Locational disadvantage and the spatial distribution of government expenditure on urban infrastructure and services in metropolitan Sydney (1988-2015)

Abstract

Provision of public services by state governments rather than municipalities is considered an important urban governance factor preventing deeper levels of socio-spatial inequality in Australian cities. The paper examines the spatial patterns of investment by the New South Wales State Government in a wide range of services and infrastructure in metropolitan Sydney, over a period of 28 years (budget years 1988/9-2015/16). Analysis examined the relationship between volume and type of investment in infrastructure and services, and a local area’s socioeconomic characteristics, distance from the CBD and designation as a strategic site in metropolitan plans. Despite an overall redistributive approach favouring relatively disadvantaged areas, the most disadvantaged suburbs in metropolitan Sydney saw significantly lower levels of investment. When funds were directed to the most disadvantaged suburbs, it was often in the form of new social housing development, reinforcing both the concentration of poverty and disadvantage in resource access. The findings suggest that rather than a market-driven process whereby disadvantaged households move into poorly-resourced neighbourhoods, this is a case of under-investment by the State Government in areas already populated by disadvantaged communities.

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Introduction

Contemporary planning discourses justify – indeed encourage – uneven allocation of resources across metropolitan areas to enhance economic productivity by prioritising infrastructure investment in regions and sectors of the economy with “the highest growth potential” (NSW Government, 2012, p. 27). However, as asserted by Fincher (1999, p. 59), strategies to maximise economic performance at the national or metropolitan level require ‘some amelioration of their disadvantaging local effects’. Uneven distribution of infrastructure and services across urban areas inevitably results in inequalities in access to resources such as education facilities, health services and public transport. Those missing out, experience a particular form locational disadvantage that typically compounds other social and spatial disadvantages (Burke and Hulse, 2015; Fincher and Iveson, 2008; Galster, 2012).

Despite a growing interest in locational disadvantage in Australian cities (Fincher and Iveson, 2008; Burke and Hulse, 2015; Pawson et al., 2015; Pawson and Herath, 2015), there is a dearth of empirical data on spatial inequalities in the availability and quality of urban infrastructure, services and resources across metropolitan areas. This paper addresses this gap by examining the spatial patterns of capital investment in a variety of infrastructure and services by the New South Wales (NSW) State Government in metropolitan Sydney, over a period of 28 years (budget years 1988/9-2015/16).

The data analysed represents only a small proportion of total public expenditure in Sydney. Analysis was focused exclusively on NSW State Government infrastructure investment and service expenditure, which typically represents approximately 20-30% of all state

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government annual expenditure, and approximately a third of funded projects were excluded due to insufficient geographic data. Furthermore, state governments represent only one of three tiers of government in Australia. As noted by Bramley et al. (1998), in a UK context, funding allocated to area-based programmes are dwarfed by the bulk of public funding, including direct welfare benefits for individual households. Household-centred expenditure is also spatially uneven. Social security benefits generally flow into less affluent areas, although geographic patterns vary by different types of benefits (see Hamnett, 2009 for a discussion in a UK context). In Australia, Groenhart (2014) found the allocation of direct and indirect housing subsidies largely favours more privileged locations.

Although in many ways imperfect, the data covers a wide range of State Government funded services and infrastructure, encompassing a whole metropolitan region and nearly three decades of investment. The total volume of investment in an area over this time period is therefore used in the paper as indicative of the availability and quality of services and infrastructure. Importantly, it provides insight not only into how funding is distributed, but also why. Analysis examined the relationship between volume and type of investment in infrastructure and services in a local area, and its socioeconomic characteristics, distance from the CBD, and status in metropolitan plans.

Despite an overall redistributive approach favouring moderately-disadvantaged areas, the paper shows that investment in Sydney’s most disadvantaged suburbs was well below the metropolitan average. Furthermore, a high proportion of investment in these suburbs was for the purpose of new social housing development, in effect reinforcing both the concentration

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of poverty and disadvantage in resource access. Furthermore, rather than a market-driven process of residential mobility whereby poor households move into poorly-resourced neighbourhoods, the evidence points to under-investment by government in suburbs where the most disadvantaged communities have already resided. This points to persistent neglect of the poorest suburbs in allocation of resources by both Labor and Coalition Governments.

The paper is structured as following. The first part includes a review of existing Australian and international literature on the concept of locational disadvantage, focusing on the relationship between the spatial concentration of poverty and disadvantage in resource access. The second part of the paper includes an empirical analysis of the spatial distribution of State Government expenditure in Greater Sydney. It presents evidence of nearly three decades of neglect of Sydney’s most disadvantaged suburbs, and examines spatial patterns in the data that could explain why resources have been allocated this way. The discussion considers the implications of these findings for both theory and urban policy and planning. Addressing the theme of this special issue, specific attention is paid to Ruth Fincher’s contributions to debates about redistribution in planning for the just city.

