Appendix: Supplementary Material to Accompany "*The Productivity Performance of Different Types of UK Regions and the Challenges of Levelling Up*" by Philip McCann and Pei-Yu Yuan

Further Evidence on the Productivity Performance of Different Regions and Urban Areas

In the UK there are 179 smaller OECD-TL3 regions, with an average population of just under 370,000 people. The OECD classifies these TL3 regions into five different categories, namely: Large Metro regions; Metro regions; Non-Metro region with Close Access to Metro Areas; Non-Metro areas with Access to a Small City or Town; Remote Rural regions. In Figure A1 these different categories of small regions are coloured differently, with: large Metro regions coloured in dark blue; Metro regions in maroon; Non-Metro regions with Close Access to Metro areas are coloured in green; Non-Metro regions with Close Access to Small or Medium Cities are coloured in yellow-gold: and remote rural regions are coloured in grey.

Figure A1 Productivity Growth-Population Growth Relationships in Different Types of OECD-TL3 Regions
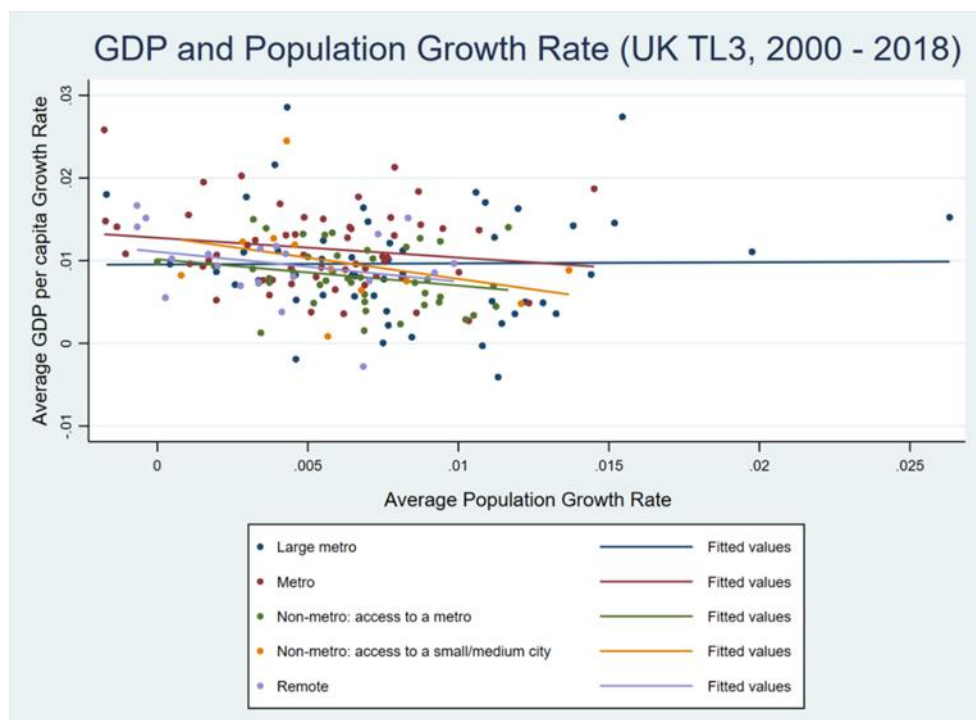

Figure A1 plots the relationship between productivity growth and population growth 2002-2018 for different types of small regions. As we see in Figure A1, for Large Metro Areas there is no relationship at all between the average productivity growth rate and the average population growth rate of a region, while for other types of regions the relationships are all slightly negative. Furthermore, if we remove the two main population growth outliers, namely, Hackney & Newham (UKI41) and Tower Hamlets (UKI42), as we see in Figure A2, all of the productivity growth-population-growth relationships are very slightly negative, but not much different from zero. In other words, what these scatterplots tell us is that for all types of places

in the UK, there are no real UK-wide systematic relationships between productivity growth and population growth.

