From: ███████████████████████████████
To: █████████████████████████████████,
Cc: ████████████████ ████████████████████

Date: 09/05/2017 09:31 AM
Subject: As discussed [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi ████

As discussed with ████, this report that I referred too

Regards

████████

████████████████
A/Group Manager
Evidence and Assessment Group | Australian Government Department of Education and Training
P: ████████████ | M: ████████████

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From: ████████████
Sent: Tuesday, 9 May 2017 9:00 AM
To: ████████████████
Subject: As discussed [SEC=UNCLASSIFIED]

UNCLASSIFIED

Capacity-to-contribute-and-school-SES-scores.pdf

1

From:	██
To:	████████████████████████████████████,
Date:	12/05/2017 08:55 AM
Subject:	Advice on paper [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi ████ and ████████

As discussed. we are looking at this paper from the Victorian Catholic Commission and would like some advice.

Could you provide some advice about the appropriateness of the methodology, in particular the approach they have taken, their findings based on their analysis, the data sources they have used and whether there are any other data sources that we might potentially be able to use. I am particularly interested in the principal components aspects and the weightings they attribute.

Thanks very much for your help on this

regards

████████

████████████████

A/Group Manager
Evidence and Assessment Group | Australian Government Department of Education and Training
P: ████████████ | M: ████████████

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Capacity-to-contribute-and-school-SES-scores.pdf

From:	■■■■■■■■■■■■■■■■■■■■■■
To:	"■■■■■■■■■■■■■■■■■■■■■,
Cc:	■■■■■■■■■■■■■■■■■
Date:	09/05/2017 09:35 AM
Subject:	As discussed [SEC=UNCLASSIFIED]

<p style="text-align:center">UNCLASSIFIED</p>

Final Technical report - Recalculation of the SES Indicator using 2011 A....pdf

Australian Government

Department of Education, Employment and Workplace Relations

Recalculation of the Modified A Socioeconomic Status (SES) Indicator using 2011 Australian Bureau of Statistics Census Data

Consultant's Technical Report

Stephen Farish

July 2013

Contents

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Foreword

Socioeconomic status (SES) scores have been calculated for non-government schools since 2001. The SES approach involves linking student residential address data to Australian Bureau of Statistics (ABS) national Census data to obtain a measure of the capacity of the school community to support its school.

Student residential addresses are collected from each school and mapped to the correct Statistical Area 1 (SA1) by a process called geocoding. Each school's community is defined in terms of the SA1s from which it draws its students. The SA1 has been designed as the smallest unit in the Australian Statistical Geography Standard (ASGS) classification for the release of Census data. Data at the smaller unit of a Mesh Block are confidentialised and only released for Basic Person Counts and Dwelling Counts.

In urban areas, SA1s average approximately 400 persons. SA1s in remote and regional areas generally have smaller populations than those in urban areas. The states and territories of Australia are defined by approximately 54,800 SA1s. The SA1 is of a slightly smaller average size than the previous geographical unit, the Collection District (CD) under the Australian Standard Geographical Classification (ASGC), which was used in the 1996, 2001 and 2006 Census.

The Modified A Indicator (SES index) that is used to calculate schools' SES scores comprises the dimensions Occupation, Education and Income (½ household income and ½ family with children income). SES scores are calculated as a weighted average of the dimension scores for each school's SA1s. Data from the Census are analysed using a recognised statistical technique known as Principal Components Analysis to produce a score for each dimension for all SA1s in Australia. This methodology is explained in detail in the *Schools Funding: SES Simulation Project Report. A report by the Steering Committee for the Simulation Project on a socioeconomic status (SES)-based model for recurrent funding of non-government schools* (December 1998).

The SES index on which schools' SES scores are based was recalculated using the 2001 ABS Census data. That recalculation was described in *Funding Arrangements for Non-government Schools 2005-2008: Recalculation of the Modified A Socioeconomic Status (SES) Indicator using 2001 Australian Bureau of Statistics Census Data* (June 2004).

A second recalculation occurred with the availability of the 2006 ABS Census data. This was described in *Funding Arrangements for Non-government Schools 2009-2012: Recalculation of the Modified A Socioeconomic Status (SES) Indicator using 2006 Australian Bureau of Statistics Census Data* (June 2008).

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With the release of the 2011 ABS Census data the SES index was again recalculated. The new index effectively comprises the same dimensions as the index based on the 2006 ABS Census data. This index will be used to produce new SES scores for each non-government school to apply from 2014.

The specialist adviser for the 1998 SES Simulation Project was Professor Stephen Farish, University of Melbourne. Professor Farish recalculated the SES index for the 2005-2008 quadrennium based on 2001 Census data, and the 2009-2012 quadrennium based on 2006 Census data. He has prepared all three recalculation technical reports.

