results and also that these results may be due to the particular small comparison group observed by both *The Economist* and *FullFact*, we can also use 16 other types of indicators/measures of interregional inequality across all of the OECD industrialised countries, data permitting. To begin with we can adopt a slightly different approach from the approach used above by calculating the ratio of the GDP per capita in the top 10% of regions and that of the lowest 10% of regions in each country. For the 30 OECD industrialised countries (not including the quasi-developing economies of Mexico, Turkey and Chile) for which we have data, at the TL2 level, the UK is ranked as 27<sup>th</sup> in terms of inequality and the most interregionally unequal amongst all large countries with a population of over 11 million people. If we consider this at the TL3 level the UK is ranked as the second most interregionally unequal country, and again it is the most unequal large country.

At the same time, if we consider the ratio of the top 20% of regions and the bottom 20% of regions, at the TL2 level the UK ranks as the 6<sup>th</sup> most interregional unequal economy, and again, except for one country (Italy) the only countries which are more unequal than the UK are all small and/or former-communist countries below 11 million people, many of which are no bigger in size than individual UK cities. At the TL3 level, in terms of the ratio of the top 20% of regions and the bottom 20% of regions, the UK ranks as the 5<sup>th</sup> most interregionally unequal country, with small and/or former communist countries being more unequal.

Similarly, if instead of GDP per capita we consider GVA per worker we see broadly the same pattern. At the TL2 level if we consider the ratio of the top 10% regions and the bottom 10% of regions we see that the UK is the 4<sup>th</sup> most interregionally unequal economy, while in terms of the top and bottom 20% of regions, the UK is ranked as the 5<sup>th</sup> most interregionally unequal country. Again, in both cases only small and former communist countries are more unequal than the UK.

In terms of GVA per worker, at the TL3 level, if we consider the ratio of the top 10% regions and the bottom 10% of regions we see that the UK is the second most interregionally unequal economy, while in terms of the top and bottom 20% of regions, at the TL3 level the UK is ranked as the 6<sup>th</sup> most interregionally unequal country. Again, in both cases only small and former communist countries are more unequal than the UK.

Finally, in terms of Regional Disposable Income RDI, at the TL2 level if we consider the ratio of the top 10% regions and the bottom 10% of regions we see that the UK is the 4<sup>th</sup> most interregionally unequal economy; and the same is true when we consider the top 20% and bottom 20% of regions, with only Slovakia, Italy and Spain being more unequal. At the TL3 level, the UK is the most interregionally unequal country in RDI out of the 11 OECD countries for which we have data calculated with respect to either the top and bottom 10% or 20% of regions.

Rather than looking at the top and bottom individual regions, the top 10% and bottom 10% regions, or the top and bottom 20% of regions, another approach to defining interregional inequality is to calculate inequality using a Gini coefficient. For GDP per capita, at the TL2 level the UK is ranked as the 10<sup>th</sup> most interregionally unequal country whereas at the TL3 level the UK is ranked as the most unequal country, out of the 28 countries for which we have data. For RDI using a Gini coefficient at the TL2 level the UK is ranked as the 5<sup>th</sup> most unequal country while at the TL3 level the UK is ranked as the most unequal country, out of the 11 OECD countries for which we have comparable data.

Another way for us to consider these issues is to use the OECD Metro Urban data for the UK and other OECD countries. However, here we have to consider these issues in a slightly different manner to TL2 and TL3 regions because out of the 30 OECD comparator countries we are considering, 10 do not have more than 1 OECD Metropolitan Urban Area and another 8 countries contain less than 5 OECD Metropolitan Urban Area, so Top/Bottom 10% or 20% ratios

are no different simply to the ratios of highest and lowest Metro values, and Gini coefficient calculations are largely meaningless. Therefore, for the 19 countries for which we have comparable data, we have two measures: (i) we can calculate simply the absolute difference in GDP per capita for the highest and lowest cities and divide this value by the national GDP per capita, and; (ii) we can calculate the ratio of the GDP per capita of the highest and the lowest cities. However, we have to acknowledge that these measures obviously suffer from exactly the same outlier/extreme value problems in TL2 and TL3 regions for which we instead used other measures such as Top 10%/Bottom 10%, Top 20%/Bottom 20% and Gini indices.

Allowing for these caveats, on the basis of the former measure – the absolute difference in GDP per capita divided by the national GDP per capita value - the UK ranks as the 8<sup>th</sup> out of 19 countries, while on the latter measure – the ratio of the Top/Bottom - the UK ranks as 5<sup>th</sup> highest out of 19 OECD country.