People, place and disadvantage

The concept of spatial disadvantage encompasses a range of perceived deficits of a place in terms of the socioeconomic status of the people residing in it; the availability and quality of resources – such as employment, services, transport and amenity – that can be accessed from it; and, levels of social ‘dysfunction’ such as crime and violence (Burke and Hulse, 2015, p. 3). In demographic terms, spatial disadvantage involves the spatial concentration of people

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who experience poverty and other forms of social disadvantage such as disability, ageing or single parenting. The concepts of social exclusion and neighbourhood effects suggest that spatial concentration of disadvantaged people in a residential neighbourhood can even further exacerbate their disadvantage. This includes, for example, impoverished social networks, which can lead to social and political isolation (Arthurson & Jacobs 2003, p.24). Some have argued further that spatial concentration of disadvantaged people can produce a “disabling social climate… that is more than the sum of individual and household disadvantages” (Vinson 2009, p.2) by facilitating a ‘culture of poverty’ and dependence (Wilson 1987; Murray 1990). The concept of ‘neighbourhood effects’ suggests that the spatial concentration of disadvantaged people creates the conditions for dysfunctional communities characterised by lack of economic self-sufficiency, violence, drug dependency and poor educational aspiration (Wilson 1987; Galster 2012).

Place-based disadvantage also involves the impact of location on residents’ ability to access a bundle of facilities and resources which are critical to their ‘real income’, well-being and life chances (Maher, 1992). Access to transport facilities or centres of employment, for example, impacts on travel time and costs (Badcock, 1994; Harvey, 1973, p. 8; Gleeson & Randolph 2002; Dodson & Sipe 2008). For example, studies in the UK and the US have found that measurable deficiencies in educational resources in disadvantaged suburbs are “strongly correlated with several aspects of student performance” (Galster, 2012, p. 14). However, as argued by Fincher and Iveson (2008, p. 34), measuring spatial disadvantage only in terms of

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place of residence is inadequate as it ignores diverse mobilities and scales through which people access resources and opportunities.

Two concepts are often used to explain why disadvantaged people often become concentrated in poorly resourced neighbourhoods. The concept of ‘filtering’ (Temkin & Rohe, 1996:160) refers to processes of residential mobility whereby when the availability or quality of services in a neighbourhood declines, wealthier residents who can afford to do so move out to newer neighbourhoods, and are replaced by less affluent residents (for an Australian example see Wulff et al., 1993). In contrast, improvements in resource access are likely to lead to the gentrification of a disadvantaged neighbourhood by more affluent households (Zuk et al., 2015).

An alternative explanation focuses on the capacity of place-based communities to secure appropriate levels of private or public investment in services and amenities in their area. Reliance on market mechanisms in allocation of public resources, such as user pay infrastructure and services, is likely to favour more advantaged urban areas in distribution of public infrastructure and services (Pagano and Perry, 2008). Infrastructure investment in more affluent areas can also be part of strategies to stimulate economic productivity (Neutze, 1995; Beer and Forster, 2002). Capture of investment by more affluent areas can also be the result of such communities using their superior economic and social capital to influence decision making processes (Golden and Min, 2013). For example, In India, Bardhan and Mookherjee (2000) describe a ‘political capture’ of public goods by elites who are able to effectively mobilise their resources. Through lobbying and campaign contributions to local

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political candidates, elites have been successful in diverting allocation of goods and services from poorer areas into more affluent ones. Such elite capture is often justified through discursive mechanisms that stigmatise poorer communities and areas as unworthy of public investment (McFarlane and Rutherford, 2008).

In the United States, a body of literature in the 1970s and 1980s tested the ‘underclass hypothesis’ suggesting poor neighbourhoods – particularly those with ethnic or racial minorities – are discriminated in the provision of public services (in the United States provided by municipal governments) (Lineberry, 1977). However, empirical analysis of the distribution of police, parks, street quality, schools, libraries and sanitation services in these studies mostly failed to identify evidence of systematic discrimination (Levy et al. 1974; Antunes and Plumlee, 1977; Lineberry, 1977; Coulter, 1980; Jones, 1980). Antunes and Plumlee (1977, p. 327), for example, concluded that allocation of resources was “essentially independent of socioeconomic and ethnic biases and is best attributed to random, unknown causal factors”. Similar conclusions were reached by Black (1977) in a study of access to services in seven Sydney suburbs. As discussed in the following sections, the patterns identified in our own research in Sydney – encompassing a later time period (1988-2015) – to some extent contrast with these findings from earlier studies.

**State Government expenditure on infrastructure and services in Greater Sydney**

*Method*

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Expenditure data was collected from annual budgets published by the NSW State Government, from 1988 to 2015. The data was collected through the Infrastructure Statement or State Capital Program section of NSW Budget Papers, accessed through the NSW Treasury website (New South Wales Treasury, 2015a; New South Wales Treasury, 2015b). Budget papers that were publicly accessible spanned the 27 years from the budget period of 1988/89 until 2015/16, with the budget year of 1995/96 missing. Infrastructure projects were categorised into seven broad groups, including: family and community services, education, health, roads, transport, utilities and a more general category of other government services. Each infrastructure project was associated with a suburb name specified in the budget and recorded using an ABS 2011 State Suburb code.

