



Australian Government

Commonwealth Grants Commission

2020 REVIEW

A BROADER ASSESSMENT APPROACH

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CONTENTS

INTRODUCTION	1
MEASURING REVENUE CAPACITY	2
The 1981 Review	2
Post-1981 Review	3
SIMPLIFYING THE REVENUE APPROACH	5
THE GST EFFECTS OF THE DIFFERENT REVENUE APPROACHES	7
Choosing a different global measure	9
Conclusions on simplifying the revenue approach	11
SIMPLIFYING THE EXPENSE APPROACH	12
A subset of the existing expense assessments	13
A subset of State attributes	16
Regressions of State actual spending	17
National government expenses	17
Past expense assessments	19
Conclusions on simplifying the expense approach	21
THE COMMISSION'S CURRENT APPROACH TO SIMPLIFICATION	22
ATTACHMENT A — GST EFFECTS OF BROADER REVENUE APPROACHES	24
ATTACHMENT B — GST EFFECTS OF GLOBAL REVENUE APPROACHES	27
ATTACHMENT C — CORRELATION BETWEEN GLOBAL REVENUE MEASURES AND STATE REVENUES	32
State revenue correlations	32
Category revenue correlations	33

INTRODUCTION

- 1 In 1978, the Commonwealth asked the Commonwealth Grants Commission to review States' shares of general revenue grants. It specified the principle (the equalisation principle) it wanted the Commission to apply in subsection 13(3) of the *States (Personal Income Tax Sharing) Act 1976*.

The respective payments to which the States are entitled ... should enable each State to provide, without imposing taxes and charges at levels appreciably different from the levels of the taxes and charges imposed by the other States, government services at standards not appreciably different from the standards of the government services provided by the other States.

- 2 This principle was (with minor wording changes) expressed in Acts or terms of reference until the 1999 Review. It was the principle the Commission was asked to implement when States signed the Intergovernmental Agreement on the Reform of Commonwealth–State Financial Relations (the IGA) in 1999. While the specific wording has evolved, the principle has continued to this day and remains the basis for the Commission's recommended distribution of GST revenue amongst the States.
- 3 Successive Commissions have concluded the equalisation principle and the terms of reference effectively determine the approaches it is to use to estimate a State's expenditure requirement and the revenue it can raise. Changing these approaches would change the Commission's:
 - measure of expenditure requirement and revenue capacity
 - recommended GST distribution.
- 4 The Commission has been criticised for having assessment methods that are too complex. This paper explores other approaches to measuring States' expenditure requirements and revenue capacity. Most research in this area has focussed on approaches to revenue capacity rather than expenditure requirement. The two unanswered questions will be whether it is possible to find alternative expense and revenue approaches that:
 - could be combined into an integrated approach to measuring States' fiscal capacity
 - are consistent with the equalisation principle.
- 5 The first part of this paper deals with approaches to measuring revenue capacity, the second part with approaches to measuring expenditure requirements and the third part with extending the Commission's existing approach to simplification.

MEASURING REVENUE CAPACITY

The 1981 Review

- 6 Comprehensive equalisation was introduced in the 1981 Review.¹ In that inquiry, the Commission said a principal issue was the choice between a general measure of revenue capacity (a global approach) and measures derived from the revenue bases on which individual State taxes were actually imposed (a tax approach).²
- 7 The Commission chose the tax approach because:
- ... the implied differences in taxable capacity under the global approach would be substantially less than the aggregated differences in the capacity of States to raise revenue from the individual taxes which they actually levied.
 - Differences in revenue-raising capacity would be even greater than differences in the revenue base, because a global standard revenue effort based on average tax collections would fall short of standard revenue efforts of individual taxes to the extent that the latter reflected an overall degree of progressivity whereby marginal rates for some taxes or some classes of taxpayers exceeded the global average rate.
 - ... if the global approach were adopted, the States with lower taxable capacity in relation to individual taxes would have to levy taxes and charges at levels that were higher than other States in order to obtain the same amount of per capita revenue. This would be contrary to the requirements of section 13(3) of the *States (Personal Income Tax Sharing) Act 1976*.³
- 8 Under its preferred approach, the Commission assessed revenue capacity by considering:
- the taxes and charges actually imposed by States
 - the revenue States could raise by imposing average rates of tax and charges.
- 9 An important feature of the tax approach is that it extracts information from what States actually do, which provides the Commission with an objective approach to

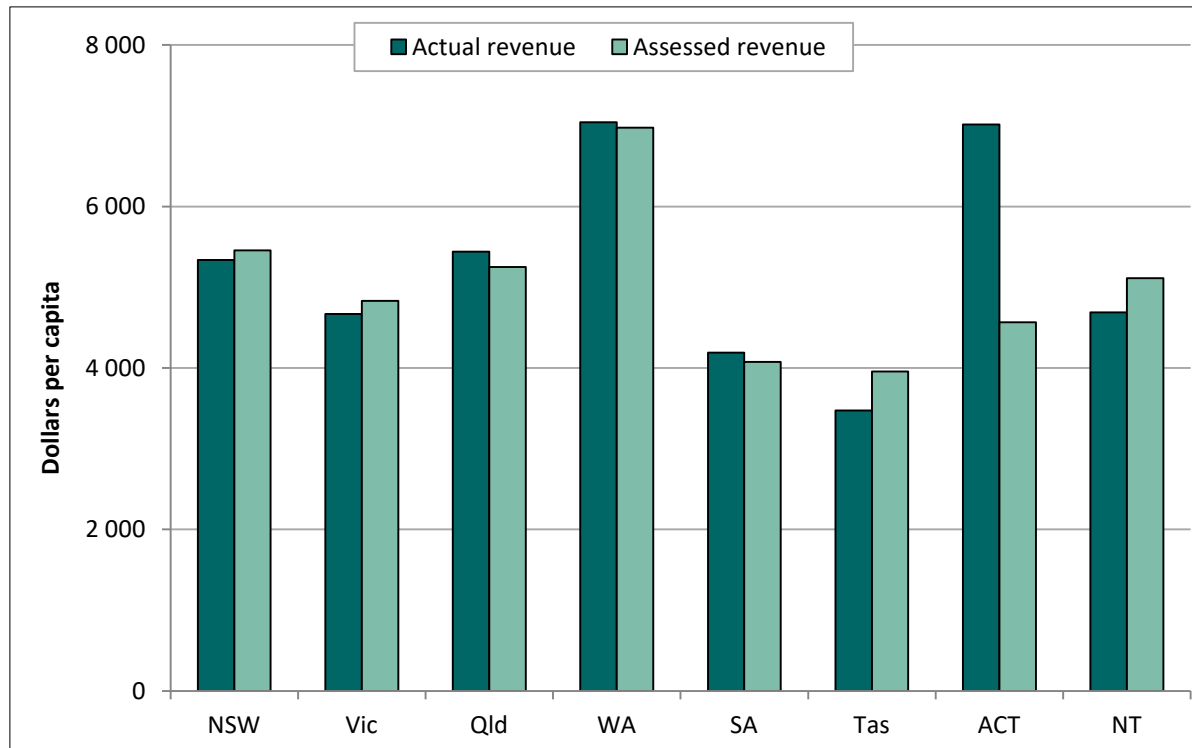
¹ Comprehensive equalisation involved equalising the capacity of all States to provide services that were not appreciably different. Prior to comprehensive equalisation (during what is called the 'claimancy period') the Commission only assessed the need of a subset of States (South Australia, Tasmania and, sometimes Queensland and Western Australia) for additional Commonwealth financial support. The two internal territories (the ACT and the Northern Territory) were added to all State equalisation after gaining self-government.

² Commonwealth Grants Commission, Report on State Tax Sharing Entitlements, 1981, Volume 1, Main Report, paragraph 3.5(a), page 80.

³ Op cit, paragraphs 3.10 and 3.11, pages 81-82. Section 13(3) refers to States not 'imposing taxes and charges at levels appreciably different from the levels of taxes and charges imposed by the other States'.

assessing revenue capacity. It means the Commission is not required to make judgments about the taxes and charges States should impose or how they should impose them. The tax approach produces a measure of revenue capacity that has a close connection to States' actual capacities (see Figure 1).

Figure 1 Actual and assessed revenue per capita, 2016-17



Note: The reason the ACT is different from other States is that the ACT does not have a separate local government sector. Its actual revenue includes \$452 million (\$1 112 per capita) in municipal rate revenue, revenue that is not included in other States' actual revenues. The ACT's municipal rate revenue is assessed EPC, which means it does not affect its GST share.

