

The Price of Democracy? Political Representation Structure and Per Capita Expenditure in Victorian Local Government

Abstract

Local government systems across the world face acute and ongoing fiscal challenges. In Australia the regulatory response has focused squarely on council consolidation. This has unfortunately meant that comparatively little attention has been paid to alternative, less disruptive methods for enhancing municipal sustainability. One such possibility lies in modifying the structure of local political representation. We conduct a number of estimations on a four-year panel of Victorian municipal data to test whether the ‘law of $1/n$ ’ has empirical support at the local government level. Our results clearly show that the number of geographically defined fragments, or wards, within a given municipality is a statistically significant determinant of local government expenditure. A number of public policy recommendations follow from the empirical evidence which might be broadly applicable to other municipal systems.

Keywords

Local government; political representative structure; Law of $1/n$

JEL: H10, H11

Introduction

Many local government systems across the world, including the seven Australian state and territory local government jurisdictions, face daunting problems, often centered on securing ongoing financial sustainability. To address these problems policymakers in many countries have instituted a host of municipal reform programs (Denters and Rose 2005; Faulk and Hicks 2011). However, Australian local government policymakers have focused principally on compulsory council consolidation as the main instrument of reform in all Australian state and territory local government systems, with the exception of Western Australia (Tiley 2012). Several deleterious outcomes arising from forced amalgamation have been identified in the scholarly literature including loss of ‘political voice’, reduced municipal efficiency, and higher local government taxes (see, for instance, Drew, Kortt, and Dollery 2013; Drew and Dollery 2014a). Moreover, the heavy reliance on a single blunt reform tool means that little effort has been invested in exploring other fruitful approaches to enhancing municipal sustainability. One such alternative lies in reforming the structure of political representation in Australian local government following the insights provided by Weingast, Shepsle, and Johnsen’s (1981) ‘law of $1/n$ ’. In essence, this model predicts that the expenditure levels in government, including local government, are proportional to the number of geographically constrained representatives.

The law of $1/n$ has been tested extensively on both state and national legislative assemblies in various countries with mixed results (MacDonald 2008). However, to date only a handful of studies have considered local government, despite the prospect that ‘the Law of $1/n$ is much more likely to hold in smaller legislatures than in larger ones’ (Primo and Snyder 2008, p. 187). Furthermore, there have been no Australian applications of the model to the local government sector. Nor has any empirical analysis controlled for citizen satisfaction (which can be considered a crude proxy for service quality). This paper attempts to address these

gaps in the empirical literature on the law of $1/n$ in the context of Victorian local government. Motivated by an interest in finding alternatives to consolidation as the dominant policy making tool of Australian public policymakers, we explore two research questions: (i) whether there is an association between the number of political representatives and per capita municipal expenditure and (ii) whether there is an association between the number of geographical fragments or wards and per capita municipal expenditure. Moreover, we investigate whether the size of any identified association is sufficiently large as to present a viable avenue for enhancing municipal sustainability. We explore these questions in the context of Victorian local government employing a four-year panel of data disaggregated by municipality.

Victoria is the second largest Australian state by population. It offers an ideal ‘natural experiment’ to test the law of $1/n$, since it has a mix of municipal representative structures ranging from geographically unconstrained councilors (also referred to as ‘at-large’ councilors) through to councils comprising 12 municipal districts or wards, in an almost normal distribution. Moreover, the number of representatives for local authorities also approximates a normal distribution,¹ ranging from five to 12. Accordingly, Victorian local government offers a fertile institutional milieu in which to consider empirically the law of $1/n$.

The paper is divided into six main parts. Section 2 explores the theoretical foundations of the law of $1/n$ and provides a synoptic sketch of previous empirical applications of the model to local government. Section 3 outlines the characteristics of Victorian local government. Section 4 details the empirical strategy employed in the study, whereas section 5 considers the results of the econometric estimations. The paper concludes in section 6 with some comments on the public policy implications of the analysis, with particular emphasis on the potential of altering political structure to improve municipal sustainability.

Theoretical Foundations and Empirical Literature

The law of $1/n$ rests on strong theoretical foundations related to the need for political representatives to convert economic benefits into political capital. However, the empirical evidence is rather mixed and inconclusive. We provide a brief explanation of the theoretical foundations before considering the extant empirical literature which we then use to inform our empirical strategy.

