Economic linkages between urban and rural regions - what's in it for the rural?

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Abstract

In this paper a two region model is applied to understanding the interdependences between urban and rural economies. The ongoing debate between proponents of agglomeration theory and those favouring more balanced growth approaches does not really differentiate rural regions.

A diagrammatic framework proposed by Overman, Rice and Venables (2010) is re-analysed to consider its potential application for understanding urban-rural linkages. Rural and regional studies are replete with references to the interdependencies between urban and rural space but modelling these in a way that can offer guidance to rural development policy makers and to improve understanding of the dynamics of commuting remains somewhat elusive.

The approach is largely conceptual but draws on earlier literature to support underlying assumptions. This generates a scenario where the relative level of urban wages can continue to outperform rural wages without residential migration acting as an equilibrating force. The inflation of cost of living in urban regions is therefore dampened while the cost of living increases in the rural region, even though the wage rate is unfavourable when compared to the urban region.

We conclude that traditional notions of trickle-down or spread effects are no longer appropriate for today's hypermobile society because the spread of people does not equate to the spread of economic activity. In fact, the spread of urban workers might have a detrimental impact upon rural regions without clear mechanisms for their human and financial capital to penetrate local rural economies.

Keywords: Rural Development; Rural Economies; Regional labour markets; Commuting; Agglomeration; Spread effects

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Introduction

Following the recent re-ignition of the 'balanced versus un-balanced growth' debate (Martin *et al.,* 2015) where the persistence of regional economic disparities have been highlighted (see also Turok, 2007), this paper considers the experience of rural regions whose economic fortunes tend to be overshadowed by urban regions. Trickle-down and spread effects are not new concepts (Hirschman, 1958; Myrdal 1957) but Martin *et al*'s evidence of regional divergence calls for a closer examination of the potential for economic development in 'the rural'. In drawing this dichotomy, we recognise the fact that urban and rural economies are increasingly interdependent (Lichter and Brown, 2011) and that they are increasingly seen as complementary parts of a larger economic entity (Cabus and Vanhaverbeke, 2003).   However, while a binary rural-urban divide is a "fundamental oversimplification" (Partridge *et al*., 2007, p.128), understanding the dynamics of urban-rural interdependencies through their labour and housing markets and inter-regional flows, and productivity and growth rates identifies different economic features of urban and rural regions.

Migration and commuting should moderate differences in regional economic performance and unemployment, but these adjustment mechanisms are more complex that the theoretical constructs might lead us to assume (Turok, 2007). Therefore, the aim of this paper is to explore these regional interdependencies, by developing the Overman *et al.* (2010) model towards an interdependent urban-rural scenario, to assess the impact of a productivity increase in an urban region for wages, cost of living, migration and commuting flows for a connected rural region. With recent OECD data identifying that compared to urban regions, rural regions in Western Europe have been experiencing faster rates of population and productivity growth since 2002 (McCann *et al*., 2014), the need to understand more about their economic performance is particularly pertinent.

Characterising Rural Economies

Gruber and Soci (2010) described the periphery as being somewhat neglected in New Economic Geography models wherein rural and peripheral regions are assumed to be subservient to the core region(s). Dominated by agriculture, the periphery has been conceptualised as a place of constant returns to scale where only immobile resources are employed – the assumption being that mobile resources move to the more productive and profitable core regions. However, as the share of labour employed in agriculture has declined, rural areas have experienced a concurrent rise in a diverse range of microbusinesses (Woods, 2005; CRC, 2008). The UK and other developed nations have moved to a rural economy that is driven by consumption – and those consumption demands are associated with a largely urban society (Slee, 2005; Woods, 2005). As a result, "Rural goods and services are directed toward and consumed disproportionately by people with strong ties to urban and big city populations" (Lichter and Brown, 2011, p.574). Thus, there are clearly prospects for rural regions to grow based on demand fuelled by urban growth but further questions emerge concerning the labour market impacts of these firms. While counterurbanisation continues to fuel increases in rural populations, the numbers of jobs within rural regions has not been keeping pace (CRC, 2007; Bosworth, 2010).

In their Canadian research, Partridge *et al*. (2007) concluded that the countryside has a major stake in urban growth and that mutual interest suggests that economic growth takes place in broader regions that benefit from the critical mass needed to generate wide-scale growth. This supports views that rural-urban interactions are increasingly symmetrical rather than asymmetrical, with mutual interdependencies and reciprocal flows of people, goods and services, and information (Lichter and Brown, 2011). However, for more remote rural regions, alternative sources of growth are also needed to overcome the dominance of backwash effects (Partridge *et al*., 2007). For these regions, the out-migration of younger people (Stockdale, 2004) and the level of rural service provision (Malecki, 2003) remain significant concerns for economic development.