This technical report describes the dimensions and variables used in the recalculated index based on 2011 Census data and the steps taken to align it to the previous one. A brief summary of the dimensions and relevant changes to their structure follows:

- The *Occupation* dimension required no changes in order to create a revised *Occupation* dimension that was comparable to the one in 2006.
- The *Education* dimension was comparable to the one in 2006, with one minor change related to a change in the ABS educational classification reporting.
- The two *Household Income* dimension variables have been changed to take account of changes in income levels over the previous 5 years.
- The two *Family Income* dimension variables have also been changed to take account of changes in income levels over the previous 5 years.

July 2013

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Introduction

This document details the processes involved in the recalculation of the SES Modified A Indicator (SES index) using the 2011 Australian Bureau of Statistics (ABS) Census data. These processes are straightforward, being simply a translation of the 2006 approach to the 2011 data. However, two major changes are important. Firstly, the ABS has replaced the Australian Standard Geographical Classification (ASGC) with the Australian Statistical Geography Standard (ASGS) as its geographical framework. Under the ASGS, data from the Census at the Collection District (CD) level are no longer available. Therefore, the latest recalculation of the SES index has used data at the new Statistical Area 1 (SA1) level.

The second change is that the percentage variables used to calculate the SES index were all produced using the ABS online tool called "TableBuilder Pro" at the SA1 level. In previous recalculations, these Census data were provided through a single large data file, namely the "Basic Community Profile" at the CD level. This change means that cell references used in the past are no longer relevant for the current recalculation. The classifications required for the recalculation of the current SES index are specified in the Appendix using TableBuilder Pro nomenclature.

In various instances, it was necessary to make changes to the data used in order to align 2011 Census data with the equivalent 2006 Census data. For example, movements in wages make the income variables from the 2006 Census less relevant in 2011. In all instances where slight adjustments were made, these are described herein, along with the rationale for each adjustment.

The Principal Components Analyses, being based on a new 2011 dataset, are not identical in outcome to the 2006 analyses but, as seen further below, were well aligned and in all cases had similar Eigenvalues. This indicated a good result from the Principal Components Analyses in terms of summarisation of the underlying traits or dimensions. An Eigenvalue is a statistical term which, in plain language, measures the value of the overall dimension in terms of how much common information is represented in that dimension. For example, a dimension based on 10 variables and with an Eigenvalue of 6 indicates that 60% of the total information in the 10 variables is common, and that this common information is captured in the single dimension score. In most cases in this document the Eigenvalues are expressed as a percentage of the total information captured, in order to make interpretation easier.

Within the adjustments made to align the 2011 percentage variables to those used in the 2006 analysis, the recalculated SES index is an appropriate successor to the 2006 version. Real changes in socio-demographics mean that the 2006 and 2011 versions will not have identical scores for the same geographical areas. However, in this change from 2006 to 2011, there is no longer the concept of the "same geographical areas" because of the change from CDs to SA1s. As occurred with the 2006 data, the availability of 2011 Census data coded to place of usual residence adds to the utility and validity of the recalculated Modified A scores.

One minor cosmetic change has been introduced. To aid in clarity, what was previously called the *Income* dimension in previous technical reports has been renamed the *Household Income* dimension to more clearly distinguish it from the *Family Income* dimension.

The recalculated SES index using 2011 Census data uses the weighted combination of four dimensions:

$$Modified\ A = \frac{2 \times Occupation + 2 \times Education + Household\ Income + Family\ Income}{6}$$

To be a valid successor to the 2006 Modified A index, it is necessary to ensure that the four component dimensions are aligned closely to those used in the 2009-2013 period (using 2006 Census data).

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Steps taken to align the 2011 SES Index to the 2006 SES Index

Occupation Dimension

In the 2011 Census, the ABS retained the *Occupation* classifications that were used in the 2006 Census. These are summarised below:

Occupational Classifications in the ABS Census data for 2011 and 2006
Managers
Professionals
Technicians & Trades Workers
Community & Personal Service Workers
Clerical & Administrative Workers
Sales Workers
Machinery Operators & Drivers
Labourers

Whilst the 2011 classifications and variables could be replicated in the same way as in 2006, it was necessary to ensure that these were still valid when analysed through Principal Components Analysis. Therefore, just as with the 2006 data, an exploratory Principal Components Analysis was conducted with all classifications included for men and women. Three variables were found to be neither positive nor negative markers of occupational status. They were: *Male Sales Workers, Female Clerical & Administrative Workers* and *Male Community & Personal Service Workers.* By comparison, *Female Sales* and *Female Community & Personal Service Workers* were good negative contributors, and *Male Clerical & Administrative Workers* was a good positive contributor. This outcome was consistent with the exploratory Principal Components Analysis conducted on the 2006 data. Thus the 2011 *Occupation* dimension was able to be created using the same variables as used in the 2006 dimension. Using 1996 data the Eigenvalue for this dimension was 29%, for 2001 data it was 31%, for 2006 data it was 33%, and for 2011 data it was 34%.

