

CHAPTER 29

HOW THE RELATIVITIES ARE CALCULATED

INTRODUCTION

- 1 The terms of reference ask the Commission to report on the ‘per capita relativities which the Commission would regard as appropriate to apply after 2009-10 for the distribution of GST revenue among the States’. We consider relativities to be appropriate if they achieve fiscal equalisation. The definition of fiscal equalisation adopted by the Commission in this review is:

State governments should receive funding from the pool of goods and services tax revenue such that, after allowing for material factors affecting revenues and expenditures, each would have the fiscal capacity to provide services and their associated infrastructure at the same standard, if each made the same effort to raise revenue from its own sources and operated at the same level of efficiency.
- 2 The best relativities for a given year would capture the relative fiscal position of the States in that year. However, we cannot calculate those relativities until the year is complete and the necessary data have become available. Therefore, we require a way of generating ‘appropriate’ relativities which rely on the historical information that is available before the year in which the relativities are to be used. This chapter addresses how we do that.
- 3 What we are actually recommending in this report is a way of calculating appropriate relativities which can be used with new data as they become available. It is not recommending a fixed set of relativities to be used over a span of years. We consider that State fiscal capacities evolve and that the appropriate relativities to achieve equalisation evolve with them.

HOW ARE APPROPRIATE RELATIVITIES CALCULATED?

- 4 The process we have used is a variant¹ of the one developed in the Commission's first review of State tax sharing entitlements in 1981² and used ever since. It uses historical State budget and other data to calculate differences in State fiscal capacities which arise from differences in the costs of providing services, in the need for new investment in infrastructure and financial assets, in own-source revenue raising capacity and in other Commonwealth payment receipts. The GST required by each State in each of the historical years is intended to recognise these differences and to equalise State fiscal capacities. The relativities derived for each historical year are averaged and used to calculate State shares of GST in the year in which they are applied.
- 5 Relativities are calculated in a sequential way. That involves:
- compiling the adjusted budget to obtain average expenses on State services, average revenues for State own-source revenues and from Commonwealth payments, average State investment and average State net lending;
 - calculating for each State expense, how much more or less than the average that State would need to spend to deliver the average service (assessed expenses);
 - calculating for each State revenue, how much more or less it would raise if it adopted the average tax policy of the States (assessed revenue);
 - calculating how much each State would need to invest to give it the average stock of infrastructure, recognising differences between States in the quantity they require and its costs (assessed investment); and
 - calculating how much each State needs to save to give it the average stock of financial assets (assessed net lending).
- 6 The Commission uses the assessment guidelines set out in Attachment A of Volume 1 to help it make the decisions on what should be assessed and how. Those guidelines require it to make explicit the conceptual case for an assessment and to ensure that there are reliable data and a method to measure the impact. Any assessment must also be material. Judgment is also used to make assessments when complete data are not available. In cases where we considered there was a strong conceptual case for an assessment and it would materially improve the equalisation outcome, an assessment was made using judgment informed by the available qualitative and quantitative evidence.
- 7 Once these assessments are made, we calculate the GST, a State needs to balance its revenue and expenses, investment and leave it with the average stock of savings (net financial worth).

¹ The model has changed in line with the new equalisation objective — the equalisation of net financial worth. This has resulted in the introduction of new terms into the model — investment and net lending.

² Commonwealth Grants Commission, *Report on State Tax Sharing Entitlements, 1981*, Australian Government Publishing Service, Canberra.

- 8 Relativities can be calculated from State shares of GST revenue. The relativity measures how a State's calculated GST share differs from its population share of that revenue. The difference encapsulates the inherent fiscal differences between a State (for example, its share of school children) and the average of all States and measures its relative fiscal capacity.
- 9 We determine appropriate relativities by bringing together relativities calculated from the most recent years for which data are available.
- 10 The chapter on the Adjusted budget describes how the adjusted budget is compiled. The rest of this chapter describes:
 - how assessed expenses are calculated;
 - how assessed revenue are calculated;
 - how assessed investment and net lending are calculated;
 - how relativities are calculated; and
 - how relativities are combined to form appropriate relativities.

EXPENSE ASSESSMENTS

- 11 The expense assessments estimate what it would cost each State to provide the average level of service in a particular year — its 'assessed expense'. The average level of service is represented by the average expenses per capita, which encapsulates the average policies, practices and circumstances of the States. This is a population weighted average, giving equal weight to each Australian's experience. Since more Australians experience the New South Wales level of service, it carries more weight in the calculation of the average.
- 12 The expense assessments start from a presumption that, if all things were equal, each State could provide the average level of service by spending the average amount per capita on it — in this case, assessed expenses per capita would equal the average expense per capita.
- 13 However, all things are not equal. The circumstances of the States are different and these differing circumstances lead to differences in:
 - the use of services; and
 - the cost of providing each unit of service.
- 14 The expense assessments adjust the average expenses per capita up or down to allow for the financial impact of differences in State circumstances — but only to the extent that those circumstances are beyond the direct control of individual State governments.
- 15 Each State's assessed expenses therefore:
 - are based on the average level of service; and
 - only make allowances for the effects on the use or assessed unit cost of services that are due to influences beyond the control of individual States (called disabilities). These

disabilities generally reflect differences in the demographic, economic and geographic circumstances of the States.

- 16 A State's assessed expenses for a service generally differ from its actual expenses because:
- it may decide not to provide the average level of service; and
 - it may provide the service more or less efficiently than the average.
- 17 The assessed expenses do not take account of the effect a State's own decisions have on the level of services provided or how they are provided. Any additional expenses or any savings arising from a State's own decisions accrue entirely to it.

