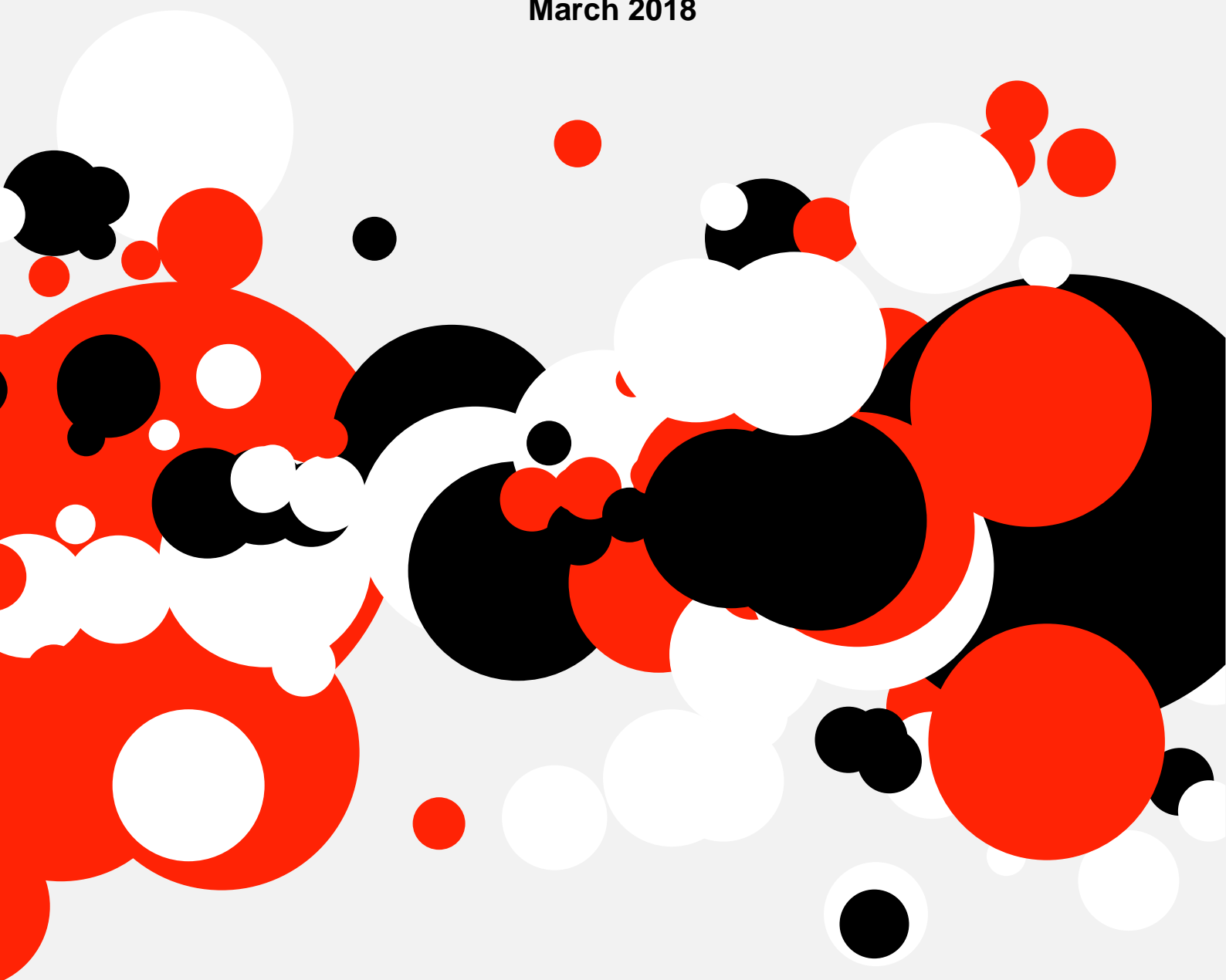# Measuring Relative Technical Efficiency of South Australian Local Governments

**UTS Centre for Local Government**

**March 2018**

## Citing this report

## Acknowledgements

# Contents

# Figures

# Tables

# Executive Summary

## Background

Local Government efficiency has attracted significant attention from regulators, media, and the public over recent decades. This has been principally in response to concerns regarding the imposts placed on ratepayers and a perception of diminishing financial sustainability amongst councils. After all, striving for high levels of efficiency is important because this can reflect effective stewardship of taxes paid by landowners and consumers of local government services, as well as being an important ingredient for ensuring financial sustainability. Within this context, a number of public policy interventions have been proposed to generate greater efficiencies in the local government sector in South Australia.

In particular, the recently elected South Australian government has committed to capping of council rate revenues as a means to indirectly produce improvements in efficiency of expenditures. In addition, renewed encouragement for further amalgamation of councils has been advocated by the Property Council of South Australia, as a means of achieving cost savings through scale economies.

Despite this interest in local government efficiency levels, and the common objectives of advocates of respective public policy interventions, there has been little robust empirical evidence to guide decision-makers in South Australia to date. Specifically, there are no extant robust empirical estimations of efficiency over time, no measures of the effect of scale on efficiency, and no econometric analyses of the determinants (drivers) of efficiency for South Australian local governments.

In this report we provide an empirical estimation of efficiency levels and distribution of efficiency scores in South Australian local government over the past five years. This is supported by an analysis of the effect of relative scale on efficiency levels, along with an examination of the relevant determinants of efficiency. The empirical results presented in this report may supply important evidence for councils when discussing policy proposals with stakeholders and also form a strong foundation for measuring the effect of future public policy interventions designed to improve efficiency. Armed with this evidence, the sector and policymakers may be better informed of the current state of play and better equipped to determine which public policy interventions, if any, might be best suited to improve efficiency levels. We also identify potential future research that may be valuable in supporting decision-making going forward.

## The Local Government Research and Development Scheme

The Local Government Research and Development Scheme funds specific projects that are 'strategically for the benefit of Local Government as a whole'. In particular, the Local Government Research and Development Scheme has prioritised research that is 'designed to support Council efficiency measures', and 'which may assist Councils to measure, record, and communicate efficiency in consistent ways'. In response to the call for applicants, Joseph Drew from the Institute for Public Policy and Governance at the University of Technology Sydney Centre for Local Government proposed to measure the relative technical efficiency over time for South Australian local governments.

# Methodology

The author undertook to measure the relative technical efficiency of all South Australian councils for each of the last five years (2012-2016[1]), using data envelopment analysis (the most sophisticated empirical tool available for this purpose). To facilitate this analysis, financial data were obtained directly from relevant audited financial statements of all South Australian councils over the reference period and demographic data was obtained from the Australian Bureau of Statistics (2018) *National Regional Profile* reports.

An efficiency score is produced by estimating the most optimal conversion of inputs to achieve a given set of outputs – an input minimisation strategy – and identifying each council's relative conversion of inputs to outputs in reference to this (ranging between 0 per cent to beyond 100 per cent). Compared to the commonly employed metric of ratio analysis (typically operating expenditure per capita), data envelopment analysis has substantial benefits because it includes the effect of multiple inputs (operational expenditure and staffing expenditure) and multiple outputs (number of disaggregated rating assessments and road lengths), which together better approximate local government production functions.

The measures produced from the data envelopment analysis detail for each council (in Section 2): (i) how their efficiency level has changed over time, and (ii) how their efficiency level compares to peers. In addition, we produce precise scores to represent the effect that scale (increasing returns to scale or decreasing returns to scale) has had on efficiency (in Section 3). Measures of this kind will allow councils to communicate to citizens, staff and other stakeholders how efficiency has changed over time and the role that scale has played in same. Finally, we conducted censored regression to identify the determinants of efficiency for South Australian local government and the results which we report will be an important resource for decision-makers moving forward.

# Overview

- In Section 1, we concisely summarise the primary public policy interventions in South Australian local government and describe the possible implications for local government efficiency levels.

- In Section 2, we conduct an intertemporal data envelopment analysis in order to examine the level and distribution of relative efficiency in South Australian local government over time – including a disaggregation between rural and urban councils.

- In Section 3, we extend the intertemporal data envelopment analysis in order to examine the effect of scale on efficiency. This method is used to identify and describe the distribution of South Australian local governments according to those that are constituted below and above the relevant optimal size.

- In Section 4, the results of the intertemporal data envelopment analysis are augmented into a censored panel regression. This is performed in order to identify the determinants of local government efficiency in South Australia. We specify an econometric model (informed by the scholarly literature) which facilitates an analysis of policy-relevant factors that may impact upon the relative efficiency levels in local government.

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[1]Data backlogs prevent us from reporting on 2017 at the time of writing.

- In Section 5, we synthesise the findings in this report and elucidate implications for public policy, as well as highlight possible areas in which future research may further inform decision-makers in South Australian local government.

## Research Findings

The analysis of efficiency levels in South Australian local government revealed that:

- The relative technical efficiency of the typical council in South Australia has reduced somewhat during the period of the study and the spread of efficiency results has been increasing over time.