The final way that we can consider these issues is to use the Eurostat NUTS2 and NUTS3 regional definitions<sup>18</sup> and compare UK interregional inequality with the other EU countries which are also full members of the OECD<sup>19</sup>. The OECD-TL2 areas correspond to the NUTS1 areas for the three EU countries, namely Germany, UK, France and Belgium, while in 14 EU countries TL2 is the more or less the same as the NUTS2 classifications. For all EU countries the NUTS3 area definitions largely correspond to the OECD-TL3 definitions. As such, the NUTS2 definitions typically sit between the OECD TL2 and TL3 classifications. Using these NUTS regional definitions we can develop indicators which to some extent act as a bridge between the OECD TL2/TL3 construction and the OECD Metro Urban Area construction by defining those NUTS2 and NUTS3 groupings which most closely replicate OECD Metro Areas of 250,000 or more as functional regions in their own right, and distinct from other regions. This approach more closely measures the inequalities between large (functional) urban areas and either small town or non-urban areas. We can examine these issues using three measures, namely the ratio of the highest and lowest 10% of GDP per capita regions, the ratio of the highest and lowest 10% of GDP per capita regions, and we can also calculate a coefficient of variation of regional GDP per capita.

Using this approach, in terms of the ratio of the highest and lowest GDP per capita NUTS2 regions, the UK ranks as the 6<sup>th</sup> out of 22 countries, after Ireland, Germany and Italy, as well as Slovakia and Hungary. At the NUTS3 level the UK ranks as the 6<sup>th</sup> out of 20 countries, after Ireland, Germany and Poland, as well as Slovakia and Hungary. In terms of the GDP per capita ratio of the top 10% of NUTS2 regions divided by the bottom 10% of NUTS2 regions the UK has higher values than all western European countries except Ireland, with only Hungary and Slovakia being the other two EU countries with higher ratios than the UK.

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<sup>18</sup> <https://ec.europa.eu/eurostat/web/nuts/background>

<sup>19</sup> We do not include Romania or Bulgaria as comparators, for similar reasons that we did not include Mexico, Turkey or Chile in our earlier discussions of OECD TL2 and TL3 data. Also, Malta, Cyprus and Croatia are all very small countries which are not full members of the OECD so we do not include these either.

**Table 1** UK Interregional Inequality Rankings (Number of OECD and EU Countries with Comparable Data)

Ratio Top/Bottom OECD TL2 Regions GDP per Capita	Difference Top-Bottom OECD TL2 Area GDP per Capita Divided by national GDP per Capita	Ratio Top/Bottom OECD TL2 Regions GDP per Capita	Difference Top-Bottom OECD TL2 Area GDP per Capita Divided by national GDP per Capita	Ratio Top 10%/Bottom 10% OECD TL2 Regions GDP per Capita
<b>5/27</b>	<b>5/27</b>	<b>1/26</b>	<b>1/26</b>	<b>4/26</b>
Ratio Top 20%/Bottom 20% OECD TL2 Regions GDP per Capita	Ratio Top 10%/Bottom 10% OECD TL3 Regions GDP per Capita	Ratio Top 20%/Bottom 20% OECD TL2 Regions GDP per Capita	Ratio Top 10%/Bottom 10% OECD TL2 Regions GVA per Worker	Ratio Top 20%/Bottom 20% OECD TL2 Regions GVA per Worker
<b>6/26</b>	<b>2/27</b>	<b>4/26</b>	<b>2/25</b>	<b>5/25</b>
Ratio Top 10%/Bottom 10% OECD TL3 Regions GVA per Worker	Ratio Top 20%/Bottom 20% OECD TL3 Regions GVA per Worker	Ratio Top 10%/Bottom 10% OECD TL2 Regions RDI per Person	Ratio Top 20%/Bottom 20% OECD TL2 Regions RDI per Person	Ratio Top 10%/Bottom 10% OECD TL3 Regions RDI per Person
<b>3/27</b>	<b>6/27</b>	<b>4/27</b>	<b>4/27</b>	<b>1/11</b>
Ratio Top 20%/Bottom 20% OECD TL3 Regions RDI per Person	Gini Index Regional GDP per Capita OECD TL2 Regions	Gini Index Regional GDP per Capita OECD TL3 Regions	Gini Index Regional RDI per Capita OECD TL2 Regions	Gini Index Regional RDI per Capita OECD TL3 Regions
<b>1/11</b>	<b>9/26</b>	<b>1/27</b>	<b>5/26</b>	<b>1/11</b>
Difference Top-Bottom OECD Metro Urban Area GDP per Capita Divided by national GDP per Capita	Ratio Top/Bottom OECD Metro Urban Area GDP per Capita	Ratio Top/Bottom GDP per Capita EU NUTS2 Region (including Metro Urban Regions)	Ratio Top/Bottom GDP per Capita EU NUTS3 Region (including Metro Urban Regions)	Ratio Top 10%/Bottom 10% GDP per Capita EU NUTS2 Regions (including Metro Urban Regions)
<b>8/19</b>	<b>5/19</b>	<b>6/20</b>	<b>6/22</b>	<b>4/22</b>
Ratio Top 10%/Bottom 10% GDP per Capita EU NUTS3 Regions (including Metro Urban Regions)	Coefficient of Variation GDP per Capita EU NUTS2 Regions (including Metro Urban Regions)	Coefficient of Variation GDP per Capita EU NUTS3 Regions (including Metro Urban Regions)		
<b>11/22</b>	<b>5/23</b>	<b>11/22</b>		