The expense assessment framework

- 18 The assessment framework involves:
- breaking each expense category into discrete components;
 - measuring the disabilities for each component (assessing factors);
 - combining the factors for each component (calculating component factors);
 - calculating the assessed expenses for each component; and
 - calculating the assessed expenses for the category.
- 19 A summary of the framework is in Box 29-2. Box 29-3 provides a simplified example of the process.

Calculating expense disabilities

- 20 Expense disabilities can be classified into two groups according to whether they affect:
- the use of services; or
 - the unit cost of services.
- 21 *Disabilities that relate mainly to use.* These disabilities reflect the specific influences (such as the characteristics of the potential users) which affect the use of services in a State. Where possible, data for all States are taken from a common database, such as the ABS population data.
- 22 A State has a disability above one if the proportion of potential service users in its population exceeds the average proportion for the States as a whole. The assessment assumes a direct link between the proportion of a State's population who are potential service users and the per capita cost of providing it. For example, if the proportion of a State's population aged 15 to 64 is 10 per cent greater than the average proportion, it is assumed the State's per capita expenses on vocational education would be 10 per cent above average.

Box 29-2 Expense assessment framework

1. Derive the average expense per capita for each category of services

This is the total expenses incurred by all States divided by their combined population.

2. Define category components

Since expenses within a category may be affected by different disabilities, most categories have been sub-divided into two or more components to match the disabilities with the expenses they affect. In most categories the components are: service delivery expenses and other expenses.

3. Identify disabilities

Identify the influences that are beyond the direct control of individual State governments and which affect the use or unit cost of services in each component of the category.

4. Measure the factors or assessed expenses

Measure the size of each influence in each State.

- For service delivery expenses, a disability factor for a State is calculated by relating its position to the average position. For example, for vocational education, a State's relative disability (or factor) is measured by comparing the proportion of its population aged 15 to 64 with the average proportion for the States as a whole. A State has a positive disability if its proportion of 15 to 64 year olds exceeds the average proportion — that is, its factor (the ratio of the two figures) is greater than one.
- For the other expenses component, a direct estimate of the expenses a State needs to incur because of the influence is made. This estimate may be based on: actual expenses if they are primarily driven by the disability (such as expenses arising from native title legislation); adjusted actual expenses (such as for administrative scale affected expenses); or average per capita expenses (where the level of expenses is primarily driven by State policies).

5. Combine the factors for a component

When more than one factor is assessed for a component, they must be combined to get the component factor. The factors are added if they are independent of one another — this is, because they affect different expenses in the component. If the factors interact (for example, when one affects quantity and the other price levels), they are multiplied.

6. Calculate the assessed expenses for each component

The assessed expenses for the service delivery component are determined by:

- allocating the total State expenses for the component across the States in proportion to their share of the population (this is equivalent to assuming they each spend the same amount per capita); and
- multiplying each State's allocated expenses by its component factor.

The assessed expenses for the other expenses component is the sum of the assessed expenses attributed to each influence.

7. Estimate each State's assessed expenses

Each State's assessed expenses (that is, the expense it would incur to provide the average level of service to its population) is derived by summing the assessed expenses for each component.

An overall category disability factor (often called the relative cost of providing services) can be derived by relating a State's assessed expenses per capita to the average per capita expenses for the category.

Box 29-3 Simplified example of an expense assessment

1. The **start point** is the average expense per capita across all States for a category, say Schools education.
2. We then ask how much more than the average a State needs to spend because its population characteristics mean its residents **use** of the service is above or below average. For example, if New South Wales had 40 per cent of enrolments and 30 per cent of the total population, it would have per capita enrolments 33.3 per cent above the average ($40/30 = 1.3333$). So, it would need 1.3333 times the average expenses to deliver the average education service per capita — this factor converts the national average per capita expense into what the State would need per capita. In a usual assessment, many more influences are included, but they result in a factor like the 1.3333 above.
3. So far we have looked at how differences in use affect State expenses. **Price effects** are dealt with through location.
 - **Interstate price differences:** We consider wage and non-wage costs separately and then weight them together according to the share of wages and non-wages in category expenses. For example, if New South Wales wages are 3 per cent above average and wages account for 80 per cent of school expenses and non-wage costs are 1 per cent below average, the interstate location factor for education would be: $0.80 * (1.03) + 0.20 * (0.99) = 1.0220$.
We then adjust the use factor (1.3333), by the interstate price effect $(1.0220) = 1.3333 * 1.0220 = 1.3627$.
We could now say that after adjusting for differences in use and interstate prices, New South Wales would need 1.3627 times the average per capita expenses to deliver the average education service.
 - **Regional price differences.** In measuring this we look at where people live in a State — assume two regions: urban and rural. The data on service use tell us what services the population in each area use (at average levels). Data also indicate that delivering a unit of service in a rural region needs more physical units of input than in the urban region. In the case of schools, this would mean that average class sizes in rural areas are less than in urban areas (more teachers per pupil than in the city). This is called a **service delivery scale** effect.
Let us say the service delivery scale effect means five per cent more physical resources are needed in rural areas.
Now the scale weighted population of New South Wales would be its urban population plus 1.05 times its rural population.
This calculation is repeated for each State. For example, the New South Wales service delivery scale factor will be its share of the total weighted population divided by its share of the population. So, if New South Wales is assumed to have 25 per cent of the weighted population, its scale factor would be $(25/30 = 0.8333)$ — implying it has a below average share of its population in rural areas.
We would now take this factor and use it to adjust the average expense (already adjusted for differences in use and interstate prices) to derive a new factor: $0.8333 * 1.3627 = 1.1356$.
After adjusting for service delivery scale, use differences and interstate price differences New South Wales would need 1.1356 times the average per capita expenses to deliver the average service.
 - So far we have assumed the cost of delivering a physical unit of State input is the same across all regions. Data suggest this is not true.
Assume that on a national average basis a unit of State education input is 10 per cent more expensive in rural than urban areas. We would calculate a weighted population for New South Wales and each other State as its urban population plus 1.1 times its rural population. Assuming the New South Wales share of this weighted population is 22 per cent, its **regional cost factor** would be $(22/30 = 0.7333)$. Since this implies New South Wales has a below average share of its population in rural areas, its factor is less than one.
When combined with the previous steps its factor is: $1.1356 * 0.7333 = 0.8327$.
4. The example implies that after adjusting for differences in use, interstate costs, service delivery scale and regional costs New South Wales needs 0.8327 times the average per capita expenses to deliver the average service.

