Capacity to contribute and school SES scores

March 2017
Background

This paper examines school Socio-Economic Status (SES) scores, which pay a critical role in the Australian Government’s school funding model – the Schooling Resource Standard (SRS) model. It is intended to initiate discussion on how SES scores might be improved or replaced.

In the SRS model, SES scores determine how much funding a non-government school is expected to raise privately to fund school operations, which is technically known as a school community’s “capacity to contribute”. SES scores carried over from the Government’s previous school funding model, even though both the funding model and the intended purpose of SES scores changed when the SRS model was introduced in 2014.

Perhaps recognising this issue, the Review of Funding for Schooling recommended that school SES scores be used only in the short term, with the Government advised to “commence work as a priority to develop, trial and implement a better measure of the capacity of parents to contribute in consultation with the non-government sectors”. ¹

This work remains outstanding.

In response, and with the next iteration of the SRS model currently under consideration, the Catholic Education Commission of Victoria (CECV) has undertaken its own analysis of school SES scores. The analysis draws on a wide range of evidence in an assessment of whether SES scores are a suitable measure of capacity to contribute in the SRS model. It identifies clear shortcomings and major areas of concern. Altogether it confirms the findings of the Review of Funding for Schooling that there is a need to develop a better measure of capacity to contribute. This should be a priority for the Australian Government in 2017, working with the Catholic and independent sectors.

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<th>Contacts</th>
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¹ Expert Panel (Gonski, Boston, Greiner, Lawrence, Scales, Tannock) 2011, Review of Funding for Schooling – Final Report, Canberra, December.
Executive Summary

This paper examines school Socio-Economic Status (SES) scores, which pay a critical role in the Australian Government's school funding model – the Schooling Resource Standard (SRS) model. It is intended to initiate discussion on how SES scores might be improved or replaced.

School SES scores are used within the SRS model to determine a school community’s “capacity to contribute” to each school’s resource benchmark. In simple terms, school SES scores set the amount of private income schools are expected to raise for operating purposes, which is deducted from base funding for each school. The expectation to raise private income applies only to non-government schools.

This function confers upon SES scores significant influence over the estimated ‘resource needs’ of non-government schools in the SRS model – and thus the funding they receive from the Australian Government. For most non-government schools, "capacity to contribute" is the single most important factor in the SRS model (after base funding).

Given this importance, it is critical that SES scores form a reliable measure of a school community’s capacity to contribute. This paper considers whether this is the case.

It finds there are major limitations with using SES scores to measure capacity to contribute. There are shortcomings and errors in how SES scores are currently calculated from Census data. However there are also issues with the Census data itself, which call into question whether it should be used at all to estimate capacity to contribute.

The paper further considers how the identified limitations with SES scores impact different types of families and non-government schools. It presents evidence that the limitations make SES scores biased in favour of high-income and affluent families. SES scores underestimate the financial means of these families. Conversely, they overestimate the financial means of lower and middle income families. The practical impact on non-government schools is that independent schools (especially high-fee independent schools) appear to benefit from SES scores while Catholic schools (and probably low-fee independent schools also) appear to be disadvantaged.

This pattern of impacts undermines claims the SRS is truly needs-based for non-government schools. Accordingly there is a need to develop a new measure of capacity to contribute in the SRS model.
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1. Introduction

School SES scores are used within the Australian Government’s school funding model (the Schooling Resource Standard (SRS) model) to determine a school community’s “capacity to contribute” to each school’s resource benchmark. In simple terms, school SES scores set the amount of private income schools are expected to raise for operating purposes, which is deducted from base funding for each school. The expectation to raise private income applies only to non-government schools.

This function confers upon SES scores significant influence over the estimated ‘resource needs’ of non-government schools in the SRS model – and thus their funding allocation from the Australian Government. This is because, for most non-government schools, “capacity to contribute” is the single most important factor in the SRS model (after base funding).

From SES scores, the Australian Government assumes Catholic school families across Australia will contribute over $1.7 billion per annum toward school operating costs. The estimated need of Catholic schools for public funding is reduced commensurately. In 2016, each 1 point decrease in SES score increases the amount of public funding a non-government secondary school is estimated to need by $287 per student. For Catholic systems, small changes in their weighted average SES score can have very large financial impacts. If the Catholic Education Commission of Victoria (CECV) average SES score (100.66, which is rounded to 101) decreased by 0.2 points, for example, the CECV would have received $6 million more funding from the Australian Government in 2016.

Given this importance, it is critical that SES scores form a reliable measure of a school community’s capacity to contribute. This paper considers whether this is the case. It proceeds as follows:

- Section 2 explains how school SES scores are calculated
- Section 3 identifies the role of “capacity to contribute” in the SRS model
- Section 4 details the limitations of SES scores as a measure of the capacity to contribute of school communities
- Section 5 considers the implications of this report and future directions.

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2 The SRS model can also be considered a “system” funding model for Catholic and government systems, since funding outcomes are calculated at the system level and funding is provided as a block to system authorities. For Catholic systems, the applicable SES score is the system average score (weighted by enrolments in each systemic school). For simplicity, throughout this paper, the SRS model is described as a school funding model.

3 This applies for school SES scores in the range of 93 and 125 (which includes the vast majority of non-government schools).
2. How are school SES scores calculated?

School SES scores were created in 1998-99, following a review of the Education Resource Index (ERI). They were designed to substitute for the ERI “as a mechanism for assessing the relative need of non-government schools for Commonwealth funding”. At this time there was limited information on the characteristics of student populations in schools. Upon their development SES scores were an innovative approach to better understand these characteristics.

SES scores provide a portrait of the student population at a school using an “area based” or “indirect” approach to collecting student data. This means that student attributes are inferred from the areas in which students reside, not the actual characteristics of each student. The key “area unit” used to calculate SES scores is the Statistical Area 1 (SA1). SA1s are the smallest geographical unit used by the Australian Bureau of Statistics (ABS) for the processing and output of data from the Census of Population and Housing. There are 54,805 SA1s covering the whole of Australia (without overlaps or gaps) and on average they have a population of approximately 400 people.

SES scores are constructed through a number of steps, using student residential address data from schools and SA1 data from the Census. Students are assigned individual scores based on their SA1. Schools are assigned an aggregate score based on the average scores their students. The methodology is summarised in Figure 1. The higher a school SES score, the more advantaged its school community is estimated to be.

**Figure 1: Methodology for constructing school SES scores**

SES scores are constructed from four dimensions:

- Education
- Occupation
- Family Income
- Household Income

Scores are based on responses to various Census questions within each SA1.