Approaches to rural development that are based on local resources and "immobile" forms of capital (Terluin, 2003) are considered to offer the potential for more endogenous development trajectories that are less dictated by urban regions (Lowe et al, 1998). While information, goods and services, skilled labour and capital are increasingly mobile, other resources, including social capital, cultural capital and environmental capital, are recognised as being immobile and intrinsically spatial (Terluin 2003). These attributes make the periphery increasingly dynamic and diverse but the mobility of rural labour markets demands greater understanding of commuting patterns and housing costs within any core-periphery model that attempts to explain the economic processes occurring in rural areas.

Analytical Framework

To consider the impact of growth in an urban region for an adjoining rural region, we apply a conceptual model of two competing regions, initially developed by Overman *et al.* (2010)[1]. We consider that this work has been neglected in subsequent publication (the web of Science academic database lists just five citations at April 2015) but see significant potential in such an approach tailored towards different regional analyses. In their model commuting was assumed not to take place between the two regions under analysis and no urban or rural presumption was made. However, adapting their model for the case of an urban and a rural region highlights the nature of inter-regional interdependencies and there is a weight of evidence that suggests commuting is occurring over larger distances, and tending to be towards urban regions (Champion *et al.,* 2009; Axisa *et al*., 2012; Ozkul, 2014). Moreover, as labour markets become increasingly complex and technological advances allow people to live more remotely from workplaces, the economies of rural regions cannot be understood in isolation (Coombes and Champion, 2011).

In this model, positive returns to scale are assumed such that a larger labour force in one region is assumed to fuel an increase in the real wage in that region. This generates the EE relationship in Figures 1 and 2 where an increase in the Urban:Rural wage ratio (Wu/Wr) sees an increase in the urban share of the labour market (λ). Turning to the bottom right quadrant, the relationship between the size of the labour market (λ) and the cost of living (H) is also modelled, with an assumption that the cost of living (based on house price effects) will be higher in the region with the larger share of

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[1] Overman also set out a scenario where regions were "complementary", where labour market migration to a higher-wage region is assumed to result in the real wage equilibrating more quickly due to rises in the cost of living. For the Urban-Rural region comparison, there is an implicit assumption that agglomeration economies apply to the urban region (McCann, 2013) and thus the competing model is more appropriate.

labour. Overman *et al.* (2010) represented this with the HH relationship (Figure 1) but if we allow commuting from a rural region to fuel the larger labour market in the urban region, we argue that this relationship should be represented with the less elastic curve HH_2 (Figure 2). As the urban labour market grows, agglomeration effects see productivity and thus wages rising but we assert that demand for urban houses need not escalate to the same degree if workers can commute from rural areas. Moreover, we also make the assumption that demand from commuters will push up the price of houses in the rural region so the ratio H_U/H_R does not increase as much once we factor in the effects of urban-rural commuting.

Combining these two relationships in the top right quadrant, we see that a number of possible points can be traced out along the ZZ curve. The assumption underlying Overman *et al*'s original model (Figure 1) is that migration will occur to ensure that an equilibrium position will exist where ZZ intersects with the 45˚ line (M) such that there is a balance between the real wage and cost of living. However, the revised HH_2 relationship (Figure 2) generates a ZZ curve that diverges from M, moving into the sector of the graph where the relative wage in the urban region is greater than the relative cost of living in the urban region. As in Overman *et al*'s model, the ZZ curve traces the combinations of relative wages and relative living costs consistent with the division of labour between regions. Unlike in Overman *et al*'s models, however, this schedule is moving away from M (the 45° line where wage ratios are equal to cost of living ratios) into the sector of the graph where the relative wage is consistently greater than the relative cost of living. This implies an unstable equilibrium. Before turning to policy implications we elaborate on some possible scenarios in which this situation might exist for longer periods.

Firstly, the elasticities of wages and housing cost with respect to employment are key parameters in this model. On page 21, Overman *et al*. (2010) explicitly refer to their symmetric regions point and infer that elasticities in both regions should be more or less the same around symmetric equilibrium. The slope of ZZ depends on whether returns to scale on the labour market occur, assuming a positive elasticity of housing cost to population. In the case of the urban-rural setting, the slope of ZZ is determined first and foremost by the positive returns to scale on the labour market, which are now less inhibited by the pressures induced on the housing market.

