ATTACHMENT B

THE DISTRIBUTION MODEL
A MATHEMATICAL PRESENTATION

1. The terms of reference for this review required the Commission to estimate, according to the principle of fiscal equalisation, per capita relativities that it considered appropriate to apply after 2003-04 for distributing the pool of GST revenue and health care grants (GST and HCGs) among the States. The Commission calculated the relativities using data for the most recent five completed financial years (1998-99 to 2002-03). These are called the assessment years.

2. The Commission calculated a relativity for each State for each assessment year using the methods described in this attachment. To derive the relativities considered appropriate for application in 2004-05, the Commission took a simple average of the relativities calculated for each of the five assessment years. This gave a 'best estimate' of the relative needs of States for funding in a future year. The five year averaging also acted to reduce volatility in grants from year to year.

3. The per capita relativities for each assessment year can be calculated using one of two equivalent approaches — one based on standardised expenses and revenues, the other using needs. The **standardised model** describes State requirements in terms of total expenses, less revenues and specific purpose payments (SPPs) treated by inclusion. The **needs version** is based on differences from the average in each of expense, revenue and SPPs. The latter approach is particularly useful for understanding the changes in State needs requirements. This attachment explains both approaches mathematically and shows their equivalence.

Notation

4. The following terms and definitions are used:

i, s	=	subscripts used to denote an individual State (i) or all States (s), the standard
E_S	=	total expenses of the States
R_S	=	total own-source revenue of the States
B_S	=	total budget result of the States

G_S	=	total payments to the States of GST revenue and unquarantined health care grants
O_i	=	Australian Government SPPs treated by inclusion paid to State i
O_S	=	total Australian Government SPPs treated by inclusion paid to the States
$TFAR_i$	=	total financial assistance requirement of State i (that is, the amount required for it to be in a position of fiscal equality)
$ATFAR_i$	=	the standardised deficit of State i (that is, its total financial assistance requirement, adjusted to take account of its revenue from SPPs treated by inclusion)
P_i	=	population of State i
P_S	=	total population of the States ($\sum P_i$)
$\frac{E_S}{P_S}$	=	standard expenses per capita
γ_i	=	State i's expense disability (or its relative cost of providing services)
$\frac{E_S}{P_S}\gamma_i$	=	State i's standardised expense per capita
$\frac{E_S}{P_S}(\gamma_i - 1)$	=	State i's expenses needs per capita
$\frac{R_S}{P_S}$	=	standard own-source revenue per capita
Y_i	=	State i's revenue base
Y_S	=	the total revenue base of the States (= $\sum Y_i$)

ρ_i = State i's revenue raising disability (or its relative revenue raising capacity), where

$$\rho_i = \frac{Y_i}{P_i} / \frac{Y_S}{P_S}$$

$\frac{R_S}{P_S}\rho_i$ = State i's standardised revenue per capita. This can also be expressed in the form in which it is generally calculated, as

$$\frac{R_S}{Y_S} \cdot \frac{Y_i}{P_i}$$

t_S = Australian average effective rate of State tax. This can also be defined as

$$\frac{R_S}{Y_S} = \frac{\Sigma R_i}{\Sigma Y_i}$$

$\frac{R_S}{Ps}(1-\rho_i)$ = State i's revenue needs per capita

$\frac{B_S}{P_S}$ = standard budget result per capita

ϕ_i = State i's disability due to the difference between its SPP receipts and the average for all the States, that is

$$\phi_i = \frac{O_i}{P_i} / \frac{Os}{Ps}$$

$\frac{Os}{Ps}\phi_i$ = State i's standardised SPPs (treated by inclusion) per capita

$\frac{Os}{Ps}(1-\phi_i)$ = State i's SPPs (treated by inclusion) needs per capita

f_i = per capita relativity assessed for State i

STANDARDISED MODEL

5. The per capita relativities for each assessment year were calculated by:

(i) calculating in per capita terms, each State's standardised expenses (the expenses it would incur to provide the average standard of State services, given the disabilities arising from the use of its services and its cost structure) and standardised revenue (the amount it could raise if it made the average effort to raise revenues from its own sources);

(ii) summing standardised expenses, standardised revenue and the standard budget result to produce a State's total financial assistance requirement (TFAR) (the total assistance the State would require to enable it to provide the average standard of State services, assuming it did so at an average level of operational efficiency and made the average effort to raise revenues from its own sources);

(iii) deducting from a State's TFAR its receipts of those Australian Government specific purpose payments (SPPs) that were treated by inclusion (this produces the State's adjusted total financial assistance requirement (ATFAR), called its standardised deficit); and

(iv) expressing a State's standardised deficit per capita as a ratio of the total per capita pool of GST and HCGs distributed during the year.