- 23 The way factors are calculated varies between categories.
- Where there is a single user group, the factor is equal to the proportion of a State's population from which the user group is drawn, compared with the average proportion.
 - Where there are multiple user groups, each using the service more or less intensively, a more detailed approach is applied. The approach derives notional users for each State based on the average use rates for each user group. The factor is the State's share of the total notional user population³ divided by its share of population.
- 24 The calculations are based on average use rates to ensure they are not affected by an individual State's policy.
- 25 A further allowance is made if it is more costly to provide the service to particular sub-groups (such as people with low income or Indigenous people) and the States as a whole devote more resources to those sub-groups. This is done by applying the average unit cost weight⁴ to the sub-group population. A State's factor is then equal to its share of the cost weighted notional user population compared to its share of population. Box 29-4 illustrates these calculations.

Box 29-4 Example of a disability calculation

A disability factor for State i = State i's notional users/State i's population **divided by** total users/total State populations

Where:

State i's notional users = sum of all notional users in each sub-group of State populations

Notional users in each sub-group = State i's population in sub-group **multiplied by** the national use rate of the sub-group

If further unit cost disabilities relate to a sub-group, a cost weight is included in the calculation:

Notional cost weighted users in each sub-group = State i's population in subgroup
multiplied by the national use rate of the sub-group
multiplied by the national cost weight for the sub-group.

- 26 *Disabilities that mostly affect unit costs.* The effect of these disabilities (such as administrative scale and location) can vary from service to service because the proportion of the costs they affect varies across services. For example, wages are a higher proportion of the costs of some services than they are of others.
- 27 In each case, we measure the underlying disability. But, before it is applied to a category, it is weighted to reflect the proportion of the total service costs it affects.

³ Calculated as the sum (across all sub-groups) of the population in each sub-group, multiplied by the national use rate for that sub-group.

⁴ These cost weights reflect the extra (fewer) expenses incurred in providing services to each member of the sub-group relative to all users of the service. Where data are available, they are calculated as the average expenses per user for the relevant sub-group relative to average expenses per user across all users of the service. In cases where data are limited, the extra costs per member of the sub-group may be estimated.

- 28 *Interaction of disabilities*. The effects of many disabilities interact or have a compounding relationship. For example, the age and gender of the potential users of a service, their Indigenous status, their socio-economic status and the region in which they live can each influence costs and may do so in an interactive way. The age of a user may increase or reduce the cost of delivering a service and if the user also has a low socio-economic status, this may increase the cost more or less than proportionally.
- 29 A model that simply compounds the effects of separate measures of each influence could produce inappropriate interactions and double counting. This is avoided by measuring the joint effects of several influences. Where possible, this is done using data on the population and service users that are cross-classified according to the relevant characteristics (such as age, Indigenous status, socio-economic status (SES)).
- 30 Most socio-demographic composition factors are calculated in this way; that is, average expenses (or separate use or cost weights) are assessed for each population sub-group with more than one common characteristic (such as 60 to 70 year old Indigenous males with low SES). A factor is calculated by:
- deciding which population sub-groups affect the expenses;
 - measuring the size of each sub-group, using estimated resident population data;
 - estimating the expenses on each sub-group using administrative data;
 - calculating average expenses for each sub-group by dividing the expenses by the number of people; and
 - calculating each State's assessed expenses by multiplying the average expenses for each population sub-group by the number in the sub-group for each State.
- 31 If administrative data on use and unit costs for each group are used instead of expense data, the use and cost weights are calculated for each sub-group, and notional users are derived by multiplying use weights, cost weights and State populations for each sub-group. A State's total notional users are the sum of its notional users in each sub-group. A factor is obtained by dividing a State's per capita notional users by the average per capita notional users.
- 32 A specific population sub-group is included in the calculation if the cost of providing services to it is materially different from the average cost; or the sub-group's use or unit cost of services is materially different from the average, and the proportion of the sub-group population in each State is materially different.
- 33 Total expense data disaggregated by relevant population groups was only available in this review for Admitted patients. The Australian Institute of Health and Welfare (AIHW) can provide expense data disaggregated by age, sex, Indigenous status, country of birth and location. (The location data allowed us to recognise both the impact of remoteness on costs and socio-economic status because each location can be classified by its socio-economic index for areas (SEIFA) index.) Expense data disaggregated by age and sex were also available for

Community and other health services, but other data were required to estimate disaggregation for Indigenous and socio-economic status and location.