Secondly, Overman *et al.* explicitly assume symmetric regions, which implies equalized amenity values, productivity parameters and housing market flexibility. In our setting, these assumptions are rather more unlikely, as explained earlier. It is important to note that whereas relative wage levels and housing costs suggest and incentive to migrate, this need not be the case when considering amenity adjusted wages for example. A stable equilibrium, given heterogeneous preferences for residential amenities may result in a stable equilibrium off the implied 45° line MM.

Figure 1: Overman *et al*'s framework showing the relationship between labour markets and cost of living in two competing regions
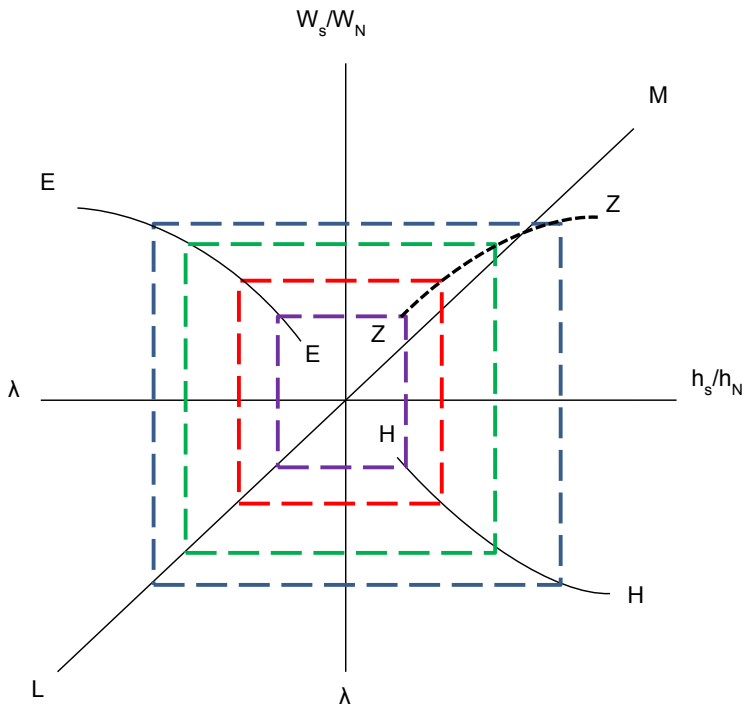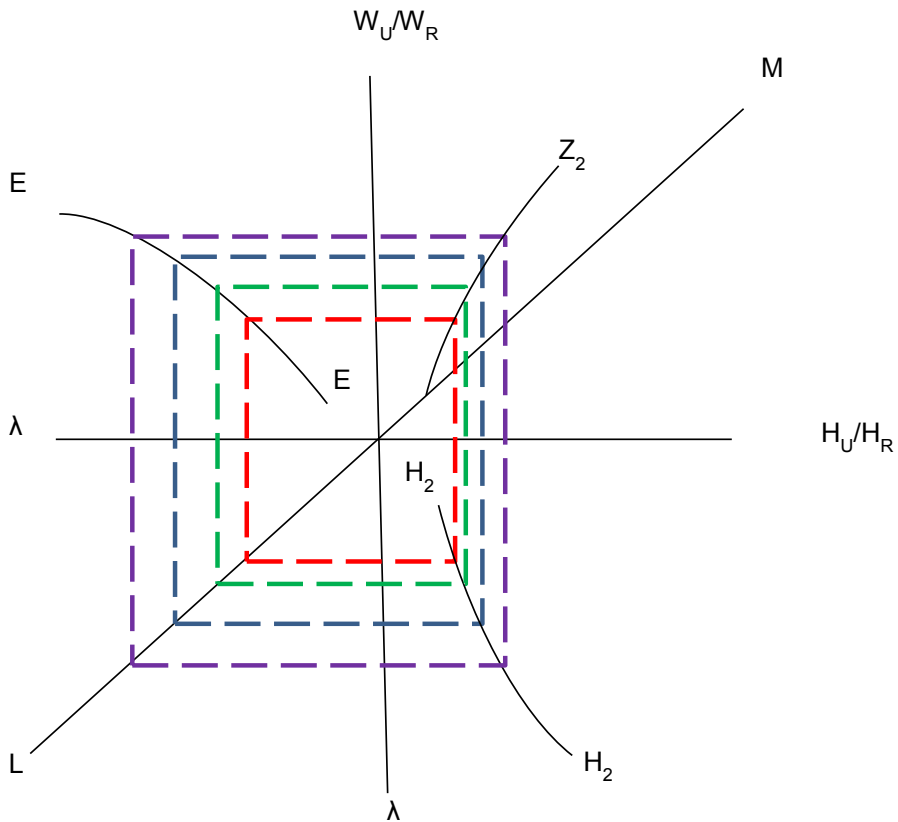
Figure 2. Adapting Overman *et al* (2010) to include commuting from the rural to the urban region