Theoretical Foundations

The law of $1/n$ is predicated on three key assumptions: (i) political representatives are concerned exclusively with the public projects which flow into their geographical wards; (ii) the taxes which pay for the projects are more or less uniform and derive from a common income pool; and (iii) the legislature is prone to ‘universalism’² deriving from a trade in votes (Primo and Snyder 2008). The first assumption of the ‘law’ is consistent with the oft-observed propensity of political representatives to engage in ‘pork barreling’ in response to the fact that they are beholden solely to the residents of the ward for re-election (Weingast, Shepsle, and Johnsen 1981). The second assumption means that ‘constituent representatives who allocate government projects from a common tax base bear only a portion of the cost burden of constituent-specific projects, and the corresponding cost burden declines as the number of legislative districts increases’ (Bradbury and Stephenson 2003, p. 185). The final assumption reflects the presumption that “‘democracy’ generically understood, embodies majority rule as a central feature’ and it is thus necessary to obtain the indulgence of other councilors in order to pursue a project with geographically concentrated benefits (Buchanan and Yoon 2002, p. 503).

The law of $1/n$ rests on the observation that the economic benefits of public projects can be transformed into political capital where beneficiaries can be identified according to

geographic rather than demographic characteristics. In particular, where economic benefits are conferred on geographically constrained constituents, political representatives are able to claim credit and extract political capital (Weingast, Shepsle, and Johnsen 1981). Where the funding for conferred economic benefits can be extracted from non-constituents, such as taxpayers of other wards contributing to the common pool, then the result is a clear political gain for the representative in question. Furthermore, in addition to being diffuse, economic costs may be difficult to determine by voters since – information costs are high because Australian municipal financial statements do not provide details of expenditures disaggregated to the level of individual projects.

For maximum political capital to be extracted from a geographically defined project, it is important for the funding to be derived from a common tax pool, where the contributions of a given representative's area are equal or less than the contributions of n other wards.

Intuitively this means that the constituents of the particular political representative will only bear, at most, $1/n^{\text{th}}$ of the cost of the geographically constrained spending (Bradbury and Stephenson 2003), and less if intergovernmental grants form a significant component of municipal revenue, which holds for many Australian local authorities. Thus, under the assumptions underpinning the law of $1/n$, residents of one ward could end up paying a small fraction of the cost associated with a project for which they are the principal beneficiaries.

However, because major projects are the result of a legislature vote, geographically defined benefits can proceed only with the acquiescence of at least a majority of other representatives. This implies implicit vote trading wherein support is exchanged on the understanding that it will be reciprocated (Buchanan and Tullock 1962). The result is a progression to universalism in voting, over time.

An example may go some way towards explicating matters. Consider a very simple case wherein a municipality is separated into three wards A, B, and C, with one representative for

each ward. Residents of all three wards pay similar local government taxes which accrue to a common tax pool. The representative of Ward A wishes to meet the demands of residents for new municipal services – such as a new aquatic center – in order to maximize the prospects of re-election. However, to ensure the passage of the project through council, the representative for Ward A must secure a majority and this will entail the support of at least one of the remaining two councilors. Yet by supporting the project, representatives of wards B and C will effectively be committing their residents to paying for a proportion of the cost, despite the fact that residents in Ward A will be the principal beneficiaries owing to the geographical location of the project. In the ordinary course of events one might expect that the project would have little chance of passing through council. However, the representatives of wards B and C would also have their chances of re-election enhanced by securing a visible project for the residents living in their geographical areas. This common need to convert economic benefits into political capital conjures circumstances in which representatives of one ward have an incentive to allow a project to proceed in a different ward in order that their support might be reciprocated. Moreover, a larger ‘coalition’ of representatives willing to trade support is likely to be more stable over time (Buchanan and Yoon 2002). There is thus a rational-choice incentive for representatives to become members of universal ‘virtual coalitions.’ Where such universalism is achieved and remains stable, higher numbers of geographically concentrated projects can be expected to pass and this can lead to higher municipal expenditure.