A total of 11,860 projects within metropolitan Sydney were included in analysis. Approximately a third of all funded projects were excluded from analysis because they contained insufficient information on expenditure and geographic location (for example if a project was assigned to unspecified ‘various locations’ or was not assigned any location).

To account for inflation and the time value of money, all historical expenses were compounded to 2015 values at an annualised rate of 5%. The NSW Treasury (2007) recommended a rate of 7%, but due to lower inflation rates since 2007 we have used the lower discount rate of 5% in the paper. The models were tested at 2% and 7% discount rates, and the geographic patterns identified were not sensitive to the use of these different rates.

Suburbs were categorised according to their scores in the Index of Relative Socio-Economic Disadvantage (IRSD) of 2011 within metropolitan Sydney, whereby decile 1 suburbs fall in

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the lowest decile and are the most disadvantaged, and decile 10 are the least disadvantaged. We also examined results for suburbs that have moved from one IRSD decile to another between 2001 to 2011 (earlier IRSD data was not available at state suburb scale).

Analysis included both the total volume of expenditure in an area and an average annual per-capita figure sensitive to spatially uneven changes in population over the years.

The study involved both statistical and spatial analysis examining expenditure data against various geo-demographic data obtained from ABS at state suburb level. Using ArcGIS for Desktop 10.3, thematic mapping was conducted to identify spatial patterns of infrastructure investment. Statistical analysis using SPSS 23 referred to aggregate spatial categories based on socioeconomic characteristics drawn from the ABS Index of Relative Socio-Economic Disadvantage (IRSD). An alpha level of .05 was used for statistical analyses when necessary.

Limitations

There were inconsistencies over time in the reporting of funding allocations (e.g. rounding of figures or exclusion of smaller projects) leaving some room for error.

A more essential limitation of the study is that public expenditure in an area may not necessarily be beneficial to the local community. Certain types of publicly funded projects (e.g. a polluting water treatment facility) can be considered externalities rather than beneficial. Furthermore, the spatial scale of benefits or externalities may differ from one project to another and typically is not limited to a specific suburb. For example, certain types of infrastructure, such as road and rail, enhance connectivity between areas and their benefits

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are spread well beyond the specific location in which improvements were made. In addition, equal inputs in terms of resource allocation might result in disparate outcomes in different contexts (Stein and Bickers, 1994). In this study, we have only partly addressed these limitations through consideration of distribution by different broad categories of expenditure. The data is therefore highly imperfect; however, the total allocated funding of state government expenditure is still a strong indicator, as our assumption is that the large majority of projects funded are overall beneficial to local communities.

Prior to presenting the findings from this analysis, we now briefly outline some relevant background information about Sydney’s geography, planning and governance of infrastructure and service provision.

*Sydney geography and planning*

Sydney is the most polarised Australian city characterised by two patterns of spatial divide: first, between the more affluent north-east and more disadvantaged south-west; and, second, between the inner and the outer suburbs. In the last few decades polarisation has seen income rising faster in suburbs closer to the city centre than in suburbs further away. As a result of such polarisation, Sydney has some of the most affluent urban areas in Australia, as well as the largest (and most rapidly increasing) number of highly disadvantaged suburbs (Baum et al., 2005; Kelly and Mares, 2013; Pawson et al., 2015). Inequality in the spatial distribution of incomes has paralleled longstanding inequalities in public infrastructure investment in Sydney – as in other Australian cities – which has “always favoured the core of metropolitan primates at the expense of proliferating suburbs” (Badcock 1984, pp.251–2).

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A number of recent studies funded by the Australian Housing and Urban Research Institute (AHURI) examined dynamics of locational disadvantage in a number of Australian cities, including Sydney (Pawson et al., 2015; Burke and Hulse, 2015). A survey of residents in areas of concentrated social disadvantage by Pawson et al. (2015) found mostly positive attitudes about their neighbourhoods, including feelings of local belonging and general satisfaction with provision of health, schools and social services. In contrast, limited access to employment opportunities was a major source of dissatisfaction. Overall, Pawson et al. (2015) as well as Burke and Hulse (2015) concluded that in international terms locational disadvantage in Australia is ‘moderate’ rather than extreme, particularly in comparison with North American cities.

From the late 1980s onwards, Sydney has changed from an accidental ‘city without a plan’ to ‘a city with many plans’ (Ashton and Freestone, 2008). In the face of rising housing prices and service and infrastructure shortages in outer suburbs, a more centralised approach to planning by the NSW state government promoted urban consolidation through a series of metropolitan plans (1988, 1995, 1998, 2005, 2010, 2014). Key themes running through all of these plans were the consolidation of development in existing built up areas; the integration of land use and transport infrastructure; and, the promotion of suburban activity centres. The 2005 City of Cities plan, in particular, provided a detailed blueprint vision of a multi-centred metropolis, with growth corridors and priority growth areas for new development on the west metropolitan edge (Ashton and Freestone, 2008).