Incorporating commuting between urban and rural regions in Figure 2, results in a conceptual separation of population and the labour force, which were assumed equal by Overman *et al.* In a world with commuting, this need no longer be the case. We therefore define λ specifically as the share of

workers active in Region U relative to the number active in the rural region. The share of population in urban regions (P_U/P_R) is not made explicit, but acts in the background as the difference between P_U/P_R and L_U/L_R and signals a need for commuting. Also for many countries it is observed that $L_U/L_R > P_U/P_R$ as employment opportunities are usually more concentrated in larger urban cores than population.

Scale and heterogeneity: commuting as a driver of urban-rural divergence

The model introduced by Overman *et al.* (2010) can be thought to offer an explanation for the existence of cities within the Urban Economics tradition (Brakman *et al.*, 2009). The key mechanism is migration which serves to equalize amenity-adjusted relative wages with relative housing costs throughout the economy. The presentation in Overman *et al.* (2010) is essentially place neutral. However, their assumption of equality of amenities and their focus on migration as the main linkage, seems to suggest the authors have the level of larger, relatively uniform, macro regions in mind. This has important implications, when we move to an urban-rural setting.

Firstly, we have to consider regional spatial scale and its effect on key model assumptions and parameters. It has been argued elsewhere (Brakman *et al.*, 2009, Combes *et al.*, 2005) that a key difference between Krugman's New Economic Geography and the field of Urban Economics is scale. The analysis of larger regional units is concerned mostly with relations between these units, for example through trade, as captured by NEG. As we move down the spatial hierarchy to the analysis of individual cities or regions, characterized as smaller, rather solitary units with fixed land supply, intra-city spillovers as captured by Urban Economics become a stronger focus, whereas linkages to other places are featured less prominently. These two approaches need not be contradictory (Brakman *et al.*, 2009), but both the relative importance as well as the nature of interregional linkages may very well be related to the scale at which one seeks to theorize their role. One could also argue that, as the size of the unit under study increases, linkages to places elsewhere become less important compared to the size and scope of activities contained in the area under study. Conversely, for smaller areas, there is more "foreign" to contend with, more dependencies on resources outside the unit. Next to this, whereas trade or migration can be thought of as the main mode of interaction for large macro regions or countries, as we move down the spatial hierarchy commuting and other daily mobility and consumption patterns might be expected to be at least relatively more important, if not the most important. As we move down the spatial hierarchy, it seems natural to take alternative linkages to migration into account.

A second implication of re-focussing the model on urban-rural linkages is the role of heterogeneity. Overman *et al.* (2010) assume that the regions involved have the same amenity scores, productivity and housing market shift parameters. All in all, we are dealing with two very similar regions, which, if regions are thought of as sizeable, countries even, is not a very heroic assumption to make. Again, with increasing scale, more activities can be thought of as captured within the unit. As more activities are covered with size, it is likely that two large regions will be relatively similar. When we consider the urban-rural case it is likely that the regions involved differ at least in some of these dimensions. The scale issue aside, as smaller regions cannot cover everything, the two regions in our model are heterogeneous by construction along the urban-rural dimension. Furthermore, the very existence of both urban and rural regions suggests heterogeneity in worker/inhabitant characteristics and

preferences. For example, spatial sorting on the basis of skills is being thought to spur urban growth (McCann, 2013).

This heterogeneity between regions combined with the commuting effects, leads to a situation where the introduction of a productivity increase for one region has a greater impact. The potential for urban wages to outperform rural wages without the control mechanism of migration and cost of living effects indicates that the rural region will endure a more disadvantageous position relative to the urban. As the urban wage rate increases, the ZZ schedules moves further away from equilibrium. Once again adapting Overman *et al.* (2010), this is illustrated in Figure 4 where a productivity shock in the urban region accentuates the disparity, with minimal corrective forces derived through the cost of living effect.