Figure A2 Productivity Growth-Population Growth Relationships in Different Types of OECD-TL3 Regions (After Removing Outliers)
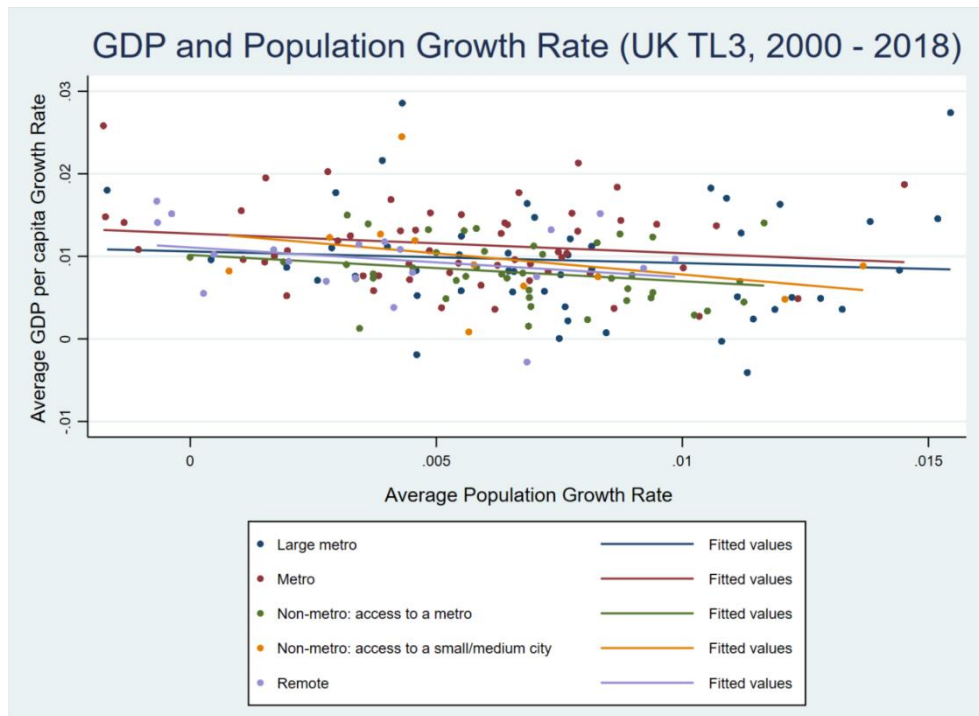
In most well-functioning interregional economic systems, these relationships should all be upward-sloping, whereas this is not the case in the UK. There are various reasons for this. One is the role of land use planning system, which dramatically constraints supply-side responses, such that productivity growth is immediately translated in terms of local house price appreciation, which in turn makes migration from lower to higher productivity areas more difficult for house owners. As we have seen, both gross and net interregional migration rates have barely changed in four decades, even though the UK is a high mobility country by OECD standards. The question still remain, however, as to whether improved migration responses would narrow the UK's interregional productivity disparities.

Examining specifically the urban areas in more detail, the nationwide patterns of metropolitan urban area productivity performance over the last two decades are displayed by Figure A3. As we see, these urban area performance patterns largely reflect the regional patterns depicted in Figure 1. Obviously, as already mentioned, not all urban areas in prosperous regions are themselves very productive and not all urban areas in economically weaker regions are themselves economically weak. However, as we see here, the general correspondence between regional performance and local urban performance still holds, and this is especially marked for the large metropolitan urban areas outside of the core regions of the wider south and southeast.