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Education Dimension

The *Education* dimension was able to be reproduced using the same classifications as the 2006 version. The only difference involved one variable. In the 2006 data there was a classification for people with "no qualifications". In the 2011 data this classification was absent. In 2006 the qualifications data was provided for persons aged 15 and over. Using the 2011 data, the number of people 15 and over was determined, and by subtracting all those with any qualification, it was possible to estimate the number without any qualifications. This is not fully consistent with the 2006 variable, because in the 2011 data the numbers come from different tables, and non-response or other factors may introduce minor discrepancies. However, these should be of minimal significance. The overall national percentage with no qualifications is also consistent with that for 2006. Using 1996 data the Eigenvalue for the *Education* dimension was 49%, for 2001 data it was 54%, for 2006 data it was 52%, and for 2011 data it was 54%.

Household Income Dimension

The *Household Income* dimension uses only two variables. In the 2006 calculation, these were the percentage of households with an income below $52,000 (47.0%) and the percentage with an income above $117,000 (15.5%).

Income growth has changed the meaning of these absolute amounts. Therefore, various cut-off points were investigated within the possibilities afforded by the data in the ABS Census tables, as shown below:

1996	below $36,400	53.3%		1996	above $78,000	11.9%
2001	below $41,600	49.4%		2001	above $90,000	10.7%
2006	below $52,000	47.0%		2006	above $117,000 [1]	15.5%
2011	below $52,000	40.5%		2011	above $130,000	20.6%
2011	**below $65,000**	**49.2%**		**2011**	**above $143,000 [2]**	**16.1%**
2011	below $78,000	57.3%		2011	above $156,000	11.7%

[1] The $117,000 cut-off is not provided directly from the 2006 ABS tables, but is generated as the average of the above $104,000 and above $130,000 figures in each Collection District.

[2] The $143,000 cut-off is not provided directly from the 2011 ABS tables, but is generated as the average of the above $130,000 and above $156,000 figures in each Statistical Area 1.

For the lower end, increasing an income of $52,000 to $65,000 generates the nearest percentage to 2006. For the upper end, increasing an income of $117,000 to $143,000 generates a percentage close to the 2006 value. Using 1996 data the Eigenvalue for the *Household Income* dimension was 90%, for 2001 data it was 94%, for 2006 data it was 91%, and for 2011 data it was 92%.

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Family Income Dimension

The *Family Income* dimension uses only two variables, which are based on the income of families with dependent children. In 2006, the variables used were the percentage of such families with an income below $52,000 (35.4%) and the percentage with an income above $130,000 (15.9%). Various cut-off points were investigated within the possibilities afforded by the data in the ABS Census tables, as shown below:

1996	below $26,000	28.4%		1996	above $78,000	13.6%
2001	below $36,400	33.5%		2001	above $90,000	18.7%
2006	below $52,000	35.4%		2006	above $130,000	15.9%
2011	below $52,000	29.1%		2011	above $143,000	20.8%
2011	**below $65,000**	**38.1%**		**2011**	**above $156,000**	**15.1%**
2011	below $78,000	47.2%		2011	above $169,000	11.5%

At the lower end the cut-off point of $65,000 generated the nearest percentage to the 2006 value. At the upper end the cut-off point of $156,000 generated the closest percentage to the 2006 value. Using 1996 data the Eigenvalue for the *Family Income* dimension was 79%, for 2001 data it was 86%, for 2006 data it was 84%, and for 2011 data it was 86%.

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Overall summary of the variables used

In constructing the dimensions of *Occupation, Education, Household Income* and *Family Income*, a series of key percentage variables are used. The changes described above between 2006 and 2011 were necessitated by the movement of incomes over time and by one change in the ABS data (the absence of a "no qualifications" category in 2011). The variables used in the 2011 ABS data file are either directly comparable to variables available in the 2006 version or are reasonable substitutes. Unlike the 2006 recalculation, for the 2011 recalculation no variable was dropped nor any new variable added. These variables are summarised below, along with their national average values across all CDs in 2006 and SA1s in 2011.

Comparability table for percentage variables used – 2006 and 2011

2006 variable and national average per cent		2011 variable and national average per cent	
Occupation Dimension	**%**		**%**
Male & Female Labourers	11.4	Male & Female Labourers	10.3
Male & Female Unemployed	5.6	Male & Female Unemployed	6.0
Female Managers	9.7	Female Managers	9.6
Female Sales	13.6	Female Sales	12.8
Female Machine Operator/Drivers	1.7	Female Machine Operator/Drivers	1.6
Female Professional	22.1	Female Professional	24.0
Female Trades	4.7	Female Trades	4.6
Female Community Service Workers	13.7	Female Community Service Workers	15.0
Male Managers	15.8	Male Managers	15.4
Male Clerical/Admin	6.5	Male Clerical/Admin	6.6
Male Operator/Drivers	11.6	Male Operator/Drivers	11.7
Male Professional	17.1	Male Professional	18.2
Male Trades	23.4	Male Trades	23.2
Education Dimension	**%**		**%**
Diploma, degree+	23.1	Diploma, degree+	26.6
Left school year 9	14.2	Left school year 9	13.4
Never attend school	0.9	Never attend school	0.9
Tertiary students 15-24	22.0	Tertiary students 15-24	24.9
Trade certificate	17.6	Trade certificate	18.2
No qualifications	59.3	No qualifications	55.2
Household Income Dimension	**%**		**%**
Household Income < $52,000 pa	47.0	Household Income < $65,000 pa	49.2
Household Income >$117,000 pa	15.5	Household Income > $143,000 pa	16.1
Family Income Dimension	**%**		**%**
Family Income < $52,000 pa	35.4	Family Income < $65,000 pa	38.1
Family Income > $130,000 pa	15.9	Family Income > $156,000 pa	15.1