The governance of infrastructure finance and delivery

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In Australia’s three-tiered government system, the Federal (or Commonwealth) Government is responsible for the conduct of national affairs such as defence, foreign affairs, trade, commerce, currency, immigration, telecommunications and air travel. It is also responsible for most social services and pensions and provides funding for projects that are largely carried out by the States, such as health and education. The States are responsible for everything not listed as a Federal responsibility, including schools, hospitals, conservation and environment, roads, railways and public transport, public works, public housing, community services, sport and recreation, police, prisons and emergency services. Local Councils are concerned with matters such as planning and development, public health, local roads and footpaths, parks and playing fields, libraries, local environmental issues, waste disposal, and local community services. Local Government Areas (LGAs) vary greatly in size and character and their powers are controlled by the states.

Since the mid-1980s the NSW government faced growing fiscal pressures and debt, associated with growing expenditure on energy, health, education, police and transport without sufficient growth in revenue. Emulating the neoliberal ideologies of Thatcher in the UK and Reagan in the US, the NSW Government turned to privatisation as an increasingly important approach to financing public infrastructure (Searle, 1999). Public–private partnerships have become common in provision of railways (the Sydney Airport Line), tolled expressways (including the Sydney Harbour Tunnel in 1992 and much of the city’s orbital motorway) and hospitals (e.g. Port Macquarie Hospital) (Ashton and Freestone, 2008; Haughton and McManus 2012). Infrastructure NSW was established in 2011 as an

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independent agency of the State Government to plan and oversee the delivery of critical public infrastructure. In 2012 the agency published a 20-years State Infrastructure Strategy, followed by a 2014 ‘Update’. The primary objective of the plan is to enhance economic productivity through infrastructure delivery. The plan is introduced by quoting economist Paul Krugman’s view that “productivity isn’t everything but in the long run it is almost everything” (NSW Government, 2012, p. 6). Three overarching principles guiding the allocation of infrastructure in the strategy are: first, incremental improvements prioritised over mega projects; second, investing in areas and sectors with the highest growth potential which are constrained by inadequate infrastructure capacity; and, third, fiscal sustainability and prioritisation of projects most likely to deliver economic returns (NSW Government, 2012, p. 27).

Selective redistribution: the spatial allocation of State Government expenditure

Our analysis examined the relationship between the socioeconomic status of suburbs and their share of investment. Some degree of redistribution was evident through relatively high per-capita investment in moderately disadvantaged suburbs. About 46% of all expenditure has been allocated to suburbs in IRSD deciles 2, 3 and 4, where only around one third of the metropolitan population resides. In decile 2, a significant proportion of the funding went to a small number of suburbs whose strategic significance is highlighted in Sydney’s most recent metropolitan plan: Arncliffe, Leppington, Gosford, Penrith, Warragamba (NSW Government, 2014).

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The high level of investment in decile 3 suburbs can be attributed, in part, to its inclusion of Sydney CBD (or the Sydney State Suburb), which benefits from a highly centralised metropolitan pattern of investment (discussed in the following section). Sydney CBD contributes more than half of all expenditure (51.86%) in its IRSD decile. However, even after excluding Sydney CBD data, decile 3 suburbs still benefit from relatively high levels of investment (Table 1).

Yet, under-investment in the most disadvantaged suburbs (decile 1) suggests it is a highly selective form of redistribution. Average annual per-capita expenditure of $423.41 as in 2015 dollar over a period of nearly three decades in decile 1 suburbs, was almost half the average annual per-capita expenditure of $656.72 across the metropolitan region. The least disadvantaged, decile 10 suburbs, received the lowest levels of per capita investment, at an average annual per capita expenditure of $138.34. Middle class suburbs in deciles 5, 6, 7 received per capita funding roughly around the metropolitan average.

Funding was unevenly distributed between the suburbs within each decile, with a high concentration of funding in a relatively small number of suburbs. About 86% of total expenditure was concentrated in just 16% of all the metropolitan suburbs. The concentration was higher in more advantaged IRSD deciles. Only 40% of suburbs in decile 10 received funding in the past 30 years, compared to approximately 70% of disadvantaged suburbs (deciles 1, 2 and 3).

With the descriptive statistic presented above, a One-way Analysis of Variance (ANOVA) was applied to test the statistical significance whether mean annual per capita expenditure in

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different suburbs varied by IRSD status. The test was conducted to compare the effect of socio-economic backgrounds in low socio-economic (IRSD deciles 1, 2 and 3), middle socio-economic (IRSD deciles 4 – 7) and upper socio-economic (IRSD deciles 8, 9 and 10) conditions. A significant negative correlation between socio-economic status and annual per capita expenditure was detected at a $p < .01$ level [$F (2, 800) = 7.341, p = .0007$]. The post hoc comparisons using the Tukey HSD test indicated that the mean annual per capita investment in lower socio-economic status suburbs (including IRSD deciles 1, 2 and 3) was significantly higher than advantaged suburbs.

