



What drives long distance commuting into Australian regions? A spatial panel model approach



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ABSTRACT

Impacts of long distance commuting (LDC) on a host region have been a topic of research interest for some time. Recently, however, criticisms have surfaced about the validity of studies which address this topic. Specifically, temporal variability and spatial interaction have rarely been considered. This article argues that a single model which jointly incorporates these two aspects can improve the predictive power of LDC impacts. Using spatial panel modelling, 516 Local Government Areas (LGAs) across Australia over two census periods (2006 and 2011) were used to explore drivers of LDC. It was found that local labour market characteristics had minimal influence on recruitment strategies of firms that typically use LDC. Housing affordability does not impact on the decision of non-resident workers to either migrate into a region or adopt LDC into that region. However, local service provision and the availability of rental accommodation reduces the uptake of LDC. In addition, higher turnover of the resident population erodes social capital in host regions, which reduces the attractiveness of the local area and leads to increased use of LDC.

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1. Introduction

Long distance commuting (LDC) and its socio-economic impact on regions that host LDC workers continues to be a topic of interest in academia (Chapman et al., 2015; Haan et al., 2014; Misan and Rudnik, 2015; Silin, 2015). LDC is characterised by a cyclical nature of travelling to a work region, spending several days in the work region, followed by returning to the region of residence for leisure. Travel between a work region and region of residence is predominantly conducted through Fly-in Fly-out (FIFO) and Drive-in Drive-out (DIDO). Nicholas and Welters (2016) demonstrate that mining is an important industry in the LDC workforce in Australia, even though it is not the only industry adopting LDC practices (see also Skilton (2015)). Consequently, research which investigates the impacts of LDC has typically been situated in a mining context.

Mining in Australia predominantly occurs in rural/remote regions whose economies depend on a limited number of industries

(Kotey, 2015; Tonts et al., 2013). As a result, the opportunities for the mining industry to build local backward and forward industry linkages and hence contribute to the growth and diversification of the local economy are restricted. Instead, the region becomes a resource bank to other regions from which the mining industry sources its input requirements – typically urban regions (MacKinnon, 2013; Rolfe and Kinneer, 2013; Tonts et al., 2013). The adoption of LDC into a region – whether related to mining or otherwise – only reinforces this tendency. LDC workers do not spend (or only disperse limited amounts of) their wages in the host region, which gives rise to the hollow economy syndrome (McKenzie, 2010). Furthermore, LDC might contribute towards fractionalisation of the community (Storey, 2010; Tonts and Plummer, 2012) and social disorder (Carrington et al., 2012).

It is against this backdrop that research exploring the impact of LDC into a region or mining in general on the socio-economic wellbeing of host regions is conducted. This body of research has highlighted the displacement of non-mining related industries (Fleming and Measham, 2015a), increased income (Hajkowicz et al., 2011), increased income inequality (Fleming and Measham, 2015b; Reeson et al., 2012), increased housing cost (Haslam McKenzie and Rowley, 2013) or more general increased cost of living (Lawrie et al.,

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2011). In addition, the diversity of the commodity base was found to be a driver of socio-economic outcomes (Tonts et al., 2012).

However, this body of research has recently drawn criticism from two ends. First, Chapman et al. (2015) show that the impact of drivers of socio-economic wellbeing in resource rich regions is highly variable both across time and space. Hence, results from studies that explore the impacts of LDC or mining in a particular region (Chapman et al., 2015; Tonts et al., 2013) or studies that compare impacts across regions, but not simultaneously across time (Fleming and Measham, 2015a; Hajkowicz et al., 2011; Haslam McKenzie and Rowley, 2013; Reeson et al., 2012; Tonts et al., 2012) are difficult to reconcile. Studies that account for both time and space are rare (Fleming and Measham, 2015b). Second, Nicholas and Welters (2016) show the importance of spatial interaction in explaining the extent of LDC in a host region, which is arguably an important driver of impacts on regional socio-economic wellbeing. Spatial interaction occurs if the extent of LDC into a region not only depends on circumstances in the region, but also on circumstances in other regions. They argue that this is likely the case given the relatively undeveloped economic structure of host regions. This implies mining industries in the region must interact with other regions to source capital input (the resource bank argument) and labour input (the LDC argument).

Not controlling for spatial interaction may lead to biased model results. Yet, none of the above studies controls for spatial interaction – though Fleming and Measham (2015b) and Rolfe and Kinnear (2013) demonstrate the importance of spatial spill over effects.