Alternatively, if we calculate a coefficient of variation for GDP per capita at the NUTS2 regions now France and Ireland are both slightly higher than the UK, and again Hungary and Slovakia still have higher ratios again. Meanwhile, if we calculate the ratio of the GDP per capita of the top 10% of NUTS2 regions divided by the bottom 10% of regions at the NUTS3 level we see that the UK ranks as the 11<sup>th</sup> most interregionally unequal country out of 22 behind 6 former Communist countries plus Ireland, Italy, France and Germany. On the other hand, if we calculate

a coefficient of variation for GDP per capita at the NUTS3 regions again we see that the UK is the 11<sup>th</sup> most interregionally unequal country in Europe out of 22 EU and OECD countries behind 5 former communist countries plus France, Italy, Greece and Ireland. In these particular types of NUTS rankings the UK displays lower inequalities between large urban and either small town or non-urban areas than countries such as France, as is already well-known (Dijkstra et al. 2013; McCann 2016). Inequality in the UK is more of a regional than an urban/non-urban phenomenon (McCann 2016), although while every UK indicator of this type was falling between 2000 and 2007 they have all very slightly risen since the crisis of 2008, a finding consistent with Martin et al. (2018).

### Discussion and Conclusions

All of these various results are summarised in Table 1 which reports each of the individual measures of interregional inequality and the UK's inequality ranking out of the range of countries for which comparable data is available. A higher ranking means that the UK is relatively more unequal on that particular measure. What we see is that across all 24 indicators the UK has a high ranking of interregional inequality. In terms of the country comparisons employed by both *The Economist* and *FullFact*, when we consider interregional inequality across all of the available TL2, TL3, Metro Urban and NUTS2 and NUTS3 indicators, we see that across all 28 indicators the UK is more interregionally unequal than the US on 6 measures while the US is more unequal than the UK on 5 measures, and they are equal on 2 measures. However, if the District of Columbia is removed for the reasons outlined above, the USA is more interregionally unequal to the UK on 4 measures while the UK is more unequal to the USA on 9 measures, and they are equal according to 1 measure. Similarly, the UK is more interregionally unequal than France according to 15 measures and France is more unequal than the UK on 4 measures and they are equal on 2 measures; Germany is more unequal to the UK according to 4 measures while the UK is more unequal than Germany on 17 measures; Italy is more interregionally unequal to the UK on 10 measures while the UK is more interregionally unequal than Italy on 11 measures; the UK is interregionally more unequal to Japan on 18 measures; Spain is more interregionally unequal than the UK according to 3 measures while the UK is more unequal to Spain according to 19 measures; the UK is more interregionally unequal than South Korea according to 16 measures while Korea is more unequal to the UK on 2 measures; the UK is interregionally more unequal than Sweden on 16 different measures. In other words, across all of the indicators used, the UK comes out as the most interregionally unequal country amongst this particular group of large advanced industrial economies.

Indeed, what comes out when we compare the UK with 30 OECD countries is that the UK is one of the most interregionally unequal countries in the industrialised world, and almost certainly the most interregionally unequal large high-income country. The only countries which are interregionally more unequal than the UK are Slovakia and Ireland<sup>20</sup>. In other words, across a very broad range of 28 indicators, the UK is interregionally more unequal than 28 other advanced OECD countries<sup>21</sup>. Amongst its own particular competitor peer-group of large countries with similar or higher levels of income, the UK is much more unequal interregionally than any of its peers. Only Italy, with its longstanding problems of the Mezzogiorno has somewhat nearly comparable interregional inequalities to that of the UK, although Italy's measures are very dependent on the fact that three of the four richest TL2 and NUTS2 regions of Italy only have

<sup>20</sup> Slovakia is more interregionally unequal than the UK according to 14 measures, Slovakia is equal to the UK on 2 measures, and the UK is more unequal to Slovakia than 8 measures. Ireland is more interregionally unequal than the UK according to 13 measures, while the UK is interregionally more unequal than Ireland on 12 measures.