The logic underlying the law of $1/n$ suggests that it is more likely to prevail in small legislatures dominated by independent political representatives (Primo and Snyder 2008). This is because universalism is promoted by small groups where the actions of individual actors are more transparent and people come into closer contact with one another, thereby fostering collaboration. Moreover, it would seem that political party structures may

undermine the law of $1/n$, given that political discipline implies that party objectives rather than individual goals will dominate. In sum, legislature size and political party allegiance may explain why the law of $1/n$ has been questioned at the national and state level, but has received solid support in its limited local government applications (Primo and Snyder 2008).

Empirical Evidence

Bradbury and Stephenson (2003, p. 195) employed cross-sectional data on 154 counties in the U.S. state of Georgia and found that ‘the Law of $1/n$ holds irrespective of whether or not elected representatives are geographically constrained.’ Baqir (2002, p. 1351) used a cross-section of 1,968 U.S. city governments and found that the law of $1/n$ holds ‘whether legislatures run for office from the entire jurisdiction or from geographic districts within it, their decisions relating to government spending do not differ.’ However, strictly speaking without geographical fragmentation (wards) within a local government entity, it is not correct to speak of the law of $1/n$, since the economic costs of projects are not reduced by a factor of n non-constituent geographical areas. Instead the entire cost is born by constituents, or in the case of intergovernmental grant income, diluted by the proportion of revenue derived from the grants. Rather the increase in expenditure associated with a higher number of representatives should be viewed as economic benefits being transformed into political capital. In this instance it appears that increased expenditure is advantageous purely as a result of the diffuse and often difficult to discern nature of its associated economic costs. Baqir (2002, p. 1351) explained his results as follows:

Keeping the fiscal house in order depends in large part on how many people get to spend out of the tax revenue pool. When more people are added, everybody, including the incumbents raises his or her spending decisions.

It is noteworthy that both of these studies had small council (or legislature) sizes: Bradbury and Stephenson (2003) were dealing with a mean council size of 4.80 and Baqir (2002) had a mean council size of 6.86. The only other prominent empirical application of the law of $1/n$ to local government was a study of Finnish and Swedish municipalities using pooled data over a 25-year period by Pettersson-Lidbom (2012). Pettersson-Lidbom (2012, p. 277) concluded that ‘the results indicate a negative effect i.e., the larger the size of the legislature the smaller is the size of government in both settings.’ However, it is important to note that the legislature size in these jurisdictions was considerably larger than that of the earlier studies, with a mean of 28.66 for Finland and 47.35 for Sweden. Moreover, the municipal politics examined by Pettersson-Lidbom (2012) are dominated by three major parties in Finland, whilst elections are conducted on the basis of ‘party lists’ in Sweden. It is thus evident that the embryonic empirical literature on the law of $1/n$ on local government is unsatisfactory for several reasons. By contrast, the characteristics of Victorian local government are much more consistent with the underlying pre-requisites for the operation of the law of $1/n$.

Local Government in Victoria

Victorian local government comprises 79 municipalities represented by 5–12 elected councilors. Of these 79 councils, 22 have no ward structure, whilst the remaining 57 are divided into as many as 12 wards, with a mean of 3.50 divisions. Municipalities are required to consult with the Victorian Electoral Commission (VEC) regarding both the number of councilors and their ward structure (Economou 2010). However, ultimate power to make decisions on the number of wards and representatives rests solely with the Victorian Governor in Council, comprising the Governor and members of the ruling Victorian political party. It should be noted that the Governor is an apolitical appointee of the Head of the Commonwealth of Australia, Queen Elizabeth II. Moreover, the Victorian Local Government

Act (1989) specifically prohibits legal proceedings designed to impinge on the powers of the Governor in Council, including a limitation on the jurisdiction of the Supreme Court (see section 220H and 220I of the Local Government Act (1989), Parliament of Victoria 1989). This largely unfettered power to alter the political structure of Victorian local authorities stems from the lack of constitutional recognition of Australian local government (Twomey 2013).

Table 1 lists descriptive statistics for population per ward and population per representative. It is clear from these statistics that Victorian local government structure is not currently predicated on population size. Indeed, the reasoning behind representational structure does not appear to have been articulated by the VEC. However, a recent review of local government representation in Victoria has recommended that the maximum number of councilors prescribed by legislation be increased from 12 to 15 and that a ministerial directive be issued to relate the number of councilors to the voting population (with a minimum of 6 councilors for municipalities of 6,000 voters or less ranging through to 15 councilors for local authorities with voting populations exceeding 130,000) (DTPLI 2014a).