Source: 2018 Update.

Post-1981 Review

- 10 Since the 1981 Review, Commissions have continued to assess revenue capacity using a tax approach. They have made separate assessments for individual revenue streams and measured revenue capacity by capturing the material features (on average) of States' tax regimes.
- 11 The main arguments for a tax approach are that it:
 - captures the capacity of States to raise revenue from the taxes they impose
 - reflects what States do.
- 12 While most States have preferred the tax approach, there has been support for a global approach in each subsequent review. For example, in the 2015 Review, New South Wales, Queensland and Western Australia supported a global approach. In its

2020 Review submission on the Commission’s position paper⁴, Western Australia restated its support for a global approach.

- 13 The main arguments for a global approach are that it:
- is less policy influenced
 - is simpler and, perhaps, more transparent
 - would produce more stable GST outcomes.
- 14 Staff Research Paper 2017-03⁵ explored three different ways of distributing the GST (an equal per capita, a partial equal per capita and an actual per capita distribution). This research paper examines different approaches to assessing revenue capacity:
- a global approach — a single broader assessment of every revenue stream.
 - a macroeconomic (or macro) approach — a broader revenue assessment of each revenue stream
- 15 These broader revenue approaches differ in terms of:
- the degree to which revenue streams are bundled together
 - the choice of capacity measure applied to each revenue stream.
- 16 Table 1 shows the capacity measures applied under each approach. While Gross State Product (GSP) is shown as the global measure, other global measures are considered later in the paper.

Table 1 Broader approaches to assessing revenue capacity

Category	Macro approach	Global approach
Payroll tax	Private sector wages and salaries	GSP
Land revenue	Value of land	GSP
Stamp duty on conveyances	Value of property transferred	GSP
Motor vehicle registrations	Number of vehicles	GSP
Vehicle transfer duties	Value of vehicles transferred	GSP
Mining revenue	Value of mining production	GSP
Insurance taxes	Total premiums	GSP
Gambling taxes	Population	GSP
Other revenue (a)	Population	GSP

(a) Currently, the Commission’s Other revenue category includes revenue from gambling taxes, user charges and municipal rate revenue. For the purposes of the analysis in this paper, user charges and municipal rate revenue have been removed and gambling taxes are shown separately.

⁴ Commonwealth Grants Commission, CGC 2017-21 *The principle of HFE and its implementation*, September 2017.

⁵ Commonwealth Grants Commission, *Staff Research Paper 2017-03, Achieving HFE — Other approaches to distributing the GST*, May 2017.

- 17 As Table 1 shows, the macro approach uses no bundling — each revenue stream is separately assessed. The global approach bundles all State revenue together and applies a single capacity measure to the combined revenue.

SIMPLIFYING THE REVENUE APPROACH

- 18 Most States appear to accept that differences in the level of activity (value of payrolls, value of land, value of property transferred and value of mineral endowments) should affect States' assessed revenue capacities. Where there is disagreement is whether their assessed capacities should be affected by their collective policies on:
- the parts of the activity they tax (for example, the use of exemptions and tax free thresholds)
 - the rates of tax applied to various parts of the activity (for example, the use of concessions and progressive rates of tax).
- 19 This issue can be explored through a few practical examples.
- 20 The first example is payroll tax. Consider the case where two States have the same total payrolls. One State has a greater number of companies with smaller payrolls, the other has fewer companies but with bigger payrolls. Do the two States have the same capacity to raise payroll tax?
- 21 The second example is land tax. Consider the case where two States have the same total value of residential properties. One State has more principal places of residence, the other has more investment properties. Do the two States have the same capacity to raise land tax?
- 22 The third example is conveyance duty. Consider the case where two States have the same total value of property transferred. One State has a greater number of transactions but they are transactions of low value properties. The other has fewer transactions, but they are transactions of high value properties. Do the two States have the same capacity to raise conveyance duty?
- 23 The final example is royalties. Consider the case where the States have the same value of production. One State extracts a mineral that (nationally) attracts a low royalty rate. The other extracts a mineral that (nationally) attracts a high royalty rate. Do the two States have the same capacity to raise royalties?
- 24 If States applied a (single) uniform rate of tax to all parts of the activity in their jurisdiction, then the revenue they raise would be in proportion to the level of activity. But, collectively, States do not treat all the activity uniformly — some parts of it may not be taxed and some parts may have lower rates of tax applied. Thus, the revenue each State raises tends not to be in proportion to its level of activity. The composition of the activity is also relevant.

- 25 In relation to the four examples, the second State would have the capacity to raise more revenue if States collectively:
- offer a tax free threshold for payroll tax
 - exempt principal places of residences from land tax
 - apply stamp duties progressively or
 - apply different royalty rates to different minerals.
- 26 Traditionally Commissions have treated differences between States in the importance (or size) of those parts of the activity subject to exemptions, concessions and progressive rates of tax as **revenue disabilities**. They have made adjustments to account for States' tax regime decisions. These adjustments are a key feature of the tax approach⁶ and they generate most of the complexity in the existing revenue assessments.
- 27 Under a macro approach, States' tax regime decisions would not be treated as revenue disabilities and these adjustments would be removed, thereby simplifying revenue assessments. Assessed revenue would be calculated using the level of activity in each State — there would be no components, no tax free thresholds, no value distribution adjustments and mining capacity would be assessed using total value of production rather than a mineral by mineral assessment. That is, States' collective policy choices would no longer affect their GST shares — just as policy choices of individual States do not affect their GST share under the tax approach. In effect, less weight would be placed on the 'what States do' supporting principle and more weight on the 'policy neutrality' supporting principle.
- 28 In relation to the four examples postulated earlier, revenue capacity would be assessed by applying an average tax rate to the total level of payrolls, land values, value of property transferred and value of mining production in each State. Thus, the two States would be assessed to have equal revenue capacity. These simple examples illustrate why the macro approach produces a different GST distribution from the tax approach.
- 29 One of the reasons Commissions have traditionally treated State tax regime decisions as revenue disabilities is because they have a counterpart on the expense side. Recognising the impact of exemptions, concessions and progressive rates of tax on revenue capacity is analogous to recognising that States do not provide services to some groups of people or that some groups cost more to service than others. For example:

⁶ Under the tax approach, adjustments are required even if States have identical tax legislation. Given the level of exempt activity can differ between States, adjustments are required to ensure exempt activity has no effect on States' assessed revenue capacity and activity that attracts a lower rate of tax has a reduced effect on States' assessed revenue capacity.

- recognising some groups of employers are exempt from payroll tax is analogous to recognising some people in the 5 to 18 year old age groups are not enrolled at school
 - recognising some groups of conveyance transactions are taxed more heavily than others is analogous to recognising that States spend more on Indigenous students and students from low socio-economic backgrounds.
- 30 If a macro approach was adopted, the Commission would need to consider whether, for consistency, it should adopt a comparable approach to expense assessments — for example, whether the schools assessment might be based solely on enrolments with no additional loadings to reflect student characteristics.
- 31 A global approach is different again. Under this approach, separate assessments are not made for each revenue stream. All State revenue is bundled and assessed together. This implies that State decisions on the taxes and charges to impose and how to impose them only affect their GST shares to the extent that they affect the total revenue raised.
- 32 In relation to the examples postulated earlier, it means a State’s revenue capacity is not related to its level of activity (value of payrolls, value of land, value of property transferred or value of mineral endowments). Its revenue capacity is determined by applying an average rate to a selected global measure. If the two States have different shares of this global measure, they are assessed to have different revenue capacity. If they have the same share, they are assessed to have the same revenue capacity.
- 33 Though proponents of using a global measure for assessing revenue capacity tend not to argue for it, the same rationale could be applied in support of using a global measure of each State’s expenditure requirement (such as population share).

THE GST EFFECTS OF THE DIFFERENT REVENUE APPROACHES

- 34 Attachment A provides the GST effects for the two broader approaches and compares them with the GST effects of the tax approach. It confirms one of the findings of the 1981 Review — broader revenue approaches generate GST distributions that differ materially from the tax approach. Table 2 provides a summary.