- 34 Disaggregated administrative data on users were available for many categories — Schools, Post-secondary education and Justice services. Unit cost data were more difficult to obtain.
- 35 Information on how costs varied by location, cross-classified by other characteristics, was hard to obtain. For most categories, differences in regional costs have been recognised in a separate location factor which is multiplied by the socio-demographic composition factor. This approach gives an approximation of the true result. How good that approximation is depends on how close the distribution of population by location (classified by the State-based index of accessibility and remoteness — SARIA) is to the distribution of services (or notional users). For example, notional users can be greater than population in areas where Indigenous people live because of the above average costs of delivering services to Indigenous people. In this case, regional location assessments may underestimate the assessed expenses for States with more Indigenous people.
- 36 While assessing disabilities using cross-classified data improves accuracy, it does so at the cost of making the calculations larger. For example, if a calculation covers 6 age bands, 2 sex bands, 2 Indigeneity bands, 2 remoteness bands, 2 socio-economic status bands and 2 English proficiency bands, a total of 192 weights are calculated.
- 37 Table 29-1 is a summary of the disability factors assessed in each expenditure category. The glossary at the end of the report provides definitions.

REVENUE ASSESSMENTS

- 38 The revenue assessments aim to measure the revenue each State would raise from its own sources if it made the average effort — that is, if they each imposed taxes and charges at the average rate and collected them with the average effort and efficiency. We make separate assessments of the revenue base for each activity being taxed because it better captures differences in State capacities to raise revenue from the taxes available to them — it better reflects what States actually do.
- 39 The task of estimating assessed revenues for each revenue category involves:
 - deciding whether differences in revenue capacity for a category reflect different disabilities (reflected in interstate differences in the per capita size of revenue bases), or are caused by differences in State policies;
 - identifying and measuring the policy neutral revenue base available to each State for relevant revenues; and
 - measuring the assessed and average revenue capacity for each revenue.
- 40 Tax bases are measured by reference to data on the value or number of transactions or assets subject to a tax under conditions representative of those applied by the States in general — that

is, they reflect the legal incidence of the tax. For example, the revenue base for Payroll tax was measured by reference to the value of the wages bill in a State, adjusted for a threshold below which taxes are not applied because that is what the majority of States taxed.

- 41 In this review, we used the broadest measure possible of each revenue base that is consistent with the average tax policy.

Table 29-1 Summary of disability factors measured in each expense category

Category	Socio-demographic composition	Cross-border	Interstate location	Regional location	Service delivery scale	Administrative scale	National capital	Native title and land rights	Other
Schools education	X	X (a)	X	X	X	X			(b)
Post-secondary education	X (c)	X	X			X			
Admitted patients	X (d)		X			X			
Community and other health services	X (e)	X	X	X	X	X			
Welfare and housing	X	X	X	X	X	X	X		(f)
Services to communities	X (g)		X	X (h)		X		X	(i)
Justice services	X		X	X	X	X	X	X	
Roads			X	X		X	X	X	(j)
Transport services			X			X			(k)
Services to industry			X			X		X	(l)
Other expenses		X	X	X		X	X	X	(m)
Depreciation (n)	X	X	X	X	X	X	X	X	
Investment (o)	X	X	X	X	X	X	X	X	(p)
Net lending									(p)

- (a) Assessed in the socio-demographic composition factor.
 (b) Transport and non-government school SPP.
 (c) Includes a remote cost weight.
 (d) Recognises intrastate location.
 (e) Includes economic environment.
 (f) First home owners' scheme and Remote Indigenous housing national partnership payment (NPP).
 (g) Concession and community development factors.
 (h) The factor only applies to water and sanitation, electricity subsidies and community development.
 (i) Water and sanitation, electricity subsidy factors.
 (j) Road length, traffic volume and heavy vehicle use for urban and rural roads, local roads, bridges, other services.
 (k) Urban/non-urban operating subsidies, capital subsidy.
 (l) Economic environment.
 (m) Natural disasters relief, transitional superannuation and cultural and linguistic diversity.
 (n) Relevant expense use and cost disabilities (from Other expense assessments), weighted by depreciation proportions, are applied to depreciation expenses.
 (o) Relevant expense use disabilities (from Other expense assessments), weighted by depreciation proportions are applied to the change in average physical assets per capita. Relevant expense cost disabilities, weighted by capital expenditure proportions, are applied to assessed investment per capita.
 (p) Population growth assessment.

42 Once the revenue base is measured, the average revenue raising effort (or the Australian average effective rate of tax⁵) is applied to the revenue base of each State to calculate its assessed revenue. This is equivalent to sharing the total revenue raised in all States among them in proportion to their shares of the tax base.

43 Box 29-5 sets out the framework used to identify an appropriate policy neutral revenue base.

Box 29-5 Revenue assessment framework

Step 1: Review States' legislation and provisions to establish how the tax is levied — who pays it, on what activities or assets it is levied, and what exclusions from taxable liability are allowed by the States.

Step 2: Establish the average policy. The average policy is the policy applied to the majority of the total tax base. Account may also be taken of the number of States that follow the policy.

Step 3: Determine the best conceptual measure of the revenue base under the average policy.

- Where the tax policies of all States are virtually the same, the actual revenues raised by each State could be an appropriate measure of each State's relative ability to raise revenues. In this case (called the actual per capita (APC) method), it would not be necessary to measure the revenue base itself, all differences in observed revenues per capita between States can be attributed to differences in revenue raising capacities.
- Most often, observed differences in per capita revenues are due to differences in revenue effort (policy) and in revenue bases (which are assumed to arise from factors beyond the direct control of State governments).
The aim is to measure the revenue base in terms of the value of the transactions (for example, the value of conveyances) or assets (the value of land) that would be taxed if the average tax policy was applied in each State.
- Where differences between each State's policy and the average policy are very large, and a policy neutral revenue base cannot be determined, the Commission uses State populations as the revenue base. This method (called the equal per capita (EPC) method) implies each State has the same per capita ability to raise revenues. It attributes all interstate differences in observed per capita revenues to policy differences, and does not cause any redistribution of GST shares.