Scores for each dimension are 'standardised' with mean of 100 and standard deviation of 15

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5 Prior to the 2011 Census, the relevant area unit was the Collection District. SA1s replaced Collection Districts in the 2011 Census.
6 ABS 2011, *Statistical Geography Fact Sheet: Statistical Area Level 1*
• Occupation
• Family income\(^7\) (derived from families with dependent children only)
• Household income.

Each SA1 in Australia receives a score for each of these dimensions (except where data is not available). The scores that SA1s receive are constructed so that they have a mean of 100 and a standard deviation of 15. Schools receive an average score for each dimension, from the SA1s of their students, and then an overall dimension-weighted-average SES score.

SA1 scores are calculated using a Principal Components Analysis model.

For the education and occupation dimensions, several variables are used to determine the scores that SA1s receive. The impact of each variable (or “component”) on a dimension score is known as its “eigenvector”, which is similar to a loading. The most important variables (reflected by the size of their eigenvalues) are:

• Occupation dimension factors (with eigenvalues)
  o Percentage of male employed persons employed as operators/drivers (-0.3642)
  o Percentage of total workforce employed as labourers (-0.3527)
  o Percentage of female employed persons employed as professionals (+0.3880)
  o Percentage of male employed persons employed as professionals (+0.3892)

• Education dimension factors (with eigenvalues)
  o Percentage of people aged over 15 who have no qualifications (-0.4935)
  o Percentage of people aged over 15 who left school in year 9 (-0.4522)
  o Percentage of people aged over 15 who are tertiary students aged 15-24 (0.4020)
  o Percentage of people aged over 15 who have a diploma/degree or higher (0.5373).

Thus factors may have a positive or negative impact on dimension scores. The variables used to calculate scores for the occupation and education dimensions have barely

\(^7\) Note that the family income dimension is calculated from a subset of the sample used to calculate the household income dimension. The family income dimension is based only on households with families with dependent children. This means it is better-targeted to the needs of the SRS model, however, it also reduces the number of observations available to derive estimates.
changed since SES scores were created (with most changes due to changes in Census classifications).

For the family income and household income dimensions, the scores are based on simple income thresholds (see Table 1). SA1s are scored from the percentages of families/households within them that have incomes below (negative impact on score) and incomes above (positive impact on score) certain thresholds. The thresholds have been updated each Census for income growth.

Table 1: Thresholds used to calculate SA1 scores for the income dimensions

<table>
<thead>
<tr>
<th>Measure</th>
<th>2011 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Household income</strong></td>
<td></td>
</tr>
<tr>
<td>Percentage of households with incomes below…</td>
<td>$65,000</td>
</tr>
<tr>
<td>Percentage of households with incomes above…</td>
<td>$143,000</td>
</tr>
<tr>
<td><strong>Family income</strong></td>
<td></td>
</tr>
<tr>
<td>Percentage of families with incomes below…</td>
<td>$65,000</td>
</tr>
<tr>
<td>Percentage of families with incomes above…</td>
<td>$156,000</td>
</tr>
</tbody>
</table>


It is unclear why the education and occupation dimensions are each weighted at one-third, and the income dimensions each weighted at one-sixth, when school SES scores are calculated. These weightings are more or less arbitrary.

In summary, the key attributes of SES scores that are relevant to this paper are:

- SES scores are based on the characteristics of the local area (SA1) in which a student lives, not the actual characteristics of each student
- SES scores measure education levels and occupation types in SA1s, as well as family and household incomes
- SES scores are based on data collected in the Census of Population and Housing.
3. “Capacity to contribute” in the Schooling Resource Standard funding model

In the SRS model, the intent of “capacity to contribute” is very clear:

*Capacity to contribute reflects the idea that some parents and school communities are more able than others to contribute financially to their school’s operating costs.*

Similarly, the Review of Funding for Schooling defined “capacity to contribute” as the “anticipated capacity of parents enrolling their children in the [non-government] school to contribute financially towards the school’s resource requirements.”

Thus capacity to contribute is intended to measure the capacity of student families to make a financial contribution to the school. It is supposed to be a financial “means test” of student families.

Comparable “means tests” are required for government funding in a range of other areas in social policy. Examples include the aged pension, unemployment benefits, the private health insurance rebate, family tax benefits, and childcare benefits. All of these involve targeting Australian Government payments to members of the community who are assessed to have the greatest need. Thus they have the same high-level objective as needs-based funding in schooling.

Conceptually, there is no overlap between capacity to contribute and other factors in the SRS model, such as the loading for low socio-economic status (low SES) students. Those other factors estimate school needs based on characteristics that might inflate school costs (school size, school location) or increase student learning challenges. They do not consider the financial means of student families to contribute toward school operating costs. This is the unique and sole purpose of capacity to contribute.

Furthermore, the SRS model contains 66 discrete levels of private income that schools can be expected to raise for each student, under the way capacity to contribute is currently calculated from school SES scores (Figure 2). This is a fine-grained calculation. To have integrity, the careful and nuanced escalation in capacity to contribute levels shown in Figure 2 requires an underlying parameter that measures the capacity to contribute of school communities with some precision.

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8 Australian Government, *Guide to the Australian Education Act 2013*
10 The full set of factors are the two school loadings (school size and school location) and four student loadings (students with disability, Indigenous students, low-socio-economic status students, and students with low English proficiency).
11 This amount varies with the school SES score and whether a student is a primary student or a secondary student.
Figure 2: The capacity to contribute function in the SRS model for 2016

Source: Derived from the Australian Education Act 2013
4. Limitations of school SES scores as a measure of capacity to contribute

Under current arrangements, a school SES score “aims to measure the capacity of the school’s parent community to financially support the school”. However SES scores have major limitations when applied for this purpose. In fact, school SES scores are probably the worst means-test applied in government policy anywhere in Australia.

This section details the major limitations with SES scores as a measure of capacity to contribute. These limitations are wide-ranging. In this section they are grouped into two high-level categories:

- Problems with how SES scores are currently calculated (section 4.1)
- Problems with the use of Census data to estimate capacity to contribute (section 4.2).

Data is also presented to highlight how the limitations with SES scores impact different types of families and non-government schools. Among non-government schools, data is shown comparing Catholic schools to other types of non-government schools (referred to as independent schools). While this simple distinction aligns with how Census data is collected, there is considerable diversity within each sector meaning that the general findings will not apply to each individual school within each sector. For example, it is likely that SES scores impact low fee (non-Catholic) religious independent schools in a similar way to Catholic schools.