6. The model used in these calculations can be summarised by the following five equations:

The Budget Identity:
$$G_S + O_S + R_S - E_S = B_S \quad (1)$$

The Equalisation Budget:
$$G_S = E_S + B_S - R_S - O_S \quad (2)$$

The Standardised Budget:
$$TFAR_i = P_i \frac{E_S}{P_S} \gamma_i + P_i \frac{B_S}{P_S} - P_i \frac{R_S}{P_S} \rho_i \quad (3)$$

The Standardised Deficit:
$$ATFAR_i = TFAR_i - O_i$$
$$= TFAR_i - P_i \frac{Os}{Ps} \phi_i \quad (4)$$

Calculation of Per Capita Relativity:
$$f_i = \frac{ATFAR_i}{P_i} \Big/ \frac{G_S}{P_S} \quad (5)$$

7. Equations (1), (2) and (3) treat all expense categories (E_S) as one category and all revenue categories (R_S) as another, and equation (3) applies the disability factors (γ_i or ρ_i) to State i's population share of the total expenses and revenues. In practice, these factors are weighted averages of the assessments of the individual expense and revenue categories. User charges brought into the assessments are also included in E_S. To that extent, E_S is a net amount.

8. Equation (4) treats all SPPs (treated by inclusion) as one category and applies the disability factor (ϕ_i) to the population share of them.

9. ***The standard***. The standards are the population weighted averages of the States' total expenses or revenues. The standards therefore reflect an average of the experiences and policies of the eight States. They are usually expressed in per capita terms.

Equalisation budget

10. Equations (1) and (2) represent the equalisation budget identity and reflect the components used in assessing the total financial assistance requirement of each State. They are:

(i) total GST revenue and unquarantined HCGs (G_S);

(ii) total expenses of all States (E_S) on the functions in the equalisation budget;

(iii) total own-source revenues of all States (R_S) raised from the taxes and charges in the equalisation budget;

(iv) total specific purpose payments treated by inclusion (O_S); and

(v) the standard budget result (B_S), which is the difference between the total revenues ($G_S + O_S + R_S$) and total State expenses (E_S) in the equalisation budget.

11. The equalisation budget was compiled by analysing the annual operating statements of the States. Transactions were classified on a common functional basis — that is, E_S and R_S were split into categories for assessment purposes. Where necessary, figures were adjusted to ensure that they reflected common financial and accounting practices.

12. Equation (2) expresses the relationship as:

Total GST and HCGs	***equals***	total State expenses
	plus	standard budget result

minus	total own-source revenue
minus	total SPPs treated by inclusion.

13. Standard expenses, standard own-source revenue, standard budget result, standard general revenue assistance and standard SPPs received may collectively be called the financial standards. They are expressed in per capita terms and are calculated as follows:

(i) **standard expenses per capita** is total expenses of all eight States divided by their total population, or

$$\frac{E_S}{P_S} = \frac{\Sigma E_i}{\Sigma P_i}$$

(ii) **standard revenue per capita** is total own-source revenue of all eight States divided by their total population, or

$$\frac{R_S}{P_S} = \frac{\Sigma R_i}{\Sigma P_i}$$

(iii) **standard budget result per capita** is the sum of the budget results of all eight States, as derived from the difference between standard expenses and standard revenues in the equalisation budget, divided by their total population, or

$$\frac{B_S}{P_S} = \frac{\Sigma B_i}{\Sigma P_i}.$$

(iv) **standard SPPs per capita** is the total of the SPPs treated by inclusion received by the States divided by the total population of the States, or

$$\frac{O_S}{P_S} = \frac{\Sigma O_i}{\Sigma P_i}.$$

14. A separate standard was calculated for each expense or revenue category in the equalisation budget. The standard budget result was calculated, as shown in equation (1), by reference to all other standard amounts (expense less revenue).

Standardised budget

15. Equation (3) in paragraph 6 defines the standardised budget of State i. This was a budgetary outcome that State i could achieve if it were provided with Australian

Government assistance in accordance with the principle of fiscal equalisation. After receiving assistance equal to its total financial assistance requirement, State i could achieve the standard budget result by:

(i) providing a standard level of recurrent services;

(ii) levying taxes and charges at standard rates; and

(iii) operating at an average level of efficiency in both the provision of services and the collection of revenues.