[INSERT TABLE 1 HERE]

The roles of the representative and administrative arms of local government in Victoria are clearly defined by legislation. The elected council representatives have a role similar to that of a corporate board of directors, implying that ‘it adopts a strategic view of the future it wishes to achieve for its community and makes plans and policies to achieve this’ (Department of Transport Planning and Local Infrastructure (DTPLI 2014b)). The mayor is elected annually by the body of councilors and may be re-elected each year if the council so chooses, except for the City of Melbourne and City of Greater Geelong, which have directly elected mayors. A mayor is responsible for chairing council meetings and conducting

ceremonial functions. The administrative arm of local government is charged with the execution of the elected arm's policies. Moreover, the general manager is the only administrative appointment made by councilors (DTPLI 2014b).

Council elections are held on a four-year cycle on the fourth Saturday of October. Elections are conducted by either postal vote or attendance at polling booths. Each council chooses its method of voting. However, most councils (70) conduct postal voting (VEC 2014). Voting is compulsory for all residents of a municipality, irrespective of whether they own property in the area. Moreover, owners of rental properties have the statutory right to one vote in a municipal election even if they do not reside in the electorate (VEC 2014). Foreign owners of property and one representative of corporations occupying property may also cast a vote in municipal elections, but must apply to be added to the electoral roll (DTPLI 2013). Despite statutory compulsory voting for residents, an absentee rate of nearly 25% has persisted in local elections since 1999 (Economou 2010). It might be noted that the fine for failing to vote is just half a penalty point, which equates to \$75 as of July 2015 (Victorian Electoral Commission, 2015).

The most recent elections (held in 2012) have confirmed this trend in voter absenteeism, as well as a pattern of returning incumbents. Just over half (52%) of the 631 representative vacancies in Victoria were filled by incumbents. In addition, 26 councilors were returned unopposed, including four mayors (Municipal Association of Victoria 2013). This could be interpreted as evidence in support of the success of universalism in the pursuit of political capital. However, other explanations, including voter apathy, may be responsible. In general, Victorian local government elections have maintained a 'strong sense of candidates being independent of political parties' (Economou 2010). Indeed, only the City of Melbourne has political party affiliations on ballot papers (DTPLI 2013).

The characteristics of the Victorian local government sector – such as its relatively low number of representatives and wards as well as the predominance of independent candidates – suggests that the law of $1/n$ may explain municipal expenditure levels. If this is the case, then it has implications for local government financial sustainability.

Empirical Strategy

A common criticism of the extant empirical work on the law of $1/n$ is that it is often conducted using cross-sectional data (MacDonald 2008). We thus conducted our analysis using a panel of data spanning the years 2009–2012 inclusive, where 2012 is the most recent year of municipally disaggregated Australian Bureau of Statistics (ABS 2014) data.

Consistent with previous work in this field, we used the natural log of per capita spending³ as our regressand (see, for instance, Bradbury and Stephenson 2003; Baqir 2002; Pettersson-Lidbom 2012). We then conducted a random effects panel regression, after first testing that the random effects estimator was unbiased (i.e., Hausman test).

A total of four models were tested. Model 1 (Table 3) tested the law of $1/n$ with geographical constraint relaxed, that is, the association between number of political representatives and expenditure per capita. Model 2 (Table 3) is the earlier model repeated with the City of Melbourne – an extreme outlier with per capita spending in 2012 at \$4,381.31 compared to a mean of \$1,303.16 – excluded from the dataset. In both models a dummy variable ‘fragmented’ (where 0 was assigned for ‘undivided’ or ‘at-large’ councils and the value 1 was assigned to councils with geographical fragments or ‘ward’ structures) was included to determine whether there was a statistically significant difference in expenditure associated with geographically fragmented municipalities (councils with wards) when controlling for the number of political representatives.

Model 3 (Table 4) tested the law of $1/n$ following Weingast, Shepsle, and Johnsen's (1981) 'strict' hypothesis: the association between number of geographical fragments (wards) and per capita expenditure will be positive. Model 4 (Table 4) repeated the test of expenditure against number of geographical fragments (wards), with the exclusion of the City of Melbourne. Table 4 is concerned only with the subset of Victorian councils which have geographically defined fragments or wards.