  - Rural councils typically have relatively higher technical efficiency (with respect to the output proxies that we employ) when compared to urban councils and the spread of efficiency scores is narrower for rural councils than urban councils

The analysis of scale in South Australian local government revealed that:

- The majority of councils in South Australia might be expected to suffer efficiency losses from any increases to their size, with relatively few councils expected to enjoy efficiency gains from increasing their size.

Based upon the findings of our analysis of the determinants of efficiency, we observed that:

- Efficiency might be expected to *decrease* as population increases up to 75,183 persons, after which efficiency might increase again (to partially mitigate earlier losses).

- Increases in population density are associated with an increase to efficiency, though the magnitude of this influence is relatively small.

- Demographics of local government populations are generally associated with the level of efficiency, consonant with the corpus of scholarly literature.

- There is no evidence of an association between the relative level of financial assistance grants and efficiency.

- The participation of councils in shared services was statistically associated with reduced efficiency.

## Implications for local government policy

  - There is little empirical evidence to suggest that public policy interventions currently on the table are likely to decisively improve local government efficiency in South Australia.

  - There is evidence to suggest that wide-spread amalgamation may result in *reductions* in efficiency levels.

    - In some instances, de-amalgamation may achieve cost savings, but only where councils have been constituted at an exceptionally large size.

- There is evidence to suggest that shared services provision is *not* associated with higher levels of efficiency.

    - A better understanding of the drivers of shared services efficiencies may be necessary to ensure such arrangements do contribute to efficiency gains in future.

- It is likely that the possible introduction of rate-capping may result in further constrains on local government efficiency.

# 1.  Local Government in South Australia

Compared to other Australian jurisdictions, councils in South Australia tend to be relatively small and display relatively high variation in sizes and financial capacity. This variation is largely a result of South Australia's unique geography and demography, as well as the result of amalgamations of councils in the 1990s.

At the time of publication, two public policy issues remain especially pertinent in the South Australian local government context:

- The recently elected Marshall Liberal government has commitment to introduce a rate capping scheme.

- The Property Council of South Australia has actively prosecuted the case for renewed amalgamations of councils in South Australia.

A consistent theme of proponents of each of the respective proposals is the prospect of relief in rates payable by landowners. It is generally argued that rate relief will be made possible as a result of greater efficiency levels that are anticipated from the respective proposals.

Despite this interest in local government efficiency levels, and the common objectives of advocates of respective public policy interventions, there has been little robust empirical evidence to guide decision-makers in South Australia to date. Specifically, there are no extant robust empirical estimations of efficiency over time, no measures of the effect of scale on efficiency, and no econometric analyses of the determinants (drivers) of efficiency for South Australian local governments. Without robust empirical evidence of this nature it is difficult for decision-makers to implement effective public policy interventions.

In light of this, in this report we undertake the following activities:

- Demonstrate the appropriate empirical methodology to measure relative efficiency levels in local government.

- Measure the level of efficiency for South Australian councils over the past five years.

- Describe the whole-of-sector performance and the distribution of performance amongst the councils in South Australia.

- Analyse the influence of relative scale compared to the efficient size of local government in South Australia.

- Examine the possible determinants that influence efficiency levels for local government in Australia.

- Discuss the possible public policy implications arising from the analysis in this report.

In this Section, we briefly describe the current policy debates that are present in South Australia. In Section 2 we then describe the current state of affairs by measuring relative technical efficiency of South Australian councils to observe trends over time as well as describe the distribution of efficiency levels. In Section 3, we examine to what extent councils in South Australia are constituted at an efficient size – which has direct relevance to the proposals made by the Property Council. In Section 4, we examine the factors which our econometric analyses indicate drive efficiency levels across the local government sector.

Finally, in Section 5 we synthesise the results of the empirical analysis in terms of possible public policy implications.

## 1.1 Rate capping

Rate capping is a state government-imposed limit on the amount that a council may increase its rates in any financial year. The cap is represented as a percentage of permitted growth and is usually consistent with inflation (Riddle and Johns 2016). Rate capping is employed by state governments to fix the increase to the amount that councils can impose by way of rates in any financial year, and to ensure that increases to the cost of rates remain consistent across the state.

In May 2015, the Economic and Finance Committee of the South Australian House of Assembly, announced an inquiry into Local Government Rate Capping Policies. On 8 July 2016, the South Australian Economic and Finance Committee (the Committee) tabled its report, Inquiry into Local Government Rate Capping Policies. The Committee recommended against the capping of rates, however, in an Annex to the report, a minority report (compiled by the then Opposition Liberal members) recommended that rate capping should be introduced to help 'reduce cost pressures on households and property owners'. Moreover, the minority report argued that 'ratepayers should not be held responsible for all expenditure not being carried out as efficiently as possible'.

Among the commitments made ahead of the 2018 South Australian election by the then Marshall Liberal opposition was the establishment of a rate capping scheme, despite the primary recommendations of the Committee. This commitment was made on the basis that 'there is a duty to ensure service delivery is as efficient and effective as possible to contain costs to taxpayers and ratepayers and ease cost of living pressures'.

With the successful election of the Marshall Liberal Government in March 2018 it would appear likely that the Government will seek to adopt its proposed policy. Additional details of the policy as proposed by the South Australian Liberals include that:

- The Scheme will be administered by an independent regulator.

- The regulator will determine a rate cap on a region by region basis, recognising that council costs can vary between regions.

- The regulator will apply the Local Government Price Index (LGPI) as the basis for determining a rate cap.

- Individual councils will be able to apply to the independent regulator for a rate increase above the cap when able to demonstrate the support of ratepayers.

- Five years after its introduction, a Liberal Government will review the Rate Capping Scheme in consultation with local government.

### 1.1.1 Rate capping and local government efficiency

It is argued that through imposing financial discipline on local authorities, by limiting their ability to increase rates, municipal efficiency will be enhanced. However, with rate capping, councils may instead be forced to either find another revenue source (for example increasing local fees and charges or generating own source revenue from business ventures), take on additional debt, run down financial reserves, or delay infrastructure renewals and maintenance (Drew and Grant 2017a). There is no extant evidence to validate the claim that

rate capping will enhance efficiency and really it is pretty unlikely that a revenue-side approach could achieve this result.

For instance, empirical evidence comparing New South Wales and South Australian councils found that average expenditure per household was appreciably higher in New South Wales, and, accordingly concludes that rate capping has not been successful in creating superior performance in terms of the efficiency (Dollery and McQuestin 2017). In addition, in a comparison between New South Wales and Victorian councils, Drew and Dollery (2017) did not observe empirical evidence in support of the claim that rate capping increases municipal efficiency. As indicated in Section 5.2.2 we recommend an empirical technique that could be used to provide an evidence base for assessing the impact of the policy change, should it come to pass.

## 1.2 Municipal amalgamations

Much of the effort to improve the efficiency and capacities of local governments has involved the merging of councils to take advantage of scale in the provision of services, to enhance financial viability and improve administration (Productivity Commission 2017). Councils are merged (amalgamated) in order to reduce the total number of councils, and, in turn, increase the constituent size of the remaining entities.

Over the period 1995-98 the South Australian State Government led a process of structural reform of local government, motivated, in part, to achieve increases in efficiency (Aulich et al 2011). The ensuing amalgamation of councils resulted in reduction in the number of councils from 118 to 68.

Councils in South Australia are generally smaller on average than for some other Australian jurisdictions, with local populations averaging 24,790 and ranging from 900 to 165,000 (ACIL Allen 2016). However, it might be noted that relative to the OECD average size of local government (27,244) the size of South Australian councils is, on the whole, unremarkable (Drew and Grant, 2017a)

The Property Council of South Australia has encouraged further amalgamation of councils in South Australia. In particular, it advocates for a reduction in metropolitan councils from nineteen to nine and a reduction in regional councils from 49 to 23.

### 1.2.1 Municipal amalgamations and local government efficiency

The Productivity Commission (2017, p. 2) suggests that 'the amalgamation of councils has been, for some, an effective way of taking advantage of scale in the provision of services, and pooling resources and technical capacities', though it cautions that 'whether amalgamation produces net benefits is not always clear cut'. Nonetheless, many reports and inquiries aimed at reforming local government have tended to suggest that amalgamations 'will inevitably result in greater efficiencies and cost savings for local governments' (Aulich et al 2011).

The major focus is a question of optimum size and efficiency (Aulich et al 2011) – which is a matter to which we turn attention to in Section 3 of this report.

There remains much debate about the outcomes on the efficiency of councils arising from South Australia's earlier amalgamations. For instance, cost savings of $19.4 million per annum (McKinlay Douglas 2006) have been reported, however Dollery (2005) has argued that savings were substantially lower than that promised by authorities at the time.

Nonetheless, it is generally accepted that overall cost savings were relatively modest (Aulich et al 2011).

According to the proposed amalgamations advocated by the Property Council, a reduction in councils is expected to deliver savings to councils and the community of around $65 million per annum and result in a total benefit of around $505 million in Net Present Value terms – with a benefit-cost ratio of 4.54 (ACIL Allen 2016). However, as demonstrated by Dollery and Drew (2017) the ACIL Allen report was seriously flawed – it employed incorrect facts that were misrepresented and the supposed savings were largely based around unsubstantiated assumptions (assumptions without evidence are really only guesses).