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Principal Components Analyses used to construct the 2011 dimensions

Results of the Principal Components Analysis for each dimension are provided below:

Occupation Dimension	13 Variables	Eigenvalue 4.44 or 34%
		2006 Eigenvalue 33%
Variable	Eigenvector	
Unemployed (M&F)	−0.2225	
Labourers (M&F)	−0.3527	
Managers (F)	0.2409	
Sales (F)	−0.1918	
Machine Operator/Drivers (F)	−0.1906	
Professional (F)	0.3880	
Trades (F)	−0.1140	
Community Service Workers (F)	−0.2554	
Managers (M)	0.2835	
Clerical/Admin (M)	0.1135	
Operator/Drivers (M)	−0.3642	
Professional (M)	0.3892	
Trades (M)	−0.2979	

Education Dimension	6 Variables	Eigenvalue 3.24 or 54%
		2006 Eigenvalue 52%
Variable	Eigenvector	
Diploma, degree+	0.5373	
Left school year 9	−0.4522	
Never attend school	−0.1073	
Tertiary students 15-24	0.4020	
Trade certificate	−0.3002	
No qualifications	−0.4935	

Household Income Dimension	2 Variables	Eigenvalue 1.84 or 92%
		2006 Eigenvalue 91%
Variable	Eigenvector	
Income < $65,000 pa	−0.7071	
Income > $143,000 pa	0.7071	

Family Income Dimension	2 Variables	Eigenvalue 1.72 or 86%
		2006 Eigenvalue 84%
Variable	Eigenvector	
Income < $65,000 pa	−0.7071	
Income > $156,000 pa	0.7071	

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Comparability of Principal Components Analyses

A further test of these analyses is the Eigenvalues (expressed here as a percentage), compared between 2011 and 2006 (with 2001 and 1996 for reference). As can be seen below, the 2011 analyses were very close in outcome to the 2006 analyses, with dimensions that were also of comparable strength to the 2001 and 1996 figures.

Dimension	Variables	Eigenvalues (%)			
		1996	2001	2006	2011
Occupation	13	29.4	31.2	33.4	34.2
Education	6	49.1	54.2	52.3	54.0
Household Income	2	89.7	94.1	90.6	92.3
Family Income	2	79.4	86.2	84.0	85.9

In each case, the proportion of common variance from the 2011 analysis of dimensions at the SA1 level was very close to that obtained in the 2006 analysis (and in the 2001 and 1996 analyses).

Comparing 2006 and 2011 SES Indexes

It is important to measure the correlation between 2011 and 2006. In the previous recalculations, this was done on the basis of comparing CD scores. With the move from CDs to SA1s, this comparison is not possible. However, 2006 CDs can be mapped into Australia Post postcodes, as can 2011 SA1s. Therefore, one practical way to compare scores from 2006 and 2011 is at the postcode level.

For both 2006 and 2011, the relevant scores were aggregated up to population-weighted postcode scores. There were 2421 postcodes that were in both the 2006 and 2011 data. Of these 2421 postcodes, those that differed in population by more than 15% between 2006 and 2011 were excluded. This left a total of 2273 postcodes for analysis.

Using these data comprising 2273 postcodes with an aggregate 2011 population of 21,140,044 people or 98.3% of the population, there was a population-weighted correlation of 0.9896 between the SES indexes in 2011 and those from 2006.

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Figure 1 below shows a scatterplot of the relationship between the two SES indexes based on the 2006 Census data and recalculated using the 2011 Census data as outlined above. This scatterplot includes only the 2273 postcodes described above.

It should be noted that the graph as drawn does not fully reflect the strength of the relationship because of the large number of data points plotted, which conceals a much higher density towards the core of the plot.
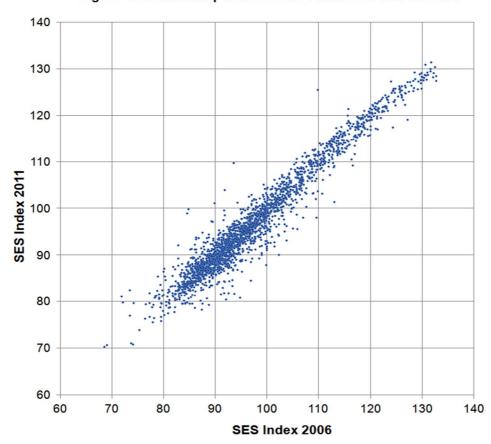