Step 4: Adjust the data to:

- exclude activities that are exempt from tax under the average policy, if there is reliable evidence that represent a materially different proportion of the tax base across States; or
- make it more comparable across the States. This is necessary if the data are obtained from the States and there are differences between States in the scope of the activities they tax.

Step 5: Calculate assessed revenue for each State by:

- deriving the average effective tax rate (done by dividing the total revenue collected in all States by the total revenue base of all States) and applying it to each State's measured revenue base; or
- sharing the total revenue in the category on the basis of State shares of the revenue base.

44 Box 29-6 provides a simple example of the steps required.

⁵ Effective rates are the total revenue collected by the States divided by the total of their revenue bases.

Box 29-6 Example of a revenue assessment

1. The **starting point** for measuring the capacity of States to raise revenue is to identify the best measure of the revenue base. Take the example of Mining royalties. States generally collect Mining royalties on the value of mineral production. For the Mining revenue assessment, the value of production data come from the ABS.
2. If the data come from a national collection (as it does for Mining revenue), consideration is given to whether **adjustments** are needed because some part of it is not taxed under the average tax policy. In the case of Mining revenue, we exclude the value of offshore oil and gas production from the ABS data since it is subject to Commonwealth, not State jurisdiction.
3. **Other adjustments.** In some cases, factors other than the total value of the tax base may affect a State's capacity to raise revenue from the tax. For example, Mining royalty rates differ from mineral to mineral. While States collect Mining royalties on value of production, they generally aim to ensure royalty rates are in line with the long term profitability of production. Reflecting this, royalty rates on oil, gas, export coal, iron ore (lump) and bauxite (over six per cent of the value of production) are higher than rates on domestic coal, iron ore (fines), base metals such as copper and other minerals (below five per cent).
4. To reflect this feature of average royalty policy, value of production data are separated into minerals subject to higher and lower royalty rates.
5. If there are no other disabilities affecting the relative capacities to raise revenue, **assessed revenue** is estimated for each component (grants in lieu, high, and low royalty minerals in the case of Mining revenue) for each State by applying the average effective rate of tax to each State's adjusted component revenue base — for example, if the average effective rate of royalty for high royalty minerals is 10 per cent, then each State's assessed revenue is 10 per cent of its value of production for those minerals. Alternatively, assessed revenue for high royalty minerals may be calculated by allocating the total royalties collected from them by all States among them according to their share of the value of production. For example, Queensland has 57.0 per cent of the value of production of high royalty minerals and it is assessed to be able to raise 57.0 per cent of royalties from them.

45 Table 29-2 summarises the revenue bases and the adjustments used in each assessment.

Table 29-2 Revenue assessments

Category	Revenue base	Adjustments
Payroll tax	Compensation of employees	The measure of the base is adjusted to remove: <ul style="list-style-type: none"> • defence forces and embassy employees; • public sector employees except those working in PTEs and higher education institutions; and • earnings of private sector employee below threshold.
Land tax	Value of holdings of non-principal residential and commercial and industrial land	The measure of the base is adjusted to remove holdings valued below \$300 000. To allow for the effects of progressive tax rates and interstate differences in the value distribution of land holdings, the revenue base is sub-divided into value ranges.
Stamp duty on conveyances	Value of transactions	The value of transactions in each value range provided by the States is adjusted to accord with the average policy: <ul style="list-style-type: none"> • on the scope of duty on land rich transfers; • to impose land holder rather than land rich tests; • not to tax land rich transfers involving listed • to tax off the plan sales of units; • to tax non-real property; and • to account for refunded assessments in the year refunds are made.
Insurance tax	Premiums collected on general, life and CTP policies	Adjustments are made to the revenue base to exclude workers compensation and reinsurance premiums. Revenue collected from fire and emergency services levies is excluded from the average revenue.
Motor taxes	Number of passenger vehicles and light commercial vehicles; Number of heavy rigid trucks and articulated trucks; and Value of vehicles liable for stamp duty.	
Mining revenue	Value of production of high royalty minerals (a) Value of low royalty minerals (b) Grants in lieu of royalties (c)	
Other revenues	Population (EPC)	

- (a) High royalty minerals include export coal, iron ore (lump), oil and gas subject to State royalty and bauxite. The average royalty rate on these minerals exceeds five per cent.
- (b) Low royalty minerals are those minerals subject to a royalty rate of less than five per cent. They include coal mined for domestic use iron ore (fines), base metals other than bauxite, uranium, industrial materials such as salt and gypsum, and construction materials such as sand and gravel.
- (c) Grants in lieu of royalties are payments made by the Commonwealth to Western Australia and the Northern Territory in lieu of royalties collected by the Commonwealth on offshore oil and gas production and, in the case of the Northern Territory, uranium.

INVESTMENT AND NET LENDING ASSESSMENTS

- 46 The Investment and Net lending assessments are made in a similar way to expense assessments. However, the average policy to which we are equalising for these assessments

relates to average per capita asset holdings rather than average flows (such as average expenses per capita). A State will need more or less than average per capita investment, depending on how the average per capita level of assets, its population and other characteristics have changed from one period to the next. It will also depend on the changes in relative price levels States face.

- 47 Assessed investment per capita in a year is calculated by subtracting the assessed per capita level of infrastructure required at the start of the year from the assessed per capita level of infrastructure required at the end of the year and multiplying the result by unit cost disabilities. The assessed per capita level of infrastructure in each period is calculated by applying the expense disabilities for the period (which affect the quantity of infrastructure required by a State) to the average per capita infrastructure of the period. The total of infrastructure at the end of the year is the published ABS Government Finance Statistics (GFS) figure; the value of infrastructure at the start of the year is calculated by subtracting from the end of year figure, the net investment in the year.
- 48 The assessed net lending for a State in a year is calculated by subtracting the average per capita level of net financial worth at the start of the year from the average per capita level of net financial worth held by States at the end of the year. Again the starting year figure is calculated by subtracting from the published ABS GFS total net financial worth for all States at the end of the year, the total net lending for the year.