We provide analysis in this report (Section 3) which examines relative scale and efficiency of councils in South Australia in a robust and empirically defensible manner, which contrasts sharply with the work done by others.

## 1.3 A guide to this report

Having brought attention to the primary public policy debates in South Australian local government in this Section, the remainder of this report is dedicated to providing an empirical estimation of efficiency levels and distribution of efficiency scores in South Australian local government over the past five years. This is supported by an analysis of the effect of relative scale on efficiency levels, along with an examination of the relevant determinants of efficiency levels.

The empirical results presented in this report may supply important evidence for councils when discussing policy proposals with stakeholders and also form a strong foundation for measuring the effect of future public policy interventions designed to improve efficiency. Armed with this evidence, the sector and policymakers may be better informed of the current state of play and better equipped to determine which public policy interventions, if any, might be best suited to improve efficiency levels. We also identify potential future research that may be valuable in supporting decision-making going forward.

# 2. Efficiency of South Australian Local Government

Local Government efficiency has attracted significant attention from regulators, media, and the public over recent decades. This has been principally in response to concerns regarding the imposts placed on ratepayers and a perception of diminishing financial sustainability amongst councils.

Striving for high levels of efficiency is important because this can reflect effective stewardship of taxes paid by landowners and consumers of local government services, as well as being a key ingredient for ensuring financial sustainability. This is because, for instance, inefficient governments require relatively greater in-flows of revenue or relatively higher levels of debt, which, may, in turn, carry implications for their financial sustainability. Nonetheless, it bears emphasis that efficiency in itself is no guarantee of financial sustainability (see, Drew et al. 2015a).

In any case, policymakers have regularly misunderstood and mismeasured efficiency in Australian local government settings, and, as a result, public policy instruments have not always been well targeted toward increasing efficiency levels. For this reason, it is important that efficiency is appropriately measured in the first instance and that an accurate depiction of the level and distribution of relative efficiency amongst councils is produced. Only with this this sort of evidence in hand will stakeholders and policymakers be adequately positioned to make determinations of possible public policy interventions.

In response to the lack of empirical evidence to date, the analysis in this Section provides the results of a globally intertemporal data envelopment analysis (DEA) for all South Australian local governments over the period 2012 to 2016 inclusive[2]. Global intertemporal DEA is the most sophisticated technique available to measure relative technical efficiency. The results of this analysis produce a relative efficiency score, ranging between 0 per cent (for total relative inefficiency) through to 100 per cent (for completely efficient) and beyond (for super-efficient) for each council against both its peers and itself for each of the years studied.

The results of this analysis are presented in Sections 2.3 to 2.5 and are summarised in Section 2.6. Prior to the analysis, an introduction to the concept of efficiency and the empirical technique employed for the analysis are provided in Sections 2.1 and 2.2 respectively.

## 2.1 Defining efficiency

In economic parlance reference is generally made to three types of efficiency (Drew and Grant 2017a):

- **Allocative efficiency**: refers to the ability to match demand for specific services with supply and is resolved as part of the political process (Andrews and Entwistle, 2013).

- **Dynamic efficiency**: refers to improvement in the conversion of inputs into outputs over time as a result of better technology, training and diffusion of best practice (Grant and Drew, 2017a).

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[2]Data backlogs prevent us from reporting on 2017 at the time of writing.

- **Technical efficiency**: relates to the optimal conversion of inputs into outputs (Farrell, 1957, Feiock et al. 2006).

It is this latter type of efficiency which regulatory authorities and reform architects tend to refer to when prosecuting the case to enhance efficiency – sometimes rather vaguely in terms of cost-effectiveness or economy.

High levels of technical efficiency are generally desirable because this may reflect good stewardship of taxes paid by landowners, given that taxpayers expect all tiers of government to spend funds prudently. In addition, efficiency levels can act as a helpful guide to those charged with deliberating on the introduction of new services, outsourcing of services and improvement of services or infrastructure. Finally, high levels of efficiency can contribute toward financial sustainability through reductions in reliance upon debt or inflows of revenue.

## 2.2 Modelling efficiency

In order to empirically model technical efficiency it is necessary to identify inputs and outputs. Since outputs of Australian local government production are not directly observed, it is common practice in empirical analysis to employ appropriate proxies[3]. The proxies that we employ here are consistent with both theoretical and empirical evidence (see, Drew and Dollery, 2015; Drew et al., 2015b). Specifically, the inputs and outputs employed in this model are as follows:

**Inputs** = operational expenditure + staff expenditure

**Outputs** = number of residential assessments +
number of employing business assessments
+ number of other assessments
+ length of sealed roads + length of unsealed roads.

Our preferred technique for measuring efficiency is known as data envelopment analysis (DEA) and it enables us to consider all inputs and all relevant output proxies simultaneously. This allows for more appropriate specification of local government production functions, unlike simpler, more commonly employed metrics such as ratio analysis – which typically consider only the operating expenditure per capita (hence introducing bias to the results). Ratio analysis which typically employs just a single proxy for output (invariably population) implicitly and implausibly asserts: (i) that local government services are predominantly provided to persons, (ii) that the costs of providing services is a linear function of the number of people living in a property, (iii) that councils do not provide services to business, (iv) that local governments do not spend money on roads (when this is, in fact, the single largest item of expenditure[4]). Hence it can be easily seen why the multiple outputs that DEA facilitate are important.

In addition, DEA is a non-parametric technique which can produce point estimates of efficiency for each decision-making unit (in our case, this refers to councils) relative to councils that demonstrate the most optimal conversion of inputs into outputs (see, Drew et al. 2015b or Cooper et al. 2007 for a more detailed description of the linear programming which forms the foundation of DEA).

DEA is a commonly employed empirical methodology for estimating relative technical efficiency. Conceptually, DEA first establishes an efficient frontier comprised of the local

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[3]There are also constraints imposed by the empirical models themselves – such as Nunamaker's rule – see Drew and Dollery, 2015.
[4] Indeed, road length is negatively correlated with population so a single proxy of population not only ignores an important area of expenditure, but also introduces bias to the results.

governments that have the most optimal conversion of inputs whilst holding outputs constant[5]. Following this, the distance of local governments that do not lie on the efficient frontier is then used to calculate the relative technical efficiency for non-frontier councils. It is important to note that efficiency is a relative measure – the score produced for each council can only generally be interpreted with respect to the peers measured and the years of analysis.

We employ an input orientation for our DEAs, consistent with the corpus of scholarly literature (see, Drew et al. 2015a, 2015b, 2015c). An input orientation measures the possible reduction of inputs with output taken to be fixed (Coelli et al. 2005) and accords with the fact that councils have relatively little control over output proxies (local governments can't significantly reduce the number of properties or length of roads). The specification for the DEA is also consistent with Australian scholarly literature (see, for example, Drew et al. 2015a; Drew et al. 2015b).

Global intertemporal DEA is an advance on cross-section methodologies as it allows for comparisons of efficiency to be made over time, against both peers and the individual council itself. Essentially it considers all councils for all years in a single linear program. Thus, in a single DEA, each council is compared to itself and its peers for all of the years of the analysis (in our case 2012 to 2016). In order to ensure that fair comparisons are made between years all financial data is inflated to 2016 dollars. Apart from the significant advantage of allowing councils to be compared both across time and against themselves, global intertemporal analysis also minimises the (sometimes claimed) deterministic nature of DEA (because councils are compared against themselves across time using the same model specification).

In order to ensure robust and reliable evidence, super-efficiency scores have been calculated in this instance. Super-efficiency imposes a constraint on the linear program that restricts the peers to which a council is compared and thus allows for efficiency scores greater than 100 per cent. Super-efficient local governments can be conceived of as councils which have a conversion of inputs into outputs that is greater than one might expect from local governments lying on the efficient frontier. Super-efficiency allows one to discriminate between efficient councils that would have been considered equally efficient (100 per cent score) in the absence of the methodology. In addition, super efficiency allows for non-biased second stage regressions, which are critical to the accurate identification of determinants that we make later in this report.

An alternate technique, that is sometimes employed, is bootstrapping. Bootstrapping is a re-sampling process which is undertaken in order to provide additional assurance when one wishes to extrapolate from a sample to an entire population. Because we have an entire census of local governments in South Australia, rather than a sample, bootstrapping would introduce bootstrapping bias and is therefore not indicated in this instance (Coelli et al., 2005; Cooper et al., 2007). Moreover, bootstrapping is not possible with super-efficiency scores.

Figure 1 provides a conceptual illustration of DEA, by way of explication regarding the above material. In this diagram council B is on the efficient frontier and would be assigned a relative technical efficiency score of 100 per cent. Council A is relatively inefficient and would be assigned a score less than 100 per cent. By way of contrast council E is super-efficient and would be assigned a relative technical efficiency score greater than 100 per cent.