Other regressors employed include population size, population density, average wage data, proportion of individuals from a non-English-speaking background (NESB), proportion of individuals identifying as Aboriginal and Torres Strait Islander (ATSI), overall satisfaction survey data, length of local government roads, and total intergovernmental grants per capita. Except for the case of number of wards, number of representatives and satisfaction data natural log transformations were employed to counter skewed distributions.

Model specification includes all variables previously employed in the literature, with the addition of citizen satisfaction data and length of local government roads⁴ and the omission of political party voting data. Citizen satisfaction data are based on a Victorian state-wide survey by council of the overall satisfaction of citizens with local government goods and services. It acts as a critical proxy for service quality for it is clear from the empirical literature that service quality affects municipal expenditure (Drew, Kortt, and Dollery 2014b). Local government roads have been included on the basis that this is the single largest expenditure item for Australian (and Victorian) councils, accounting for approximately a quarter of all spending (PricewaterhouseCoopers 2006). Given that the length of roads maintained by Victorian councils ranges from 42 km to 13,081 km, this is clearly an important control variable. Political party voting data used by Bradbury and Stephenson (2003) was omitted in response to the strong independent orientation of candidates (outside of the City of Melbourne) (Economou 2010; DTPLI 2013).

Of the remaining variables, population density and population size have been shown to be statistically significant determinants of local government expenditure in a host of studies (see, for instance, Holcombe and Williams 2009; Drew, Kortt, and Dollery 2014a). Ethnogeneity has also been demonstrated to be a determinant of local government spending both in Australia and abroad (see, for example, Van De Walle and Van Ryzin 2011; Drew, Kortt, and Dollery 2014b). If local government goods are normal goods in the Samuelsonian sense, then a control for wage levels is clearly warranted (Holcombe and Williams 2009). Finally, non-source revenue (principally intergovernmental grant funds) account for up to 40% of income for some local authorities. Given the significant empirical evidence in support of the flypaper effect, wherein grant funds raise municipal spending, there is thus a strong case for its inclusion as a control variable (see, for instance, Dollery and Worthington 1995).

[INSERT TABLE 2 HERE]

Results

Model 1 (Table 3) examines the association between the natural log of per capita expenditure and number of political representatives: the case where economic benefits are transformed into political capital without the costs being diluted by n groups of geographically defined constituents. This association was identified by both Baqir (2002) and Bradbury and Stephenson (2003) and rests on the proposition that the costs of public outlays to individual taxpayers are difficult to discern. At first sight it appears that the association is also supported by the Victorian local government data (at the 1% level of significance). However, as noted earlier, the expenditure of the City of Melbourne – Victoria's capital – is an extreme outlier. This is due to significant additional public transport, infrastructure responsibilities, and other expenses incumbent on a capital city.

Model 2 (Table 3) omits data from the City of Melbourne, thereby bringing the sample size down to 78 municipalities over four years. As a result, the overall explanatory power of the model increases significantly which *inter alia* validates the decision to exclude Melbourne. When this outlier is excluded, then the number of political representatives is no longer statistically significant. This suggests that either universalism has not occurred or that costs are not as diffuse or difficult to discern as those in the U.S. jurisdictions studied by Baqir (2002) or Bradbury and Stephenson (2003). Part of the reason for this may be the compilation and dissemination of a range of financial indicators (at the municipal level) for all councils within the Victorian local government, in both Annual Reports and DPTLI comparative data reports. In addition, the 1994 compulsory council merger program, which saw some 60% of Victorian local authorities disappear, may also be acting as a restraint on municipal spending. If this latter factor carries weight, then we would not expect to observe the law of $1/n$ in Model 3 or Model 4.

It is noteworthy that both Model 1 and Model 2 detail a statistically significant association for the dummy variable ‘fragmented.’ This association suggests that geographically fragmented councils with ward structures – on average – have just over 10% higher expenditure per capita than undivided or ‘at-large’ councils with all other variables (including number of political representatives) held constant. This result has important implications for municipal sustainability and motivates the analysis detailed in Table 4.