4.1 Problems with how SES scores are currently calculated

This section details a number of problems with SES scores, as currently calculated, as a measure of capacity to contribute. Specifically:

- The education and occupation dimensions in SES scores are not relevant to capacity to contribute (section 4.1.1)
- The education and occupation dimensions in SES scores overlap with other factors in the SRS model (section 4.1.2)
- There is no consideration of family/household wealth in SES scores (section 4.1.3)
- Nil and negative income households are misclassified in the family and household income dimension scores (section 4.1.4)
- There is no consideration of family/household size in SES scores (section 4.1.5).

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12 In the Census, household members are asked whether children in the household attend a government school, a Catholic school, or an “other” non-government school.
4.1.1 The education and occupation dimensions in SES scores are not relevant to capacity to contribute

A major shortcoming of SES scores as a measure of capacity to contribute is that they include education and occupation dimensions. These make up two-thirds of SES scores but they are not directly relevant to assessments of the financial means of student families. None of the “means tests” involved in comparable areas of social policy take into consideration ‘education’ or ‘occupation’ variables.

It has been argued that the education and occupation dimensions are closely correlated to the two income dimensions.\textsuperscript{13} However, the correlation between income and education, and between income and occupation, is typically low for individual-level measures. Data collected in the Longitudinal Study of Australian Children shows, for example, the correlations at the individual-level between income and education, and between income and occupation, are between 0.3 and 0.4.\textsuperscript{14} Data on the scores that SA1s receive for these dimensions across Australia shows stronger correlation – although the scores that SA1s receive can differ significantly (Figure 3).\textsuperscript{15}

\textsuperscript{13} For example, see Department of Education, Training and Youth Affairs 1998, Schools Funding: SES Simulation Project Report, Commonwealth of Australia, Canberra.

\textsuperscript{14} Marks, G.N. (2016) “Is SES really that important for education outcomes in Australia? A review and some recent evidence”, The Australian Education Researcher, December 2016

\textsuperscript{15} The correlation coefficient between SA1 scores for the family and household income dimensions (average) and the education and occupation dimensions (average) is 0.75.
The data in Figure 3 shows that including the occupation and education dimensions do not always validate SA1 scores for the income dimensions. In many SA1s these scores are materially different.

As a result, for many Catholic schools in Victoria, there are significant differences between the scores that schools receive for the education and occupation dimensions, and the scores they receive for the family and household income dimensions.

Figure 4 plots the scores that Catholic systemic schools in Victoria would have received from 2014 to 2017 if:

- SES scores were based on the education and occupation dimensions (average)
- SES scores were based on the family and household income dimensions (average).

The overall correlation between scores, at the system level, is strong. Yet of the 486 applicable schools, only 27 receive the same scores for the education and occupation dimensions (averaged) and the family and household income dimensions (averaged). For 195 schools (40% of the total), the difference in scores is 5 points or greater. Moreover, 25 schools (5%) have a difference in scores of at least 10 points.

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16 The correlation coefficient is 0.89.
17 This excludes special schools and special assistance schools, which do not receive SES scores.
These differences have important consequences for school funding. In the SRS model in 2016, a 5 point change in school SES scores can change a secondary school’s estimated need for public funding by up to $1,435 per student.

4.1.2 The education and occupation dimensions in SES scores overlap with other factors in the SRS model

A further issue with the education and occupation dimensions in school SES scores is that these overlap with factors in the ‘low SES’ loading in the SRS model. The low SES loading applies to students assessed to be in the lowest two quartiles of socio-educational advantage (SEA) in Australia.

The SEA measure includes very similar input measures to the education and occupation dimensions in SES scores.

The data inputs are compared in Table 2. While there is considerable overlap, there are two critical distinctions between the datasets. First, the SEA data is, in most cases, collected directly from student families whereas in SES scores student characteristics are implied from SA1s. Second, the SEA data has been constructed and calibrated to model student achievement in NAPLAN, whereas the basis for the calculation methodology used in SES scores is unclear. Accordingly the SEA data is more accurate and rigorous.
Table 2: Overlaps in school SES scores and school SEA data

<table>
<thead>
<tr>
<th>Socio-Economic Status (SES) scores</th>
<th>Socio-educational advantage (SEA) data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education variables</strong></td>
<td></td>
</tr>
<tr>
<td>Key variables within each SA1:</td>
<td>Parental school education</td>
</tr>
<tr>
<td>% of people aged over 15 who have no qualifications</td>
<td>• Year 9 or equivalent</td>
</tr>
<tr>
<td>% of people aged over 15 who left school year 9</td>
<td>• Year 10 or equivalent</td>
</tr>
<tr>
<td>% of people aged over 15 who hold a trade qualification</td>
<td>• Year 11 or equivalent</td>
</tr>
<tr>
<td>% of people aged over 15 who are tertiary students aged 15-24</td>
<td>• Year 12 or equivalent</td>
</tr>
<tr>
<td>% of people aged over 15 who have a diploma/degree or higher</td>
<td>Parental non-school education</td>
</tr>
<tr>
<td></td>
<td>• No non-school education</td>
</tr>
<tr>
<td></td>
<td>• Certificate I-IV inc. trade certificate</td>
</tr>
<tr>
<td></td>
<td>• Advanced diploma/diploma</td>
</tr>
<tr>
<td></td>
<td>• Bachelor degree or above</td>
</tr>
<tr>
<td><strong>Occupation variables</strong></td>
<td></td>
</tr>
<tr>
<td>Key variables within each SA1:</td>
<td>Parental occupations</td>
</tr>
<tr>
<td>% of total workforce employed as labourers</td>
<td>• Machine operator</td>
</tr>
<tr>
<td>% of male employed persons employed in trades</td>
<td>• Tradesperson/clerk/sales</td>
</tr>
<tr>
<td>% of male employed persons employed as managers</td>
<td>• Professional/manager</td>
</tr>
<tr>
<td>% of female employed persons employed as professionals</td>
<td>• Senior manager</td>
</tr>
<tr>
<td>% of male employed persons employed as professionals</td>
<td>Parental non-paid occupations</td>
</tr>
<tr>
<td></td>
<td>• In non-paid occupation</td>
</tr>
<tr>
<td></td>
<td>• In paid occupation</td>
</tr>
</tbody>
</table>


It is important to emphasise that the low SES loading and capacity to contribute are distinct concepts, which are both valid inclusions in the SRS model. It is the way SES scores are estimated which causes overlaps. The duplication in education and occupation variables, between the low SES loading and school SES scores, means that these have excessive influence on the funding outcomes the SRS generates for non-government schools. Meanwhile, the impact of financial factors (which should be the main focus of SES scores) is reduced.