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[5] An input orientation such as this is employed in local government analyses as outputs are generally conceived to be exogenous

**Figure 1 Data Envelopment Analysis**
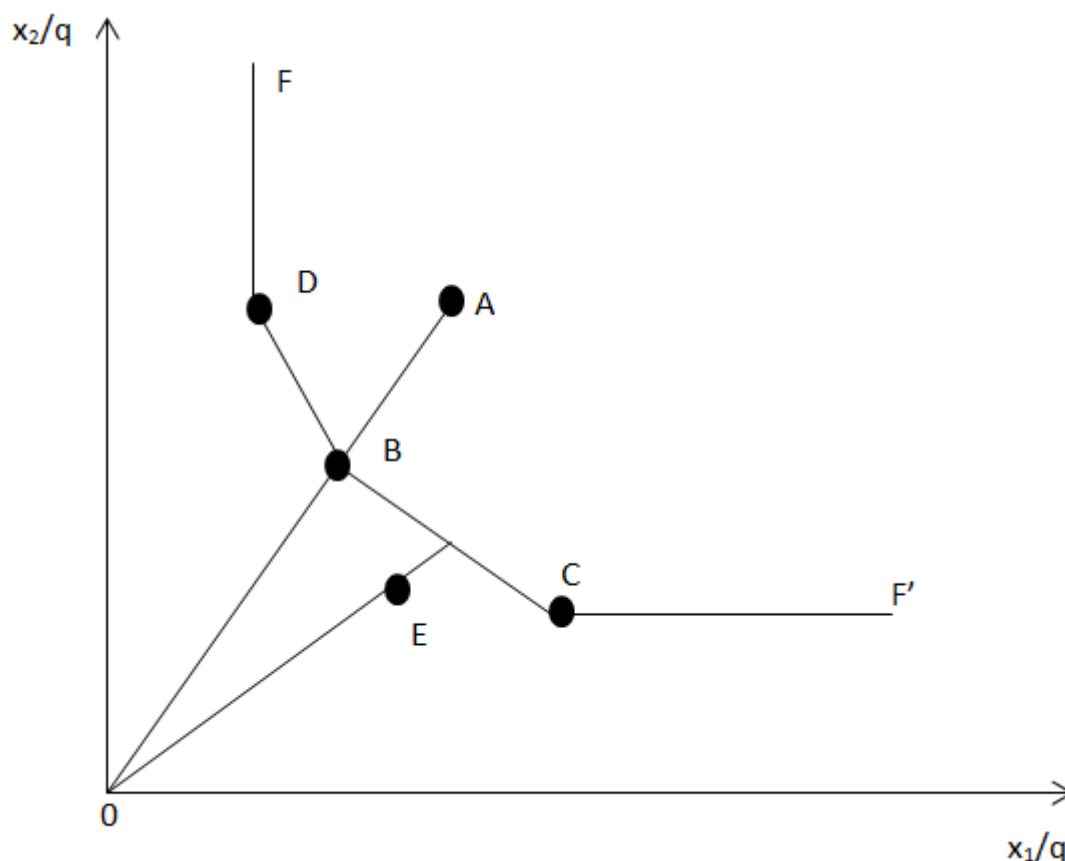


In the following section we proceed to provide summary data for efficiency estimates for South Australian local government over the period of analysis. Summary data is used because we are primarily interested in trends that have occurred for the entire sector, rather than what has occurred for individual councils. However, should councils wish to receive their specific scores for the period 2012-2016 they can do so by contacting the author directly at Joseph.Drew@uts.edu.au and appending a written request signed by the General Manager and Mayor. This process ensures that the scores are treated as privileged information and cannot be used to produce league ladders and the like, which have been linked to deleterious and unanticipated outcomes abroad.

## 2.3 Efficiency of the Entire South Australian Local Government Cohort

Table 1 provides details of relative technical efficiency in the sector over the period 2012 to 2016 inclusive. A variable returns to scale algorithm was employed to ensure that relatively inefficient councils were only compared to peers of a similar size (that is, we have ensured that the effects of scale are not reflected in relative technical efficiency scores reported below).

It appears that relative technical efficiency of the typical council in South Australia (as measured by both the median and mean) has reduced somewhat during the period of the study – specifically, there was a sharp correction occurring in the 2014 financial year from which there has not yet been a full recovery. Councils in the top quartile of relative technical efficiency were subject to the least amount of correction.

Moreover, the standard deviation (which measures the spread of results) has been largely increasing over time and this is suggestive of some councils being left behind by their peers in efforts to improve efficiency. That said, the results should not be interpreted as being a poor reflection on the sector – the median efficiency of councils demonstrates a relatively tight grouping of the two highest quartiles.

**Table 1. Global Intertemporal Technical Efficiency, South Australia Local Governments, 2012-2016.**

|  | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|
| **Lowest** | 20.7 | 20.75 | 20.17 | 18.66 | 18.78 |
| **Quartile 1** | 75.01 | 74.05 | 71.59 | 72.79 | 69.55 |
| **Median (Q2)** | 90.29 | 91.61 | 86.65 | 84.36 | 85.51 |
| **Quartile 3** | 99.46 | 99.85 | 96.45 | 98.1 | 98.32 |
| **Highest** | 114.55 | 151.37 | 106.97 | 114.4 | 109.51 |
| **Mean** | 86.07 | 86.27 | 83.46 | 83.08 | 82.32 |
| **Standard Deviation** | 17.7 | 20.05 | 17.16 | 18.72 | 18.99 |

Figure 2 provides a graphical representation of the data presented in Table 1.

**Figure 2. Global Intertemporal Variables Relative (Super) Efficiency, 2012-2016.**
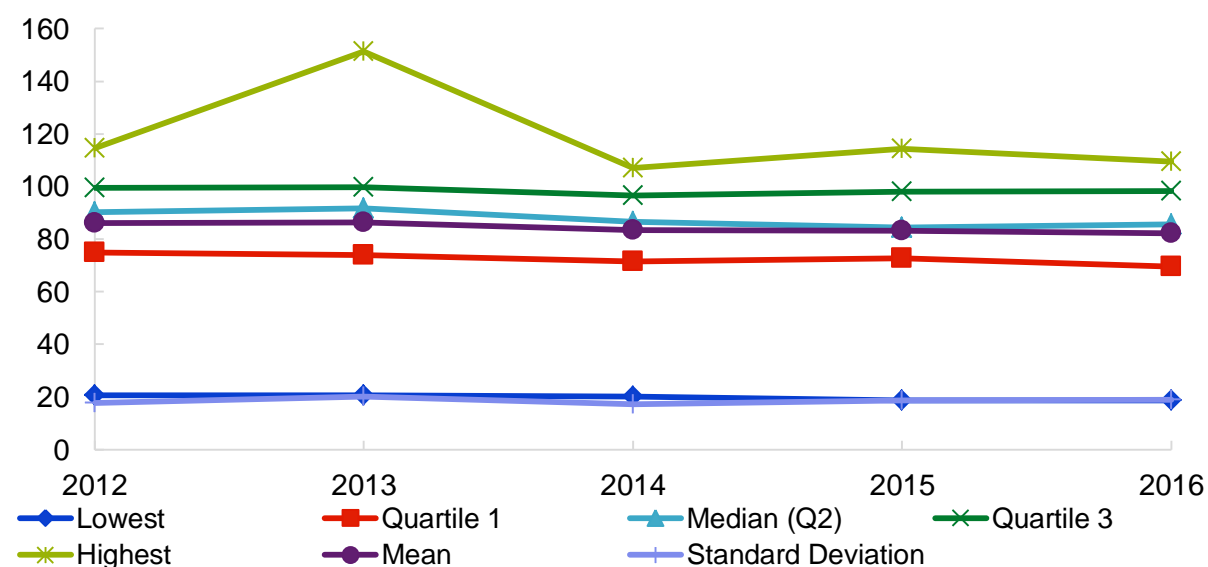


## 2.4 Rural Efficiency

Table 2 reports relative technical efficiency that has been disaggregated to include only rural councils (as informed by the Australian Classification of Local Government typology). Notably, the lowest relative efficiency scores for rural councils were over twice that of the entire cohort (and hence of urban peers). Moreover, the mean relative technical efficiency of

rural councils was superior to the entire cohort (with respect to the output proxies employed), although the median result was mixed (therefore suggesting a skewed distribution of efficiency scores for this sub-cohort). The standard deviation suggests a relatively narrow spread of scores for rural councils which, whilst unsurprising given the aforementioned lowest scores, is a more desirable state of affairs.