Figure 3. The impact of a productivity shock in one region on the relationship between wages and cost of living in a competing region (Overman et al 2010)
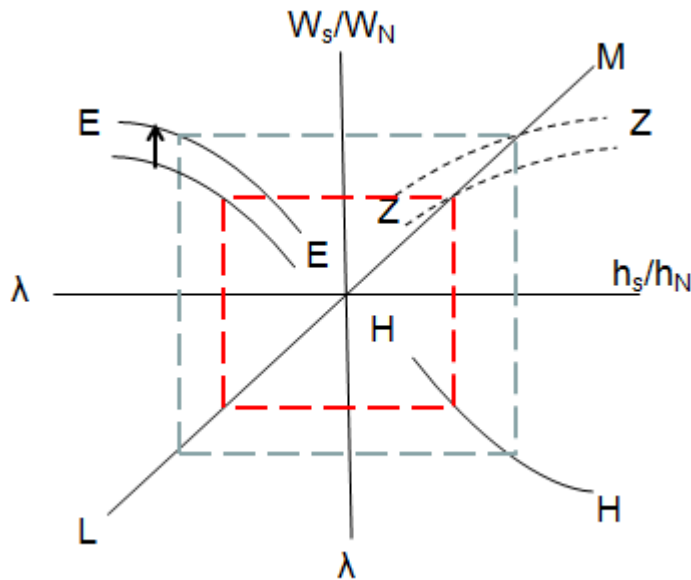
Figure 4. The impact of a productivity shock in an urban region on the relationship between wages and cost of living in competing urban and rural regions (H_2 illustrates the more elastic cost of living to wages ratio assumed from above)
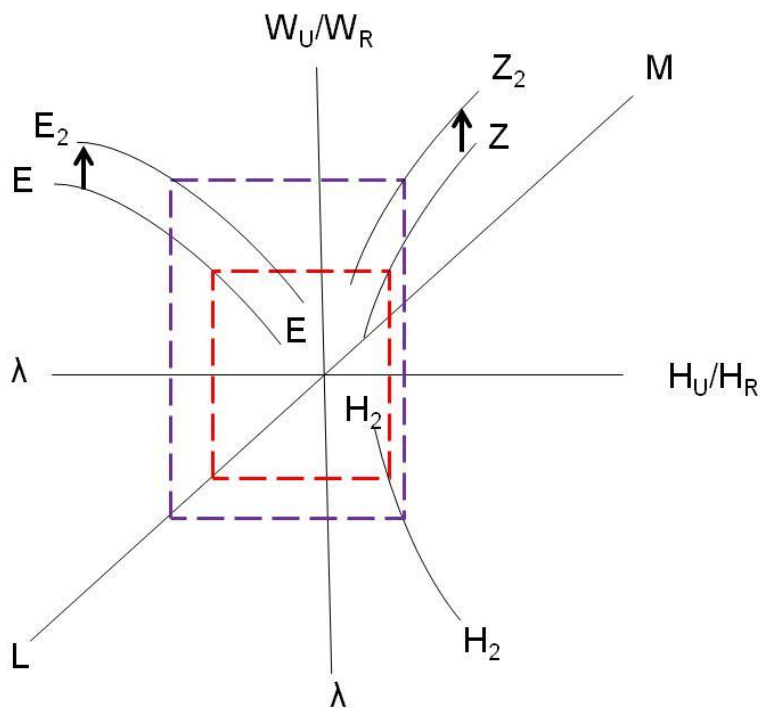

Figure 4 suggests pessimistic conclusions for the rural, where rural house price inflation combined with growing urban wages widens the gap in economic performance between the two regions. Overman *et al*. (2010) do discuss a scenario where the positive returns to scale on the labour market initially outweigh the positive elasticity of housing costs with respect to labour. However, this "divergent" case is still developed with the assumption that inter-regional commuting is not taking place and thus they assume that cost of living constraints will still eventually have an impact. As we demonstrate, recognising commuting as a key variable with implications for both the relative cost of living and labour migration between regions raises significant questions about the prospects of rural regions in the shadow of urban productivity growth. To understand how the economy of the rural region might experience trickle-down benefits, more behavioural understanding of rural populations is needed, and in particular we need to explore the cost of living section of the graph in more detail.