4.1.3 There is no consideration of family/household wealth in SES scores

The family and household income dimensions in SES scores are the only components that actually target the core focus of capacity to contribute – the financial means of schools communities. These dimensions, unlike the education and occupation dimensions, are directly relevant to capacity to contribute.
There remain significant shortcomings with the family and household dimensions as a measure of capacity to contribute, however.

A ‘fit for purpose’ measure of capacity to contribute would take into account all of the financial means available to student families to contribute to school costs. This would include both income and wealth. Means tests in related policy areas – which also seek to target Australian Government payments to those who have the greatest need – include assessments of wealth. For example:

- To be eligible for the full pension, from 1 January 2017, applicants may only hold assessable assets\(^{18}\) of up to a maximum of $575,000. Higher threshold values apply for the part pension.
- Eligibility for a Newstart allowance depends on an asset test, with a maximum value\(^{19}\) of $575,000 used to determine eligibility.

In contrast, the family and household income dimensions omit consideration of family/household wealth. This omission has two major impacts. These relates to the interactions of wealth with demographic and socio-economic factors.

First, it disadvantages younger parents/carers and advantages older parents/carers. This is because household wealth accumulates strongly with age, whereas household incomes only grow modestly (Figure 5).\(^{20}\)

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\(^{18}\) This threshold applies for non-home owners (couples). Lower thresholds apply for home-owners and singles.

\(^{19}\) This threshold applies for non-home owners (couples). Lower thresholds apply for home-owners and singles.

\(^{20}\) Note that Figure 5 also suggests that parental capacity to pay school fees is lower for primary school students than secondary school students, because they are likely to be younger.
Second, it advantages parents with high incomes over other parents. This is because household wealth is more unequally distributed than household income (Figure 6). Whereas households with high incomes have 48.5% of total income, they have 62.1% of total wealth. If household wealth were included in capacity to contribute calculations then high-income households would be expected to contribute more than they currently are (relative to other households).
4.1.4 Families and households with nil or negative incomes are misclassified

A further shortcoming with the family and household income dimensions is that families and households with an income that is “nil” or “negative” are misclassified in the current methodology. These are treated as part of the low-income cohort and have a negative impact on the dimension score calculated for each SA1.

This approach misclassifies these families/households. The ABS examined the characteristics of people living in households that report nil or negative income and reported as follows:21

For these households, we looked at a number of Census variables including the number of vehicles, household mortgage repayments, and highest level of educational attainment. In all the analyses, it was observed that people living in households with nil or negative income tended to have more similar characteristics to those living in higher income households.

The ABS also examined the data at an area level, and found that the proportions of nil or negative income households are not a good indicator of disadvantage at an area level.22

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21 ABS 2013, Census of Population and Housing: Socio-Economic Indexes For Areas (SEIFA), Australia 2011, Cat no 2003.0.55.001
22 ABS 2013, Census of Population and Housing: Socio-Economic Indexes For Areas (SEIFA), Australia 2011, Cat no 2003.0.55.001
Although the number of families reporting nil or negative income is not large overall (1.2% of usable observations on family income), in some SA1s the percentage of families reporting nil or negative income is material. For example, in almost 10% of SA1s across Australia, the percentage of families reporting nil or negative incomes was greater than 5% of usable observations. If these families were treated as high-income households rather than low-income households, consistent with the observations of the ABS, this would change the scores received by these SA1s materially.

4.1.5 There is no consideration of family/household size in SES scores

The SRS model is built on student-level data. Funding calculations primarily reference the characteristics of the students at each school or in each school system (where relevant). This is the correct approach and integral to the aspirations of a student-centred, needs-based funding model.

It follows that the calculation of capacity to contribute should be based on each family’s capacity to contribute to the cost of educating each student. Like other variables in the SRS model there should be a student focus.

The current way capacity to contribute is measured is not student-focussed. Instead, the income dimensions have a family/household focus. They do not consider the number of students in each family/household, which the family/household income must support.

The ABS recognises that the income that households need to support the same standard of living grows with the size of the household:

> It would be expected that a household comprising two people would normally need more income than a lone person household if the two households are to enjoy the same standard of living.

To make comparisons between household incomes, the ABS has therefore developed an ‘equivalised’ household income measure that adjusts for household size:

> Equivalised total household income can be viewed as an indicator of the economic resources available to each individual in a household…

> Equivalised total household income is household income adjusted…to facilitate comparison of income levels between households of differing size and composition, reflecting that a larger household would normally need more income than a smaller household to achieve the same standard of living…

This concept is directly relevant to the calculation of capacity to contribute in the SRS model. Families with a large number of children have less capacity to contribute to school costs per-student than families with the same income but fewer children. The failure of

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23 This percentage excludes observations of “partial income stated”, “all incomes not stated” and “not applicable”.
24 ABS 2013, Household Income and Income Distribution, Australia, 2011-12, Cat no. 6523.0
25 ABS 2011, Census Dictionary, Cat no. 2901.0
the current approach to take into account family size disadvantages large families over small families. As it turns out, this also benefits high-income families. These families tend to have fewer dependent children than other families, on average (Figure 7).

**Figure 7: Average number of dependent child by family income**

<table>
<thead>
<tr>
<th>Annual family income</th>
<th>Average number of dependent children</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=$65,000</td>
<td>1.98</td>
</tr>
<tr>
<td>$65,000 to $130,000</td>
<td>1.93</td>
</tr>
<tr>
<td>$130,000 to $182,000</td>
<td>1.93</td>
</tr>
<tr>
<td>&gt;$182,000</td>
<td>1.82</td>
</tr>
</tbody>
</table>

*Only includes couple families with dependent children. Excludes families with nil or negative income. Excludes single-parent families because of the shortcomings in the way the Census estimates family incomes for these types of families (section 4.2.4).*

Source: ABS 2011, Census of Population and Housing: Expanded Community Profile, Australia

**4.2 Problems with the use of Census data to estimate capacity to contribute**

Setting aside problems with current calculations of SES scores (section 4.1), there are major issues with using Census data to estimate capacity to contribute. As discussed below, the problems are that:

- Area-level data misclassifies individuals and families (section 4.2.1)
- A lack of observations greatly limits the reliability and usefulness of income data from the Census (section 4.2.2)
- The infrequent collection of Census data means it can quickly become out of date (section 4.2.3)
- The collection of income data in household units can be misleading (section 4.2.4).