CALCULATING RELATIVITIES

- 49 As shown in Box 29-7 relativities are calculated for each State by:
- combining the assessed expenditures and revenues to calculate the per capita amount of GST required to give each State the same per capita net financial asset holdings in each assessment year; and
 - converting each State's assessed per capita requirement to a proportion of the per capita GST in each year (that is, calculating per capita relativity for each assessment year).
- 50 The assessed GST requirement for each State can also be represented as the average or equal per capita distribution of the GST, adjusted to recognise the State's above or below average assessed expenditure, revenue raising capacity and receipts of Commonwealth payments.
- 51 Box 29-8 illustrates that calculation. This is described as the 'needs' presentation of the model. Needs are the difference from the average expenditure or revenue of a State's assessed figure. This version of the model shows how differences from the average in States' assessed relative fiscal capacities lead to shares of GST that differ from the average.

Box 29-7 Distribution model for the 2010 Review

We define net financial worth and net lending	= net financial worth in the previous year (a) plus net lending (b) = GST plus own source revenue (c) plus Commonwealth payments impacting on State fiscal capacities less State expenses (c) less investment (c)
So, Assessed GST requirement (per capita) for State i:	= State i's assessed net lending plus State i's assessed expenses plus State i's assessed investment less State i's assessed revenue less State i's Commonwealth payments impacting on State fiscal capacities (all per capita) And
State i's per capita relativity for each assessment year	= State i's assessed GST requirement per capita divided by average per capita GST

- (a) Measured in current year price levels excluding revaluations and other non-transactional changes.
 (b) Each State's assessed net lending is determined as its per capita share of net financial worth at the end of the year less its per capita share of net financial worth at the end of the previous year.
 (c) For reasons of transparency and accuracy, these terms include balancing items designed to ensure the net lending figure in the Commission's comparisons is equal that shown in the ABS GFS.

Box 29-8 Calculation of GST requirement using needs to adjust average per capita GST

Assessed GST requirement (per capita) for State i:	= GST/Total population of States plus Expense needs _i (a) plus Investment needs _i (b) plus Net lending needs _i (c) plus Revenue needs _i (d) plus Commonwealth payment needs _i (e)
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- (a) Expense needs are calculated for each expense category by subtracting the average per capita expense for the category from the assessed expense for each State (calculated by adjusting average per capita expense for the category by State disabilities, or influences outside their control which influence their per capita costs. These are summed to obtain total expense needs).
 (b) Investment needs are calculated by subtracting average investment per capita from assessed investment per capita for each State (calculated by subtracting each State's assessed per capita infrastructure requirements in the previous year from those of this year).
 (c) Net lending needs are calculated by subtracting average net lending per capita from assessed net lending per capita for each State (calculated by subtracting a State's per capita net financial worth in the previous year from that of this year).
 (d) Revenue needs are calculated for each revenue category by subtracting the assessed revenue for each State (calculated by applying the average tax rate to the tax bases of each State) from the average per capita revenue for the category. These are summed to obtain total revenue needs.
 (e) Commonwealth payment needs are calculated by subtracting the average payment from States' actual payments.

CALCULATING APPROPRIATE RELATIVITIES

- 52 We have chosen to calculate the relativities we consider appropriate for distributing the GST in the application year by averaging the relativities calculated for the three most recent years for which actual State budget data are available. In our view, these relativities give the best estimate of State GST requirements in that year because they best balance our competing

objectives of reliability, contemporaneity and simplicity. We considered a range of different ways of calculating relativities.

- 53 *Why not calculate relativities using State forward estimates?* While it would be ideal to use data that relate to the application year, this is not possible. Relativities are required before the application year commences so that States can plan their budgets for that year.
- 54 While budget forward estimates for the application year are available, the Commission would be reluctant to calculate relativities using them because we are not satisfied they are sufficiently reliable. They often differ significantly from the outcomes in the year. Nor are estimates of State circumstances (tax bases, demographic characteristics) in the application year available. While these could be projected using trending, this would be complex, data intensive, potentially unreliable, difficult to implement and give uncertain results.
- 55 All States were opposed to any approach using such estimates. We therefore rely on historical data.
- 56 *Why not use only one year of data?* It would be possible to use the last completed financial year to calculate relativities. However, we know that the financial data and data on State circumstances available for that year would often be revised and could result in unreliable results. For example, ABS GFS data are not available for that year. As a result, we must use data provided by the States which are revised when GFS becomes available. Similarly, other data series on State circumstances can be substantially revised following that year or they may not be available.
- 57 One year may also be influenced by abnormal events that could distort the underlying State fiscal capacities. For example, floods and fire storms in a year can have a major impact on State economies which may not be on-going.
- 58 We are not attracted to using one year of data only. An averaging process to reduce the impact of these effects is much preferred.
- 59 *Why use three years of data?* The relativities are more contemporary than in the past because they are based on historical data for three, instead of five, years. The use of three years of data smoothes the effects of year to year fluctuations and one-off anomalies in the data, although not to the same extent as the use of five years of data. Most States supported a change to three years at the Commission's meeting with the Heads of Treasuries held in November 2007.
- 60 The relativities now reflect circumstances that precede the application year by between two and four years. Using three years provides a balance between our desire to produce relativities that are as contemporary as possible and avoid volatility caused by data revisions or changes which do not reflect the underlying fiscal positions of the States. If there are cycles in State fiscal capacities, generally due to changes in State revenue raising capacity, the use of three years' data will flatten them.
- 61 *Why use simple averages to calculate relativities?* It would be possible to weight the assessment year relativities differentially; for example to give more weight to the more recent

years and to the most recent revealed State budget priorities. This would give more weight to data that are most subject to revision. In any case, the Commission has no basis for deriving such weights and their choice would be arbitrary. Moreover differing weights would have significant impacts on the recommended distribution of the GST revenue in the application year. We have decided that a simple average is most appropriate in these circumstances. The simple average approach avoids complexity and each assessment year is given equal weight in calculating the relativities.