This can be expressed as:

Total financial assistance requirement	***equals***	standardised expenses
	plus	standard budget result
	minus	standardised revenue.

16. Standardised expenses were defined as the expenses a State would incur if it provided the average standard of State services and did so at the average level of operational efficiency. Standardised revenue was defined as the revenue a State would collect from taxes and charges if it applied the standard tax rates to its revenue base, defined in accordance with the standard tax policy.

17. A State's total standardised expenses were the sum of the standardised amounts calculated for each expense category in the equalisation budget. Similarly, total standardised revenue was the sum of the standardised revenues for each revenue category.

18. Differences between States in their actual per capita revenues and expenses may be attributed to:

(i) policy differences affecting revenue raising effort or levels of service;

(ii) differences in efficiency of revenue collection or service provision; and

(iii) non-policy differences, being the unavoidable differences in revenue capacities or costs of providing the standard level of services arising from:

- different characteristics of State populations;
- different geography and physical environments; and

- differences in State economies.

19. The effects of State policies on revenue efforts, levels of service and operating efficiency affected equalisation outcomes to the extent that they influenced the Australian average financial and policy standards. Once the standards were established, each State's total financial assistance requirement was set by the non-policy influences on its costs of providing the standard level of services and its revenue raising capacities. Hence, the main task in estimating a State's standardised expenses and standardised revenue was the measurement of those non-policy influences.

20. ***Estimating standardised expenses.*** Standardised expenses for a category were estimated by multiplying the standard expenses per capita by the State's category disability ratio (or cost of service provision ratio) (γ_i) and its population. The cost of service provision ratio expressed the effects on the cost of providing services in a State of all relevant non-policy influences relative to their Australian average effect. Thus, for each category:

$$\text{State i's standardised expenses} = P_i \frac{E_s}{P_s} \gamma_i$$

21. Under the expense framework adopted for this review, a State's category disability ratio was calculated by adding its weighted rescaled component factor for each component of the category — the weights being the proportions of the category standard represented by each component. Within each component, individual disability factors were generally combined multiplicatively. However, dispersion and input costs factors were added because costs associated with population dispersion, wages, accommodation and electricity are different and do not interact. The result was multiplied with the other factors assessed for the component.

22. When the factors within each expense component were multiplied, some interaction effects resulted.

23. This expense assessment method ensured that the disabilities that applied to each class of expense in each category were applied to only that class of expense. This meant that any unintended interactions of disability factors were minimised, and a better horizontal fiscal equalisation result was achieved.

24. In concept, individual disability factors can be represented as:

$$\frac{X_i}{P_i} \Big/ \frac{X_S}{P_S}$$

where X_i, X_S are measures of cost and/or demand influences for State i and the total of the influences for all States;

$\frac{X_i}{P_i}$ = the per capita measure of the cost/demand influence for State i; and

$\frac{X_S}{P_S}$ = the Australian per capita measure.

25. In the following cases, a special approach was used to assess standardised expenses:

(i) where the Commission considered that all States could provide the standard level and quality of service with the same per capita level of expenses (all cost differences were attributable to policies and none to disabilities), the standardised expenses were set equal to the per capita standard expenses — that is, the equal per capita method was applied; and

(ii) where the Commission considered that differences in the per capita costs of providing a standard service were due wholly to non-policy influences, the standardised expenses were set equal to the actual per capita expenses of the States — that is, the actual per capita method was applied.

26. Total standardised expenses for a State were obtained by summing the standardised expenses calculated for each category.

27. ***Estimating standardised revenue.*** Standardised revenue was generally a direct estimate for each category of how much the State would raise from its own revenue base (Y_i) if it applied the standard revenue raising effort (generally represented by the Australian average effective rate of tax, t_S). Thus, for each category:

State i's standardised revenue = $t_S Y_i$

where $t_S = \frac{R_S}{Y_S} = \frac{\Sigma R_i}{\Sigma Y_i}$

28. The Commission used three types of revenue bases:

(i) **tax bases —** these reflected the legal incidence of the tax as indicated by actual tax provisions. Tax bases inherently captured differences in revenue raising disabilities. Data were obtained directly or estimated indirectly from actual collections. Tax bases may be contaminated by differences in State policies and adjustments were often made to remove the effects of those differences;

(ii) **proxy tax bases —** these were similar to tax bases in that they reflected the legal incidence of the tax but were generally broader than the actual tax base and used data from independent sources, such as

the ABS. They should be less affected by State policy. However, adjustments to these bases were also often made to remove the effects of policy; and

(iii) **sub-global bases —** these were broad economic indicators, such as gross state product, household disposable income or State population. They tended to reflect judgements about the effective incidence of tax and should be the least affected by policy differences. Adjustments were made to these bases for differences between the States that the Commission judged to reflect disabilities not otherwise recognised.