Differences were also apparent in the funding breakdown for each IRSD decile. For example, health services and family and community services accounted for nearly half of all expenditure in decile 1 suburbs (21% and 27% respectively), while over half of the funding of Decile 10 suburbs was for road infrastructure (52%). In decile 1, expenditure on new social housing units represented approximately 80 percent of all expenditure within the category of ‘Community Services’. In decile 1 suburbs, investment in roads was the lowest in the metropolitan area, and investment in education, police, fire and justice, transport, utilities and the ‘other’ category was also below the metropolitan average (as shown in Table 2).

Historically, it appears annual per capita expenditure in decile 1 suburbs was significantly higher until the mid-1990s, with average annual per-capita expenditure of over $6,000 during 1988-1991 and over $8,000 during 1992-1996. Indeed, in 1992-1996 decile 1 suburbs received the largest share of investment of all IRSD deciles. Since 1996 investment in decile 1 suburbs has declined sharply to under $2,000.
Our findings also indicate that suburbs that have moved from higher IRSD deciles into decile 1 also experienced a decline in government expenditure. Nine suburbs moved from IRSD deciles 2 or 3 in 2001, to IRSD decile 1 in 2011. In five of the nine suburbs, the socioeconomic decline paralleled an overall trend of decline in government expenditure between 1988-2001. Three other suburbs received no funding throughout this time period. A similar trend was observed for suburbs that have moved from IRSD deciles 3 or 4 in 2001 to IRSD decile 2 in 2011.

*Outside strategic interest*

A critical factor explaining the low levels of investment in decile 1 suburbs is their geographic position. Suburbs located within 10km from Sydney’s CBD receive a share of expenditure that is dramatically higher than those outside this radius even after controlling for population (Table 3). Most of Sydney’s decile 1 suburbs are located more than 10km from Sydney’s CBD (Table 4).

Most (all but six) decile 1 suburbs also sit outside the strategic regions identified in metropolitan planning strategies - ‘Global Sydney’ and the ‘Economic Growth Corridor’ – which have benefited from higher levels of expenditure, consistent with metropolitan planning objectives (Figure 1; Table 5). Yet, these expenditure patterns predate the release of the 2005 metropolitan plan in which these areas were declared as strategic sites, suggesting the plan was to a large extent an endorsement and formalisation of an existing trend.

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The ‘Economic Growth Corridor’ extends from Port Botany and Sydney Airport to Parramatta and Castle Hill, through the CBD and Chatswood. ‘Global Sydney’ has been weakly and inconsistently defined in strategies. A relatively narrow definition includes Sydney CBD and North Sydney (in the 2005 ‘City of Cities’). A broader definition includes most suburbs within 10 km of Sydney CBD (in the State Infrastructure Strategy 2012 - 2032).

For the purpose of analysis, we have used the latter definition (Figure 1).

Suburbs identified as regional centres in various strategies were also more likely to receive some infrastructure investment, however in some cases relatively modest. Over the period examined, Liverpool and suburbs within a radius of 5 kilometres were allocated approximately 4% of the total metropolitan funding, compared to 2% for Penrith, and only 1% for Campbelltown and their immediate surrounding areas.

Discussion

Provision of public services such as schools, hospitals and public transport by state governments rather than municipalities is considered an important urban governance factor preventing deeper levels of socio-spatial inequality in Australian cities (Burke & Hulse, 2015, p. 12). Indeed, our findings point to a significant redistributive pattern in Sydney whereby the average annual per capita expenditure was higher in suburbs experiencing moderate socio-spatial disadvantage (IRSD deciles 2 and 3).

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This redistributive pattern echoes Bramley et al.’s (1998) findings in the UK. This could be partly explained by lower costs of provision of infrastructure due to lower land prices and higher economic growth potential compared to more economically developed areas. At the same time, the evidence is also clear that the most disadvantaged suburbs (decile 1) were largely excluded from this redistributive pattern and are persistently neglected in allocation of resources. The channelling of public investment to ‘the better off among the most in need’ (as identified also by Luca and Rodríguez-Pose (2015) in Turkey), leaves critical urban resources further out of reach from the very people who are arguably most reliant on locally provided services (Briggs, 2003, p. 923).

The persistent neglect of the most disadvantaged suburbs by both Labor and Coalition State Governments can be partly explained as a process of path dependency - political and practical difficulties to radically change existing spatial patterns of infrastructure investment (Wildavsky, 1964). The prioritisation of ‘incremental improvements’ (NSW Government, 2012) arguably reinforces such path dependency. This neglect can also be attributed in part to these suburbs’ spatial position outside the metropolitan centre, and outside the zones of strategic interest as defined in metropolitan plans. The evidence suggests that the shift from a ‘city without a plan’ to a ‘city with many plans’ (Ashton and Freestone, 2008) has not turned Sydney into a more equal city; rather, the neglect of the most disadvantaged suburbs – excluded from the strategic sites determined in these plans - has continued and even intensified since 2005. This raises concerns about the role of planners and planning strategies.
- which are focused on aggregate economic productivity, but blind to the distribution of its benefits - in the production of socio-spatial disadvantage in Sydney.