[INSERT TABLE 3 HERE]

Model 3 (Table 4) regresses the number of geographic divisions (wards) against the natural log of per capita spending for fragmented councils (councils with wards) thus testing the law of $1/n$ as articulated by Weingast, Shepsle, and Johnsen (1981). There is no statistically significant association evident between number of geographical wards and per capita

spending when all 58 fragmented councils (municipalities with wards) are included in the panel regression. However, when the City of Melbourne is excluded (Model 4), the association between the number of geographical fragments or wards becomes statistically significant at the 1% level. Specifically, Model 4 suggests that the increase of one geographical fragment (ward) results in a 3.4% lift in expenditure per capita *ceteris paribus*. This supports the law of $1/n$ and falls midway between estimates produced in previous work: Baqir (2002) found the degree of fragmentation to be associated with a 1.6% increase in spending, whilst Bradbury and Stephenson (2003) found an association of 4.4%. It suggests that expenditure increases when political representatives are able to confer benefits on geographically defined constituents.

[INSERT TABLE 4 HERE]

Concluding Remarks

Our panel study of Victorian local authorities over the period 2009–2012 inclusive has provided empirical support for the law of $1/n$ in its ‘strict’ sense. However, it has failed to support previous work which suggests municipal expenditure is positively associated with the number of political representatives, irrespective of geographical constraint. Several policy implications flow from our findings.

First, in relation to previous work on local government, the empirical evidence presented in this paper seems to support the claim by Primo and Snyder (2008) that the law of $1/n$ is valid only over a restricted domain. Put differently, in common with Baqir (2002) and Bradbury and Stephenson (2003), our study had a relatively limited number of geographically constrained wards, as opposed to Pettersson-Lidbom (2012), which did not support the law of $1/n$. There is thus a need for future empirical work on other local government systems so that an estimate of the domain upper bound might be found. Future empirical work might also

examine the law of $1/n$ in the context of recently consolidated municipalities, given the evidence that councilors in newly formed entities tend to vote according to the territorial interests of the former municipalities (see, for instance, Spicer 2012).

Second, the absence of a statistically significant association for number of political representatives when the extreme outlier (City of Melbourne) was excluded raises interesting questions. For instance, it may partly explain the findings of Baqir (2002), who recognized the presence of extreme outliers, but does not appear to have truncated his dataset. By contrast, Bradbury and Stephenson (2002) did remove an outlier – Burke County – from their data set. Finally, the absence of a statistically significant association with the number of political representatives may mean that increased democratic representation need not diminish financial sustainability, apart from the comparatively negligible expense directly associated with councilor remuneration. If this is the case, then it suggests that the recent recommendation for greater number of political representatives in Victorian local government need not have a deleterious effect on municipal financial sustainability (DPTLI 2014a).

An intuitively plausible explanation for our findings is that economic (and hence political) costs of projects are much easier to discern in undivided ('at-large' systems) municipalities. Clearly it would be quite difficult for voters to determine the costs of economic benefits disaggregated to a number of municipal geographical wards. On the other hand, municipality-wide costs are transparent and regularly disseminated through annual reports and media reports on contentious projects. This might suggest that dissemination of information on costs contributes to expenditure restraint.

Taken as a whole, the findings presented in this paper suggest an additional and – as yet – unexplored approach to the problem of municipal financial sustainability in Australian local government, which goes beyond the unfortunate current emphasis on compulsory council

consolidation. As we have demonstrated using the insights of Weingast, Sheple, and Johnsen (1981), financial sustainability may be significantly enhanced by altering the political structure of local government. In fact our findings suggest that eliminating municipal wards in favor of an ‘at-large’ or undivided municipal structure might result in savings in the region of 3.4% per ward structure removed *ceteris paribus*. Given that Australian state governments exercise largely unfettered powers over the structure of their local government systems, the proposed policy remedy would appear to be achievable (notwithstanding the possibility of some public disquiet⁵). Unlike the harsh consequences associated with forced amalgamation, including the loss of local political ‘voice’ and large one-off and continuing merger costs, changes to the political structure of councils have relatively few drawbacks. This option thus warrants further consideration by Australian policy makers, as well as additional empirical analysis by scholars of local government.

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Notes

¹ A normal distribution is a symmetric or bell shaped distribution which forms the foundation of the most prominent statistical tests.