These issues call into question whether Census data should be used at all to estimate capacity to contribute.
4.2.1 Area-level data misclassifies individuals and families

The SES estimation methodology assigns to each student in non-government schools the dimension scores for the SA1s in which they reside. It uses area-level data for students rather than individual or personal data.

This “area-level” approach leads to risks relating to “the ecological fallacy”. This is defined by the ABS as follows:26

*If inferences are made about these individuals based purely on the characteristics of the area in which they live, they could be misleading and there is potential for error in any conclusions – this is referred to as the ecological fallacy.*

The ABS has explored this risk and concluded that a large portion of the 15-64 year old population live in areas that have different average characteristics to those observed at the individual level.27 In other words, area-level data is not accurate for many individuals.

Figure 8 is instructive. It shows that the individuals within Collection Districts (CDs) can be highly diverse. Data from the 2006 Census on the socio-economic status of individuals is matched against data on the socio-economic status of the CDs in which they reside.29 For simplicity, individuals and CDs are placed into three groups – deciles 1-3 (most disadvantaged), deciles 4-7 (middle) and deciles 8-10 (most advantaged).

Figure 8 shows that 55% of individuals in CDs that are rated as advantaged are not advantaged. Similarly, 50% of individuals residing in CDs rated as disadvantaged are not disadvantaged. With these simple groupings, the area-level data misclassifies individuals at least 50% of the time.

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28 Collection Districts were the predecessor the SA1s, as the smallest geographic unit for which Census data is processed and published, and were used up to the 2006 Census.
29 The measure of socio-economic status used by the ABS to generate the data in this figure is the Socio-Economic Indexes For Areas (SEIFA), Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD). This is broadly similar to the methodology used to calculate SES scores for SA1s.
In simple terms, Figure 8 shows that area-level data is frequently inaccurate for individuals and should not be used for this purpose (including as part of estimating school SES scores). Specifically, the ABS has concluded that:30

*Using an area-level indicator of socio-economic disadvantage will not be a good proxy for the socio economic status of many of the individuals and families living within that area. Because of this, analyses which use SEIFA indexes…as a proxy for family and individual socio-economic status will be at high risk of an ecological fallacy.*

Accordingly the ABS cautions against using its area-level indexes to classify families and individuals:31

*The indexes are assigned to areas, not individuals…When area level indexes are used as proxy measures of individual level socio-economic advantage and disadvantage, many people are likely to be misclassified.*

When all families within a SA1 are assumed to be the same, this benefits the most affluent families and individuals in each SA1 and disadvantages the poorest. Both are

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31 ABS 2013, *Census of Population and Housing: Socio-Economic Indexes For Areas (SEIFA), Australia 2011*, Cat no 2003.0.55.001
wrongly assumed to have the average characteristics of their SA1. Thus the way that area-level data misclassifies families and individuals is regressive within SA1s.

This concern is compounded when area-level data is used to estimate the financial means of families in non-government schools.

In economic parlance, schooling is a “normal good”. Household expenditure on schooling increases significantly with income (and wealth) – see Figure 9. The most affluent households tend to spend much more on schooling than other families.

**Figure 9: Expenditure on schooling by income and wealth**

![Expenditure on schooling by income and wealth](image)

*Source: ABS 2011, Household Expenditure Survey, Australia: Detailed Expenditure Items, 2009-10, Cat no. 6530.0*

Moreover, there is considerable diversity among non-government schools in parental fees and charges. In average per-student terms, fees and charges in Catholic schools are much lower than in independent schools – in both primary and secondary schools (Figure 10).
The overall result of these forces is that the most affluent families – which greatly benefit from the use of area-level data relative to their true circumstances – are not evenly spread across non-government schools. Rather, family types within non-government schools tend to be stratified by school fees and charges. The most affluent families tend to be concentrated in the non-government schools with the highest fees and charges. As these families are all advantaged by the use of area-level data, this means that the overall advantage from area-level data coalesces in the non-government schools with the highest fees and charges. Most families using these schools would be misclassified by area-level data in a way that underestimates their true financial means. The misclassifications of families from using area-level data are highly unlikely to ‘even out’ between non-government schools.

The major beneficiaries of “the ecological fallacy” that affects school SES scores are therefore likely to be high-fee non-government schools. These schools are overwhelmingly independent schools. Consequently Catholic schools (and probably low-fee independent schools also) are likely to be disadvantaged.

This argument is supported by the available data. Figure 11 reports on a comparison of family incomes within SA1s by school sector (Catholic or independent). Within each jurisdiction, data is shown on the percentage of SA1s in which families using Catholic schools have lower and higher average incomes than families using independent schools.
The data is restricted to SA1s in metropolitan areas.32 While there are major problems with the data on incomes collected in the Census (section 4.2.2), the findings of Figure 11 are nonetheless telling. In all states and territories, in the majority of SA1s in metropolitan areas, families using Catholic schools have lower average incomes than families using independent schools.

Overall, across Australia, families using Catholic schools have lower average incomes than families using independent schools in 56% of SA1s in greater metropolitan areas. This is not an anomaly from the 2011 Census. In the 2006 Census (processed for Collection Districts rather than SA1s), the respective figure was 59%.

Figure 11: Comparison of family incomes within SA1s by school sector*

![Graph showing comparison of family incomes by school sector in SA1s in greater metropolitan areas, by jurisdiction (2011)](image)

*The comparison of family incomes is restricted to SA1s in greater metropolitan areas, in which there are both families using Catholic schools and families using independent schools. There are a small number of SA1s in which the average incomes of both family types are equal.

Source: ABS 2011, Census of Population and Housing (unpublished data)

Figure 11 shows that Catholic schools tend to be disadvantaged, on average, by area-level data. Whereas the use of area-level data assumes that students in Catholic schools and students in independent schools who live in the same SA1 have the same financial means, in truth, the student in the independent school usually comes from a higher income family in that SA1.

32 About 80% of students in non-government schools come from greater metropolitan areas, so these are the most relevant SA1s for comparisons of family income between Catholic and independent schools within SA1s.
The bias appears to be greatest in SA1s in affluent areas. Figure 12 compares family incomes within SA1s by school sector (Catholic or independent) in affluent parts of Melbourne and Sydney. In these locations, the average income of families using Catholic schools is lower than the average income of families using independent schools in up to 69% of SA1s. The assumption that students who live in the same area have the same financial means, irrespective of the type of non-government school they attend, is most untenable in these areas.