**Table 2. Global Intertemporal Technical Efficiency, Rural South Australian Local Governments, 2012-2016**

|  | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|
| **Lowest** | 48.71 | 47.08 | 53.23 | 49.88 | 51.21 |
| **Quartile 1** | 78.5 | 75.0 | 73.53 | 74.89 | 71.98 |
| **Median (Q2)** | 90.02 | 91.62 | 86.35 | 85.05 | 83.93 |
| **Quartile 3** | 98.18 | 99.14 | 99.71 | 98.83 | 97.53 |
| **Highest** | 114.27 | 151.37 | 106.97 | 114.4 | 107.95 |
| **Mean** | 87.55 | 89.07 | 85.88 | 86.03 | 84.14 |
| **Standard Deviation** | 13.17 | 17.97 | 13.63 | 15.12 | 14.78 |

**Figure 3. Rural Relative Efficiency, 2012-2016.**
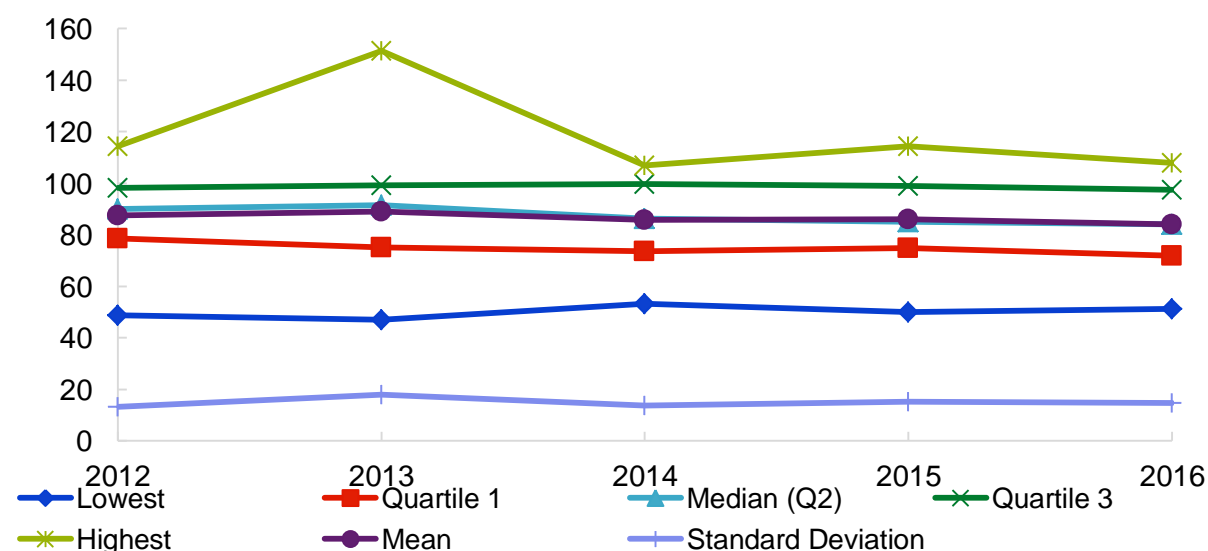


## 2.5 Urban Efficiency

Table 3 reports relative technical efficiency scores disaggregated to include only urban councils. It is clear that the lowest technical efficiency councils in the state are located in urban areas as indicated by the lowest score and first quartile (with respect to the output

proxies employed). This suggests that any forthcoming public policy prescriptions might be most profitably directed to urban councils. Moreover, given that the median scores (and some of the third quartile scores) are superior or comparable to rural councils this suggests that attention should ideally focus on the councils performing at below median levels. Not surprisingly the standard deviation for urban councils is considerably higher than for rural councils. Similar to rural councils, all councils in the top two quartiles are performing at relatively high levels.

**Table 3. Global Intertemporal Technical Efficiency, Urban South Australian Local Governments, 2012-2016**

|  | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|
| **Lowest** | 20.71 | 20.73 | 20.17 | 18.66 | 18.78 |
| **Quartile 1** | 72.25 | 69.52 | 66.89 | 66.27 | 68.75 |
| **Median (Q2)** | 91.65 | 91.29 | 87.17 | 83.34 | 85.6 |
| **Quartile 3** | 99.97 | 98.89 | 95.68 | 94.14 | 98.24 |
| **Highest** | 114.55 | 113.01 | 101.31 | 112.34 | 109.51 |
| **Mean** | 84.20 | 82.73 | 80.39 | 79.34 | 80.01 |
| **Standard Deviation** | 22.01 | 21.92 | 20.37 | 21.91 | 23.04 |

**Figure 4. Urban Relative Efficiency, 2012-2016.**
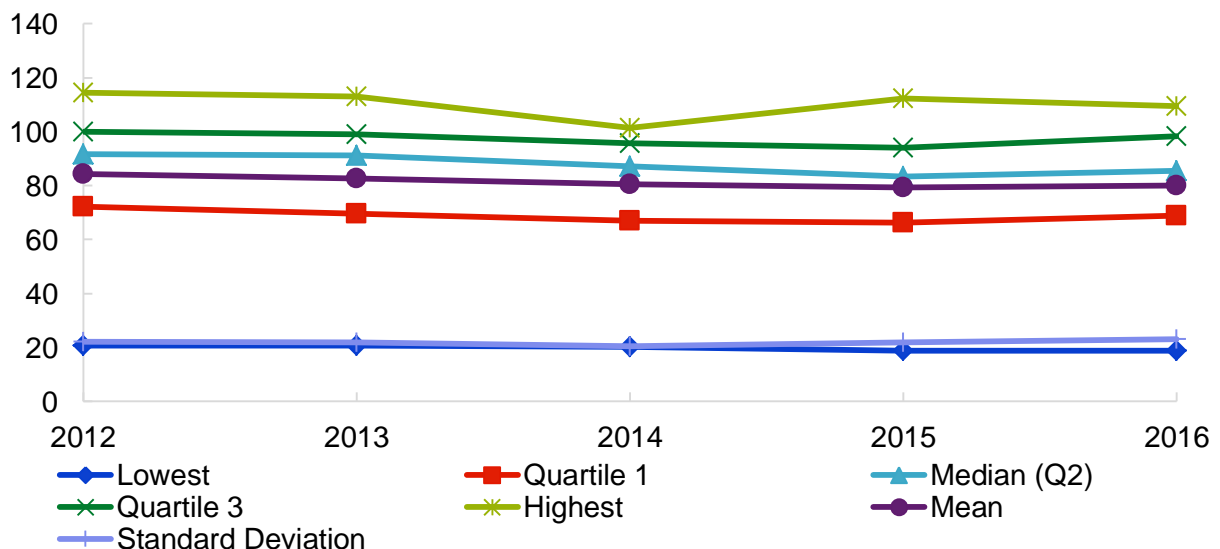
## 2.6 Summary of efficiency findings

The analysis of efficiency in South Australian local government presented in this Section revealed that:

- The relative technical efficiency of the typical council in South Australia has reduced somewhat during the period of the study.

    o In particular, there was a sharp correction occurring in the 2014 financial year from which there has not yet been a full recovery.

- There appears to be a relatively tight grouping of the two highest quartiles, however the spread of efficiency results has been increasing over time.

    o This suggests some councils are being left behind by their peers in efforts to improve efficiency.

- On average, rural councils enjoy higher relative technical efficiency than urban councils (with respect to the output proxies employed), though the distribution may be somewhat skewed.

    o The lowest relative efficiency scores for rural councils were over twice that of their urban peers.

    o The spread of scores is narrower for rural councils than urban councils.

- Generally, technical efficiency of urban councils was relatively low and the spread of efficiency scores relatively high.

    o This suggests that any forthcoming public policy prescriptions might be most profitably directed to urban councils, with specific attention paid to councils performing at below median levels of efficiency.

# 3. Scale of South Australian Local Government

The size of local government entities is important in efficiency considerations because of the potential influence of scale economies in council production. Scale economies refer to the economic concept whereby the average total costs of some functions might reduce as output increases (Drew and Grant 2017a). Theory predicts that if economies of scale do exist then they occur over relatively short domains, followed by a long domain of constant returns to scale, and ultimately diseconomies of scale (where average total costs increase as output increases) if output is pushed even further. It is important to note that not all local government functions exhibit evidence of economies of scale (Drew and Grant 2017a). Economies of scale principally occur as a result of exploiting excess capacity, greater specialisation of staff, and greater purchasing power. Diseconomies of scale might emerge as the costs of co-ordinating large numbers of staff begin to have a material effect, as a result of a reduction in transparency, and as a consequence of higher wages paid to management in response to the number of staff supervised (Drew and Grant, 2017a).

When local government entities are constituted at the optimal scale, any potential nett gains associated with size have been fully exhausted. Our analysis presented in this Section identified that the relative scale estimate of council varies slightly from year to year. This is mainly in response to organic growth in councils – namely, the growth in number of assessments and length of Council-maintained roads.

While the optimal scale represents a point estimate, in practice, deviations of around ten per cent (from optimal) are generally appropriate, and indeed probably prudent in the case of increasing returns to scale councils (that is, those councils whose size is slightly smaller than the optimal size). This allows for some level of organic growth in which increasing returns to scale may be further realised.

For councils that are identified as suboptimal in scale, then, this implies one of two conditions:

- Increasing returns to scale (which are councils that are smaller than optimal):

  - For these councils, increasing output is associated with falling average total costs. That is, marginal increases in the number of rating assessments and length of roads are associated with efficiency gains arising from scale economies. This means that councils identified accordingly could be constituted into a larger entity, or allowed to grow organically, and potentially enjoy associated improvements in efficiency. In turn, such councils have the potential to gain from amalgamation, adjustment to boundaries, or consolidation of some council functions (although care needs to be exercised to ensure that the merged entity is not over-scaled).

