Modelling Commuting Flows in the Sydney Commuting Area

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ABSTRACT

The commuting literature has increasingly focused on the relationship between the urban form and commuting behaviour by modelling and estimating the average incoming or outgoing commutes by time or distance for travel zones within metropolitan areas, mainly in the USA. Both the minimum commute based on the system wide solution to the Transportation Problem and/or the jobs/housing balance are viewed as key determinants of the average commute, and recently another benchmark pattern of commuting, Proportionately Matched Commuting, has been used in empirical work (Yang, 2005). The impact of the local job-housing balance remains contentious, however, with some scholars advocating the improvement of this balance to reduce average commutes, whilst others challenge this perspective with respect to the associated regulatory issues, and also whether commuting behaviour would be affected in the manner predicted. Most studies employ ordinary least squares, thereby ignoring the inevitable spatial dependence of commuting behaviour which requires the adoption of spatial econometric techniques.

A further shortcoming of modelling average commutes across travel zones, even when spatial econometric techniques are employed, is that most spatial information has been suppressed by the modelling of the average commute, as opposed to the actual commuting flows between origin and destination zones. However, researchers who modelled origin destination flows typically adopted a gravity model, but failed to take account of any spatial dependence. In a recent paper, LeSage (2006) has extended the conventional spatial econometric specification to capture spatial interdependence within an origin destination setting. He applies this econometric framework to modelling migration flows across US states.

In this paper, the author undertakes some preliminary spatial modelling of commuting flows in 2001 across the Statistical Local Areas in New South Wales which comprise the largely self-contained Sydney Commuting Area that was derived via the use of the Coombes grouping algorithm. The specification allows each commuting flow to be influenced by the characteristics of both the associated origin and destination zones, rather than confining the explanatory variables to the characteristics of the origin or destination of commuting. This should provide greater insights as to the determinants of the pattern of commuting. The conceptual and estimation issues associated with inclusion of an explanatory variable representing the pattern of commuting flows which minimises the system average commute or is associated with Proportionately Matched Commuting will also be explored.

Key Words: commuting flows, spatial econometrics, transportation problem