Figure 1: Relationship between 2006 and 2011 SES Indexes

Correlation = 0.9896 (population weighted)

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Figure 2 shows the difference between the 2006 and 2011 SES indexes for the 2273 postcodes. The average absolute difference is 1.9 (standard deviation also 1.9). The maximum difference is 16.
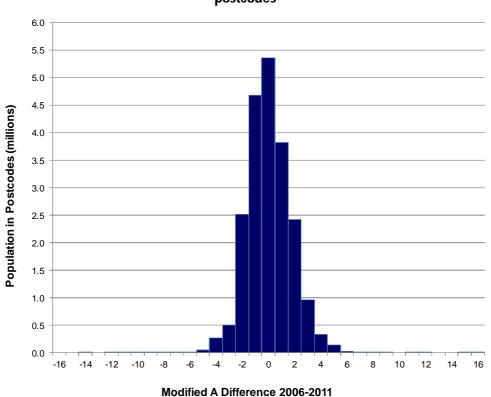
Figure 2: Difference between 2006 and 2011 SES index within postcodes

Final comment

The recalculated 2011 index provides a robust equivalent of the 2006 version. The change from CDs to SA1s should provide some additional precision because of the slightly smaller geographic unit size. The very clear concordance between 2006 and 2011 for both the variables used and the Principal Components Analyses further reinforces that the 2011 index is a good successor for the 2006 index. Similarly, the correlation between the 2011 index and the 2006 index at the postcode level indicates a good match between these two measures. Changes in school SES scores will nevertheless occur through changes in school catchments, with changes in the social demographics within the underlying catchment area of the schools, and the change from CDs to SA1s.

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Appendix

The ABS variables used to create the percentage variables

The percentage variables from the 2011 Census data were calculated as for the 2006 Census data. However, the use of the ABS data extraction software "TableBuilder Pro" for 2011 data uses different data nomenclature than was used for 2006 data. The table below provides the relevant ABS descriptors for each of the percentage variables calculated at the SA1 level. In all cases, classifications such as "not specified" or "partially specified" or "missing" or other values that cannot be clearly defined are omitted from both the numerator and the denominator.

In all cases, the denominator for any numerator is the one preceding it in the table.

Variables in the Occupation Dimension

Denominator *Labour Force Males & Females*	Denominator variable LabourForce **ABS keyword LFSP** Unemployed *plus* Employed
Numerator % Male & Female Unemployed	Numerator Variable: B_Unemp **ABS keyword LFSP** Unemployed
Denominator *Employed Males & Females*	Denominator variable BOcc **ABS keyword OCCP** Managers *plus* Professionals *plus* Technicians and trades workers *plus* Community and personal service workers *plus* Clerical and Administrative workers *plus* Sales workers *plus* Machinery operators and drivers *plus* Labourers
Numerator % Male & Female Labourers	Numerator variable B_Labourer **ABS keyword OCCP** Labourers
Denominator *Employed Females*	Denominator variable FOcc **ABS keyword OCCP** Managers *plus* Professionals *plus* Technicians and trades workers *plus* Community and personal service workers *plus* Clerical and Administrative workers *plus* Sales workers *plus* Machinery operators and drivers *plus* Labourers Crossed with **ABS keyword SEXP** = Female

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% Female Managers	Numerator variable F_Manage **ABS keyword OCCP** Managers Crossed with **ABS keyword SEXP** = Female
% Female Sales	Numerator variable F_Sales **ABS keyword OCCP** Sales Workers Crossed with **ABS keyword SEXP** = Female
% Female Machine Operators / Drivers	Numerator variable F_MachOpDrive **ABS keyword OCCP** Machinery Operators and Drivers Crossed with **ABS keyword SEXP** = Female
% Female Professionals	Numerator variable F_Prof **ABS keyword OCCP** Professionals Crossed with **ABS keyword SEXP** = Female
% Female Trades	Numerator variable F_Trade **ABS keyword OCCP** Technicians and Trades Workers Crossed with **ABS keyword SEXP** = Female
% Female Community Service Workers	Numerator variable F_CPSW **ABS keyword OCCP** Community and Personal Service Workers Crossed with **ABS keyword SEXP** = Female
Denominator *Employed Males*	Denominator variable MOcc **ABS keyword OCCP** Managers *plus* Professionals *plus* Technicians and trades workers *plus* Community and personal service workers *plus* Clerical and Administrative workers *plus* Sales workers *plus* Machinery operators and drivers *plus* Labourers Crossed with **ABS keyword SEXP** = Male

Numerators

% Male Managers	Numerator variable M_Manage **ABS keyword OCCP** Managers Crossed with **ABS keyword SEXP** = Male