- 62 *Why not modify the average to reflect significant events or developments?* We take into account some recent developments in calculating relativities. When federal financial relations change in a major way, we adopt the policies in operation in the application year and modify historical data on Commonwealth grants to the States or on State taxes before we determine assessment year relativities. Using this process, known as backcasting, the recommended relativities reflect current policy settings.
- 63 We have considered if it should backcast other significant developments, such as the rapid rise then fall in Western Australia's ability to raise revenue from mining royalties. To be confident that we were not introducing bias we would need to include all significant developments. Doing that would require a large number of judgments to be made on how those developments would affect the relative fiscal capacities of the States. While ad hoc adjustments could be made, we prefer not to make such adjustments or to arbitrarily decide which developments to include because arbitrary choices do not necessarily improve fiscal equalisation.
- 64 *Why not correct 'errors'?* While the Commission has revised data in subsequent updates in the past, it had not adjusted State GST shares in a later year for discrepancies between the GST each State received in a year and what it would have received if the GST shares had been calculated using data for the year.
- 65 We acknowledge that the distribution of the GST recommended as being appropriate for a future year will differ from what would be calculated once that year has passed and data for it become available. However, there is a margin of error around any set of relativities and making corrections in a future year for a year that is past may lead to better equalisation or it may result in a divergence from equalisation. It would only be possible to partially correct for errors — the known ones — and that might, or might not, improve the result. In the face of the greater instability in States' total revenues and greater uncertainty for States in framing their budgets that such a process could produce, we prefer to allow 'bygones to be bygones'.
- 66 *Why not an advance and completion grant system?* It would be possible to adopt a system of advance and completion grants to partially correct for errors of the past. For example, an approach similar to that previously adopted by the Commission for the calculation of special grants for claimant States could be adopted. An advance grant was provided on the basis of historical data and an adjustment or completion grant calculated when data for the application year became available.

- 67 Alternatively, a simple one-calculation approach could be adopted. In that approach, each State would receive in a year:
- an EPC allocation of the application year GST revenue based on its estimated application year population; and
 - a borrowing adjustment calculated using data for the three most recent historical years, indexed to the application year using an average interest rate. The borrowing adjustment would be the GST requirement for the years, assessed using the Commission's methods of assessment for each service, revenue and Commonwealth payment, less the EPC share of the GST for the years.
- 68 This model⁶ provides an advance grant on an EPC basis and the completion grant on the basis of the three most recent historical years, escalated to the application year using a chosen interest rate⁷. The outcomes (in terms of State allocations of the application year GST revenue) would be equivalent to those under the review approach if the rate of growth of the GST between the assessment and application years was equal to the rate of interest and State populations were stable.
- 69 Heads of Treasuries were not attracted to an advance and completion grant model. They were concerned that it would increase the complexity of the Commission's calculations and lead to less certainty of annual outcomes. Like us, they are prepared to accept by-gones are by-gones — that the GST they receive in a year will not be clawed back (or increased) after the year has been completed. They have spent the available funds and do not wish later years' budgets to be affected by revisions to earlier relativities.
- 70 We accept the views of the Heads of Treasuries. In addition, we note the annual update process means revisions are continually taking place and known errors that can be corrected are not perpetuated.
- 71 *Should the effect of changes in State populations on State assets be recognised in a more contemporary way?* We aim to give States the capacity to hold the same financial worth per capita and to recognise the impact of population growth on all asset holdings. The way the appropriate relativities are determined could be adjusted to reflect the impact of relative population growth among the States between the assessment years and the application years. It could be said that this would be more contemporary. However it would be a partial adjustment, and by ignoring other possible changes in fiscal conditions over the same period may not improve the equalisation outcome. We prefer not to make such partial adjustments.
- 72 *Combining assessments to calculate relativities.* Table 29-3 to Table 29-8 illustrate how relativities are calculated. They show the assessed expenses, revenues, Commonwealth

⁶ Under this approach, relativities *per se* would not be needed — the GST received by each State each year would be the sum of its EPC advance and its differential borrowing requirement.

⁷ The review approach can be thought of as an EPC advance grant and an assessed completion grant based on the average of the three most recent years and escalated to the application year using the growth in the GST.

payments, investment and net lending for 2008-09 and how they are combined to calculate annual relativity and average relativity factors.