29. The Commission preferred to use tax bases or proxy tax bases where possible. However, if policy effects were thought to be large and too difficult to remove, sub-global measures were adopted.

30. The calculation of standardised revenue could also be expressed in terms of revenue raising disability factors, such that:

$$\text{State i's standardised revenue} = P_i \frac{R_S}{P_S} \rho_i$$

$$\text{where } \rho_i = \frac{Y_i}{P_i} / \frac{Y_S}{P_S}$$

31. There were also the following special cases.

(i) Where the Commission considered that all States had the same ability to raise revenue (that is, they had the same per capita revenue bases), the standardised per capita revenues were equal to the standard per capita revenue (the EPC method); that is,

$$\frac{Y_i}{P_i} = \frac{Y_S}{P_S}$$

hence $\rho_i = 1$.

(ii) where the Commission considered that all States were making the standard revenue raising effort, the standardised revenue for any State was equal to its actual collections (the actual per capita method). This situation did not arise during the 2004 Review, although the deduction from a State's TFAR of SPPs received was tantamount to such an assessment. However, there was one category (Stamp Duties on Shares and Marketable Securities) where the States' revenue efforts were effectively the same in all but the last assessment year. It was simpler to estimate standardised revenues from the actual collections than it was to measure the underlying revenue bases and apply the average tax rates to them.

32. Total standardised revenue for a State was obtained by summing the standardised revenues calculated for each category.

33. ***Standard budget result term.*** Equation (3) in paragraph 6 shows that the total financial assistance requirement included a standard budget result — that is, States were funded to enable them to achieve the standard per capita budget result, not to balance their budgets. Disabilities were not assessed for this term because the Commission considered that once States received financial assistance calculated for all functions in the equalisation budget, each State could provide standard services without having to tax at differential rates. An equal per capita budget result rather than a differential result was the more equitable outcome.

Standardised deficit

34. Equation (4) in paragraph 6 defines the standardised deficit, or the adjusted total financial assistance requirement (ATFAR), of State i. It expresses the relationship:

Standardised deficit ***equals*** adjusted total financial assistance requirement

equals total financial assistance requirement

minus SPPs treated by inclusion.