- Decreasing returns to scale (which are councils larger than optimal):

  - For these councils, increasing output is associated with rising average total costs. That is, marginal increases in rating assessments and length of roads are associated with efficiency reductions arising from scale diseconomies. This means that councils identified accordingly could be disassembled into smaller entities, and potentially enjoy associated improvements in efficiency.

Accordingly, proponents of amalgamation (de-amalgamation) should focus attention to councils identified as possessing significant and materially increasing (decreasing) returns to scale only and ensure that such proposals are designed so as to constitute entities which are as close as possible to the optimal size. It is generally prudent for councils to be slightly smaller than the optimal size if precisely achieving optimal size is elusive, especially in local government areas which are exhibiting growth. In any case, it bears emphasis that suitable merger partners do not always exist – as a result of geographical, socio-economic and demographic constraints.

## 3.1 Empirical modelling of scale estimates

In order to estimate the effect of scale on efficiency, we re-estimated efficiency scores according to a constant returns to scale (CRS) algorithm[6], and then divided the scores obtained by the relevant variable returns to scale (VRS) results. This is a commonly employed technique in the literature (see Cooper et al., 2007). Scale estimates are presented as a percentage and are further disaggregated according to the two different types of sub-optimal scale.

## 3.2 Increasing Returns to Scale

Most increasing returns to scale councils are operating close (within a decile of optimal) to optimal scale. As a result, there is no evidence-base to support calls for wide-spread amalgamation predicated on increasing efficiency. In our second stage regressions, which examine the determinants of efficiency for South Australian local governments (see, Section 3), we largely confirm this result.

Notably the proportion of councils operating with increasing returns to scale is relatively small.

**Table 4. Distribution of Increasing Returns to Scale Councils, 2012-2016.**

|  | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| **Lowest** | 70.93 | 76.64 | 69.09 | 68.23 | 69.07 |
| **Quartile 1** | 91.26 | 90.64 | 93.67 | 93.83 | 94.78 |
| **Median (Q2)** | 98.86 | 98.61 | 98.53 | 98.44 | 98.83 |
| **Quartile 3** | 99.83 | 99.23 | 99.83 | 99.61 | 99.87 |
| **Highest** | 99.98 | 99.98 | 99.99 | 99.99 | 99.99 |
| **Mean** | 94.79 | 94.39 | 94.56 | 94.67 | 94.38 |
| **Standard Deviation** | 7.75 | 7.31 | 8.09 | 7.95 | 8.48 |
| **Number of Councils** | 18 | 16 | 18 | 17 | 18 |

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[6] This removes the convexity constraint used in variable returns to scale models

**Figure 5. Global Intertemporal Relative Scale, Increasing Returns to Scale, 2012-2016.**
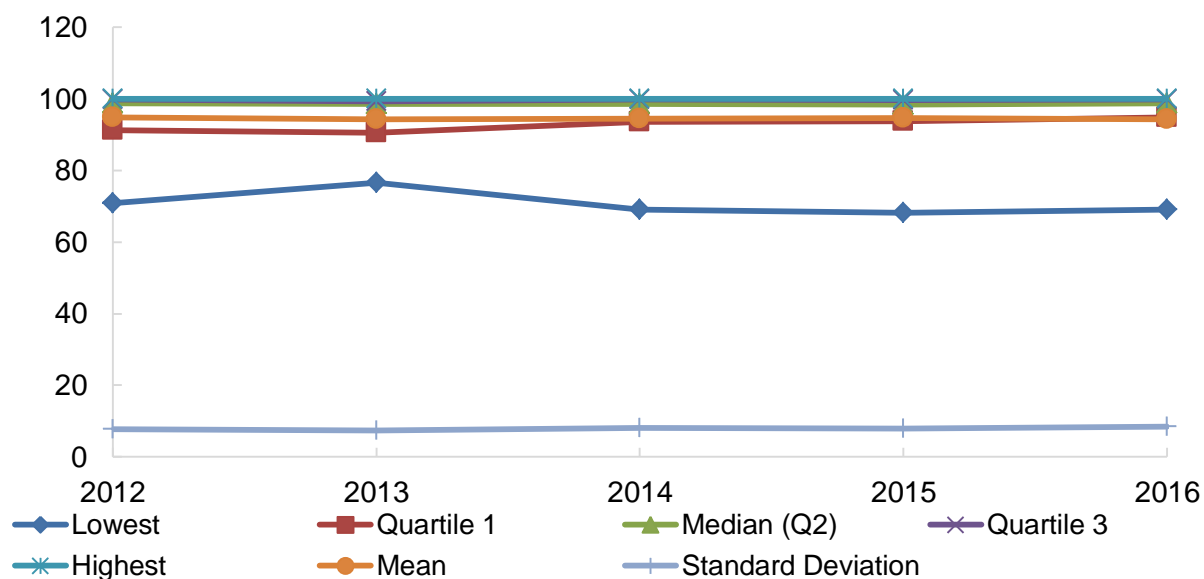


## 3.3 Decreasing Returns to Scale

The majority of councils operating in the jurisdiction of South Australia do so with decreasing returns to scale. This means that as a result of their relatively large size, there is a negative influence on efficiency levels. In most cases the relative effect of scale is not large enough to warrant public policy intervention (such as de-amalgamation) however, it certainly presents as a compelling case against further amalgamations.

**Table 5. Distribution of Decreasing Returns to Scale Councils, 2012-2016.**

|  | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| **Lowest** | 49.39 | 39.44 | 49.45 | 49.72 | 40.96 |
| **Quartile 1** | 88.75 | 90.03 | 90.39 | 90.38 | 90.42 |
| **Median (Q2)** | 94.85 | 95.04 | 94.35 | 95.07 | 96.01 |
| **Quartile 3** | 97.63 | 98.13 | 98.67 | 98.79 | 98.15 |
| **Highest** | 100 | 99.99 | 99.98 | 99.99 | 99.99 |
| **Mean** | 91.97 | 92.29 | 92.29 | 92.71 | 92.73 |
| **Standard Deviation** | 9.21 | 9.68 | 9.35 | 8.64 | 9.62 |
| **Number of Councils** | 50 | 52 | 50 | 51 | 50 |

**Figure 6. Global Intertemporal Relative Scale, Decreasing Returns to Scale, 2012-2016.**
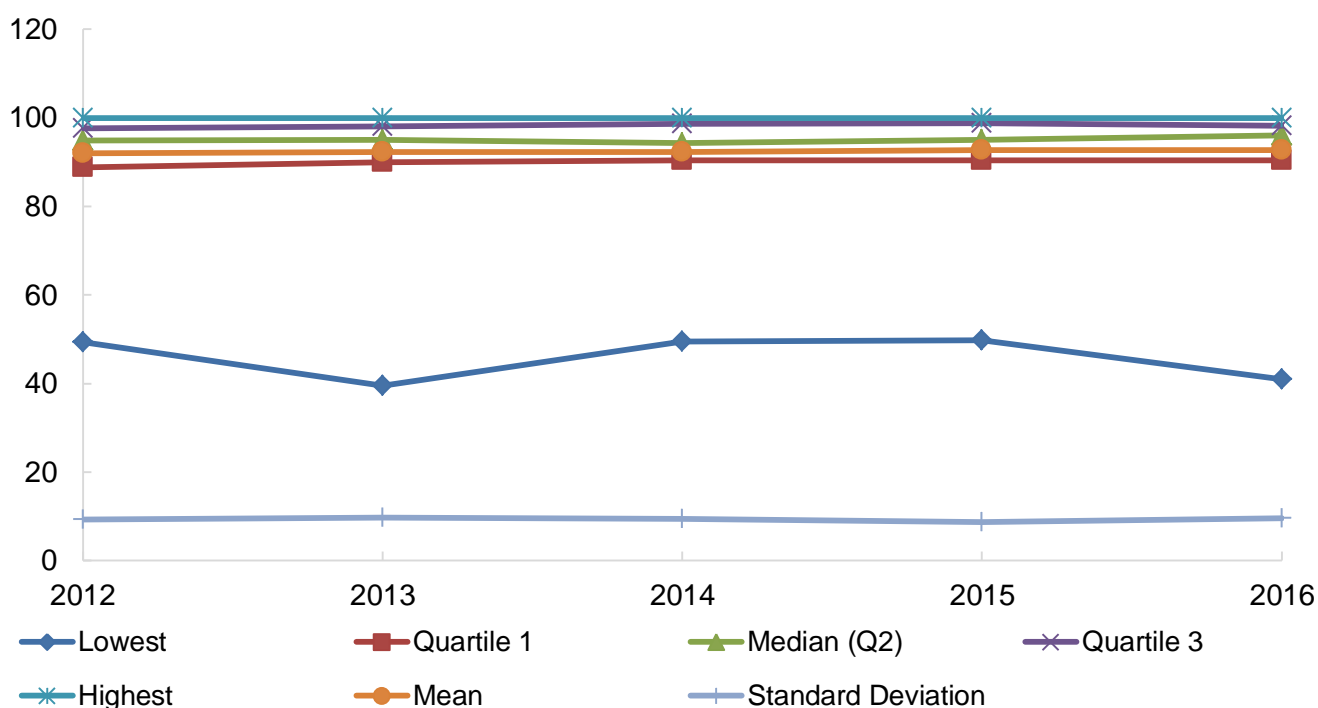


## 3.4 Summary of scale findings

The analysis of scale in South Australian local government presented in this Section revealed that:

- There are relatively few councils in South Australia which might be expected to enjoy efficiency gains from increasing their size.

  o At present, most increasing returns to scale councils are operating close to the optimal scale.

  o As a result, wide-spread amalgamation would be unlikely to increase efficiency, and indeed could well result in decreased efficiency.