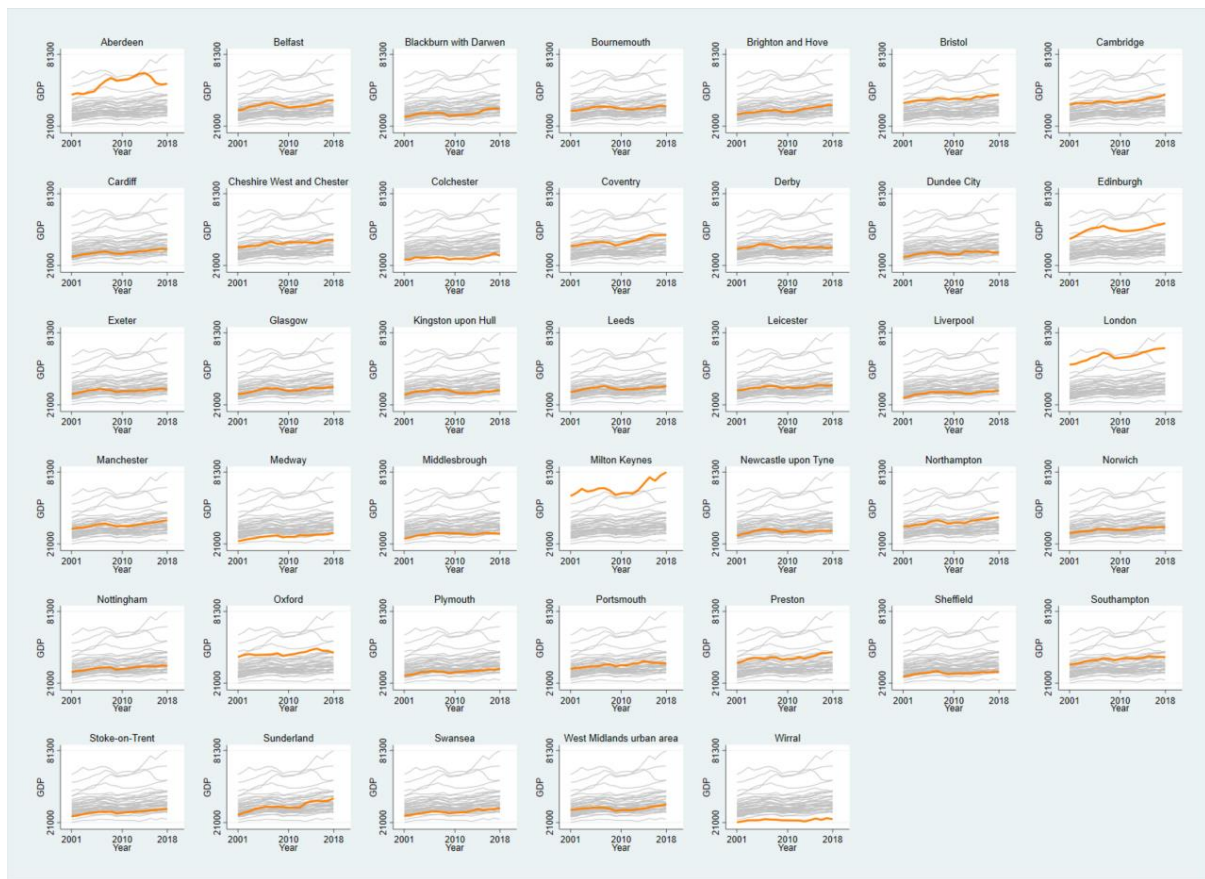**Figure A3** Productivity Performance for UK Metropolitan Urban Areas (2001-2018)


Figure A4 depicts the UK-wide relationship between productivity levels and population scales for UK Metropolitan Urban Areas in 2001, and Figure A5 shows the same relationship without London. As we see, the pattern is almost identical to the same comparisons undertaken using 2018 figures, as depicted in Figures 7 and 8. In other words, the lack of any systematic relationship between urban scale and productivity is a longstanding issue in the UK.

We have already seen that amongst UK Metropolitan Urban Areas there are no clear relationships between growth and scale. One argument could be that these scatterplots are rather static. Therefore, another way to consider these issues is to examine the relationship between urban productivity growth and urban population growth. This is examined in Figure A6 which plots the scatterplot between the average annual growth in GDP per capita and the average annual population growth rate for urban areas. High productivity growth places might be expected to be associated with high population growth, primarily through in-migration, but also due to high fertility rates associated with younger population cohorts who are the most mobile. As we see in Figure A6, however, the relationship is very slightly negative, but again, in general it is little different than zero. In other words, this relationship is also similar to the other growth and scale relationships depicted above in Figures A1 and A2 for different types of UK regions.