This study builds on the Chapman et al. (2015) and Nicholas and Welters (2016) studies. That is, Chapman et al. (2015) account for time and space but not spatial interaction, whereas, Nicholas and Welters (2016) control for space and spatial interaction but not time. To address this gap, the current study incorporates all three elements: space, spatial interaction and time. The addition of temporal effects to the Nicholas and Welters (2016) study is not only likely to increase the accuracy of the model, but also to address issues of causality. That is, without controlling for time, only correlation (not causality) between the extent of LDC into a region and regional characteristics can be detected. The analysis presented here establishes both correlation and causation; thus, a much stronger evaluation of the determinants which influence the extent of LDC in a host region can be achieved, and hence, firmer policy implications can be suggested.

To do this, data from the 2006 and 2011 Australian Censuses for 516 regions are utilised. Findings from the study confirm that spatial interaction is present; hence, consideration of this element does indeed improve the accuracy of the model. Researchers interested in explaining the extent of LDC or the impacts of LDC on the wellbeing of regions should endeavour to incorporate spatial interaction in their analysis next to space and time. Furthermore, local service provision and the availability of rental accommodation rather than the tightness of the labour market or housing affordability reduce the uptake of LDC into a region. Lastly, population transience increases LDC into a region.

2. Long distance commuting in rural/remote Australia

Spatial interaction occurs if economic activity in a region uses inputs which are not sourced locally. With respect to labour requirements, this will typically happen in thin labour markets; these markets cannot accommodate substantial additional labour demand – not even if significant wage premiums are offered. Thin labour markets are found in rural and remote regions of Australia. Hence, if firms require workers, they must entice them to migrate to the region or commute to the region either on a daily basis or less

frequently through LDC. In the case of the mining industry, which typically operates in rural/remote Australia, this was illustrated by SCRA and Windsor (2013, 25) “resource companies prefer to engage with local workers where possible; however, this pool is very quickly exhausted particularly in regards to skilled workers”.

Traditionally, mining workers would relocate (i.e. migrate) to the host region at least for the duration of their contract. Subsequent increased demand for housing and other services combined with miners’ significant purchasing power have, however, led to inflationary pressures on the local housing market. These pressures have caused concerns around housing affordability (Haslam McKenzie and Rowley, 2013) and cost of living in general (Lawrie et al., 2011). In some regions with extraction firms, the cost of living can rival that of cities (McKenzie, 2010). Windle and Rolfe (2013) argue that high prices discourage permanent migration into the region, which serves as the main justification used by mining companies to adopt LDC (Lawrie et al., 2011). High cost of living also encourages local residents to sell their house while the price is high and to relocate to lower cost regions. Some of these former residents then utilise LDC practices to work in their original region (Basson and Basson, 2012).

Nonetheless, the notion that mining firms use LDC as a recruitment strategy of last resort is contested. McKenzie (2010) argues that LDC workers are more mobile and provide mining firms more flexibility to move workers between smaller extraction sites. As a result McIntosh (2012, 233) argues that “nowadays, however, workers are hired by contracting companies and essentially all new recruits are FIFOs/DIDOs”. Regardless of the motives, the use of LDC in Australia, particularly in rural/remote Australia, is widespread and not confined to mining (Nicholas and Welters, 2016; Skilton, 2015). Accordingly, spatial interaction could distort research findings if not appropriately controlled for in the Australian context. In subsequent sections, the idea of ‘regions’ will be defined followed by the provision of the working definition of LDC adopted in this article; these definitions are employed to build a spatially inclusive model which explores the determinants of the extent of LDC into a region.

3. Defining a region in the Australian context

In this study, ‘region’ represents a spatial unit where areas are grouped together based on similar economic, social and geographic characteristics (Garnett and Lewis, 2007). Overall, three demarcation strategies are commonly employed to define regions. Firstly, population-based demarcations use pre-established government defined regions. These areas are determined based on administrative needs indirectly influenced by population size. Up until 2011, the Australian landscape was divided by Statistical Local Areas (SLAs) and Local Government Areas (LGAs). Population-based demarcations are employed extensively in government data collections such as the Australian census. Regions do not overlap and the entirety of Australia is covered in this approach. Secondly, place-based demarcations use the borders of towns, cities or mining sites to determine regions. This form of demarcation is particularly useful when investigating specific points of interest which need to avoid influences from surrounding areas. Thirdly, activity-based demarcations use commuting behaviour to inform regional boundaries. That is, if the share of people who both live and work in a region surpasses a critical level, the area is considered to be self-contained and a region is declared (Mitchell and Stimson, 2010).

Due to the desire to encompass Australia in its entirety, place-based strategies are inappropriate. An activity based-demarcation strategy, on the other hand, holds value in that it can demarcate regions based on economic activity. Two main factors, however, determined this strategy to be a non-viable albeit preferred option.

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