Table 2 Average per capita GST change of moving from the tax approach

Approach	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
2018 Update	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Macro approach	-24	70	18	48	-211	-98	-92	-85	27
Global approach	79	-12	285	114	-390	-387	-2 062	-2 205	94
Average of 2010 Review to 2018 Update									
Macro approach	-9	26	139	-112	-163	-153	-198	-214	34
Global approach	-23	-61	471	52	-263	-283	-1 930	-2 046	100

Note: The average per capita GST change is derived by calculating the GST change in each inquiry. If there is more than one inquiry, the GST changes are averaged. The average per capita GST change is obtained by dividing the average GST change by the 2018-19 populations.

Source: Table A-4 and Table A-6.

- 35 The difference between the tax approach and macro approach arises because the macro approach applies a measure of capacity that is less connected to the activity States tax. For the 2018 Update, Table 2 shows that, compared with the tax approach, a macro approach reduces the assessed revenue capacity (increases the GST shares) of Victoria, Queensland and Western Australia and increases the assessed revenue capacity of the other States.
- 36 The difference between the macro approach and the global approach arises because the global approach applies a high level measure of capacity (GSP) to every category (including gambling taxes and Other revenue). For the 2018 Update, Table 2 shows that, compared with the macro approach, the global approach increases the assessed revenue capacity (reduces the GST shares) of the least populous States.
- 37 These results are driven by the relationship between the chosen capacity measure and the activity States tax. For example, for the 2018 Update, Table 2 shows the global approach produces the lowest assessment of revenue capacity for Western Australia. This happens because the global approach uses GSP as its capacity measure for royalty revenue rather than value of mining production. GSP is a broad measure that is not directly related to mining activity. Table 3 shows Western Australia's share of value of mineral production is higher than its share of other broad measures. Thus, Western Australia's assessed GST depends, in part, on whether mining revenue capacity is assessed using a measure that is strongly, weakly or not related to mining activity. Again, this highlights that how the Commission assesses revenue capacity involves a judgment along a spectrum of policy neutrality and what States do.

Table 3 State shares of broad measures, 2016-17

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	%	%	%	%	%	%	%	%
Gross State Product	32.9	23.2	18.6	14.1	5.9	1.7	2.2	1.5
Private sector wages and salaries	34.3	25.2	18.1	12.8	5.6	1.4	1.5	1.2
Land values	41.0	27.6	14.1	8.6	5.3	1.3	1.6	0.6
Value of property transferred	40.7	25.7	20.5	5.8	3.8	1.2	1.7	0.5
Insurance premiums	37.4	19.3	19.4	10.9	7.7	1.9	2.1	1.3
Number of vehicles	29.4	25.8	20.8	11.6	7.5	2.5	1.6	0.8
Value of vehicles transferred	31.4	25.4	20.6	12.3	6.1	1.9	1.4	0.9
Value of mining production	14.8	1.0	27.3	51.0	2.9	0.9	0.0	2.0
Population	32.0	25.6	20.0	10.5	7.0	2.1	1.7	1.0

Source: ABS data and State data returns

Choosing a different global measure

38 Table 4 lists other global measures investigated by Commission staff. They included measures proposed by Western Australia or investigated by the Productivity Commission.

Table 4 Global measures investigated by Commission staff

Gross State Product	This is an annual measure of growth in output in each State. It has been suggested by the Productivity Commission and academics.
Partial Gross State Product	This was a measure Western Australia included in its 2020 Review submission. (a)
Total factor income	This is a measure of the income received by the factors of production in each State.
Gross household disposable income	This is a measure of the income of households after income taxes. It has been suggested by the Productivity Commission and academics.
Household final consumption expenditure	This is a measure of consumer spending.

(a) Western Australia had a second proposal, which was an amalgam of the existing revenue bases. This measure was not included in the analyses because Commission staff were unsure how to construct the measure for inquiries prior to the 2015 Review.

39 Table 5 shows the change in GST from replacing the tax approach with each of these global measures in the 2018 Update. Table 6 shows the average per capita GST change from replacing the tax approach with one of these global measures in each inquiry since the 2010 Review. Attachment B sets out the GST effects by inquiry.

Table 5 Comparison of global measures with the tax approach, average per capita GST change, 2018 Update (a)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	79	-12	285	114	-390	-387	-2 062	-2 205	94
Partial Gross State Product	-6	-45	286	143	-348	-311	-896	-1 340	72
Total factor income	115	128	239	-86	-391	-417	-2 516	-3 131	118
Gross household disposable income	-134	20	277	1 300	-677	-705	-4 617	-1 517	196
Household final consumption expenditure	-65	-407	176	1 714	-695	-772	-1 057	-622	214

(a) The average per capita GST change is derived by calculating the GST change in each inquiry. If there is more than one inquiry, the GST changes are averaged. The average per capita GST change is obtained by dividing the average GST change by the 2018-19 populations.

Source: Table B-9.

Table 6 Comparison of global measures with the tax approach, average per capita GST change between 2010 Review to 2018 Update (a)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	-23	-61	471	52	-263	-283	-1 930	-2 046	100
Partial Gross State Product	-129	-108	431	233	-261	-228	-734	-622	111
Total factor income	-12	86	424	-149	-244	-324	-2 281	-2 645	107
Gross household disposable income	-231	-63	301	1 623	-596	-710	-4 314	-1 178	230
Household final consumption expenditure	-242	-467	352	2 017	-596	-772	-1 193	-531	281

(a) The average per capita GST change is derived by calculating the GST change in each inquiry. If there is more than one inquiry, the GST changes are averaged. The average per capita GST change is obtained by dividing the average GST change by the 2018-19 populations.

Source: Table B-7.

40 Table 5 and Table 6 show that, compared with the tax approach, the global measures:

- always reduced the GST shares of the four least populous States
- mostly reduced the GST shares of New South Wales and Victoria
- mostly increased the GST share of Western Australia
- always increased the GST share of Queensland.

41 Table 5 and Table 6 provide support for the view expressed by fiscally weak States in previous reviews. They said that, compared with the tax approach, a global approach would underestimate the revenue capacity of fiscally strong States and overestimate the revenue capacity of fiscally weak States.

- 42 Past Commissions preferred a tax approach because of concerns that a global approach:
- would overestimate the ACT’s revenue capacity (see Box 1)
 - did not recognise that a State’s revenue capacity can change independently of the income of its residents (for example, when the High Court ruled State taxes to be invalid)
 - did not recognise that States could export their taxes interstate and overseas, implying that a State’s revenue capacity did not depend solely on the income of its residents.

Box 1 — Measuring the revenue capacity of the ACT

The ACT cannot tax Commonwealth assets or impose payroll tax on Commonwealth employees and it has no mineral endowments that it can tax. Therefore, its revenue sources are more limited than other States’.

Some global measures assess the ACT to have high revenue capacity. Those measures take no account of the legal constraints on its taxing powers. Were revenue capacity to be assessed using one of them then, in order for the ACT to raise the average revenue, it would have to impose above average rates of taxes and charges on the revenues it can tax.

This is consistent with one of the findings in the 1981 Review. If a global approach was adopted, States with lower taxable capacity in relation to individual taxes would have to levy taxes and charges at levels that were higher than other States in order to obtain the same amount of per capita revenue.

Conclusions on simplifying the revenue approach

- 43 In the first comprehensive review (the 1981 Review), the Commission chose to assess revenue capacity using a tax approach rather than a global approach. It did so because it concluded that:
- the taxable capacity differences under a global approach were substantially lower than under a tax approach
 - fiscally weak States would have had to impose taxes and charges at rates above those of fiscally strong States
 - this would have been inconsistent with the equalisation principle, which said States should not have to impose taxes and charges at levels different from other States.
- 44 This paper shows these conclusions are as relevant now as they were in 1981.
- 45 Successive Commissions have chosen to assess revenue capacity using the tax approach. They did so because they concluded a tax approach was more consistent

with terms of reference requiring them to distribute GST in accordance with the equalisation principle. In addition, the tax approach provides the Commission with an objective way to assess revenue capacity. It does not require it to make judgments about the taxes and charges States should impose nor how they should impose them.

- 46 The Commission's terms of reference require the GST to be distributed in accordance with the equalisation objective. The broader revenue approaches explored in this paper are not consistent with that objective, as understood, and agreed to, by governments to date.
- 47 Previous Commissions have said the equalisation principle and the objective(s) that govern the distribution of the GST are matters for governments to decide. In position paper CGC 2017-21, the Commission said its terms of reference were clear:
- ... it is to recommend how the GST should be distributed in accordance with the 'principle of HFE' ... the Commission is not asked, nor given the discretion, to decide when other policy objectives ... should moderate the achievement of HFE.⁷
- 48 Were governments to change the equalisation principle or to ask the Commission to achieve additional objectives, then the Commission would be prompted to give more consideration to broader revenue approaches.