Figure A4 Productivity Levels and Population Scale (2001) for UK Metropolitan Urban Areas

Figure A5 Productivity Levels and Population Scale (2001) for UK Metropolitan Urban Areas (Excluding London)

Figure A6 Productivity Growth and Population Growth for UK Metropolitan Urban Areas (2001-2018)
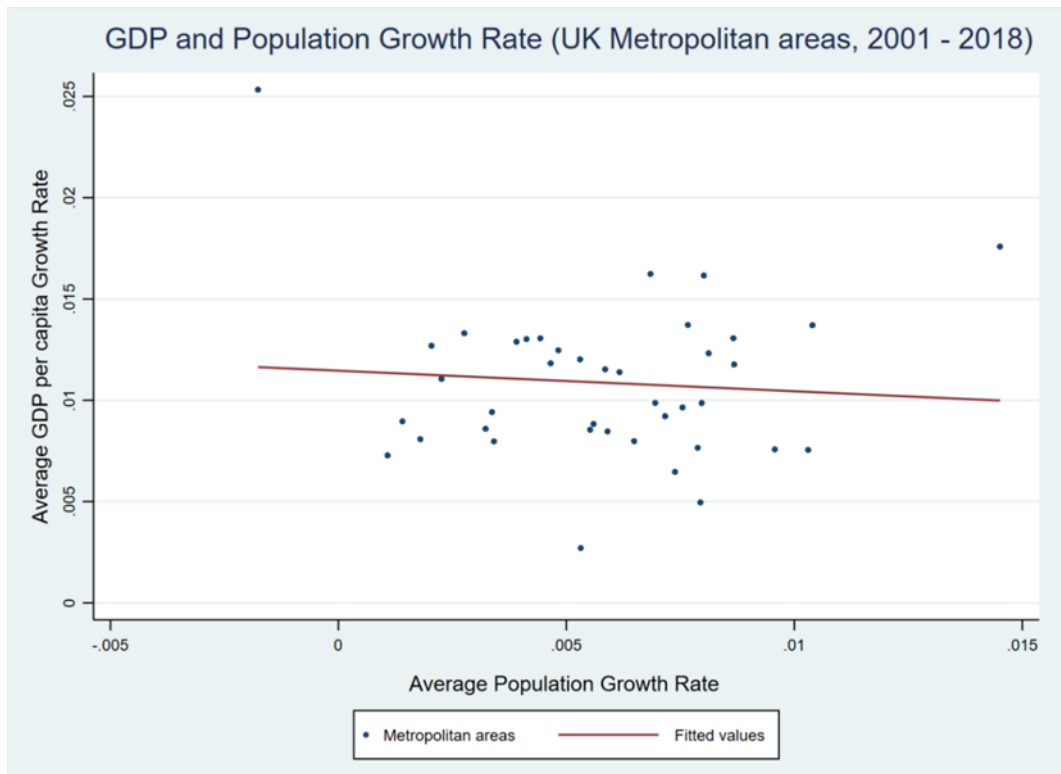
Figure A7 GDP Per Capita Levels (2001) and Annual Population Growth for UK Metropolitan Urban Areas (2001-2018)
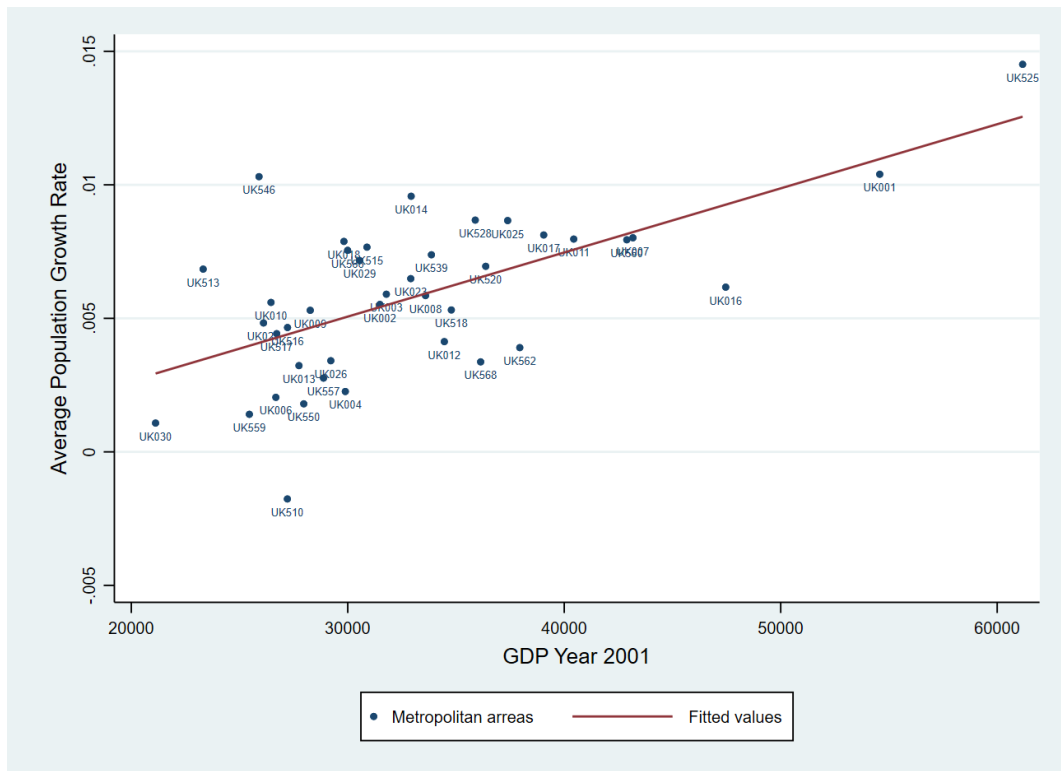
Figure A7 plots the relationship between average annual population growth 2001-2018 and the GDP per capita in 2001 for the UK's Metropolitan Urban Areas. This scatterplot suggests that there is a strong and upward sloping relationship, which means that cities which were previously prosperous back in 2001 have tended to grow faster over the following two decades. Again, it may be the case that these relationships are affected by the presence of two key outliers, namely Milton Keynes and London. We can therefore re-plot this scatterplot after excluding these two cities, as is done in Figure A8.