Despite the strategic vision of a multi-centred metropolis – as articulated in metropolitan plans since 2005 – the findings demonstrate that allocation of resources in Sydney is still highly centralised around the traditional CBD core. It remains to be seen whether and how Sydney’s centralisation would be challenged by the latest developments in metropolitan planning. In particular, we refer to the establishment of the Greater Sydney Commission and its vision of a “metropolis of three cities”, centred around three nodes: Sydney City, Greater Paramatta and the planned Western Sydney Airport in Badgery’s Creek (GSC, 2016). However, our findings also highlight significant disparities even across suburbs at the same distance from the CBD, calling for a more nuanced understanding of the spatial patterns of resource allocation.

Our findings contrast those in earlier studies in US cities (Levy et al. 1974; Antunes and Plumlee, 1977; Lineberry, 1977; Coulter, 1980; Jones, 1980) and Sydney (Black 1977) which have found no evidence of socioeconomic biases in the allocation of urban services and resources. In our study, while the correlation between socioeconomic status and allocation of urban resources is not straightforward, there is a significant negative correlation between socioeconomic status and share of resources, but also an obvious bias against the most disadvantaged suburbs. The contrast with the current study could be attributed perhaps to significant differences in our methodology. But it is also evident that in Sydney the bias against the poorest suburbs has increased since the mid-1990s, which can explain the

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difference in results compared to earlier studies. The resource allocation patterns we observed since the mid-1990s thus reflect a turn away from – or at least a partial and flawed version of - the Keynesian state that saw reduction in uneven development a necessary step to “secure the conditions for mass production, mass distribution and mass consumption” (Jessop, 2002, p. 77).

The low levels of investment in Sydney’s most disadvantaged suburbs are consistent with Pawson and Herath’s (2015) finding that restricted access to services was the most commonly occurring form of socio-spatial exclusion reported by residents in Sydney’s most disadvantaged suburbs. However, Pawson et al. (2015) also note that the majority of residents in disadvantaged suburbs were generally satisfied with their access to health, schools and social services. This highlights the need to be sensitive of potential inconsistencies between objective measures of social disadvantage and its subjective experience. It is also an important reminder that not all residents of a suburb will be equally affected by infrastructure and service provision in the same way.

Simply channelling more funds for services and infrastructure in these suburbs will not necessarily redress the disadvantage of residents. As noted by Fincher and Iveson (2008, p. 27), in cities where it has taken place, “redistributive planning did not create urban landscapes of reduced disadvantage. Indeed, despite the lofty intentions of national policy settings, the practice of planning and the implementation of public policy often worked to disadvantage some people and some areas”.

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Pawson et al. (2015, p. 42) comment that some residents can even be opposed to higher level of social services provision which “might only compound the area’s negative external image”. Furthermore, redistribution in the allocation of resources could potentially result in displacement of low-income renters, if the improvement of public services and amenities leads to local house price inflation and gentrification. Investment in affordable housing is one way to mitigate against this risk. But investment in social or affordable housing needs to complement investment in other types of services and resources, not replace them as observed in our Sydney case study. Relatively high levels of investment in social housing in the most disadvantaged suburbs, alongside under-investment in nearly all other types of urban services and infrastructure, reinforces both the concentration of poverty and disadvantage in resource access. Investment in affordable housing in areas designated for higher level of infrastructure investment will ensure the benefits of such investment are more equitably spread (Randolph, 2016).

Redistribution is necessary, but must not be understood as a simple quantitative exercise of equalising expenditure across urban areas. Rather, the services and resources provided in disadvantaged areas need to reflect diverse needs and wishes of their residents in order to play a positive transformative role in their lives. Furthermore, a just distribution of public urban resources requires that some of the infrastructures and services in which investment is made - in both disadvantaged areas and elsewhere – are designed neither to enhance aggregate metropolitan or national economic productivity, nor to correct a particular unjust local outcome. Rather, resources need to be designed such that they can help alter broader

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and deeper social arrangements giving rise to these outcomes. Challenge the norms and practices of social differentiation that underpin distributive injustices, can involve, for example, investment in community infrastructure - such as public libraries and neighbourhood houses - that create opportunities for encounter (Fincher and Iveson, 2008).

Conclusions

To conclude, the paper has presented evidence of socio-spatial inequalities in the allocation of State Government funding for infrastructure and services in Sydney. A more centralised allocation of infrastructure and services – e.g. by central governments rather than municipalities - is associated with lower levels of socio-spatial inequality (Galster, 2012, p. 15). Nevertheless, in Sydney, the evidence points to consistent and significant under-investment by the NSW State Government in the most disadvantaged suburbs, in most categories of infrastructure and services provision other than social housing and health services. Such persistent patterns over three decades cannot be readily excused as unintended consequences. Rather, these are arguably the outcomes of consecutive governments intentionally turning a blind eye to questions of equality in allocation strategies where aggregate economic productivity represents “almost everything” (NSW Government, 2012, p. 6).