SIMPLIFYING THE EXPENSE APPROACH

- 49 This section explores other options to assessing States' expenditure requirements. These options focus on replacing the existing expense assessments with proxy assessments based on:
- a subset of the existing expense assessments
 - a subset of State attributes
 - regressions of State actual spending
 - national government expenses
 - past expense assessments.
- 50 In each case, the GST effects of replacing the existing expense approach with one of these other options are estimated.
- 51 These options attempt to mirror the approaches explored to simplify revenue assessments. More work has been done on the revenue side than the expense side and the conceptual basis for some of the options are stronger than others. For example, one of the revenue options was whether GSP could be used as a global

⁷ Op cit, paragraph 1.13, page 8.

measure of revenue capacity, based on the conceptual argument that GSP is a measure of underlying revenue capacity. A similar approach on the expense side attempts to use either national government expenses or past assessed expenses as a global measure of expense need. However, the conceptual basis for either indicator is relatively weak.

A subset of the existing expense assessments

- 52 Currently, the Commission has 14 expenditure assessments (including Investment and Net borrowing), with total State spending of \$224 billion in 2015-16.
- 53 Under this option, regression analysis was used to:
- identify the subset of existing assessments that were the best explanatory variables for total assessed expenses
 - the weights that would need to be apply to those assessments.
- 54 Table 7 sets out the weights that would be applied to each existing expense assessment.
- 55 If, an expense category was not statistically significant in the regression analysis, it received a weight of zero (that is, it was omitted). Table 7 shows six existing expense assessments would be omitted.
- 56 A weight of 1.00 implies the category would have the same weight under this option as it does under the existing expense approach. A weight in excess of 1.00 implies the assessment captures some of the influences of omitted assessments. This could be because they have similar drivers. For example, a major driver of Justice service delivery costs is the higher unit costs associated with Indigenous people. A major driver of two of the omitted assessments (Housing and Welfare) is also high Indigenous service delivery costs.

Table 7 Weights to apply to the subset of expense assessments, 2015-16

Category	Weight
Equal per capita	0.11
Schools education	0.79
Post-secondary education	(a)
Health	0.95
Housing	(a)
Welfare	(a)
Services to communities	1.20
Justice	2.46
Roads	1.82
Transport	(a)
Services to industry	(a)
Other expenses	0.67
Depreciation	(a)
Investment	0.95
Net borrowing	1.35

(a) These assessments were not a statistically significant in the regression analysis and so received a zero weight. That is, they were omitted.

Source: Staff simulation.

57 Compared with the existing expense approach, Table 8 shows this option produces similar GST outcomes, despite requiring only half of the existing assessments.

Table 8 GST effects of using a subset of expense assessments, 2017 Update

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	-14	17	30	-31	46	-19	-47	34
2013-14	12	3	-53	-45	13	15	2	-17
2014-15	-27	-13	17	-36	11	15	37	8
2015-16	-7	13	54	-19	11	-26	33	-18

Source: Staff simulation.

58 While this option establishes a relationship between the subset of expense categories and all the expense categories, this relationship is one of correlation not causation. Applied to the four assessment years considered for the 2017 Update, the relationship does not produce consistent variations in either direction or size for the majority of States.

59 The advantage of this option is that it reduces the number of moving parts in the expense assessments. However, it is difficult to view it as being more transparent or

reliable than the existing expense approach. It also would not deliver big improvements in simplification.

- 60 A variation of this option would be to extrapolate from the largest expense assessments rather than applying a regression to predict the current distribution. Under this variation, a proxy expense assessment could be derived by using the largest four expense categories (Schools education, Health, Justice and Welfare) in combination with an equal per capita (EPC) assessment. The expenses of the other 10 expense assessments were added to one of the four assessments or to the EPC assessment.
- 61 Compared with the existing expense approach, Table 9 shows this variation produces much bigger GST changes, approaching \$3 000 per capita for the Northern Territory in a year. While the GST changes are largest for the Northern Territory, they are also big for other States, with Tasmania and the ACT having changes exceeding \$700 per capita and Western Australia \$500 per capita in a year.

Table 9 GST effects of using the four largest expense assessments, 2017 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	-103	-55	-19	562	-126	-824	-723	2 800
2013-14	10	60	-162	310	-89	-809	-813	1 756
2014-15	8	108	-87	135	-59	-792	-758	684
2015-16	21	112	-83	88	-120	-806	-733	1 023

Source: Staff simulation.

- 62 The GST distribution of this variation moves closer to the current GST distribution the greater the number of existing expense assessments that are used. Compared with the existing expense approach, Table 10 shows the GST effects of this variation when the 10 largest expense assessments are used in combination with an EPC assessment. It confirms the GST changes are smaller than those in Table 9. However, the major advantage of this option (using a few expense assessments) is lost.

Table 10 GST changes of using the ten largest expense assessments, 2017 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	-21	-7	14	68	74	-79	-135	-288
2013-14	-16	-13	-14	94	72	-50	-135	-91
2014-15	-29	-13	5	101	53	-64	-125	23
2015-16	-24	-12	12	80	52	-70	-121	-50

Source: Staff simulation.

A subset of State attributes

- 63 There are many underlying drivers of the existing expense assessments. Some of them affect more than one expense assessment. Thus, potentially, a subset of these drivers might provide a reasonable approximation to the existing expense approach.
- 64 Under this option, regression analysis was used to identify weights to apply to a subset of State attributes. The attributes chosen were:
- the proportion of the population that is Indigenous
 - the proportion of the population living in remote areas
 - the proportion of the population aged 65 and above
 - population growth.
- 65 Compared with the existing expense approach, Table 11 shows the GST effects are large for this option.

Table 11 GST effects of using a subset of State attributes, 2017 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	-173	120	209	203	-165	-391	-211	-1 351
2013-14	-24	133	-27	16	-192	-88	-304	-70
2014-15	-76	113	118	-170	-64	-37	-372	247
2015-16	-79	122	152	-157	-206	-198	-399	639

Source: Staff simulation.

- 66 This option is reliant on the weight applied to each State attribute. There is no obvious source for these weights. For this paper, the weights were derived using regression analysis. For example, the regression analysis suggested a weight of 1.3 should be applied to the proportion of the population that is Indigenous. The regression analysis derived this weight from the influence of the existing Indigenous assessments. It is likely that the influence of Indigenous assessments will change over time in response to changes in State Indigenous policies and changes in the attributes of the Indigenous people. A direct assessment of Indigeneity would provide a means to update the Indigenous weight, but that would require the Commission to continue its existing expense approach.
- 67 There are other national datasets (such as the Indigenous Expenditure Report) that could potentially generate an Indigenous weight. However, the disadvantages are:
- the derived weight could lead to bigger GST changes than that shown in Table 11
 - the complexity of generating an Indigenous weight would still exist, but would be transferred to data from the Indigenous Expenditure Report

- there are no existing national data sets that could potentially generate weights for the other State attributes.

Regressions of State actual spending

- 68 Expense equalisation is practiced in other countries. They tend to use simpler approaches. For example, Italy uses a regression technique. It uses policy neutral attributes of municipalities to predict State actual spending in various categories. The Italian system, which equalises 6 702 municipalities and 86 provinces, has sufficient degrees of freedom to support a regression model.
- 69 The main hurdle for using regression analysis in an Australian context is that the small number of States makes it difficult to obtain sufficient degrees of freedom. For example, the regression analysis on the drivers of transport costs has to overcome the small number of data points. With only 8 States, a regression to predict actual costs is likely to identify both underlying drivers of expense need and factors correlated with above average effort.
- 70 One option for increasing the number of data points is to use data from more than one year. This would require State attributes and spending to be independent from one year to the next. Generally, State demographic attributes and State spending change slowly over time.
- 71 In 2007, Chan et al attempted to produce a regression of State spending and found that in the Australian context:
- It is difficult, if not impossible, to use conventional econometric techniques to estimate state service disabilities for inclusion in the equalisation model. ... What this implies is that the current approach of the CGC to estimating disabilities using more micro based methods may be a *constrained optimal* solution; that is, it is the best that can be done given constraints on using alternative *macro* type methodologies.⁸
- 72 It is unlikely that an approach based on applying regression techniques to estimate State spending will prove useful in the long term.