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% Male Clerical/Admin	Numerator variable M_Clerical **ABS keyword OCCP** Clerical and Administrative Workers Crossed with **ABS keyword SEXP** = Male
% Male Machine Operators / Drivers	Numerator variable M_MachOpDrive **ABS keyword OCCP** Machinery Operators and Drivers Crossed with **ABS keyword SEXP** = Male
% Male Professionals	Numerator variable M_Prof **ABS keyword OCCP** Professionals Crossed with **ABS keyword SEXP** = Male
% Male Trades	Numerator variable M_Trade **ABS keyword OCCP** Technicians and Trades Workers Crossed with **ABS keyword SEXP** = Male

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Variables in the Education Dimension

Denominator *Persons aged 15 and over*	Denominator variable All15plus **ABS keyword AGE5P** The sum of: 15-19 years 20-24 years 25-29 years 30-34 years 35-39 years 40-44 years 45-49 years 50-54 years 55-59 years 60-64 years 65-69 years 70-74 years 75-79 years 80-84 years 85-89 years 90-94 years 95-99 years 100 years and over
Numerators	
% With Degree	Numerator variable DegDiploma **ABS keyword QALLP** Advanced Diploma and Diploma Level *plus* Bachelor Degree Level *plus* Graduate Diploma and Graduate Certificate Level *plus* Postgraduate Degree Level
% Never Attended School	Numerator variable NotAttend **ABS keyword HSCP** Did not go to school
% With Trade or other Qualifications	Numerator variable TradeCert **ABS keyword QALLP** Certificate Level
% With No Qualifications	Numerator variable NoQuals **ABS keyword QALLP** All15plus *minus* (DegDiploma *plus* TradeCert)
% Left School Year 9	Numerator variable LeftY9 **ABS keyword HSCP** Year 9 or equivalent *plus* Year 8 or below
% Never Attended School	Numerator variable DidNotAtt **ABS keyword HSCP** Year 9 or equivalent *plus* Year 8 or below
Denominator *Persons aged 15-24*	Denominator variable Age15to24 **ABS keyword AGE5P** 15-19 years *plus* 20-24 years

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Numerator	Numerator variable Tertiary15to24
% Tertiary Students	**ABS keyword TYPP**
	University or other tertiary education *plus*
	Technical or further education institution
	Crossed with **ABS keyword AGE5P**
	15-19 years *plus* 20-24 years

Variables in the Household Income Dimension

Denominator	Denominator variable HINDtotal
Households	**ABS keyword HIND**
	The sum of:
	Negative income Nil income $1-$199 $200-$299 $300-$399
	$400-$599 $600-$799 $800-$999 $1,000-$1,249 $1,250-$1,499
	$1,500-$1,999 $2,000-$2,499 $2,500-$2,999 $3,000-$3,499
	$3,500-$3,999 $4,000-$4,999 $5,000 or more

Numerators

% Household Income < $65,000	Numerator variable HINDunder1250
	ABS keyword HIND
	The sum of:
	Negative income Nil income $1-$199 $200-$299 $300-$399
	$400-$599 $600-$799 $800-$999 $1,000-$1,249

% Household Income > $143,000	Numerator variable HINDover2750
	ABS keyword HIND
	Half of $2,500-$2,999 *plus* the sum of:
	$3,000-$3,999 $4,000-$4,999 $5,000 or more

Variables in the Family Income Dimension

Denominator	Denominator variable FINtotal
Families with dependent children	**ABS keyword FINFF**
	The sum of:
	Negative income Nil income $1-$199 $200-$299 $300-$399
	$400-$599 $600-$799 $800-$999 $1,000-$1,249 $1,250-$1,499
	$1,500-$1,999 $2,000-$2,499 $2,500-$2,999 $3,000-$3,999
	$4,000-$4,999 $5,000 or more
	Crossed with **ABS keyword CDCF** includes:
	Couple family with 1, 2, 3, 4, 5, 6 or more dependent children
	plus One parent family with 1, 2, 3, 4, 5, 6 or more dependent children

19

% Family Income < $65,000	Numerator variable FINunder1250 **ABS keyword FINFF** The sum of: Negative income Nil income $1-$199 $200-$299 $300-$399 $400-$599 $600-$799 $800-$999 $1,000-$1,249 Crossed with **ABS keyword CDCF** includes: Couple family with 1, 2, 3, 4, 5, 6 or more dependent children *plus* One parent family with 1, 2, 3, 4, 5, 6 or more dependent children
% Family Income > $156,000	Numerator variable FINover3000 **ABS keyword FINFF** The sum of: $3,000-$3,999 $4,000-$4,999 $5,000 or more Crossed with **ABS keyword CDCF** includes: Couple family with 1, 2, 3, 4, 5, 6 or more dependent children *plus* One parent family with 1, 2, 3, 4, 5, 6 or more dependent children

From:
To:
Cc:
Date: 15/05/2017 09:54 AM
Subject: Australian article

Hi ▮▮▮▮,

I'm sure you've seen the attached but just in case....▮▮▮

http://www.theaustralian.com.au/national-affairs/education/catholics-school-funding-complaints-put-to-the-test/news-story/981d454bbfc883a2d3a8ddf8d1e1bc75

The Turnbull government is - examining a plea from the Victorian Catholic education system to change the formula for the - Gonski funding of schools, which it claims has a systemic flaw that builds in a "special deal" for rich private schools and disadvantages poor Catholic schools. Education Minister Simon -Birmingham has referred a - detailed report prepared by Victorian Catholics to his department for - assessment and asked the Australian Bureau of Statistics to check the claims of systemic bias.