**Figure 12: Comparison of family incomes within SA1s by school sector***

The inference from Figure 11 and Figure 12 is that area-level data underestimates the financial means of families in independent schools, and overestimates it in Catholic schools. To test this directly, we would need to compare an area-level measure of the financial means of student families in non-government schools against the same measure derived at the student-level. Unfortunately neither dataset currently exists. As a proxy it is possible, however, to compare an area-level measure of socio-economic advantage (school SES scores) and a student-level measure of socio-educational advantage (SEA) in non-government schools. While school SES scores and student SEA data are not directly comparable, these are the only readily-available datasets which can provide insight on this issue.

Figure 13 contains this comparison. The percentages of students from the top SEA quartile are shown for Catholic and independent schools, for schools within narrow bands for school SES scores. Within every school SES score band – where area-level data

*The comparison of family incomes is restricted to SA1s in which there are both families using Catholic schools and families using independent schools. There are a small number of SA1s in which the average incomes of both family types are equal.

*Source: ABS 2011, Census of Population and Housing (unpublished data)*
suggests Catholic and independent schools are similar—there are more students from the top SEA quartile in independent schools than there are in Catholic schools. In other words, Figure 13 indicates the area-level data (SES scores) underestimates student advantage in independent schools relative to Catholic schools. This is the pattern that we would expect to observe from the data in Figure 11 and Figure 12. The consistent message is that the area-level data is biased in favour of independent schools.

Figure 13: Students in the top SEA quartile by school sector by school SES score

Data only includes non-government schools for which SEA quartile data and school SES scores are available for 2014.

Source: ACARA MySchool datasets (SEA data) and the Australian Government Department of Education and Training (school SES scores)

4.2.2 A lack of observations greatly limits the reliability and usefulness of income data from the Census

There are major limitations with how data on incomes is collected in the Census, and then processed and published. Ultimately this means that the data on incomes is not reliable the level of granularity required for the SRS model.

In the Census, respondents are asked to indicate their income according to a number of income bands. The ABS subsequently generates estimates of family and household income from this data. For the 2011 Census, the ABS used 20 different income bands for reporting family and household income (including “nil income”, “negative income”, “not applicable”, “partial incomes stated” and “all incomes not stated”). The highest income band was $5,000 per week ($260,000 per annum) or higher (see Figure 14).
There is a very high level of non-response to questions on income in the Census. On the 2006 Census, for example, the Commonwealth Grants Commission observed that:33

11% of the population live in households where one or more members of the household did not state their income, and so total household income could not be derived. Another 9% of the population spent census night away from home, or in non-private dwellings such as hostels, prisons or hospitals and could not have household income derived.

Partly for this reason, when income data is aggregated to the SA1 level, the number of observations within each income bands can be very low. This is especially true for incomes bands at the top of the range. To illustrate, with respect to family income, in the 2011 Census:

- In 82% of SA1s, there were 0-4 families in the top income band (i.e. families with incomes of $260,000 per annum or higher)
- In 68% of SA1s, there were 0-4 families in the top two income bands combined (i.e. families with incomes of $208,000 per annum or higher)
- In 55% of SA1s, there were 0-4 families in the top three income bands combined (i.e. families with incomes of $182,000 per annum or higher.

When there are few observations the ABS edits data to ensure confidentiality. For example, if a SA1 has one observation for a single income band, before the data is released (including before the data is used to calculate school SES scores) the ABS changes this observation to zero or two. ABS edits have the biggest proportional impact when there are fewer than 10 observations in a SA1, and especially when there are fewer than 5 observations.

Accordingly Census data on high-income families (e.g. families with incomes of $260,000 per annum or higher) is unreliable in most SA1s – because it is eligible for editing…but may or may not have been edited. In other words, the data on incomes from the Census cannot be used to detect high-income families.

The data can become more reliable when it is aggregated for several income bands within each SA1. This occurs under the current methodology for calculating the family and household income dimensions. As discussed earlier, this methodology applies two simple thresholds for each income dimension. The low income threshold ($65,000 for both household income and family income) aggregates observations for 9 bands, while the high income threshold ($143,000 for households, $156,000 for families) aggregates observations for 5 bands (households) / 4 bands (families). The thresholds are shown in Figure 14.

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Yet major problems remain under this approach.

First, it does not resolve the initial problem (of few observations, meaning the data is unreliable) in many SA1s. This is highlighted in Table 3 with reference to family income data. In almost 36% of SA1s, there are 0-4 observations of family income being above the threshold of $156,000. Despite the grouping of several income bands this data remains unreliable. ABS edits have a significant bearing on the proportion of high-income families assessed to reside in these SA1.

Table 3: SA1s with limited data on middle and high-income families

<table>
<thead>
<tr>
<th>Measure</th>
<th>Number</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total SA1s in Australia</td>
<td>54,796</td>
<td></td>
</tr>
<tr>
<td>SA1s with 0-4 observations of family income &gt;= $156,000 per annum</td>
<td>19,573</td>
<td>35.7%</td>
</tr>
<tr>
<td>SA1s with 0-9 observations of family income &gt;= $156,000 per annum</td>
<td>29,032</td>
<td>53.0%</td>
</tr>
</tbody>
</table>

Source: ABS 2011, Census of Population and Housing: Family income by Statistical Area 1

Second, this approach makes the way capacity to contribute is measured very crude and thus inequitable. The family and household income dimensions only take into account the percentages of families/households whose incomes are below and above two thresholds. All families that are above (or below) the thresholds are treated the same, even though their incomes can be vastly different. For example, families with incomes above $260,000 (the highest income band) are treated the same as families with incomes of $156,001. Yet, obviously, these families do not have the same capacity to contribute. As the Census data cannot be used to detect high-income families within SA1s, the current methodology does not distinguish between them and middle-income families.
This might not be a problem if there was a strong correlation within each SA1 between the percentage of families with incomes above $156,000 or above and the percentage of families with incomes of $260,000 or above. In this case the former variable would still provide an accurate guide on the latter variable – the grouping of incomes bands under the current methodology would not serve to "hide" high-income families.

But, as Figure 15 shows, the correlation between these two variables is not strong\(^{34}\). There are many SA1s which have the same percentage of families with incomes of $156,000 or greater, but vastly different percentages of families with incomes of $260,000 or greater. Thus the former percentage is not a strong guide to the percentage of very-high income families in each SA1. Families with the highest incomes are not accurately captured.