National government expenses

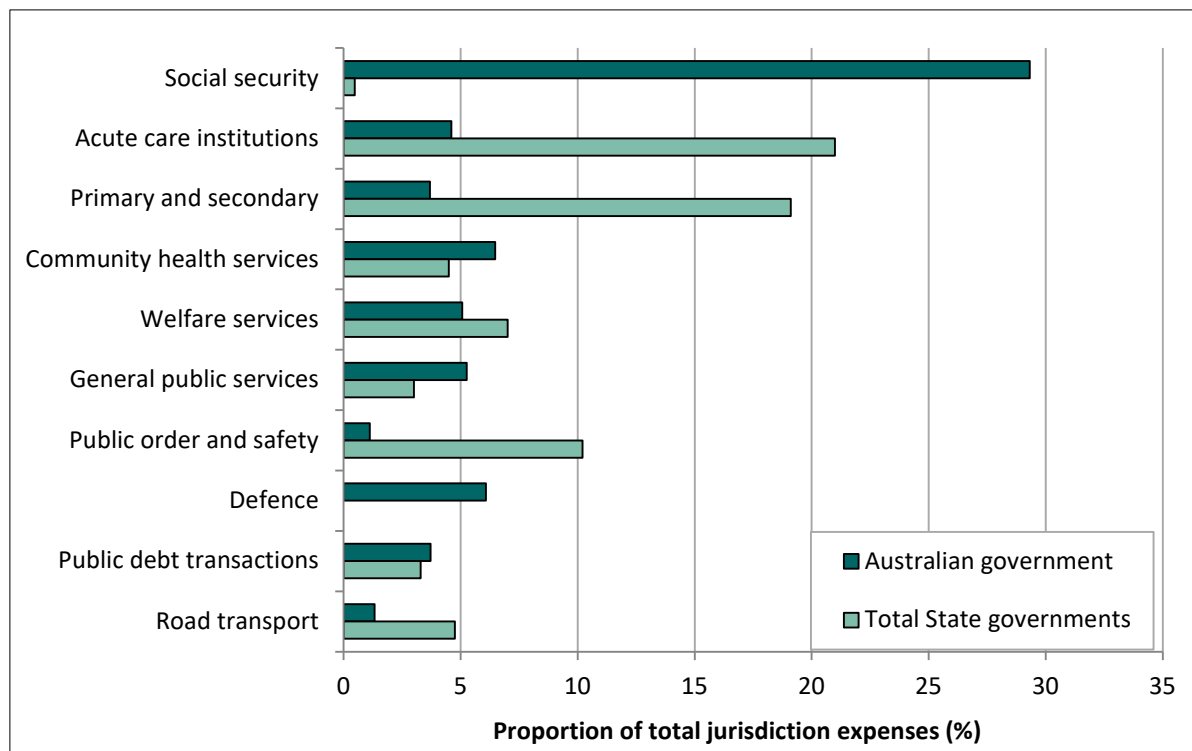
- 73 The revenue section of this paper discussed investigations of a global revenue approach. This section explores a global expense approach.
- 74 As part of its national accounts series, the ABS produces a measure of national general government final consumption expenditure by State. The attraction of this indicator is that if the Australian Government (with its nationally consistent priorities)

⁸ Chan, MacDonald and Petchey, *Measuring State Expense Needs: Report to the Commonwealth Grants Commission*, 2007.

spends more per capita in one State than another, it is possible that State would also need to spend more in total.

- 75 The main disadvantage of this option is that the functions performed by the Australian Government differ from those performed by State governments (see Figure 2). Thus, there is no reason why a State that has a high proportion of the unemployed or defence establishments would necessarily require relatively higher spending on hospitals or schools.

Figure 2 Government spending by purpose and level of government



Source: Australian Bureau of Statistics, Australian System of National Accounts, Cat No 5204.0.

- 76 Another disadvantage of this option is that adjustments would need to be made to the indicator:
- to remove the GST paid to States
 - to account for Canberra being the national capital and seat of government. The national accounts shows the Commonwealth spending 17 times the national average per capita amount in the ACT.
- 77 Compared with the existing expense approach, Table 12 shows the GST effects of assessing expense need using national government expenses. These GST effects are large. The effects for the ACT have been omitted for the reasons discussed above.

Table 12 GST change from assessing expense need using national government expenses, 2017 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	138	130	-204	1 067	-567	-1 600	(a)	-6 743
2013-14	185	118	-576	1 694	-810	-1 732	(a)	-5 183
2014-15	252	-45	-279	1 168	-732	-1 719	(a)	-4 190
2015-16	393	15	-241	629	-852	-1 910	(a)	-3 911

(a) The national accounts show the Commonwealth spending 17 times the national average per capita amount in the ACT. This is likely due to Canberra’s role as national capital and seat of government.

Source: Staff simulation.

78 A global expense indicator has not been found that captures total State spending. However, it may be possible to derive broader expense indicators for individual State functions. For example, Commonwealth payments for government schools may be a suitable proxy of State government school expense needs. However this functional approach is only likely to provide incremental improvements in simplification in each area.

Past expense assessments

79 Figure 3 shows the ratio of States’ per capita assessed expenses to average expenses. The Northern Territory is not shown because, over the past 16 years, its per capita assessed expenses have fluctuated between 2.1 and 2.3 times average expenses. The chart shows the stability of States’ assessed expenses. They are more stable than their revenue counterparts. This stability suggests past expense assessments could be used as a proxy for future expense assessments.

80 In 2005, the Commission could have decided to ‘freeze’ the expense assessments as they were at that stage and to use the ratio of each State’s per capita assessed expense to average expense to estimate assessed expenses after 2005. Under this option, the average State ratio from the first five years shown in Figure 3 was used to estimate assessed expenses in the remaining 11 years. The difference between States’ assessed expenses (as measured by the Commission) and these frozen expense assessments grew over time. In 2005-06 the average difference was \$116 per capita, but by 2015-16 it had grown to \$320 per capita. This growth reflects that:

- States’ expense circumstance change over time
- the Commission has changed its measures of expense need over time, including changing the scope of its expense assessments.

Figure 3 Ratio of assessed to average expense by State and year, 1999-00 to 2015-16



Note: The year label refers to assessment years. The chart shows the last assessment year for various inquiries. So, 2008-09 is the last assessment year of the 2010 Review, 2015-16 is the last assessment year of the 2017 Update.

Note: The Northern Territory is not shown in this figure. Over this period, its per capita assessed expenses have varied between 2.1 and 2.3 times the average per capita expenses.

Source: Commission calculation.

81 Compared with the existing expense approach, Table 13 shows the GST change of assessing future expenditure requirements using past expense assessments.

Table 13 GST change from using past expense assessments to estimate future expenditure requirements, 2017 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2012-13	138	34	-230	-78	-140	-36	288	796
2013-14	226	188	-464	-188	-220	-167	430	687
2014-15	166	63	-251	-199	-109	1	465	342
2015-16	146	61	-266	-43	-219	-289	334	1 222

Source: Staff simulation.

82 The advantage of this option is that it represents a significant simplification of expense assessments. The benefits of this option increase the longer the approach is in place. Using this option for a single review would not provide big improvements in

simplification (as it would not reduce the detail associated with reviews), but it would provide greater simplification for updates.

- 83 This option works best for expense assessments that are stable over time. A disadvantage is that not all expense assessments are stable. Investment and Net borrowing were omitted from the analysis because of their instability. The driver of these assessments is population growth, which is relatively volatile. Other volatile expense assessments are natural disaster relief expenses and expenses associated with volatile payments for specific purposes (such as major road and rail infrastructure and the National Partnership Agreement on Remote Indigenous Housing funding for housing related infrastructure).
- 84 There are a number of issues that would need to be resolved for this option to be implemented:
- how long past expense assessments retain their relevance
 - how volatile expense assessments would be assessed.
- 85 A disadvantage of this option is that it would be necessary to ‘rebase’, every so often, by doing a complete calculation of expenditure requirements — akin to that which produced the 2005 starting point. So, instead of ongoing incremental movement in expense assessments, there would be occasional jolts. That is, the Commission would still have the cost of a complete expense assessment, though less regularly.