Figure A8 GDP Per Capita Levels (2001) and Annual Population Growth for UK Metropolitan Urban Areas 2001-2018, After Excluding London (UK001) and Milton Keynes (UK525)
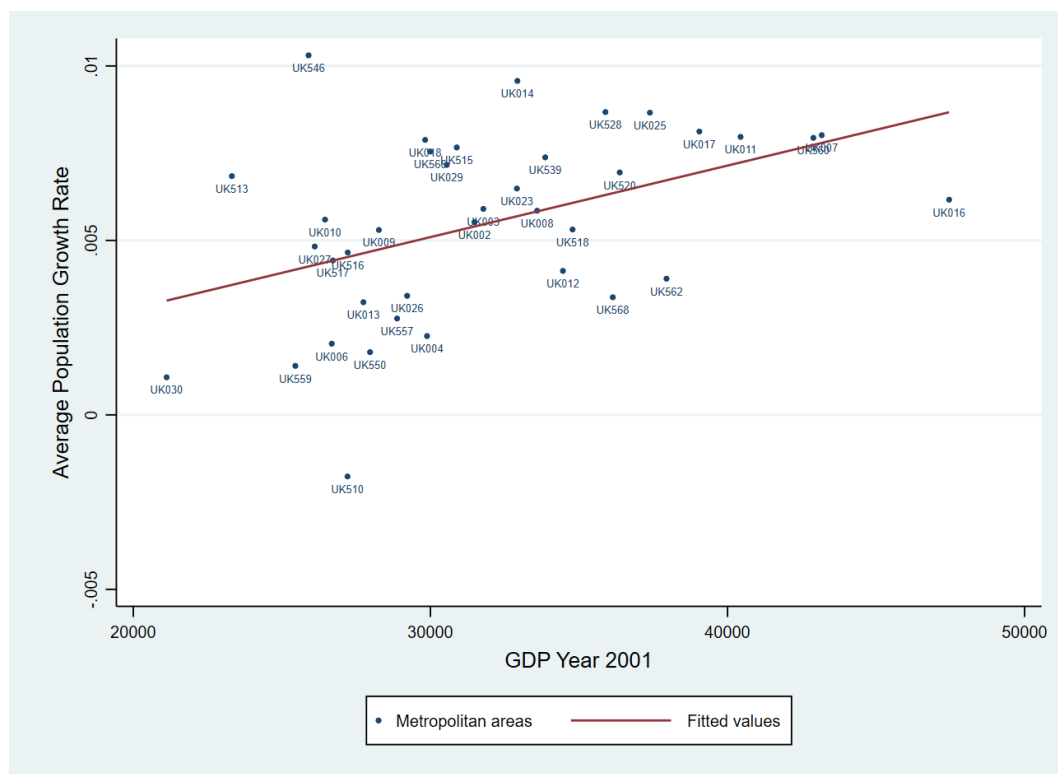
What we see from Figure A8 is that these relationships remain largely unchanged even after removing outliers. Cities and urban areas which were previously prosperous have subsequently achieved higher population growth. Again, we can repeat this exercise but instead using the 2018 GDP per capita levels rather than the 2001 levels, as is done in Figure A9, and also in Figure A10 after excluding London and Milton Keynes. These relationships hold almost identically to those depicted in Figures A7 and A8. In other words, from Figures A7, A8, we see that for Metropolitan Urban Areas, subsequent population growth is closely related to the prior levels of productivity and prosperity, as measured in terms of GDP per capita. The result of this, as displayed in Figures A9 and A10, is also that subsequent prosperity in 2018 is closely related to the prior population growth rates over the previous the two decades since 2001. Again, this is not a scale-related phenomenon, but a prosperity-related phenomenon, and suggest that local cumulative causation-types of relationships which are not scale-related hold in urban areas, exactly as with other types of UK regions.