**Figure 15: Correlation between family income variables by SA1**

Note: Due to data reliability issues, this figure only includes SA1s with 5 or more observations of families with incomes of $260,000 per annum or above (number of SA1s = 6,744)

Source: ABS, Census of Population and Housing 2011: Family income by Statistical Area 1

Due to this issue the correlation between the scores that SA1s receive for the family income dimension, and the percentage of families in each SA1 with incomes above $260,000 per annum, is modest\(^{35}\) (Figure 16). As seen in Figure 16, there are SA1s which receive a score below 100 for the family income dimension, even though more than 10% of families in that SA1 have incomes above $260,000 per annum. Conversely

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\(^{34}\) The correlation coefficient between these variables is 0.71.

\(^{35}\) The correlation coefficient between these variables is 0.55.
there are SA1s which receive a score above 130 but have less than 10% of families with incomes above $260,000 per annum.

**Figure 16: Family income dimension scores and high-income families by SA1**

Note: Due to data reliability issues, this figure only includes SA1s with 5 or more observations of families with incomes of $260,000 per annum or above (number of SA1s = 6,744)


This shortcoming is of fundamental concern. In the SRS model “capacity to contribute” only applies to non-government schools, which have many families with middle and above-average incomes (which is a predictable outcome given the requirement that students pay fees). It is therefore of paramount importance that the Census data on incomes is able to distinguish between families in this part of the income spectrum. Yet in most SA1s the data is unable to do this.

The main beneficiaries are high-income families and households – those with incomes well above the upper thresholds used to calculate SA1 scores.

These families favour independent schools over Catholic schools. Figure 17 presents data on families with incomes above $156,000 by school sector. The current approach for calculating the family income dimension in SES scores treats all families who have incomes above $156,000 the same. Yet:

- Most families who use Catholic schools who have incomes above $156,000 per annum have incomes between $156,000 and $182,000 (just above the threshold)
Most families who use independent schools who have incomes above $156,000 per annum have incomes above $182,000. In fact, almost 40% of these families have incomes above $260,000 (well above the threshold).

Thus the failure of the current approach to distinguish between families earning above $156,000 per annum appears to benefit independent schools at the expense of Catholic schools.

Figure 17: Percentage of families with incomes above $156,000 by school sector

There is a stark contrast between the way income data from the Census is translated into scores for the family and household income dimensions, and the way capacity to contribute is calculated from school SES scores. Whereas scores for the family and household income dimensions are based on only three income ranges within SA1s, the SRS model contains 66 discrete amounts\(^{36}\) of private income that schools can be expected to raise per-student (Figure 2). This fine-grained and highly targeted calculation of capacity to contribute only makes sense if the input data is similarly fine-grained. The way that income is measured in SA1s comprehensively fails this requirement.

4.2.3 The infrequent collection of Census data means it can quickly become out of date

The ABS conducts the Census of Population and Housing every 5 years. SES scores are then calculated and used for several years. For example, under current arrangements,

\(^{36}\) This amount varies with the school SES score and whether a student is a primary student or a secondary student.
SA1 dimension scores and school and system SES scores that were based on data from the 2011 Census will be used through to 2017.

By 2017, the data collected in the 2011 Census will be 6 years out-of-date. Yet the economic circumstances of communities can change dramatically within 6 years – particularly communities whose local economies are cyclical. Two notable examples are local economies that rely on mining and agriculture, where incomes are highly sensitive to world prices, weather and other forces that can be unstable and hard to predict.

The Western Australian economy is a case-in-point (Figure 18). At the time of the 2011 Census, WA was in the midst of the “mining investment boom” and the fastest growing state in Australia. In 2010-11 the WA economy grew by 10.4% compared to 3.2% for the rest of Australia. Because of this exceptional growth, using data from the 2011 Census, SA1s in WA were assigned an average score of 104 for the family and household income dimensions in SES scores. For the rest of Australia, the respective average was 99. SA1s in WA continue to carry these high scores, even though the WA economy is now experiencing a major economic downturn. In 2015-16, the WA economy contracted by 6.2% (compared to growth of 2.3% in the rest of Australia). The ongoing use of SES scores based on the 2011 Census data places non-government schools in WA at significant disadvantage.

Figure 18: Annual growth in State Final Demand, 2010-11 and 2015-16

The same issue is playing out on a smaller scale in many regional communities elsewhere in Australia. Economic circumstances in mining towns in Queensland, South Australia and New South Wales have changed since 2011 similar to WA. Victorian
communities that rely on the dairy industry are currently experiencing significant hardship. Whole milk powder prices have fallen by 20-30% since 2011, along with farmgate milk prices. Students from all of these communities bring outdated, inaccurate data on their family and household incomes into the calculation of SES scores for their non-government schools.

The forthcoming closure of the car industry will have a similar effect on communities throughout Adelaide, Melbourne and Geelong. Modelling by the Productivity Commission found that the closure of the car industry would cost up to 40,000 jobs. With the 2016 Census being carried out the year before all remaining car manufacturing plants close, it is highly likely that the data collected from affected areas will be inaccurate by the end of 2017. Ironically, new SES scores derived from this data are scheduled to determine school capacity to contribute from 2018.

4.2.4 The collection of data in household units can be misleading

The key unit of data collection in the Census of Population and Housing is the household. In calculating family incomes, the ABS refers to data collected from each household. To calculate family incomes, the ABS sums the income data collected from within each household from people who are part of the same family. The ABS does not include data from other households in this calculation.

The problem with this approach is that “capacity to contribute” should be based on the characteristics of both parents of each student. Both parents often contribute to school costs. Capacity to contribute should not be based only on the household in which the student resides.

The difference between these is most apparent when families are split between households, for example, when parents separate. For its income estimates, the ABS methodology treats these as separate families and separate households, even though both parents should be part of capacity to contribute calculations. For separated families, the ABS methodology therefore underestimates the true capacity of parents to contribute to schooling costs.

This is not a trivial point. There are many one-parent families in Australian households. Data from the 2011 Census shows 14.5% of households comprised one-parent families (Table 4). This is about one-third of the number of couple families with children in households. In total, in the 2011 Census, 11.7% of people aged 25 to 59 years were either divorced or separated.