Conclusions on simplifying the expense approach

- 86 This paper shows that there are a number of ways of simplifying expense assessments. However, it is more difficult to find options that are simpler and are still consistent with the equalisation objective.
- 87 Most of the options explored in the paper focus on whether a few independent variables can be found that could approximate State expense needs with an acceptable level of accuracy. Many of the options achieve simplicity by removing material assessments in one way or another. The options that deliver the biggest improvements in simplification do so at the cost of moving further from the existing GST distribution. This occurs because they move further from what States do. At an extreme, some of these options could produce an expenditure requirement that bears little relationship to States’ actual circumstances.
- 88 Commission staff have not found an expense option that captures States’ assessed expense need (with a reasonable degree of accuracy) that does not also have a significant amount of detail and complexity. That is, Commission staff have found no options that are both simpler and consistent with the equalisation objective.

THE COMMISSION’S CURRENT APPROACH TO SIMPLIFICATION

- 89 The different expense and revenue approaches considered in this paper would appear to produce very different GST distributions compared with the existing approaches. In many cases they do so because they omit a material driver of State differences.
- 90 To date, this research has not led it to an alternative expense or revenue approach that is consistent with the equalisation principle.
- 91 Since the 2010 Review, the Commission’s primary tool for removing complexity has been its disability materiality threshold.⁹ Only those disabilities that move more than the threshold are included. Thus, the threshold is an objective way of identifying and removing small disabilities.
- 92 Viewed broadly, the Commission has about 25 expense disabilities and seven revenue disabilities. Increasing the materiality threshold to \$100 per capita would remove seven of the expense disabilities and three of the revenue disabilities. Compared with the existing assessments, Table 14 shows the cumulative GST effect of increasing the disability materiality threshold to \$100 per capita. The change would disproportionately affect the least populous States. The biggest effects are on Western Australia (\$121 per capita), the ACT (-\$126 per capita) and the Northern Territory (-\$190 per capita).
- 93 Table 14 also shows the cumulative GST effect of increasing the disability materiality threshold to \$200 per capita. This would remove another six of the expense disabilities and another revenue disability. The cumulative GST effects are big for all States.

Table 14 GST change from increasing the disability materiality threshold, 2017 Update

Threshold	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
\$100	-39	67	-55	121	-24	-46	-126	-190
\$200	84	174	-299	143	-175	-261	-184	-580

Source: Staff simulation.

- 94 As part of the Commission’s methodology reviews, States identify specific disabilities they consider should be removed. The advantages of the disability materiality threshold are that it provides:
- an objective way for identifying (and removing) the smallest disabilities

⁹ In the 2010 Review, a disability was not included unless it caused at least one State’s GST distribution to change by more than \$10 per capita. The threshold was raised to \$30 per capita in the 2015 Review.

- an integrated approach to simplifying assessments that remains consistent with the equalisation principle.

95 While increasing the thresholds would remove more disabilities and simplify the existing assessments, Table 14 implies there is an underlying trade-off between simplicity and capturing States' fiscal capacities.

ATTACHMENT A — GST EFFECTS OF BROADER REVENUE APPROACHES

- 1 This attachment presents the GST effects of assessing revenue using a tax approach and two broader approaches to revenue equalisation:
 - the tax approach (Table A-1)
 - broader revenue approaches
 - the macro approach (Table A-2)
 - the global approach (Table A-3).
- 2 The GST effects were calculated for nine inquiries — from the 2010 Review to the 2018 Update. To remove the influence of a growing GST pool, these GST effects were derived using a constant GST pool — the 2018-19 GST pool of \$65.8 billion. The tables in the body of the paper refer to data in these tables.
- 3 For greater clarity and consistency, gambling taxes, user charges and municipal rate revenue were removed from the Other revenue category. Gambling taxes are shown as a separate revenue stream. User charges and municipal rate revenue are not typical State taxes and so they were excluded from the analyses.

Table A-1 GST effect of revenue assessments by inquiry, the tax approach

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	790	2 394	-2 368	-3 140	1 461	578	232	52	5 508
2011 Update	1 153	2 174	-2 067	-3 542	1 452	581	210	38	5 609
2012 Update	1 431	2 375	-1 620	-4 639	1 542	622	225	65	6 259
2013 Update	1 213	2 462	-656	-5 523	1 539	640	237	88	6 179
2014 Update	1 545	2 940	-680	-6 504	1 603	705	298	94	7 184
2015 Review	1 300	3 422	-322	-7 255	1 709	763	302	81	7 577
2016 Update	1 054	3 687	429	-8 156	1 736	795	397	58	8 156
2017 Update	-389	2 879	687	-6 012	1 686	750	380	20	6 401
2018 Update	-1 229	2 655	415	-4 763	1 870	698	317	35	5 991
Total	6 870	24 987	-6 183	-49 534	14 598	6 133	2 598	531	55 717
Average (\$m)	763	2 776	-687	-5 504	1 622	681	289	59	6 191
Average (\$pc) (a)	95	427	-137	-2 100	932	1 299	690	240	247

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table A-2 GST effect of revenue assessments by inquiry, the macro approach

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	1 052	2 535	-1 415	-4 080	1 269	525	172	-56	5 551
2011 Update	1 418	2 279	-865	-4 621	1 199	517	135	-62	5 548
2012 Update	1 448	2 499	-193	-5 607	1 219	541	137	-44	5 843
2013 Update	1 388	2 501	174	-6 088	1 243	569	159	53	6 088
2014 Update	1 408	2 936	278	-6 786	1 298	601	192	74	6 786
2015 Review	1 010	3 516	422	-7 304	1 411	662	225	57	7 304
2016 Update	499	3 911	529	-7 362	1 447	687	282	7	7 362
2017 Update	-589	3 216	654	-5 684	1 455	664	273	12	6 273
2018 Update	-1 422	3 112	504	-4 637	1 503	647	279	14	6 059
Total	6 211	26 505	89	-52 169	12 044	5 411	1 853	57	52 169
Average (\$m)	690	2 945	10	-5 797	1 338	601	206	6	5 797
Average (\$pc) (a)	86	453	2	-2 211	769	1 146	492	26	231

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table A-3 GST effect of revenue assessments by inquiry, the global approach

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	725	1 705	790	-3 986	1 135	501	-455	-415	4 856
2011 Update	812	1 867	1 067	-4 438	1 084	509	-507	-393	5 339
2012 Update	892	2 233	1 441	-5 268	1 099	518	-530	-384	6 183
2013 Update	917	2 459	1 798	-6 034	1 179	568	-530	-356	6 921
2014 Update	964	2 822	2 039	-6 687	1 261	595	-547	-447	7 682
2015 Review	841	2 746	1 945	-6 293	1 183	550	-506	-467	7 266
2016 Update	522	2 630	2 107	-5 927	1 170	545	-525	-523	6 974
2017 Update	94	2 375	2 088	-5 205	1 171	517	-528	-511	6 244
2018 Update	-591	2 575	1 846	-4 464	1 192	495	-546	-508	6 109
Total	5 176	21 414	15 122	-48 303	10 474	4 797	-4 674	-4 005	56 982
Average (\$m)	575	2 379	1 680	-5 367	1 164	533	-519	-445	6 331
Average (\$pc) (a)	72	366	335	-2 047	669	1 016	-1 241	-1 806	252

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table A-4 Comparison with the tax approach, average per capita GST change between 2000 Update to 2018 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Macro approach	-9	26	139	-112	-163	-153	-198	-214	34
Global approach	-23	-61	471	52	-263	-283	-1 930	-2 046	100

Source: Table A-1, Table A-2 and Table A-3.

Table A-5 Average per capita GST effect, 2018 Update (a)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Tax approach	-153	409	83	-1 817	1 075	1 331	758	143	239
Macro approach	-177	479	100	-1 769	864	1 234	666	59	241
Global approach	-74	396	368	-1 703	685	944	-1 304	-2 062	243

(a) The average per capita GST change is calculated by dividing the average change per inquiry by the 2018-19 populations.

Source: Table A-1, Table A-2 and Table A-3.

Table A-6 Comparison with the tax approach, average per capita GST change, 2018 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Macro approach	-24	70	18	48	-211	-98	-92	-85	27
Global approach	79	-12	285	114	-390	-387	-2 062	-2 205	94

(a) Table A-5.

Source: Staff simulation.