Happy to discuss.

Regards
▮▮▮▮▮▮▮▮▮▮

Program Manager

Education, Crime and Culture Branch | **Australian Bureau of Statistics**

(P) ▮▮▮▮▮▮▮   **(M)** ▮▮▮▮▮▮   **(F)** ▮▮▮▮▮▮▮

(E) ▮▮▮▮▮▮▮▮▮▮▮▮▮▮   **(W) www.abs.gov.au**

From:	████████████████████████
To:	████████████████████████████,
Cc:	████████████
Date:	15/05/2017 10:29 AM
Subject:	RE: Australian article [SEC=UNCLASSIFIED]

<div align="center">

UNCLASSIFIED

</div>

Hi – ██
███
██ **Thanks** █████████

From: ██████████████████████████████████
Sent: Monday, 15 May 2017 9:54 AM
To: ███████████
Cc: ██████
Subject: Australian article

Hi ████████,

I'm sure you've seen the attached but just in case.... ████████████████████████████
██
██
████████████████████████████████████

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Happy to discuss.

Regards
████████████████

Program Manager

Education, Crime and Culture Branch | **Australian Bureau of Statistics**

(P) ████████████ **(M)** ████████████ **(F)** █████████████

(E) ████████████████████████████ **(W)** **www.abs.gov.au**

From:	████████████████████
To:	████████████████████████████
Cc:	████████████████████
Date:	16/05/2017 10:31 AM
Subject:	Re: Advice on paper

Hi ████████,

Please find attached our response to your request. We are happy to discuss, of course.

Regards

████████████████

Program Manager

Education, Crime and Culture Branch | **Australian Bureau of Statistics**

(P) ████████   **(M)** ████████████   **(F)** ████████████

(E) ████████████████████████   **(W)** **www.abs.gov.au**

Dear ████████,

Thanks for your request that we undertake a review of the paper *Capacity to contribute and school SES scores* paper prepared by the Catholic Education Commission of Victoria.

At the outset, I should note that the following should not be interpreted as a comment by ABS on the appropriateness, or otherwise, of using area-based Census data for the specific purpose of producing SES scores that are then used for school funding. Nor is the ABS able to comment on whether the current measure is systemically biased. Whether these data are fit for that purpose is a judgement for the Department. We are, however, able to make some comments on a number of the specific issues raised in the paper and the veracity or otherwise of those issues.

In general we found that:

- the methodology and datasets used for their analyses were appropriate given the assumptions that they expressed about the purpose of the current funding approach;
- further analyses would be necessary to fully understand the impact of using alternative approaches;
- there are some potential ways in which data can be enhanced in order to respond to a number of the issues raised (some of which were not available previously); and
- there are a number of aspects where we do not believe there are practical treatments to currently deal with the potential issue raised.

Specific comments on key issues identified in the paper

The paper raises a number of issues with the current school funding model from the perspective that its purpose is "to determine a school community's "capacity to contribute" to each school's resource benchmark". Assuming this perspective and looking at the paper from a statistical viewpoint, ABS advice is that a number of the issues raised are valid albeit challenging to resolve.

1) Changes in economic conditions between regions not captured adequately due to infrequent Census collections

There is obviously potential for economic conditions to change in particular areas in ways that are not consistent across the country. These changes would not be recognised in the model until new Census data becomes available, which will be in coming months with respect to the 2016 Census. We would suggest use of the 2016 Census based data once it is available.

The Census is the only reliable vehicle that is able to produce this quality, public information for all small communities across the country. It is not clear what the solution would be as there is no prospect of the Australia undertaking a Census more frequently, as we are one of few countries that

do have a Census more regularly than every ten years.

2) Use of area-level data in the model

The main use for the area-level data produced by ABS is to support planning and service delivery. Many models, including the current school model, also use area-level data because it is considered the best, publically available, proxy estimate of individual and household socio-economic status estimates. However, as noted in the paper, in 2012 the ABS explored the relationship between the area based estimates and the diversity of socio-economic statuses of individuals within those areas and found that "*When area level indexes are used as proxy measures of individual level socio-economic advantage and disadvantage, many people are likely to be misclassified*". The ABS has not explored what impact this issue would have on the calculation of the SES scores but this analysis could be undertaken. Another approach that could be pursued is the calculation of SES scores for individuals or households which could then be aggregated to various levels of geography including school based as needed.