These results – as well as the limitations in our analysis - highlight the need for further research on the spatial distribution of government expenditure in cities in Australia and elsewhere. The next phase of our study involves a comparative study between Sydney and

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Melbourne. Unfortunately, however, in many other cities or states historical spatial data on public expenditure is not publicly available.

There is a need to develop more sophisticated models that are more sensitive to the complexities of social difference, mobility and scale in the way that people access urban resources.

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Table 1: Total State Government Expenditure (1988 - 2015) by 2011 ISRD decile within Greater Sydney

<table>
<thead>
<tr>
<th>IRSD decile (ranking within Greater Sydney, 2011)</th>
<th>No. of suburbs</th>
<th>Population¹</th>
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</tr>
<tr>
<td>most disadvantaged</td>
<td>81</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>78</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>81</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney CBD</td>
<td>1</td>
<td>4873</td>
<td>4235</td>
<td>5406</td>
</tr>
<tr>
<td>CBD excluded</td>
<td>7</td>
<td>368393</td>
<td>397729</td>
<td>420102</td>
</tr>
<tr>
<td>4</td>
<td>82</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>81</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>78</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>83</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>81</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>79</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>least disadvantaged</td>
<td>10</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Sydney</td>
<td>805</td>
<td>508</td>
<td>3346027</td>
<td>3499783</td>
</tr>
</tbody>
</table>

Note: 1. The measure of population counts by place of usual residence, adapted from Census 1986 – 2011.
2. The expenditure has been compounding to 2015 dollar at an annualised rate at 5%; the expenditure data in 1995 is missing.

Accepted version of:


Table 2: Average government expenditure (1988 – 2015) per capita per annum (A$)$^{1,2}$, by 2011 IRSD decile within Greater Sydney, by category

<table>
<thead>
<tr>
<th>ISRD decile (ranking within Greater Sydney, 2011)</th>
<th>Family and Community</th>
<th>Education</th>
<th>Police, Fire and Justice</th>
<th>Health Services</th>
<th>Road</th>
<th>Transport</th>
<th>Utilities</th>
<th>Other Government Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>89.41</td>
<td>48.54</td>
<td>32.36</td>
<td>117.08</td>
<td>33.21</td>
<td>42.15</td>
<td>27.67</td>
<td>31.08</td>
</tr>
<tr>
<td>2</td>
<td>47.05</td>
<td>63.38</td>
<td>67.27</td>
<td>171.49</td>
<td>299.81</td>
<td>52.50</td>
<td>173.82</td>
<td>55.22</td>
</tr>
<tr>
<td>3</td>
<td>849.33</td>
<td>1853.74</td>
<td>4505.72</td>
<td>630.60</td>
<td>843.67</td>
<td>6480.43</td>
<td>5926.58</td>
<td>24138.59</td>
</tr>
<tr>
<td>Sydney CBD</td>
<td>104.94</td>
<td>53.93</td>
<td>145.49</td>
<td>112.88</td>
<td>157.62</td>
<td>55.60</td>
<td>98.67</td>
<td>139.64</td>
</tr>
<tr>
<td>CBD excluded</td>
<td>64.39</td>
<td>27.84</td>
<td>13.29</td>
<td>133.77</td>
<td>66.66</td>
<td>24.51</td>
<td>104.69</td>
<td>255.08</td>
</tr>
<tr>
<td>4</td>
<td>42.99</td>
<td>67.37</td>
<td>37.67</td>
<td>62.05</td>
<td>114.34</td>
<td>49.19</td>
<td>81.99</td>
<td>18.17</td>
</tr>
<tr>
<td>5</td>
<td>63.44</td>
<td>23.70</td>
<td>4.97</td>
<td>93.25</td>
<td>110.83</td>
<td>20.26</td>
<td>68.03</td>
<td>64.21</td>
</tr>
<tr>
<td>6</td>
<td>23.99</td>
<td>50.87</td>
<td>44.26</td>
<td>119.53</td>
<td>88.51</td>
<td>52.11</td>
<td>118.29</td>
<td>52.94</td>
</tr>
<tr>
<td>7</td>
<td>32.35</td>
<td>24.79</td>
<td>4.62</td>
<td>91.59</td>
<td>68.48</td>
<td>11.34</td>
<td>89.07</td>
<td>17.23</td>
</tr>
<tr>
<td>8</td>
<td>16.11</td>
<td>35.19</td>
<td>2.12</td>
<td>118.71</td>
<td>124.65</td>
<td>26.71</td>
<td>119.98</td>
<td>106.84</td>
</tr>
<tr>
<td>9</td>
<td>1.04</td>
<td>22.57</td>
<td>1.39</td>
<td>19.10</td>
<td>74.99</td>
<td>3.47</td>
<td>11.11</td>
<td>9.37</td>
</tr>
<tr>
<td>10</td>
<td>59.04</td>
<td>47.10</td>
<td>47.69</td>
<td>107.48</td>
<td>116.60</td>
<td>49.17</td>
<td>101.58</td>
<td>127.80</td>
</tr>
</tbody>
</table>

Note: 1. The measure of population counts by place of usual residence, adapted from Census 1986 – 2011.
2. The expenditure has been compounding to 2015 dollar at an annualised rate at 5%; the expenditure data in 1995 is missing.