Treatment of SPPs

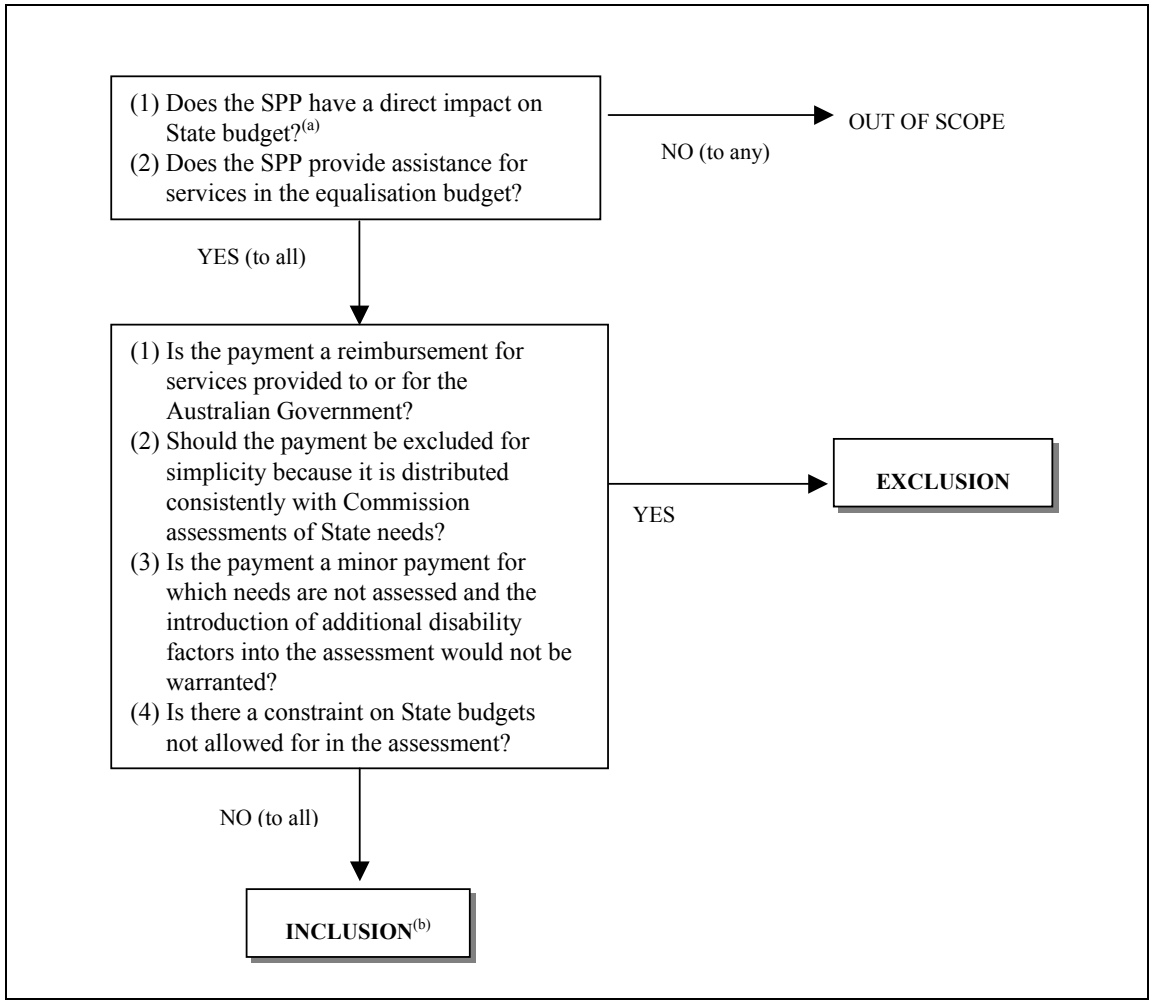
35. The Commission regarded the receipt by States of some Australian Government SPPs as contributing to their capacities to fund general operating expenses and it included the expenses resulting from the SPPs in the expense standards. For the 2004 Review, capital SPPs were brought within the scope of equalisation. In general, after deciding which SPPs fund functions in the scope of the equalisation budget, each SPP was treated in one of two ways:

(i) the inclusion method, whereby expenses financed from the SPP and State sources were included in the expenses standards. The payment itself was treated as part of other Australian Government revenue payments (O_i) which were available to finance part of the total financial assistance requirement of each State; or

(ii) the exclusion method, whereby the payment and the expenses funded from it were removed from the expense standards and O_i. Neither the receipt of the SPP nor its expense appeared in the equalisation budget.

36. Figure B-1 illustrates the process used to decide the treatment of each SPP.

Figure B-1 METHODS OF TREATMENT OF AUSTRALIAN GOVERNMENT REVENUE PAYMENTS IN 2004 REVIEW



Note: (a) Under this criterion, COPOs paid to non-government organisations and SPPs paid through the States were treated as out of scope because they did not have a direct impact on State budgets.

(b) When inclusion was used, the expense financed by the SPP was included in the equalisation budget and needs assessed in the relevant expense category. The SPP was treated as revenue, available to the recipient State to meet part of its aggregate needs.

37. ***Quarantining.*** The terms of reference required the Commission to treat certain Australian Government payments in such a way as not to affect the distribution of GST and HCGs. This 'quarantining' was achieved through the use of:

- the exclusion method (which required the amount of the payment to be removed from both the expense and the revenue side of the equalisation budget); or

- the revenue-exclusion method (where the amount was removed from only the revenue side of the equalisation budget because the payment could not be linked to specific State expenses).

38. ***Backcasting.*** The Commission adjusted its treatment of certain Australian Government payments and related budget items when it was evident that, for these items (mainly SPPs), the Australian Government-State funding arrangements in the application year would be quite different from those in the assessment period. This procedure is known as backcasting. Its aim was to ensure that, as far as possible, the relativities reflected the Australian Government-State arrangements that were expected to apply in the year when the relativities would be used. Backcasting was not used to adjust for changes in economic circumstances or State policies.