Table 29-3 Assessed expenses, 2008-09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Schools education	1 633.52	1 513.30	1 688.98	1 721.00	1 608.44	1 803.49	1 584.67	2 854.03	1 637.55
Post-secondary education	233.98	224.71	230.78	245.67	227.56	236.20	310.56	408.48	234.82
Admitted patients	1 195.37	1 128.79	1 155.80	1 176.93	1 284.39	1 289.32	970.80	1 976.23	1 182.22
Community and other health services	564.86	590.47	640.24	779.64	603.23	742.19	751.77	1 519.35	627.97
Welfare and housing	681.55	609.14	719.13	700.82	782.04	876.43	513.57	2 691.71	703.00
Services to communities	247.64	223.34	289.03	349.48	292.37	206.99	177.41	1 438.23	273.77
Justice services	590.84	517.88	624.09	661.45	587.65	669.84	616.00	2 247.43	605.59
Roads	244.65	239.32	290.74	345.95	307.26	266.59	188.91	670.52	271.54
Transport services	347.89	355.06	298.66	303.94	289.82	196.97	273.46	193.65	324.71
Services to industry	285.06	281.66	289.64	317.57	315.01	336.07	289.30	405.05	293.16
Depreciation	380.37	361.57	406.60	447.22	409.81	413.83	341.89	961.26	396.09
Other expenses	1 331.44	1 352.95	1 335.04	1 355.60	1 340.74	1 462.65	1 651.93	1 883.73	1 354.49
Total	7 737.16	7 398.19	7 968.74	8 405.27	8 048.31	8 500.57	7 670.26	17 249.68	7 904.91

Source: Commission calculation.

Table 29-4 Assessed revenues, 2008-09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Payroll tax	833.92	789.37	695.24	940.03	628.52	567.52	812.05	632.52	781.94
Land tax	256.92	270.73	273.64	404.75	155.33	120.32	171.81	184.21	265.92
Stamp duty on conveyances	416.94	418.73	522.84	447.02	312.69	285.89	427.77	454.06	431.49
Insurance tax	150.31	132.19	129.30	133.86	135.12	103.65	124.74	111.28	136.90
Motor taxes	263.25	308.40	327.82	387.30	299.16	316.83	261.56	275.53	304.06
Mining revenue	197.57	26.20	759.17	1 399.29	122.07	70.14	0.00	614.73	382.87
Other revenue	1 724.89	1 724.89	1 724.89	1 724.89	1 724.89	1 724.89	1 724.89	1 724.89	1 724.89
Total	3 843.79	3 670.51	4 432.89	5 437.14	3 377.79	3 189.23	3 522.82	3 997.23	4 028.07

Source: Commission calculation.

Table 29-5 Assessed Commonwealth payments, 2008-09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
National healthcare SPP	491.96	475.64	474.31	480.32	524.83	469.13	416.44	592.42	484.92
Commonwealth payment balancing items	407.40	407.40	407.40	407.40	407.40	407.40	407.40	407.40	407.40
National schools SPP - Non-government schools	258.90	271.19	263.40	268.16	282.03	241.44	313.52	316.05	266.58
National schools SPP - Government	155.10	147.53	155.49	143.81	167.67	175.61	143.81	308.64	154.95
Nation building program NPP - Construction - National network roads	178.41	53.18	243.70	148.75	140.23	74.03	0.00	181.26	149.37
Skills and workforce development - National SPP	62.53	61.04	57.58	59.98	66.19	64.19	66.40	78.61	61.44
Health and hospital workforce reform NPP	60.36	58.91	57.51	57.86	65.06	59.90	52.22	66.50	59.45
Other	357.02	340.97	475.32	337.67	432.76	489.04	277.27	1 545.34	394.43
Total	1 971.69	1 815.86	2 134.71	1 903.96	2 086.16	1 980.74	1 677.08	3 496.22	1 978.54

Source: Commission calculation.

Table 29-6 Assessed investment and net lending, 2008-09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Investment	461.34	401.90	633.82	608.59	382.43	352.12	310.81	753.90	488.44
Net lending or borrowing	-505.76	-482.01	-457.29	-432.84	-516.49	-524.13	-493.35	-481.69	-483.48
Total	-44.42	-80.11	176.53	175.75	-134.06	-172.00	-182.54	272.21	4.96

Source: Commission calculation.

Table 29-7 Illustrative calculation of State relativities, 2008-09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Assessed net lending	-505.76	-482.01	-457.29	-432.84	-516.49	-524.13	-493.35	-481.69	-483.48
Plus: assessed expenses	7 737.16	7 398.19	7 968.74	8 405.27	8 048.31	8 500.57	7 670.26	17 249.68	7 904.91
Plus: assessed investment	461.34	401.90	633.82	608.59	382.43	352.12	310.81	753.90	488.44
Less: assessed revenue	3 843.79	3 670.51	4 432.89	5 437.14	3 377.79	3 189.23	3 522.82	3 997.23	4 028.07
Total requirement for Commonwealth payments	3 848.95	3 647.57	3 712.37	3 143.88	4 536.47	5 139.35	3 964.90	13 524.66	3 881.79
Less: Revenue from Commonwealth payments	1 971.69	1 815.86	2 134.71	1 903.96	2 086.16	1 980.74	1 677.08	3 496.22	1 978.54
Assessed GST requirement	1 877.26	1 831.71	1 577.66	1 239.92	2 450.30	3 158.61	2 287.82	10 028.44	1 903.25
Relativity	0.98635	0.96242	0.82893	0.65148	1.28743	1.65959	1.20206	5.26913	1.00000

Source: Commission calculation.

Table 29-8 Illustrative calculation of average State relativities for the application year

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
2006-07	0.90571	0.95557	0.96283	0.69917	1.29110	1.65561	1.19669	4.81399	1.00000
2007-08	0.96409	0.90186	0.94789	0.69830	1.27638	1.54753	1.06010	5.13837	1.00000
2008-09	0.98635	0.96242	0.82893	0.65148	1.28743	1.65959	1.20206	5.26913	1.00000
Average (a)	0.95205	0.93995	0.91322	0.68298	1.28497	1.62091	1.15295	5.07383	1.00000

(a) Sum of the relativities for each State in each year divided by three.

Source: Commission calculation.