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Does where you live influence your socio-economic status?

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ABSTRACT

The relationship between the wellbeing of society and understanding of land market structure and behaviour is an important research theme for understanding socioeconomic status (SES). Traditional SES area based measures of income, occupation and education are generally applied in the examination of a broad spectrum of societal issues. This paper examines the contribution of understanding the spatial variation of SES based upon residential property sales data unrestricted by the traditional artificial geographic boundaries in which SES is assumed uniform. Originality lies in identifying the locational component of residential property wealth as a proxy for SES. It includes market behavioural characteristics that reflect both the context and composition at particular locations. This provides a broader understanding of SES than income, occupation and education. The analysis uses a hedonic regression model based on transactions of detached housing. The model is specified using only available property attributes as independent variables and is therefore blind to location.. The residuals from this hedonic model are used to calculate the relative location factor (RLF) for each transaction property. These were interpolated as a continuous surface capable of predicting values at the individual property level or aggregated to a spatial unit relevant to the particular application. There was a significant correlation with the traditional SES indicators and health outcomes that have traditionally been shown to have a correlation with SES.

1. Introduction

The link between socioeconomic status (SES) and societal wellbeing is well established. The link between SES and location is developing. The relationship between the wellbeing of society and understanding the land market structure is an important theme in the literature (Rothenberg et al., 1991; Meen, 2001) particularly as purchase decisions for residential property are often based upon perceptions of the influence of surrounding structural and environmental attributes (context) and the characteristics of the surrounding population (composition). Residential property purchasing behaviour can be observed through the prism of the real estate market reflecting the relative desirability of one location over another as the real estate market varies geographically. How SES is measured for location is critical to understanding how it influences social outcomes.

This paper, drawing upon the desire of people to live in neighbourhoods that offer amenities supportive of quality of life objectives, demonstrates that the locational component of residential property value can provide insights into the wealth aspect of SES and help inform policy on issues critical to the wellbeing of society. In breaking new ground, the paper demonstrates that property wealth may capture an important dimension of SES often missed in the more traditional measures of income, education and occupation. SES associated with property wealth is broader than traditional measures and includes the environmental quality (including, density, accessibility, vegetation cover and aesthetics) of the individual property being purchased.

While isolating residential property relative location values from real estate transactions is not new (Gallimore et al., 1996), the innovation lies in applying them as a tool for understanding spatial SES (SSES) to inform social science policy.

This paper reviews appropriate literature and develops the underlying theory and concepts of an informed model to isolate location. A hedonic regression approach deliberately specified to isolate 'location', thereby containing the market effect of 'location' in the residual, is proposed. The hedonic model, applied to the Adelaide Metropolitan Area (South Australia) demonstrated how the residual varied across geographic space at the individual property level providing a relative measure of the desirability of 'location'. To validate its utility as an SES measure, the results were compared with the widely applied SES measure in Australia, the Australian Bureau of Statistics, Socioeconomic Indices for Areas (SEIFA). Its utility for wellbeing was tested using health data as this is the most developed application of SES and

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outcomes research. In a cross sectional analysis property wealth was strongly statistically associated with relative risks for several cardio metabolic risks. The paper concludes by highlighting the application to policy issues, its significance for social science and its potential transferability.

2. Literature

The literature on SES is extensive embracing a wide spectrum of societal issues (Australian Bureau of Statistics, 2012; Baum et al., 2005), domestic violence (Abramsky et al., 2011; Aizer, 2010), social cohesion (Berry and Welsh, 2010; Rios et al., 2012), poor health (Chaix et al., 2007; Coffee et al., 2013; Matthews et al., 2011), education (Clarke et al., 1999; Frempong et al., 2012), school funding (Henry et al., 2010; Neymotin, 2010), unemployment (Klein-Hesselink and Spruit, 1992; Lynn et al., 1984), affordable housing (Anderson et al., 2003; Kautz, 2001), gentrification initiatives (Clerval, 2006) and housing policy (Dietz and Haurin, 2003; Dunn et al., 2006). In contrast, the SES literature is relatively silent on locational aspects of property wealth to the individual residential property value.

SES has traditionally been represented using income, education or occupation (Braveman et al., 2011; Laaksonen et al., 2005; Pickett and Pearl, 2001; Williams et al., 2010; Baum et al., 2005; Henry et al., 2010). The extent that these indicators of SES sufficiently capture wealth is a matter of debate (Duncan, 2002; Bond Huie et al., 2003; Pollack et al., 2007; Vernez Moudon et al., 2011). The family home (real property) has been estimated to account for between 25% to 50% of a family's net worth (Zhu et al., 2003) and hence offers a potentially superior measure of the personal wealth component of SES. The importance of housing to wealth accumulation is supported by (Berry and Wise, 2007; Somerville et al., 2007). Real property is a prime component of the urban economy and has been suggested that it accounts for as much as 15–20% of GDP (Gibb and Hoesli, 2003 p. 888) and is linked to the broader concept of class and location. The question of the theoretical and practical existence of social class has been discussed for many years (Bourdieu, 1987; Irwin, 2015). Recent contributions discuss SES and social class interchangeably although differentiating class as being along process lines (e.g. upper, middle, lower class) and SES through indicators of income, education and occupation advocating the use of both to describe social equity (Wyatt-Nichol et al., 2011). Using a property based wealth indicator may assist in identifying location or "where to live" and assist in objectively establishing a categorisation of 'class'. A report undertaken by the Australian National University (ANU) (Sheppard and Biddle, 2015) included a wealth measure using property as part of their concept of Social Class in Australia. Although class is not readily perceived as quantifiable in social research, the recognition of property wealth in the broader concept of class demonstrates an awareness of the role property wealth plays in the identification of social class in Australian society.