Determining the Cost of Living relationship

The new framework above is based on the assumption that the combined effects of rural-urban commuting dampen the upward pressure on urban house prices while inflating rural house prices. Therefore, taking the degree of housing market flexibility as given, even though H_u will increase as W_u increases, so too will H_r increase thus the ratio H_U/H_R will increase much less as the proportion of the labour force in U (L_U/L_R) increases. This logic is supported by evidence that traditional rural workers are being priced out of their communities as a result of the amenity values attributed to them (Gallent, 2007, Cloke and Milbourne, 2006; Gallent and Robinson, 2011) and by data on housing affordability shown in Table 1. The global city example of London is a particular exception influencing the "major urban" category as housing affordability is a significant issue here too but when considering contiguous urban and rural regions elsewhere in the UK, housing is more affordable in urban districts.

Table 1: Median House Prices:Median Earnings ratios (2011)

Source: Department for Communities and Local Government, (2014) with data aggregated from the Annual Survey of Hours and Earnings and the land Registry

District Category	Number of Districts	Mean of the Median House Price:Median Earnings ratio
Major Urban	70	8.0257
Large Urban	39	6.4023
Other Urban	58	6.0524
Significantly Rural	55	7.1642
Rural 50	48	7.9587
Rural 80	53	8.0566

Interestingly, Overman *et al*. (2010, p.22) note that core-periphery thinking hinges on a housing-cost elasticity with respect to labour which is negative. In New Economic Geography one arrives at such a result by thinking about the consumption of city life and urban amenities only. We do not exclude this possibility but require solely that the housing cost elasticity is lowered by commuting. In re-conceiving the diagrammatic framework above, we have assumed that the commuting effect reduces the elasticity of house prices in relation to intra-regional wages, on the premise that rural regions offer more desirable residential locations. Earlier research has shown that in many developed economies, residential preferences for rural areas have generated significant rates of counterurbanisation (Champion, 1989; Woods, 2005; Halfacree, 2008; De Groot *et al.,* 2012) sometimes linked to new business creation through commercial counterurbanisation trends too (Bosworth 2010; Mitchell and

Madden 2014). Furthermore, the convenience of rural locations for dual career families (Green *et al.*, 1999) adds to demands for rural living.

From the perspective of the urban worker commuting from a rural region, reduced pressure on urban house prices and increased pressure on rural house prices enable the urban labour market to continue to outperform that of the rural region. The HH_2 curve is less elastic as a result. However, the title of our paper asks "what's in it for the rural?" and this is a more complex question. Measures of rural populations where a significant proportion are engaged in an urban labour market will often produce indicators of high incomes, high education levels and high quality of life (ONS, 2011) but this can mask the realities of the region's economic performance. Starting from the perspective of workers in the rural region, a relative decline in productivity sees the rural wage decline in relation to the urban region. Overman *et al*. indicate that this should be equilibrated through a fall in the cost of living, largely influenced by house prices, but we are arguing here that counterurbanisation and commuting negate this. For the worker in the rural region, growth in the urban region sees their cost of living increase while their relative wage falls. Therefore, we need to explore alternative ways that the rural region might capture value from its position as a supplier of labour for urban markets.

Capturing forms of capital in the Rural Region

The outcome of this analysis is not intended to lead to the conclusion that commuting is bad for rural regions, rather to highlight the fact that the impacts need to be better understood. The general relationship between commuting and economic performance tends to be positive as more open and porous regions are more dynamic, with greater flows of knowledge and innovation facilitated by movements of people. Analysis of commuting into and out of all districts in England (Figure 5) illustrates that more "self-contained" districts tend to score lower on the UK Competitive Index (Huggins and Thompson, 2010), and this trend applies across both and urban and rural district types. Also, for the regional level, although there are only 8 regions for England (excluding London), the relationships indicates that more "contained" regions have a lower level of GVA with an R^2 value of 0.45.