Accepted version of:


Table 3: expenditure in and around CBD

<table>
<thead>
<tr>
<th>No. of suburbs</th>
<th>Population</th>
<th>Annual Population Growth (%)</th>
<th>expenditure (A$ million)</th>
<th>% of total expenditure</th>
<th>per capita per annum (A$000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney CBD</td>
<td>1</td>
<td>4873 4235 5406 5635 10282 14301</td>
<td>7.74% 11156.52</td>
<td>14.74% 48.14</td>
<td></td>
</tr>
<tr>
<td>within 10km</td>
<td>153</td>
<td>1032953 1017576 1027799 1068256 1118763 1207081</td>
<td>0.67% 19479.36</td>
<td>25.73% 0.66</td>
<td></td>
</tr>
<tr>
<td>10km - 20km</td>
<td>159</td>
<td>1003883 1023422 1050348 1100253 1144715 1248874</td>
<td>0.98% 17464.24</td>
<td>23.07% 0.58</td>
<td></td>
</tr>
<tr>
<td>20km - 30km</td>
<td>131</td>
<td>611206 650021 688342 746075 781873 83914</td>
<td>1.46% 10045.54</td>
<td>13.27% 0.50</td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>444</td>
<td>2652915 2695255 2771894 2920218 305633 3304170</td>
<td>0.98% 58145.66</td>
<td>76.81% 0.72</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. The measure of population counts by place of usual residence, adapted from Census 1986 – 2011.
2. The expenditure has been compounding to 2015 dollar at an annualised rate at 5%; the expenditure data in 1995 is missing.

Table 4 Distance to CBD by socio-economics disadvantages

<table>
<thead>
<tr>
<th>IRSD decile (ranking within Greater Sydney, 2011)</th>
<th>Mean Distance to CBD (km)</th>
<th>% of suburbs in CBD radius</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt; 10 km</td>
</tr>
<tr>
<td>1</td>
<td>30.78</td>
<td>7.41%</td>
</tr>
<tr>
<td>2</td>
<td>42.48</td>
<td>7.50%</td>
</tr>
<tr>
<td>3</td>
<td>32.67</td>
<td>15.00%</td>
</tr>
<tr>
<td>4</td>
<td>33.81</td>
<td>15.00%</td>
</tr>
<tr>
<td>5</td>
<td>34.42</td>
<td>13.58%</td>
</tr>
<tr>
<td>6</td>
<td>29.13</td>
<td>30.00%</td>
</tr>
</tbody>
</table>

Accepted version of:


Table 5: Metropolitan strategy and government investment by budget years

<table>
<thead>
<tr>
<th>Budget years</th>
<th>Economic Growth Corridor A$ million</th>
<th>% of total</th>
<th>Global Sydney A$ million</th>
<th>% of total</th>
<th>Metropolitan Total Expenditure A$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988/89-1990/91</td>
<td>4376.14</td>
<td>36.25%</td>
<td>5116.65</td>
<td>42.38%</td>
<td>12072.50</td>
</tr>
<tr>
<td>1991/92-1994/95</td>
<td>5807.02</td>
<td>36.13%</td>
<td>5118.41</td>
<td>31.85%</td>
<td>16070.92</td>
</tr>
<tr>
<td>1996/97-2000/01</td>
<td>6193.70</td>
<td>37.08%</td>
<td>7099.97</td>
<td>42.51%</td>
<td>16702.53</td>
</tr>
<tr>
<td>2001/02-2005/06</td>
<td>3944.90</td>
<td>39.41%</td>
<td>4122.98</td>
<td>41.19%</td>
<td>10009.89</td>
</tr>
<tr>
<td>2006/07-2010/11</td>
<td>4752.10</td>
<td>43.82%</td>
<td>4224.50</td>
<td>38.96%</td>
<td>10843.91</td>
</tr>
<tr>
<td>2011/12-2015/16</td>
<td>5007.86</td>
<td>50.06%</td>
<td>4953.37</td>
<td>49.52%</td>
<td>10003.21</td>
</tr>
<tr>
<td>Total</td>
<td>30081.71</td>
<td>39.74%</td>
<td>30635.88</td>
<td>40.47%</td>
<td>75702.95</td>
</tr>
</tbody>
</table>

Note: 1. The expenditure in different period has been compounding to 2015 term at an annualised rate of 5%.

Accepted version of:

2. The Economic Growth Corridor and Global Sydney overlap

Source: Authors

Accepted version of:


Figure 1: A Plan for Growing Sydney, showing the ‘Global Sydney’ and ‘Economic Growth Corridor’

Source: Department of Planning and Environment 2014

Map based on ABS data

Accepted version of:


Accepted version of:


Author/s:
Wiesel, I; Liu, F; Buckle, C

Title:
Locational disadvantage and the spatial distribution of government expenditure on urban infrastructure and services in metropolitan Sydney (1988-2015)

Date:
2017

Citation:

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