The use of property value as an SES proxy in social science research is largely associated with health studies; its wider application to social science is yet to be realised. In Great Britain[1] the council value tax bands were introduced in 1992 to enable local government to raise tax revenue and have been used in health research to link property value to general practice workloads, deprivation, obesity and diet (Beale et al., 2000, 2001; Fone et al., 2006). Similarly, US studies have used individual property value to investigate deprivation and obesity (Vernez Moudon et al., 2011; Drewnowski et al., 2015, 2014; Rehm et al., 2012). In the Rehm et al. (2012) study, the property value measure was based on the combined value of both land and improvements and calculated as the mean assessed property value per residential unit. Vernez Moudon et al. (2011) and Drewnowski et al. (2014 and 2015) calculated two individual metrics based upon the assessor's value as determined for property tax purposes, to represent real estate wealth capturing both structural as well as locational attributes. The first metric, the mean assessed property value per residential unit, was considered to be an individual wealth measure while the second, the focal mean of an 833 m buffer around each respondent's property, was used as a neighbourhood measure. Vernez Moudon et al. (2011) discussed the neighbourhood effect and the individual effect of residential property wealth as important to represent both compositional and contextual measures of SES. The authors argued that it is individual (personal wealth), and not area-level measures (neighbourhood wealth), that were important, although property values can be used to measure both by aggregation using arbitrarily defined spatial units.

Any dwelling traded in the residential property market is essentially a piece of real estate geography comprising a complex bundle of locational and structural components that include the value of attributes such as the proximity to various places of interest as well as the physical attributes of the structure of the dwelling. This may be seen through a number of factorial ecology studies spanning different decades (Burnley, 1980; Lockwood and Coffee, 2006) observed that SES was an essential component of real estate geography while authors such as (Jackson et al., 2007; Kestens et al., 2006; Reed, 2001) argued that a significant component of the price paid for real estate geography reflected SES. According to (Evans, 1995), it is this piece of real estate geography, including the influence of surrounding structural and environmental attributes of properties (context) and the characteristics of the people living in the neighbourhood (composition), that consumers purchase when satisfying their need for housing. Adding to this complexity, perhaps the most important difference between the housing market, particularly at the urban level, and other commodity markets lies in the nature of their equilibrium. The market equilibrium for the housing market is more than just the classical equilibrium between price and quantity. The housing market has an extra equilibrium of price and geographic position. Housing is unique and fixed in space and because geography is important this is indicative of a geographic equilibrium between the price of the property and its accessibility to various points of interest (Thrall, 2002). Property value modelling takes location into account in two broad forms. The first method uses smaller *a priori* spatial units (such as suburbs or postal codes) or spatial market boundaries in which homogeneous market behaviour is assumed to exist (Adair et al., 1996). The second method represents location as a continuous value surface based on geocoded property values reflecting proximity to services and facilities.. Other models such as spatially weighted analysis (Anselin, 1998; Anselin, 1995) or Geographically Weighted Regression (GWR) (Fotheringham et al., 2002) used the market value basket concept to isolate the locational component (Borst, 2014) arguing that the regression coefficients of the dwelling attributes vary over space. GWR displays different added values for a constant dwelling construct at different locations, attributing the difference in added value to location. In the context of property valuation, GWR provides a methodology that accounts for location in mass appraisal valuations (McCluskey et al., 2013; McCord et al., 2012).

Locational factors are frequently used as proxies for the many unobserved property variables in modelling residential housing price (Pavlov, 2000). However, the problem faced by researchers is the number of locational attributes is potentially infinite. While some of the attributes may be observed others cannot be collected or measured (Orford, 1999). The resultant interpretation of the regression coefficients may be subject to omitted variable bias (Koop, 2005), and as noted by (Clarke, 2005) the addition of variables may increase or decrease bias in the coefficient of interest. In addressing this issue from a locational perspective, (Gallimore et al., 1996) advocated a solution via omission, rather than the inclusion of potentially infinite variables, by building models that included variables that only represent the structure of the dwelling. The residual, it was argued, contained the cumulative effect of omitted variables including location.

While the literature describes a broad number of important societal

[1] All properties are allocated to one of eight valuation bands.