Figure 5. – Comparing the Containment and Competitiveness of English Districts
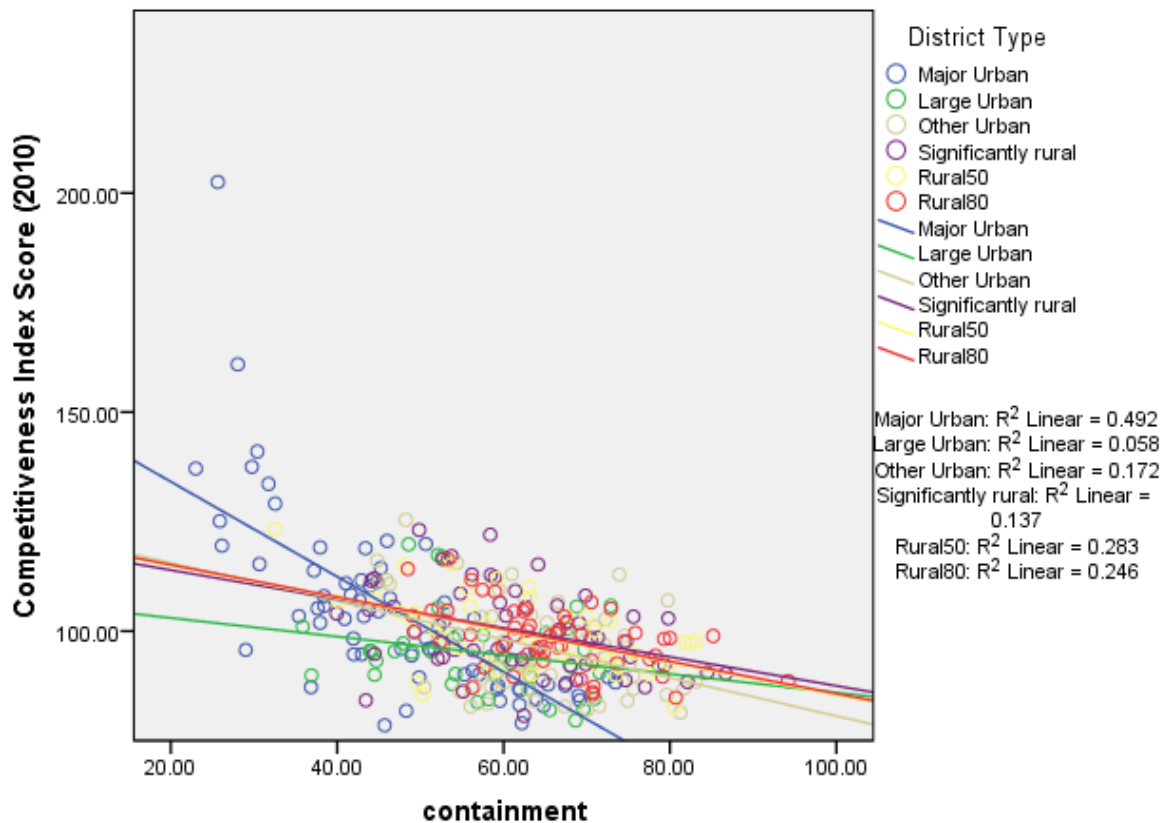
On the basis that restricting commuting is not the answer, the question must focus on how the different forms of capital attached to mobile people can generate value for the region in which they live. Concerns have been raised that "Working age in-movers who commute long distances spend a significant time away from home, and it is likely that their community participation and local spending is diminished as well" (Champion *et al*., 2009, p. 1258). Additionally, a lot of the wealth is invested in their housing stock with gentrification creating further cost of living increases for the rural region and adding to the divide between commuters and those reliant on local rural wages (Phillips, 2007).

Overman *et al*'s model identifies migration as the equilibrating force, but we argue that this need not occur when commuting is an option. Moreover, selective out-migration from the urban might occur, even in the competing scenario. As these workers living in the rural region commute back to the urban labour market, the cost of living impact can widen the urban-rural divergence. Therefore, we need to identify other mechanisms that facilitate growth for the rural region as a response to the growth in the urban region. The first of these is consumption demands but here the rural must adapt to the demands of an urban society. New rural populations and their associated demands are connected to the amenity value of the rural area leading to the commodification of the countryside (Woods, 2005) and the development of new types of businesses in rural regions.

As well as consumption expenditure drawing financial capital in to the rural region through the conduit of commuters, new networks and social capital can also benefit the rural region. Once again, though, these are linking to the urban economy and highlight the dependence on urban regions. We might go

as far as to argue that this penetration of urban norms marginalises rural social capital and emphasises the dominance of urban economies. The importance of connections to the urban region becomes the guiding principles for infrastructure investments that once again reinforce the importance of the urban region as the economic driver. This discussion illustrates that growth in the rural region is dependent upon how its economy is oriented towards the urban region. As Turok (2007) observed, theoretical adjustment mechanisms do not operate outside of their unique contexts. Instead, the economy of a rural region evolves according to an array of external relationships as well as its internal resources.