Figure A9 GDP Per Capita Levels (2018) and Annual Population Growth for UK Metropolitan Urban Areas (2001-2018)
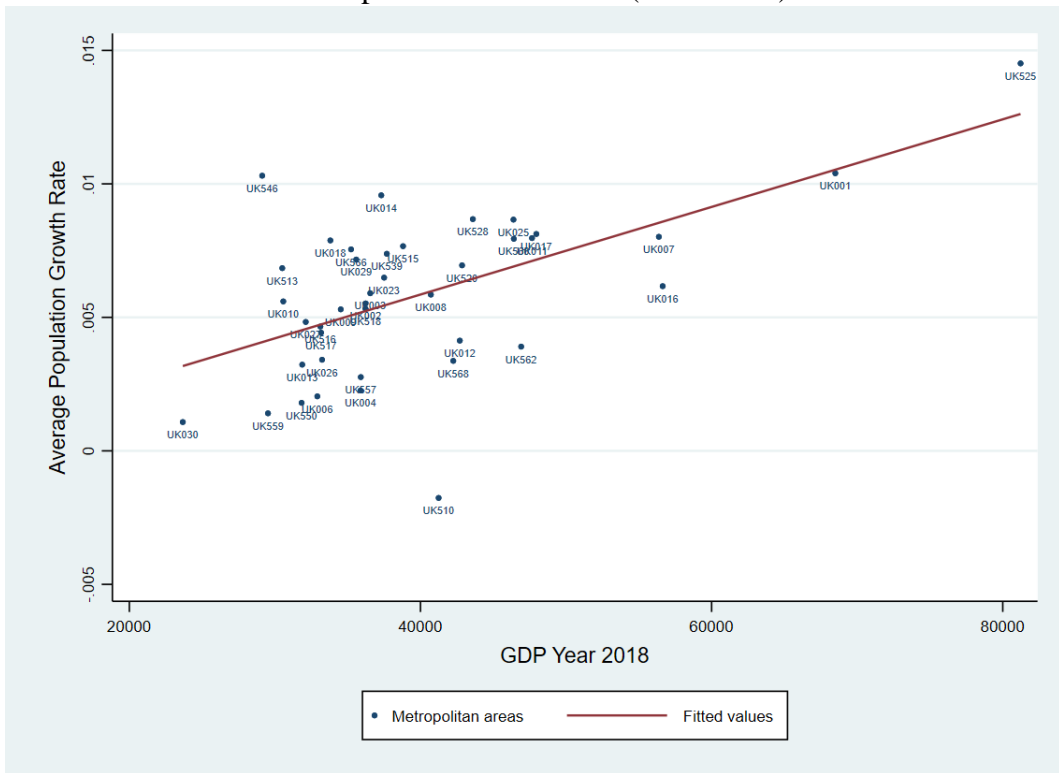
Figure A10 GDP Per Capita Levels (2018) and Annual Population Growth for UK Metropolitan Urban Areas 2001-2018, After Excluding London (UK001) and Milton Keynes (UK525)