- The majority of councils in South Australia experience decreases in efficiency as a result of being over-scaled.

  o These councils may enjoy efficiency gains from reductions in their size.

  o In most cases, however, the relative effect of scale is not large enough to warrant public policy intervention (such as de-amalgamation).

- As a result of the above, there would appear to be little case, at present, for public policy interventions, such as amalgamation, in order to enhance efficiency levels of local government in South Australia. That said, councils identified as significantly larger than optimal size (decreasing returns to scale councils) and exhibiting growth in properties and/or road lengths may potentially be appropriate targets for de-amalgamation in future.

# 4. Determinants of Efficiency in South Australian Local Government

Following the analysis of the distribution of relative efficiency and scale in South Australian local government, we now turn to consideration of the determinants of efficiency.

## 4.1 Modelling determinants of efficiency

In order to avoid conflation in our analysis, we base the model on a constant returns to scale data envelopment specification. This is because the alternative variable return to scale model adjusts for scale, which would result in biased results. We then employed a censored panel regression (censored at the lower level of 0) with time-fixed effects. Of course, all relevant tests for the robustness of our econometric estimations were conducted and hence end-users of this report can have complete confidence in the validity of the statistically significant associations that are reported. The data relating to the shared service arrangements undertaken by councils (if any) have been obtained from Note 19 of the *Notes to and Forming Part of the Financial Statements* examining Joint Ventures and Interests in Other Entities, supplemented by the appendices to the annual reports relating to presentations of annual reports of regional entities and subsidiaries. In common with the earlier analyses, demographic data was obtained from the Australian Bureau of Statistics (2018) *National Regional Profile* reports and financial data were obtained directly from relevant audited financial statements.

While our dependent variable in this model is the relative technical efficiency score, our independent (explanatory) variables to this model (informed by the corpus of scholarly literature)[7] include the following:

- Population

- Population density

- Proportion of population under 15 years of age

- Proportion of population in receipt of aged pensions

- Proportion of population in receipt of unemployment benefits

- Proportion of population belonging to a non-English speaking background

- Proportion of population of identifying as Aboriginal or Torres Strait Islander

- Median wage of local government residents

- Relative level of financial grant assistance

- Indicator for rural or urban council

- Indicator for whether council participates in shared services.

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[7] See, for example, Drew, Kortt and Dollery (2014), Drew and Dollery (2017).

## 4.2 Determinants of efficiency results

We report the details of regressions based on our five-year panel of data[8] in Table 6 and discuss these results in this Section. We are principally interested in the results obtained in Model 2 of Table 6 because of the influence of the included parabolic function for scale. The results are broken down according to relevant factors which are likely to influence efficiency. A short discussion is accompanied with each of the results from this model.

### 4.2.1 Scale and efficiency

In common with our analysis of scale in Section 3, Model 1 in Table 6 suggests that as scale increases efficiency is expected to decrease, other things being equal. In fact, a one percent increase in population is associated in a 0.1753 decrease in efficiency (a relatively modest response). This result is largely confirmed by our parabolic model (Model 2 in Table 6), which allows for a turning point to occur in response to the corpus of 'economies of scale' literature (see, for example, Drew et al, 2014).

Specifically, Model 2 in Table 6 suggests that efficiency would be expected to decrease as population increases up to 75,183 persons after which efficiency might increase again (to partially mitigate earlier losses). In sum, there is no empirical evidence to support the contention that increasing population size (generally achieved through amalgamation) would yield any increases to efficiency – indeed, the opposite is likely to be true in most cases (consistent with the findings made in Section 2).

### 4.2.2 Population Density and efficiency

The modelling results identified a statistically significant positive association between population density and efficiency. This is consistent with economic theory on economies of density, which implies that some services become cheaper to deliver as populations become denser –mainly because there is less distance to traverse between service points.

The Model 2 results in Table 6 suggest that a one percent increase in population density is associated with an increase to efficiency of 0.0444), other things being equal. This is a relatively small response which tells us that economies of density, whilst important, are not a major determinant of South Australian local government efficiency.

### 4.2.3 Demographics and efficiency

The relative age of the local government population is also a statistically significant determinant of efficiency for South Australian local government, consistent with a number of empirical studies in other jurisdictions.

In particular, a one percent increase in the proportion of persons under the age of 15 is associated with a relatively strong response to efficiency in the order of 2.60, other things being equal. Efficiency is less responsive to the proportion of persons receiving an aged pension – specifically, for an increase of one percent the influence on efficiency is just 0.2364, other things being equal.

Employment and income have long been associated with pressure on local government expenditure in the empirical literature. Accordingly, in line with these expectations, we observe a statistically significant and negative association between the proportion of persons

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[8] The interpretation of coefficients which have a natural log transformation (i.e. "ln") is that a 1% increase in the variable leads to a coefficient divided by 100 response in efficiency. For non-transformed coefficients, a one unit increase in the variable leads to the coefficient response in efficiency.

receiving Newstart allowance – namely, for a one per cent increase in Newstart recipients there is an associated reduction in efficiency equivalent to 0.1113.

In a similar vein, we also observe an expected statistically significant positive association between the median wage of persons living in a given local government area and the level of efficiency. Specifically, for a one thousand dollar increase in the median wage we observed an associated decrease of 0.64 in efficiency, other things being equal. This may be because, in general, as wages increase, a higher standard of local government goods and services are expected.

### 4.2.4 Own source revenue and efficiency

There was no statistically significant association observed between the relative level of financial assistance grants and efficiency, which suggests that the grants are being allocated in a manner which is efficiency-neutral in accordance with this aspect of the legislation (Local Government (Financial Assistance) Act 1995).

### 4.2.5 Regional status and efficiency

Given our analysis of the relative efficiency in Section 1.4 and 1.5 of both rural and urban councils, it is not surprising to find that urban councils were associated with a statistically significant mean reduction in efficiency in the order of 18.58, *ceteris paribus*.

### 4.2.6 Shared services and efficiency

What is *prima facie* surprising is that the participation of a council in shared services was significantly associated with a reduction in efficiency in the order of 8.47, holding all other factors constant. Whilst likely surprising to most practitioners, this result is consistent with the scholarly literature which has long been sceptical of the likelihood of efficiency increases in response to shared services (see, for instance, Bel and Warner, 2014; Noda, 2017; Carr and Hawkins, 2013; Kwon and Feiock, 2010; Dollery, Kortt and Drew, 2016).

It bears cautioning that this need not imply that shared services arrangements cannot or do not contribute to efficiencies in some instances. Indeed, given the diversity of shared service arrangements this is difficult to fully capture in a model of this type. Clearly, the propensity to enjoy higher or lower efficiencies in shared services may vary across participants and by the nature of services themselves.

Nonetheless, this is a compelling finding that is worthy of additional consideration, and, in turn, we encourage readers to engage with the literature as well as the recommendation for further research indicated in Section 5.2.3.

**Table 6. Determinants of Relative Technical Efficiency (Constant Returns to Scale)**

| CRS | Model 1 Super Efficiency (censored) | Model 2 Super Efficiency (censored) |
|---|---|---|
| Population (ln) | -17.53* | -75.45** |
| | (7.44) | (15.33) |
| Population squared (ln) | | 3.36** |
| | | (0.78) |
| Population Density (ln) | 5.74** | 4.44** |
| | (1.65) | (1.64) |
| Under 15 | 2.46** | 2.60** |
| | (0.54) | (0.53) |
| Aged (ln) | 27.56** | 23.64** |
| | (4.83) | (4.79) |
| Newstart (ln) | -17.87** | -11.13* |
| | (5.51) | (5.59) |
| NESB (ln) | 4.28+ | 4.01+ |
| | (2.24) | (2.19) |
| ATSI (ln) | -6.71* | -7.28** |
| | (2.64) | (2.57) |
| Median Wage ($'000) | -0.77* | -0.64* |
| | (0.29) | (0.28) |
| Financial Assistance Grant | 0.002 | 0.00 |
| | (0.001) | (0.00) |
| Urban | 15.84** | 18.58** |
| | (5.47) | (5.37) |
| Shared Services | -6.77* | -8.47** |
| | (3.31) | (3.24) |
| n | 340 | 340 |
| Coefficient of Determination (pseudo) | 1.962 | 2.206 |

# 4.3 Summary of determinants of efficiency findings

Based upon the findings of our analysis of the determinants of efficiency, we observed that:

- Efficiency might be expected to decrease as population increases up to 75,183 persons, after which efficiency might increase again (to partially mitigate earlier losses).

    o As a result, there is little evidence that increasing population size (such as through amalgamation) would yield any increases to efficiency.