Conclusions

More recently, the growth of connectivity through improved internet accessibility has increased the desirability of rural locations and reduced the costs associated with being outside of an urban region. Indeed, as rural economies are increasingly subsumed into global circuits of value (Hudson, 2011), driven by rapidly changing information technology and globalization trends (Lichter and Brown, 2011), rural regions are becoming increasingly integrated into wider economic processes. From a place-based perspective, this suggests that rural regions with high amenity values and positive connections to urban regions are well placed to benefit from the outflow of population away from congested urban regions. However, the nature of this 'benefit' depends upon the integration of the ex-urban commuter into the rural region.

Overman *et al*. (2010) argued that three relationships play a key role in determining the economic linkages between urban regions: the link between local employment and earnings; the link between local employment and the cost of living; and the migration response to differences in real wages between locations. The purpose was to provide a framework to consider how gains in one region spillover positively or negatively to other areas. Overman *et al*. concluded that with a positive relationship between employment and earnings, based on agglomeration economies, regions are in a competitive relationship whereby "the process of adjustment to shocks tends to amplify the gains to one area" (Overman *et al*., 2010, p. 29). Overman *et al*. (2010, p. 29) noted that commuting is a partial substitute for migration but went no further in the analysis of commuting within the framework.

Our re-interpretation of this framework, incorporating the effect of commuting and considering heterogeneous urban and rural regions offers further insights into inter-regional economic linkages. Developing their conclusions, Overman *et al.* (2010) continue to explain that perfect mobility of labour would see migration flows responding to higher nominal earnings in one region but that this in turn would raise the cost of living offsetting the earnings differential. However, allowing for commuting from a rural region with higher amenity values into the higher wage urban region diminishes the cost of living effect. We illustrated this in a revised version of Overman *et al*'s framework with a less elastic cost of living: wages relationship. Further empirical research is required to test these patterns at different regional scales but the new framework allows us to consider the implications for urban and rural regions in this context.

For the urban region, greater inflows of labour and agglomeration economies are facilitated without the cost of living constraint proposed by Overman *et al*. This offers the scope for extended growth in the urban region but raises questions about how the benefits of growth might reach to the rural

region. The new framework does not indicate that migration and real wage adjustments serve to rebalance any inter-regional equilibrium and we have hypothesises that residential migration out of a congested city region combined with commuting back from the rural to the urban region can be detrimental to the prospects of the rural region's economy. In particular, this can have a negative impact on housing affordability in the rural region and this can be exacerbated where planning constraints, especially in amenity-rich rural regions, act as an impediment to the housing market responding to the increased demand for rural homes.

These conclusions partly concur with Overman *et al*. insofar as the problems are more acute for less mobile workers. Overman *et al.* consider this to be the case in the expanding region as a result of increasing cost of living but we have made the argument that commuting lessens the pressure on house prices in the urban region. They pay less attention to the fortunes of those in the contracting region. However, focusing on the rural region, we see that the least mobile people suffer a falling wage relative to the growing urban region and are subjected to increasing costs of living fuelled by commuters earning the urban wage and expressing residential preferences to live in an amenity rich rural region. This highlights the importance of connecting people to their local economies and ensuring that the stocks of capital attached to the higher earning residents in the rural region can trickle down into economic opportunities for rural businesses. This could occur through individuals' consumption demands or through more nuanced processes such as the development of urban-rural networks, inflows of innovation, the creation of new rural businesses or investments in infrastructure. Without these alternative forms of trickle-down from urban growth, the risks of a two-tier rural society with divergent wage levels and productivity rates raise questions over the sustainability of rural communities for the future. Taking a longer term view, as rural populations age more rapidly than urban ones, the implications for service provision, employment opportunities and economic vitality are brought into even sharper focus.

This analysis also leaves a more fundamental question – when assessing the relative "performance" of regions, are we more concerned with the quality of life for the people living there or with the scale of economic activity taking place within the region? If it is the former, encouraging greater commuting may yield the highest dividends but if it is the latter, the prevailing scenario is more problematic. From the rural studies perspective, the social sustainability or "liveability" of rural regions, opportunities for less mobile rural residents and the potential for alternative value creation attached to immobile rural resources all provide strong arguments to consider place-based development indicators that transcend individual wealth measures. Indeed, one of the key arguments in Martin *et al*'s (2015) paper is that agglomeration effects in core urban regions are seeing public funds diverted to dampening down the diseconomies of scale effects but our findings suggest that this is already happening through the market and thus perhaps more public investment should be made in tackling inequalities that impact rural regions.

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