ATTACHMENT B — GST EFFECTS OF GLOBAL REVENUE APPROACHES

- 1 This attachment presents the GST effects of assessing revenue using different global measures. The measures investigated were:
 - Gross State Product (Table B-1)
 - Partial Gross State Product (Table B-2)
 - Total Factor Income (Table B-3)
 - Gross Household Disposable Income (Table B-4)
 - Household Final Consumption Expenditure (Table B-5).
- 2 The GST effects were derived for each inquiry, from the 2010 Review to the 2018 Update. To remove the influence of a growing GST pool, these GST effects were derived using a constant GST pool — the 2018-19 GST pool of \$65.8 billion.
- 3 The attachment also compares these GST effects with those generated by the tax approach (as set out in Table A-1). Table 6, in the body of the paper, refers to data in these tables.

Table B-1 GST effect of assessing revenue using Gross State Product

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	725	1 705	790	-3 986	1 135	501	-455	-415	4 856
2011 Update	812	1 867	1 067	-4 438	1 084	509	-507	-393	5 339
2012 Update	892	2 233	1 441	-5 268	1 099	518	-530	-384	6 183
2013 Update	917	2 459	1 798	-6 034	1 179	568	-530	-356	6 921
2014 Update	964	2 822	2 039	-6 687	1 261	595	-547	-447	7 682
2015 Review	841	2 746	1 945	-6 293	1 183	550	-506	-467	7 266
2016 Update	522	2 630	2 107	-5 927	1 170	545	-525	-523	6 974
2017 Update	94	2 375	2 088	-5 205	1 171	517	-528	-511	6 244
2018 Update	-591	2 575	1 846	-4 464	1 192	495	-546	-508	6 109
Total	5 176	21 414	15 122	-48 303	10 474	4 797	-4 674	-4 005	56 982
Average (\$m)	575	2 379	1 680	-5 367	1 164	533	-519	-445	6 331
Average (\$pc) (a)	72	366	335	-2 047	669	1 016	-1 241	-1 806	252

Note: This table is the same as Table A-3.

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table B-2 GST effect of assessing revenue using a partial Gross State Product (a)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	-149	1 389	399	-3 302	1 111	526	3	23	3 451
2011 Update	-70	1 536	713	-3 772	1 063	537	-21	13	3 863
2012 Update	-14	1 888	1 140	-4 612	1 074	548	-31	6	4 656
2013 Update	-17	2 113	1 588	-5 454	1 161	596	-6	20	5 477
2014 Update	26	2 477	1 867	-6 180	1 250	623	-1	-61	6 242
2015 Review	10	2 455	1 783	-5 883	1 191	574	2	-131	6 014
2016 Update	-286	2 341	1 968	-5 566	1 192	572	-17	-203	6 073
2017 Update	-707	2 096	1 989	-4 874	1 210	545	-39	-220	5 840
2018 Update	-1 275	2 364	1 851	-4 388	1 265	535	-58	-295	6 015
Total	-2 481	18 658	13 297	-44 032	10 517	5 056	-168	-847	47 529
Average (\$m)	-276	2 073	1 477	-4 892	1 169	562	-19	-94	5 281
Average (\$pc) (b)	-34	319	294	-1 866	672	1 071	-45	-382	210

(a) This is an option proposed by Western Australia. It is based on GSP, with an adjustment to remove 50% of General Government Final Consumption Expenditure and an adjustment for off-shore oil and gas.

(b) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table B-3 GST effect of assessing revenue using Total Factor Income

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	644	2 610	348	-4 214	1 219	474	-547	-534	5 294
2011 Update	778	2 814	686	-4 789	1 142	487	-620	-499	5 908
2012 Update	890	3 246	1 100	-5 755	1 149	496	-653	-474	6 882
2013 Update	877	3 513	1 608	-6 628	1 215	540	-668	-458	7 753
2014 Update	974	3 918	1 868	-7 355	1 306	570	-698	-585	8 637
2015 Review	960	3 688	1 828	-6 943	1 212	533	-660	-618	8 221
2016 Update	761	3 528	1 976	-6 558	1 181	524	-701	-710	7 969
2017 Update	401	3 235	1 943	-5 814	1 169	500	-715	-719	7 248
2018 Update	-304	3 483	1 613	-4 989	1 190	480	-736	-736	6 766
Total	5 981	30 036	12 970	-53 044	10 783	4 604	-5 996	-5 333	64 373
Average (\$m)	665	3 337	1 441	-5 894	1 198	512	-666	-593	7 153
Average (\$pc) (a)	83	514	287	-2 248	688	975	-1 592	-2 405	285

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table B-4 GST effect of assessing revenue using Gross Household Disposable Income

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	-630	1 801	10	-615	531	222	-1 196	-124	2 564
2011 Update	-336	2 012	85	-920	440	196	-1 320	-157	2 733
2012 Update	-407	2 305	201	-1 080	397	210	-1 438	-188	3 113
2013 Update	-714	2 605	249	-1 197	503	297	-1 541	-202	3 654
2014 Update	-928	2 738	697	-1 542	600	373	-1 705	-232	4 407
2015 Review	-1 135	2 402	1 097	-1 552	664	385	-1 621	-240	4 548
2016 Update	-1 481	2 348	1 542	-1 592	711	399	-1 641	-286	5 000
2017 Update	-1 899	2 335	1 752	-1 398	731	370	-1 577	-314	5 188
2018 Update	-2 302	2 782	1 807	-1 354	692	329	-1 615	-338	5 610
Total	-9 832	21 328	7 439	-11 250	5 269	2 782	-13 654	-2 081	36 818
Average (\$m)	-1 092	2 370	827	-1 250	585	309	-1 517	-231	4 091
Average (\$pc) (a)	-136	365	165	-477	336	589	-3 624	-939	163

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table B-5 GST effect of assessing revenue using Household Final Consumption Expenditure

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	-986	-280	928	-151	536	242	-279	-11	1 707
2011 Update	-951	-143	903	-172	442	235	-273	-40	1 580
2012 Update	-983	-178	1 027	-198	434	217	-264	-56	1 678
2013 Update	-1 047	-376	988	-112	531	279	-220	-43	1 798
2014 Update	-1 051	-434	1 111	-264	617	308	-215	-73	2 037
2015 Review	-1 074	-364	1 061	-283	638	297	-189	-84	1 996
2016 Update	-1 309	-278	1 158	-305	699	316	-177	-103	2 172
2017 Update	-1 486	-292	1 242	-201	706	303	-154	-117	2 251
2018 Update	-1 753	11	1 300	-270	662	294	-125	-118	2 267
Total	-10 641	-2 332	9 719	-1 957	5 264	2 490	-1 898	-646	17 473
Average (\$m)	-1 182	-259	1 080	-217	585	277	-211	-72	1 941
Average (\$pc) (a)	-147	-40	215	-83	336	527	-504	-291	77

(a) The average per capita GST effect is calculated by dividing the average GST effect per inquiry by the 2018-19 populations.

Source: Staff simulation.

Table B-6 Average per capita GST effect, global approaches (a)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	72	366	335	-2 047	669	1 016	-1 241	-1 806	252
Partial Gross State Product	-34	319	294	-1 866	672	1 071	-45	-382	210
Total Factor Income	83	514	287	-2 248	688	975	-1 592	-2 405	285
Gross Household Disposable Income	-136	365	165	-477	336	589	-3 624	-939	163
Household Final Consumption Expenditure	-147	-40	215	-83	336	527	-504	-291	77

(a) The average per capita GST change is calculated by dividing the average change per inquiry by the 2018-19 populations.

Source: Table B-1, Table B-2, Table B-3, Table B-4 and Table B-5.

Table B-7 Comparison with the tax approach, average per capita GST change

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	-23	-61	471	52	-263	-283	-1 930	-2 046	100
Partial Gross State Product	-129	-108	431	233	-261	-228	-734	-622	111
Total Factor Income	-12	86	424	-149	-244	-324	-2 281	-2 645	107
Gross Household Disposable Income	-231	-63	301	1 623	-596	-710	-4 314	-1 178	230
Household Final Consumption Expenditure	-242	-467	352	2 017	-596	-772	-1 193	-531	281

Source: Table A-1 and Table B-6.

Table B-8 GST effect, global approaches, 2018 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	-74	396	368	-1 703	685	944	-1 304	-2 062	243
Partial Gross State Product	-159	364	369	-1 674	727	1 020	-138	-1 197	240
Total Factor Income	-12	86	424	-149	-244	-324	-2 281	-2 645	107
Gross Household Disposable Income	-287	428	360	-517	397	627	-3 859	-1 373	224
Household Final Consumption Expenditure	-218	2	259	-103	380	560	-299	-479	90

Source: Table B-1, Table B-2, Table B-3, Table B-4 and Table B-5.