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37 Productivity Commission 2014, *Australia’s Automotive Manufacturing Industry, Inquiry Report* No. 70, Canberra
Table 4: Household family composition in Australia

<table>
<thead>
<tr>
<th>Families in household</th>
<th>Family composition</th>
<th>Number</th>
<th>Share of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>One family in household</td>
<td>Couple family – no children</td>
<td>2,048,414</td>
<td>36.0%</td>
</tr>
<tr>
<td>One family in household</td>
<td>Couple family – with children</td>
<td>2,452,774</td>
<td>43.2%</td>
</tr>
<tr>
<td>One family in household</td>
<td>One parent family</td>
<td>825,539</td>
<td>14.5%</td>
</tr>
<tr>
<td>One family in household</td>
<td>Other family</td>
<td>95,744</td>
<td>1.7%</td>
</tr>
<tr>
<td>More than one family in household</td>
<td>All</td>
<td>261,591</td>
<td>4.6%</td>
</tr>
<tr>
<td>Not applicable*</td>
<td></td>
<td>3,077,216</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8,761,278</td>
<td></td>
</tr>
</tbody>
</table>

*This refers to data collected from people who were not in a household or in their own household on the night of the Census

Source: ABS 2011, Census of Population and Housing: Household family composition

4.3 Summary

This section has provided extensive detail on the limitations of SES scores as a measure of capacity to contribute in the SRS model.

There are major limitations in the way SES scores are calculated. The education and occupation dimensions in SES scores are not relevant and overlap with other factors in the SRS model. There is no consideration of family and household wealth. Families and households who claim to have a nil or negative incomes are wrongly treated as having low incomes. The methodology also overlooks family size, which is not consistent with a student-centred funding approach.

But the problems with SES scores extend beyond the estimation methodology. The source data itself is inadequate. The use of area-level data misclassifies students and their families. It is assumed that all students who attend non-government schools are representative of the area in which they live but the evidence, and common sense, says this is not true. The ways in which data on incomes is collected in the Census, and the overall lack of data, are simply not consistent with the needs or intent of the SRS model.

Many of the identified limitations with SES scores favour the same type of families. The families that benefit are high-income, affluent families. SES scores underestimate the “true” financial means of these families. The reasons are summarised in Table 5.

Table 5: Summary of issues with SES scores and their impact on schools

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impact on families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations with how SES scores are currently calculated</td>
<td>Favours high-income families (and disadvantages low-income families) because it reduces the influence of income on capacity to contribute calculations.</td>
</tr>
</tbody>
</table>
### Issue | Impact on families
--- | ---
Education and occupation dimensions overlap with other factors | Favours high-income families (and disadvantages low-income families) because it reduces the influence of income on capacity to contribute calculations.
There is no consideration of family/household wealth | Favours high-income families (and disadvantaged low-income families) because wealth is more concentrated in high-income families than is income.
Nil and negative income families/households are misclassified | Favours high-income families because some of these families are the ones that are erroneously classified as low-income families.
There is no consideration of family/household size | Favours high-income families because these families tend to have fewer children than other families.

| Limitations with the use of Census data to estimate capacity to contribute |
|---|---|
| Area-level data misclassifies individuals and families | Favours high-income families (and disadvantages low-income families) because, within each SA1, these are assumed to have the same capacity to contribute as other families in each SA1.
| A lack of observations greatly limits the reliability and usefulness of income data from the Census | Favours high-income families because, due to shortcomings in Census data, these cannot be reliably identified at the SA1 level so are treated the same as middle-income families.

In turn, the schools which attract high-income, affluent families benefit from the use of SES scores. As Figure 19 shows, within the non-government sector, these families are largely centred in independent schools. According to Census data:

- 5.3% of families using independent schools have incomes of $260,000 per annum or higher, compared to 2.1% of families using Catholic schools
- 9.7% of families using independent schools have incomes of $208,000 per annum or higher, compared to only 4.9% of families using Catholic schools
- 14.6% of families using independent schools have incomes of $182,000 per annum or higher, compared to only 8.4% of families using Catholic schools.

Consistent with other data presented throughout this section, it is highly likely that independent schools are advantaged, relative to Catholic schools, by the use of SES scores in the SRS model.
Figure 19: Family incomes by school sector

Note: families with “nil” or “negative” incomes, families where partial incomes were stated, and families where all incomes were not stated are not shown (hence the figures do not sum to 100%)

Source: ABS 2011, Census of Population and Housing (unpublished)
5. Implications and future directions

The research contained in this paper has important implications for the SRS funding model. The SRS model is intended to fund schools and school systems according to the needs of their students. Among the various ways that need is measured in the SRS funding model, for most non-government schools, the single most important factor (after the base funding amounts) is capacity to contribute.

The research presented in section 4 shows that, through the use of school SES scores, capacity to contribute is not currently measured in a way that accurately reflects school need. Worse, the various flaws in the way SES scores measure capacity to contribute make them biased in favour of high-income and affluent families. While it is hard to estimate the precise impact, school SES scores underestimate the financial means of these families and overestimate the financial means of lower and middle income families. The practical impact on non-government schools is that independent schools (especially high-fee independent schools) appear to benefit from SES scores while Catholic schools (and probably low-fee independent schools also) appear to be disadvantaged.

This is contrary to the premise of the SRS funding model. A funding model that purports to be needs-based is, in fact, corrupted by school SES scores and ultimately favours the least-needy non-government schools.

There is, therefore, a need to develop a new measure of capacity to contribute in the SRS model. Notably, the Review of Funding for Schooling also recommended that the Australian Government develop, trial and implement a new measure of capacity to contribute as soon as possible.38 This recommendation was made in 2011, and it should be a priority of the Australian Government for 2017, working in consultation with the Catholic and independent sectors. It should certainly occur before the current, corrupted version of the SRS funding model is further applied to drive funding changes among non-government schools – especially any changes that might reduce funding to the schools that appear to be disadvantaged by SES scores at present. With the development of a new measure of capacity to contribute, school SES scores would not be re-estimated in 2017.

The various limitations with SES scores identified in section 4 point to improvements that would be essential of a new measure. In simple terms, a new measure must:

- Better measure financial means (incomes and wealth) than SES scores
- More accurately reflect the circumstances of each individual student than SES scores
- Be more up-to-date than SES scores.

Key to this improvement will be shifting the basis of measurement of capacity to contribute from area-level data to individual or personal data. As shown in section 4, area-level data, sourced from the Census, is problematic in each of the necessary areas for improvement and is inherently biased in favour of high income and affluent families. A

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38 Expert Panel (Gonski, Boston, Greiner, Lawrence, Scales, Tannock) 2011, Review of Funding for Schooling – Final Report, Canberra, December.
new measure would also need to satisfy other, standard criteria for data (administrative simplicity, availability, reliability, etc.).