3) Small cell sizes, confidentiality and income bands

As noted in the paper, the income ranges in the Census are quite broad - particularly for higher income groups. The collection of this information in ranges helps preserve the privacy of people included in the Census and encourages and simplifies the reporting of income. These groupings support reporting of data but at the same time seek to minimise the risks of identification. They do not, however, enable flexibility in changing income ranges to suit particular analytical needs. It is unclear what impact this dimension would have on school level scores as, by definition, the fact that some income groupings contain relatively small numbers of contributors may mean that they have a relatively low impact on the overall score calculated for a school.

4) Family/household size in SES scores

The paper notes that the model does not take into account differences in the size of households and proposes that this should be taken into account because it could impact on a families 'capacity to contribute'. To adjust for this the ABS, as noted in the paper, produces an 'equivalised' household income measure which is designed to adjust for the number of people in a household which could be considered as an alternative.

5) Wealth

The paper recommends that a wealth measure be included in the model in addition to income data. This is a complex area in which to collect information. It is not collected in the Census and has been challenging in our specialised household income surveys due to sensitivities in disclosure and difficulties in ensuring self assessment of wealth is reported in an accurate and consistent manner. While this is an interesting issue, we are not aware of any information available at an individual or small area that could be used to produce more complex assessments.

6) Treatment of nil income

There are a significant number of people who do not or only partially report their income on the Census. Given that the model treats these as zero income households, there is the potential for underestimation of actual income levels because it is likely that some of these households do, in fact, earn an income. Further investigation would be required to understand if different treatments of this issue might impact on SES score estimates, or whether use of alternative income sources, such as from the ATO, might produce different outcomes.

Either ▮▮▮▮▮ or I would be happy to discuss any of this further if you wish.

Cheers,

▮▮▮

▮▮▮▮▮▮▮

Senior Reconciliation Champion and
General Manager, Population and Social Statistics Division

Australian Bureau of Statistics

(P) ▓▓▓▓▓▓▓▓▓▓ **(M)** ▓▓▓▓▓▓▓▓▓▓

(E) ▓▓▓▓▓▓▓▓▓▓▓▓▓ **(W)** **www.abs.gov.au**

<table>
<tr><td>▓▓▓▓▓▓▓▓▓▓</td><td>UNCLASSIFIED Hi ▓▓ and ▓▓▓▓</td><td>12/05/2017 08:55:03 AM</td></tr>
</table>

From: "▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
To: ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓,

Date: 12/05/2017 08:55 AM
Subject: Advice on paper [SEC=UNCLASSIFIED]

<div align="center">

UNCLASSIFIED

</div>

Hi ▓▓▓ and ▓▓▓▓▓

As discussed. we are looking at this paper from the Victorian Catholic Commission and would like some advice.

Could you provide some advice about the appropriateness of the methodology, in particular the approach they have taken, their findings based on their analysis, the data sources they have used and whether there are any other data sources that we might potentially be able to use. I am particularly interested in the principal components aspects and the weightings they attribute.

Thanks very much for your help on this

regards

▓▓▓▓▓▓

▓▓▓▓▓▓▓▓▓▓
A/Group Manager
Evidence and Assessment Group | Australian Government Department of Education and Training
P: ▓▓▓▓▓▓▓▓▓▓ | M: ▓▓▓▓▓▓▓▓

Opportunity through learning
www.education.gov.au

The Department of Education and Training acknowledges the traditional owners and custodians of country throughout Australia and their continuing connection to land, waters and community. We pay our respect to them and their cultures, and elders past, present and future.

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From:	████████████████████████████████
To:	████████████████████████████
Cc:	
Date:	16/05/2017 12:57 PM
Subject:	RE: Advice on paper [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thankyou – much appreciated, will have a read and then let you know if we need further assistance!

Thanks

████████

████████████

A/Group Manager
Evidence and Assessment Group | Australian Government Department of Education and Training
P: ████████████ | M: ████████████

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From: ████████████████████████████████
Sent: Tuesday, 16 May 2017 10:32 AM
To: ████████████
Cc: ████████████████
Subject: Re: Advice on paper

Hi ████████,

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Regards
████████████████

Program Manager

Education, Crime and Culture Branch | **Australian Bureau of Statistics**

(P) ████████████ **(M)** ████████████ **(F)** ████████████

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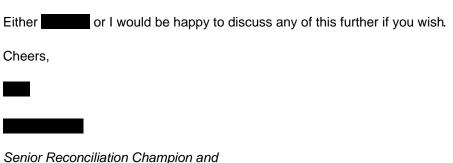4) Family/household size in SES scores

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▮▮▮▮▮▮▮

Senior Reconciliation Champion and
General Manager, Population and Social Statistics Division

Australian Bureau of Statistics

(P) ▮▮▮▮▮▮▮▮▮   **(M)** ▮▮▮▮▮▮▮

(E) ███████████████ **(W)** **www.abs.gov.au**

▼ "███████████████" ---12/05/2017 08:55:03 AM---UNCLASSIFIED Hi ██ and ██████

From: "███████████████████████████████████████
To: ██
Date: 12/05/2017 08:55 AM
Subject: Advice on paper [SEC=UNCLASSIFIED]

<div align="center">

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