<sup>21</sup> Poland displays equivalent interregional inequality to the UK. Poland is more interregionally unequal than the UK according to 10 measures, the UK is more interregionally unequal than Poland on 10 measures, and they are both equal on 2 measures.

very small populations<sup>22</sup>. Meanwhile, the small number of measures where Germany is more unequal than the UK is an entirely a legacy of the absorption of the former East Germany. All other rich OECD countries are much more interregionally equal than the UK. As such, in many ways the economic geography of the UK is more reminiscent of a much poorer country at an earlier stage of economic development (McCann 2016). Moreover, the inequalities within the UK are also across such short distances with enormous local productivity variations evident within just a two-hour driving time, whereas within Spain comparable variations would only be evident across a 7 hour driving time, and in Italy and USA across a 10 hour driving time. In the UK it is the combination both of the magnitude and the proximity of the interregional inequalities which is so marked. The productivity weakness of many regions of the UK acts as a severe drag on national productivity. Major differences in local productivity are a primary source of the 'geography of discontent' and they are also a challenge to the country's institutional and governance structures. Given these data, which are all publicly available, it is very hard to understand how *FullFact* could have put forward the argument that UK interregional inequality is only average by international standards, and even harder to understand how high-profile front-line political and media commentators could have so readily accepted this argument.

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<sup>22</sup> The richest TL2 region Bolzano-Bozen has a population of 524,256, the Trento population is 538,604, and the Val d Aosta population is 126,883.

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## Appendix: OECD Metropolitan Urban Areas in the UK

As mentioned above, in the UK there are 15 Metropolitan Urban Areas according to the OECD Metro definition accounting for a total population of just over 25.5 million, or rather 40% of the UK population (McCann 2016). Except for the case of London, where as we have seen above the OECD Metro definition is larger than the corresponding TL2 definition of Greater London, these UK OECD Metro definitions all sit below the OECD TL2 classifications and above the OECD TL3 classification areas.

As expected from standard urban economics arguments, 7 UK cities have GDP per capita levels noticeably higher than the TL2 hinterlands, with the urban productivity premia ranging between 8.7% and 32.5% above the respective regional TL2 levels in which the cities are located [Birmingham 8.7%; Glasgow 13.8%; Manchester 16.1%; Cardiff 18.7%; Leeds 27.5%; Bristol 30.8%; Edinburgh 32.5%]. At the same time, and largely contrary to textbook arguments, there are 5 UK OECD Metro Urban Area cities [Bradford; Sheffield; Liverpool, Portsmouth-Southampton; London] which have GDP per capita levels lower than the TL2 regions in which they are embedded and another 3 [Newcastle, Leicester, Nottingham] have GDP per capita levels between only 2%-3% higher than their respective TL2 regions. Therefore, if we do not include the case of London due to the boundary issues, the dispersion of OECD Metro Urban Area productivity in the UK is, as expected, greater than for the TL2 regions and lower than for the TL3 regions, whereas with the OECD London Metro definition included, it becomes lower than both the TL2 and TL3 regional classifications. As such, UK interregional productivity definitions are very sensitive to the definition of London we employ, also because the size of London in relative terms is so huge. The OECD TL2 definition of Greater London accounts for more than 23% of the UK economy, while the OECD Metro definition of London accounts for 28.4% of the UK economy. This exerts significant weighting on any UK average GDP per Capita measures, whereas for example, for New York to have a similar measurement impact on the USA it would have to have a population of more than 65 million people.

As such, because of the boundary issues associated with the defining the economy of London, and therefore unlike in almost any other OECD country, the productivity variations between the UK Metro Urban areas are lower for both the TL2 areas and also TL3 regional classifications (Gal and Egeland 2018) and similar to those in many other countries. If TL2 definition of Greater London was used along with the much smaller OECD Metro definitions of the other UK cities, then the productivity dispersion of UK cities would be greater than for TL2 regions and less than TL3 regions, as expected. However, these Metro data only provide a partial understanding of the UK economy because they do not account for the remaining 60% of the UK population in a context where 80% of the UK population live in urban areas and 74% live in functional urban areas of over 50,000 (McCann 2016). Yet, we do know that within the UK the broad north-south divide in city productivity within England has also increased in recent years (Martin et al. 2018). Furthermore, many of the UK's most prosperous places are small and medium-sized towns, especially in the south of England, whereas many of the UK's poorest places are small and medium sized towns in the Midlands, the North and Wales, which means that UK regional measures display a higher level of dispersion than city measures alone. None of these remaining areas are covered by the OECD Metro dataset.