- Increases in population density are associated with an increase to efficiency, though the magnitude of this influence is relatively small. This result suggests that in-fill developments might be prioritised wherever possible.

- Demographics of local government populations are generally associated with the level of efficiency:

    o An increase in the proportion of persons under the age of 15 is associated with a relatively strong efficiency gain.

    o An increase in the proportion of persons receiving an aged pension is associated with an efficiency gain, though this is lower in magnitude than that of the proportion of persons under the age of 15.

    o An increase in the proportion of persons receiving Newstart allowance is associated with a reduction in efficiency.

    o An increase in the median wage of persons living in a given local government area is associated with a reduction in efficiency.

- There is no evidence of an association between the relative level of financial assistance grants and efficiency.

    o This suggests that the grants are being allocated in a manner which is efficiency-neutral

- The participation of a council in shared services was associated with a statistically significant reduction in efficiency.

# 5. Options for Enhancing Local Government Efficiency

In this report we have examined the distribution of efficiency levels throughout South Australian local government (Section 2), examined the appropriateness of local government sizes in South Australia in relation to optimally efficient scale (Section 3), and analysed the nature and extent of determinants of efficiency/inefficiency (Section 4). In this Section we consolidate the results of this analysis with a view to derive the implications for local government policymakers wishing to enhance local government efficiency in South Australia.

Throughout Section 5.1 we provide discussion of principles and instruments of policymaking as relevant to the findings of this report, and the wider scholarly literature. In Section 5.2 we advise on future research which may be fruitful in guiding policy decision-making going forward.

## 5.1 Implications for local government policy

A number of efficacious methods for enhancing the efficiency of local government have been discussed in the scholarly literature (see, for example, Drew and Grant, 2017a) and warrant careful consideration by councils. Of course, not every option is suitable for every council and some reforms might require assistance from state regulators to implement.

### 5.1.1 Reforming ward structure

Changing the ward structure for local government has long been recognised as an efficacious method for reducing expenditure and hence a method for improving efficiency (see, Weingast et al., 1981; Drew and Dollery, 2017). A statistically significant association is postulated to exist between the number of wards within a council, and unit expenditure. Indeed, in a study based on Victorian local governments rigorous empirical evidence was put forward which suggests that reducing the number of wards would result in savings of around 3.4 per cent, *ceteris paribus* (Drew and Dollery, 2017). Like many efficiency measures there might be a trade-off between efficiency and effectiveness (of political representation in this case) and this needs to be carefully weighed before taking any action.

### 5.1.2 User pays principles for pricing

There is a nascent literature that examines the relationship between how money is levied and the response in the level of demand for goods and services. If goods and services that have private benefits are funded out of the common tax pool, economic theory predicts that an inefficient quantity and quality of goods will be demanded by residents, because persons can receive benefits that are effectively subsidised by their fellow taxpayers (Drew and Grant, 2017a). It is therefore imperative that private benefits (goods and services that persons can exclude others from consuming and which also diminish with consumption) be funded by fees that fully recoup costs according to a supply-side approach (Drew and Grant, 2017a).

### 5.1.3 Subsidiarity principles for revenue

The Principle of Subsidiarity is also salient to the quest to improve economic efficiency. The Principle states that *subsidium* (loosely translated as "subsidies") should only be provided in the case of *bona fide* need, and then in a manner that is designed to make it superfluous as

quickly as possible (Drew and Grant, 2017b). This has obvious implications for the level and targeting of subsidies for merit goods (goods that local governments subsidise in response to perceived virtues that might be internalised by those who consume them – for instance, swimming pools), and goods with positive externalities (goods that produce benefits which go beyond those internalised by persons consuming the good – for instance, rubbish collection). Specifically, it presents a moral argument for means-testing subsidies provided by local government to needy residents.

The Principle can also be used to make a compelling moral case for (capped) matching grants and co-production when associations seek funding from local government (Drew and Grant, 2017b). It is not possible to do justice to this moral philosophy in a few sentences and we therefore suggest that readers consult the cited literature for further details. Suffice to say, that there is a strong moral and economic argument to support the idea that better targeting of *subsidium*, use of matching grants and use of co-production would have significant impact on municipal efficiency.

### 5.1.4 Structural reforms to size of councils

Given the empirical evidence presented in this report it seems clear that de-amalgamation could be considered in some cases where efficiency is being adversely impacted by over-sized council boundaries. This public policy prescription largely runs counter to the recommendations of ACIL Allen (2016) and the Property Council which have called for further amalgamations. It demonstrates that when it comes to weighty public policy considerations it is critical to obtain robust and independent empirical evidence to inform decision-making.

### 5.1.5 Rate capping

While this is not examined specifically in this study, the scholarly literature provides good reason to believe that efficiency could be adversely affected by rate capping (see, Drew and Dollery, 2016). For this reason, the possible introduction of rate-capping should be subjected to empirical testing and careful consideration of the design of the system.

### 5.1.6 Shared services

Given the evidence relating to the effect of shared service on efficiency it may be necessary to re-configure some of the existing shared service arrangements to ensure that they occur in line with optimal functional size. Re-configuration of this kind would allow councils to fully realise the potential benefits of shared services but must be informed by rigorous scholarship (including empirical analysis) to achieve maximum benefit.

## 5.2 Recommendations for future research

In this report, we have conducted a series of empirical analyses to examine efficiency of local government in South Australia. Because of the nature of public policy debate at the present time, however, it would appear imperative to ensure that a sufficiently robust evidence-base is in place to ensure that future decision-making does not result in deleterious outcomes. For this reason, we propose here several possible analyses that we believe may be of utility for guiding decision-makers in South Australia. Due to its specialised knowledge and capabilities in undertaking empirical modelling in local government policy settings, UTS Centre for Local Government would be well equipped to provide further advice about recommended research.

### 5.2.1 Empirical analysis of interjurisdictional efficiency

In order to expand upon findings of this report, there is also a need for interjurisdictional level efficiency analysis. This is because analyses of this sort can enable one to deduce how different policy settings translate into efficiency. Moreover, an evidence base of this sort will provide a ready refutation to uninformed claims regarding South Australian local government efficiency, such as those that appeared in the ACIL Allen (2016) report.

### 5.2.2 Empirical examination of rate-capping and local government efficiency

With the introduction of rate capping potentially starting soon in South Australia there is good reason to fully understand the implications of the policy and, moreover, how the effects manifest over time. This is because the immediate effects of rate capping are likely to be much different to the effects three or even five years later. For this reason, we would recommend the use of both difference-in-difference econometric analysis and DEA globally intertemporal analysis to be conducted within three years of implementation of the introduction of rate-capping in order to provide an evidence base for assessing the impact of the policy change. Pre-planning needs to occur to be able to do this kind of analysis and it may therefore be prudent to secure an appropriately qualified econometrician to commence data collection at an early stage if the policy is implemented.

### 5.2.3 Empirical examination of shared services and local government efficiency

There is a critical need for more empirical analyses and theorising to ensure that shared services do deliver efficiencies at the whole-of-local-government level. In some cases, evidence may inform re-configuration of some of the existing shared service arrangements to ensure that they occur in line with optimal functional size. The analysis in this report produced potentially surprising findings which suggest a need for further evidence-based research. Specifically, econometric analysis should be disaggregated to the type of shared service employed and variables should be introduced to account for the duration of the arrangement. In addition, functional level DEA will be able to pinpoint the functions most suitable for shared services and even be used to guide decision-making regarding the most suitable combination of shared service partners.

## 5.3 Summary of policy options for enhancing local government efficiency

In synthesising the results presented in this report and an analysis of the academic literature we present the following policy options:

- o There is little empirical evidence to suggest public policy interventions currently on the table are likely to decisively improve local government efficiency in South Australia.

- o There is evidence to suggest that wide-spread amalgamation may result in reductions in efficiency levels.

    - o There is a case that in some instances de-amalgamation may achieve cost savings, but only where councils have been constituted at an exceptionally large size.

- o An alternative instrument for reform may be the restructuring of wards.

- o Because this is as yet untested in South Australia, it is recommended that any proposal is empirically tested and that evidence informs such decision-making.

- o There is empirical evidence to suggest that shared services provisions may be associated with relatively lower levels of efficiency.

  - o It is recommended that additional analysis with an explicit focus on shared service arrangements is conducted, in order to identify the drivers of efficiency and inefficiency at the functional level. This will help ensure that councils fully realise the potential benefits of shared services.

- o There is little empirical literature to date that has associated rate-capping with efficiency gains.

  - o It is recommended that a robust evidence-base is established before, as well as during, any policy intervention of this sort.

    - ▪ In order to ensure that appropriate monitoring of policy performance takes place, it may be necessary to engage suitably qualified researchers early.

- o Economic theory offers insight to inform local government pricing, which can aid in efforts to enhance overall economic efficiency:

  - o Private goods produced by local government should be funded by fees that fully recoup costs.

  - o For merit goods and goods with positive externalities, pricing should be guided by means-testing principles and on the basis of need.

  - o Better targeting of *subsidium*, use of matching grants and use of co-production could also have a significant impact on municipal efficiency.

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