² Universalism relies on reciprocity in logrolling amongst members of a legislature (Bradbury and Stephenson 2003). When reciprocity is wide-spread, then a virtual coalition of the entire legislature results ‘which bestow[s] benefits on virtually every district represented in the legislature’ (Stein and Bickers 1994).

³ We excluded depreciation expense from municipal expenditure data in response to Pilcher and Van der Zahn (2010) and Drew and Dollery (2014b) who show that depreciation expense is the subject of significant ‘gaming’ by municipal officials. Moreover, under accounting standard AASB116 depreciation is an accrual accounting device which may not necessarily reflect fair value or consumption of assets. This study is focussed on geographically constrained spending over the four year period and it is evident that depreciation expense relating to assets that may have been constructed up to 100 years ago (in the case of building depreciation schedules) should be omitted.

⁴ We also re-ran the models excluding length of roads and found no material difference in the regressors of interest. These results are available from the corresponding author.

⁵ We do concede that some loss of political voice may occur in the case where there is a concentration of minority groups in a particular ward. However, we believe that potential for loss of voice is considerably less than what might be lost in the case of council amalgamation which usually results in a reduction in the total number of political representatives owing to the cap on councillors stipulated in s5B(1) of the Local Government Act (1989).

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Author Biographies

Joseph Drew is a Research Fellow in the Centre for Local Government at the University of New England. His research interests focus on performance measurement, corporate governance and expenditure and revenue structures for local government. Recent publications have appeared in *Local Government Studies*, *Public Administration Quarterly* and the *Australian Journal of Public Administration*. He has consulted with numerous local governments and has appeared as an expert witness for federal and state Upper House inquiries.

Brian Dollery is Professor of Economics and Director of the Centre for Local Government at the University of New England. Recent books include *Funding the Future* (2013), *Councils in Cooperation* (2012), *Local Government Reform* (2008), *The Theory and Practice of Local Government Reform* (2008), *Reform and Leadership in the Public Sector* (2007) and *Australian Local Government Economics* (2006).

Table 1. Victorian Local Government Representative Structure, 2012.

	Population Per Ward	Population Per Representative
Minimum	1,351	619
Maximum	62,352	24,354
Mean	23,487.98	7,857
Standard Deviation	17,700	6,186
Median	18,954.13	4,832

Source: Australian Bureau of Statistics (2012) and the Victorian Electoral Commission (2014)

Table 2. Regression Variables, Victoria 2009–2012.

	Mean	Standard Deviation
Expenditure per capita (ln)	7.072	0.432
Population density (ln)	3.913	2.846
Average wage (ln)	10.636	0.217
NESB (ln)	1.978	1.109
ATSI (ln)	-0.298	0.751
Satisfaction	63.149	4.945
Length of roads (km, ln)	7.084	0.917
Population size (ln)	10.622	1.139
Total grants per capita (ln)	5.401	0.923
No. wards	3.505	2.334
No. representatives	8.127	1.741

Table 3. Law of 1/n ('relaxed') for Victoria 2009–2012.

	Model 1 Expenditure per Capita (ln) – Entire State	Model 2 Expenditure per Capita (ln) – Excluding Melbourne
No. Representatives	0.077** (0.028)	0.031 (0.022)
Population (ln)	-0.484** (0.073)	-0.382** (0.059)
Satisfaction	-0.007** (0.002)	-0.007** (0.002)
Grants per capita (ln)	0.197* (0.079)	0.204** (0.066)
Fragmented	0.108+ (0.071)	0.106* (0.053)
Controls	Yes	Yes
n	79	78
Coefficient of Determination	0.6499	0.7507

+ p<0.10, * p<0.05, ** p<0.01

Table 4. Law of 1/n ('strict') for Victoria 2009–2012.

	Model 3 Expenditure per Capita (ln) – Entire State	Model 4 Expenditure per Capita (ln) – Excluding Melbourne
No. Geographical Fragments (wards)	0.022 (0.019)	0.034** (0.013)
Population (ln)	-0.410** (0.084)	-0.390** (0.060)
Satisfaction	-0.008** (0.003)	-0.008** (0.003)
Grants per capita (ln)	0.170 (0.106)	0.178** (0.082)
Controls	Yes	Yes
n	58	57
Coefficient of Determination	0.5998	0.7578

+ p<0.10, * p<0.05, ** p<0.01