Calculation of per capita relativities

39. Equation (5) in paragraph 6 shows a calculation of the per capita relativities. In this step, a State's standardised deficit is converted to a per capita figure and divided by the Australian average per capita payments to the States (Gs) distributed during the year of assessment.

$$f_i = \frac{ATFAR_i}{P_i} \Big/ \frac{G_S}{P_S}$$

40. The per capita relativity for each State is the simple average of the relativities calculated for each of the five assessment years.

NEEDS PRESENTATION

41. Equation (3) in paragraph 6 shows the calculation of the level of assistance required for equalisation. There are other arithmetically equivalent versions of equation (3) that show the sources of fiscal inequality overcome by an appropriate distribution of GST and HCGs.

42. One of these, called the **Needs Version**, can be derived from equation (3) as follows:

$$TFAR_i = P_i \frac{E_S}{P_S} \gamma_i + P_i \frac{B_S}{P_S} - P_i \frac{R_S}{P_S} \rho_i$$

$$= P_i \left(\frac{E_S + B_S - R_S}{P_S} + \frac{E_S}{P_S}(\gamma_i - 1) + \frac{R_S}{P_S}(1 - \rho_i) \right)$$

$$= \quad P_i \left(\frac{G_S + O_S}{P_S} + \frac{E_S}{P_S}(\gamma_i - 1) + \frac{R_S}{P_S}(1 - \rho_i) \right) \qquad (6)$$

using $E_S + B_S - R_S = G_S + O_S$ from the Equalisation Budget identity; and

$\gamma_i - 1$ and $1 - \rho_i$ are respectively the factors of per capita expense and revenue needs. Needs are expressed as the differences from unity of expense and revenue disability ratios.

43. The adjusted TFAR can be derived from equations (4) and (6) as:

$$ATFAR_i = \quad TFAR_i - O_i$$

$$= \quad P_i \left(\frac{G_S}{P_S} + \frac{E_S}{P_S}(\gamma_i - 1) + \frac{R_S}{P_S}(1 - \rho_i) + \frac{O_S}{P_S} - \frac{O_i}{P_i} \right)$$

$$= \quad P_i \left(\frac{G_S}{P_S} + \frac{E_S}{P_S}(\gamma_i - 1) + \frac{R_S}{P_S}(1 - \rho_i) + \frac{O_S}{P_S}(1 - \phi_i) \right) \qquad (7)$$

where $1 - \phi_i$ is the per capita SPP needs (treated by inclusion),

or

Adjusted total financial assistance requirement	***equals***	standard financial assistance
	plus	expense needs
	plus	revenue needs
	plus	SPP needs

44. Under this presentation, the per capita relativities for each assessment year were calculated by:

(i) adopting an 'equalisation budget' of expense and revenue categories, drawn from State budgets (what States do);

(ii) taking as a starting point an equal per capita distribution between the States of the GST / HCGs pool;

(iii) estimating, for each category of expense, the amount above or below the eight-State average per capita amount that each State needs to spend to deliver services at the standard level;

(iv) estimating, for each category of revenue, the amount above or below the eight-State average per capita amount that each State could raise at the standard revenue raising effort;

(v) calculating, for each SPP (treated by inclusion), the amount above or below the eight-State average per capita amount that each State received;

(vi) accumulating these needs across all categories and SPPs for a State and adding them to or subtracting them from the standard equal per capita share of the pool to arrive at each State's adjusted total financial assistance requirement (or standardised deficit); and

(vii) dividing the standardised deficit by the total pool (in per capita terms) to find a relative share of the pool — the annual per capita relativity.

Equalisation budget

45. As in the standardised approach, the Commission defined an equalisation budget and decided the treatment of SPPs in step (i). Equation (2) is the same under the needs approach.

46. Note that the budget result term played no independent part in the calculation of relativities because it was ascribed zero needs. The application of zero needs to B_S implies that each State can, or is financed to, achieve the standard per capita budget result if the other conditions of fiscal equalisation are met. Hence, it appears as an equal per capita assessment in the standardised calculation of relativities below.

Equal per capita share

47. Step (ii) takes as its starting point the view that 'equality' and the differences in grant distribution required to achieve it should be measured in per capita terms. The base grant is therefore expressed as $\frac{G_S}{P_S}$ (where G_S is the equalisation budget pool of Australian government payments and P_S the total population of the States). That is, it is only to the extent that needs for a greater (or lesser) share exist, that each State's share of the pool will depart from equal per capita.