Table B-9 Comparison with the tax approach, average per capita GST change, 2018 Update

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Gross State Product	79	-12	285	114	-390	-387	-2 062	-2 205	94
Partial Gross State Product	-6	-45	286	143	-348	-311	-896	-1 340	72
Total Factor Income	115	128	239	-86	-391	-417	-2 516	-3 131	118
Gross Household Disposable Income	-134	20	277	1 300	-677	-705	-4 617	-1 517	196
Household Final Consumption Expenditure	-65	-407	176	1 714	-695	-772	-1 057	-622	214

Source: Table A-1 and Table B-8.

ATTACHMENT C — CORRELATION BETWEEN GLOBAL REVENUE MEASURES AND STATE REVENUES

- 1 As part of our analyses of global measures, Commission staff compared the assessed revenue generated by applying these indicators against States' actual taxation revenue and royalty revenue.
- 2 Staff constructed a time series for each measure covering the period 1999-2000 to 2015-16. The annual change in assessed revenue (using the relevant measure) was compared against the annual change in State revenue. Comparing the indicator against actual State revenue¹⁰ could be biased as both series trend upwards over time. Generally a correlation less than 30% is considered uncorrelated, 30% to 50% is a weak correlation and anything above 50% indicates a strong correlation. A correlation of 100% means the indicator moves perfectly with State revenue.

State revenue correlations

- 3 Table C-1 shows most of the indicators were either poorly correlated or had a negative correlation. In aggregate, only the land values indicator had any strong correlation with State revenue, but it is not an indicator Commission staff would support using as a global measure of State revenue capacity.

Table C-1 Correlations, global measures to State revenue (a), 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	-3	1	11	4	15	22	34	29	-9
Partial Gross State Product	-2	13	8	11	15	26	53	35	-6
Total Factor Income	-1	9	6	0	22	22	27	17	-8
Gross Household Disposable Income	-36	-38	2	-9	-11	13	3	-5	-40
Household Final Consumption Expenditure	-7	-7	32	39	-9	14	28	8	4
Land values	15	28	32	39	31	36	29	6	33

(a) State revenue comprised State taxes and royalty revenue.

Source: Staff calculation.

¹⁰ Abelson, P, *Estimating the revenue raising capacities of the States and Territories and the implications for the equitable distribution of GST revenue*, Submission to the Productivity inquiry into Horizontal Fiscal Equalisation. Western Australia reported the direct comparison in its 2020 Review submission.

- 4 The existing assessments were also compared with State revenue. Table C-2 shows strong correlations. Tax approach measures would be expected to be strongly correlated because that approach adheres to what States do. The strongest correlations were for Stamp duty on conveyances and the weakest correlations were for Insurance tax.

Table C-2 Correlations, actual and assessed revenue, 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total (a)
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Payroll tax	83	78	82	89	55	56	23	-16	100
Land revenue	39	60	72	49	75	39	52	na	100
Stamp duty on conveyances (b)	96	99	93	95	89	97	89	72	100
Insurance tax	42	54	40	-3	52	11	32	90	100
Motor taxes (b)	77	70	37	62	72	48	15	15	100
Mining revenue (c)	97	45	98	95	74	73	na	59	100
Other revenue	88	99	98	94	99	97	88	89	100
Total State revenue	75	94	93	70	96	89	81	73	100

(a) The Commission ensures total assessed revenue equals total actual revenue. Commission staff expect a 100% correlation between total assessed revenue and total actual revenue.

(b) Vehicle transfer duties were assessed with Motor taxes.

(c) Grants in lieu of royalties are Commonwealth payments and were omitted from the analyses.

na The ACT does not have mining revenue and the Northern Territory does not impose land taxes.

Source: Staff calculation.

Category revenue correlations

- 5 Finally, the annual change in assessed revenue (applying the global measure) was compared against the annual change in revenue for each of the seven revenue categories. These results are shown in Table C-3 to Table C-9.
- 6 Most indicators performed well for Payroll tax and Mining revenue. There were weak correlations for Land revenue, Insurance tax and Other revenue. The Household Final Consumption Expenditure and land value indicators were correlated with Stamp duty on conveyances and Motor taxes.
- 7 Table C-1 showed none of the global measures were strongly correlated with State revenue. For individual category revenues, some indicators perform better for some categories but not others. This highlights the problem of trying to use a single global measure to assess revenue capacity across a range of State revenue.

Table C-3 Correlations, global measures and Payroll tax, 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	42	36	69	59	47	7	6	42	68
Partial Gross State Product	43	28	69	66	47	3	-37	47	69
Total Factor Income	42	35	66	59	40	2	2	37	68
Gross Household Disposable Income	44	44	55	77	10	29	26	10	63
Household Final Consumption Expenditure	33	39	65	64	40	39	-13	22	57
Land values	-46	-39	-17	24	13	49	-43	-30	-45

Source: Staff calculation.

Table C-4 Correlations, global measures and Land revenue (a), 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	18	-18	6	1	-4	-8	-28	na	14
Partial Gross State Product	14	-30	6	-6	-5	-8	-20	na	9
Total Factor Income	30	-26	7	4	2	-12	-30	na	16
Gross Household Disposable Income	-8	19	22	-4	30	12	-42	na	28
Household Final Consumption Expenditure	-20	10	8	-13	11	42	-19	na	4
Land values	8	-22	32	-5	2	38	3	na	-5

(a) The Northern Territory does not impose land taxes.

Source: Staff calculation.

Table C-5 Correlations, global measures and Stamp duty on conveyances (a), 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	-33	27	-2	-8	60	51	28	14	-20
Partial Gross State Product	-28	36	-2	-4	63	55	66	22	-15
Total Factor Income	-46	21	-10	-13	51	49	25	3	-28
Gross Household Disposable Income	-46	2	-2	-19	33	29	-14	2	-35
Household Final Consumption Expenditure	33	20	34	22	52	5	65	-2	24
Land values	67	65	25	36	50	-1	78	14	79

(a) Vehicle transfer duties were assessed with Motor taxes.

Source: Staff calculation.

Table C-6 Correlations, global measures and Insurance tax, 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	-49	30	15	19	18	-15	72	16	5
Partial Gross State Product	-52	27	16	22	18	-12	34	16	2
Total Factor Income	-50	19	10	16	15	-18	74	19	1
Gross Household Disposable Income	13	3	12	7	18	-25	78	36	2
Household Final Consumption Expenditure	-14	44	7	17	33	-34	51	2	3
Land values	3	30	-10	10	17	-14	32	-26	21

Source: Staff calculation.

Table C-7 Correlations, global measures and Motor taxes (a), 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	29	-19	21	8	-4	51	37	4	-7
Partial Gross State Product	37	-6	19	11	-4	52	36	6	0
Total Factor Income	13	-18	19	6	3	49	35	7	-11
Gross Household Disposable Income	-9	-48	48	-2	-23	16	13	16	-15
Household Final Consumption Expenditure	64	-34	32	46	-40	23	2	40	26
Land values	28	21	4	58	7	41	18	-25	35

(a) Vehicle transfer duties were assessed with Motor taxes.

Source: Staff calculation.

Table C-8 Correlations, global measures and royalty revenue (a), 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	12	6	62	74	-3	45	na	47	54
Partial Gross State Product	5	0	62	68	-3	42	na	38	48
Total Factor Income	30	13	68	75	-9	41	na	48	60
Gross Household Disposable Income	32	30	51	29	-3	37	na	39	57
Household Final Consumption Expenditure	-49	24	-15	39	10	66	na	6	0
Land values	-50	-29	-5	13	-26	81	na	64	-52

(a) The ACT does not have mining revenue. Grants in lieu of royalties are Commonwealth payments and were omitted from the analyses.

Source: Staff calculation.

Table C-9 Correlations, global measures and Other revenue, 1999-2000 to 2015-16

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
Gross State Product	-3	-35	23	9	-12	-26	-1	29	7
Partial Gross State Product	-8	-41	21	5	-15	-33	-46	25	2
Total Factor Income	4	-20	28	13	-3	-22	6	26	17
Gross Household Disposable Income	4	12	21	20	28	23	33	19	26
Household Final Consumption Expenditure	-46	-50	-24	-37	-7	4	-49	-23	-47
Land values	-29	-43	-18	-48	-23	-10	-49	70	-41

Source: Staff calculation.