Needs

48. Steps (iii), (iv) and (v) are the point at which State specific needs (N_i) are defined and estimated. Expense needs arise from disabilities faced by the States in

providing services. For example, an aged population represents a higher cost and therefore a disability in the provision of aged welfare services. Some States, however, will be at more of a disadvantage than others.

49. Since the Commission worked with a fixed pool of GST and health care funding, the variations in the claims on that pool (the needs) must sum to zero. Therefore, while all States might share a disability, some States will have greater needs than others — some will be positive and some will be negative relative to the average so that they sum to zero.

50. On the revenue side, the concept of needs and disability can be thought of in terms of capacity and advantage. A State with a revenue raising advantage (more mining activity than average, for example) would have a greater revenue raising capacity in mining revenue than another State, or than the average. That State would therefore have less need for Australian Government funding.

51. As in the standardised approach, differences in actual expenses and revenues due to differences in State policies were not recognised as needs. For example, if one State imposed a tax at a higher rate than other States, that State was not considered to have a greater capacity to raise revenue (larger negative needs) than other States, but to be making a greater effort for policy reasons.

52. SPPs treated by inclusion were treated as revenue with an assessment of needs based on the distribution of the payment. Each State's needs were calculated as the standard payment less the State's receipt of the payment, in per capita terms. States with a greater share of the payment would have lesser needs and therefore a lesser relativity and share of the pool.

53. In some categories, the Commission decided there were no needs for any State in service provision or in revenue raising. The implication was that all States could deliver the same level of that service for the standard per capita outlays, or raise the same per capita revenue from the average effort. Any differences in per capita outcomes were regarded as the influence of differences in State policies. In such cases the relativities were unaffected.

Calculating each State's standardised deficit

54. Step (vi) brings together each State's needs across all categories and adjusts the equal per capita share of the pool calculated in step (ii) to reflect its above or below average need for assistance.

Calculation of per capita relativities

55. In step (vii) the relativity factor for each State is calculated by dividing its standardised deficit by the pool of funds that were available in that year. This is the annual per capita relativity, five of these are averaged and used to share a future pool. The relativity factor can be derived from equations (5) and (7) as follows:

$$f_i = \frac{ATFAR_i}{P_i} \Big/ \frac{G_S}{P_S}$$

$$= \left(\frac{G_S}{P_S} + \frac{E_S}{P_S}(\gamma_i - 1) + \frac{R_S}{P_S}(1 - \rho_i) + \frac{O_S}{P_S}(1 - \phi_i) \right) \Big/ \frac{G_S}{P_S}$$

$$= 1 + \frac{E_S}{G_S}(\gamma_i - 1) + \frac{R_S}{G_S}(1 - \rho_i) + \frac{O_S}{G_S}(1 - \phi_i) \qquad (8)$$

56. Equation (8) expresses State i's per capita relativity as unity plus a variation, which is in proportion to needs, divided by the GST and HCGs pool. Needs were expressed as a standard multiplied by an assessment multiple (less one). There was no separate 'budget result' because needs for that term were zero and did not contribute to the relativities. Because none of the terms shown depended on the budget result, this expression of the calculation of relativities demonstrates that the relativities themselves do not depend on the budget result. It shows separately the contribution to a State's relativity of:

- the pool (G_S);
- category standards (E_S, R_S and O_S); and
- assessments (γ_i, ρ_i and ϕ_i);

57. Equation (8) can also be derived from an expanded version of equation (5) shown as:

$$f_i = \frac{E_S}{G_S}\gamma_i + \frac{B_S}{G_S} + \frac{R_S}{G_S}\rho_i + \frac{O_S}{G_S}\phi_i$$

Equation (8) can be obtained by adding and subtracting one at the same time to the right hand side of equation (5), and then substituting $\frac{E_S + B_S - R_S - O_S}{G_S}$ for 1 (the one with the minus sign) and combining corresponding terms.

58. Expressed more simply, the annual relativity is:

$$f_i = \left(\frac{G_S}{P_S} + \frac{N_i}{P_i} \right) / \frac{G_S}{P_S}$$

$$= 1 + \frac{N_i}{P_i} / \frac{G_S}{P_S}$$

where N_i is the sum over all categories (expense, revenue and other Australian Government payments (SPPs)) of State i's needs.

59. This formula shows the adjustment to the equal per capita relativity factor of one by each State's needs per capita as a share of the per capita pool.