# Non-demographic expenditure pressure

## 8.1 Demography is not the only pressure on government spending

Ageing is not the only, or in some cases, even the major pressure on future government spending. Non-demographic factors, such as those arising from new technologies and public expectations about the quality or scope of services also exacerbate fiscal pressures. For example, the public may demand smaller school class sizes, a more visible police presence, or better health and military technologies.[1] Other non-demographic factors may reduce fiscal pressures. For instance, general improvement in the efficiency of government services may produce cost savings.

Were there to be large reductions in the GDP shares of non-age related government spending areas, then ageing would present no fiscal challenges for governments. On the other hand, State Governments have generally argued that, in fact, there are future pressures to spend more in such areas, which will add to ageing pressures on their budgets. For example, the New South Wales Government (sub. 45, p. 23) estimated that while ageing would produce a fiscal gap of 1.3 percentage points of GSP by 2041-42, there would be further pressure of 3 percentage points of GSP associated with non-demographic factors.[2]

This paper examines the potential magnitude and scope of non-demographic fiscal pressures so as to place ageing effects into context. It is organised as follows.

- Section 8.2 examines the relative importance of expenditure categories. This identifies which areas of expenditure may be the most important for considering non-demographic pressures.

[1] In health care, such non-demographic effects are intertwined with age effects. For example, new technologies in medicine are often applied most intensively to older people. These interactions are complex and are examined elsewhere in this study (chapter 6).

[2] Non-age expenditure growth for health and education accounts for 1.1 percentage points (of the 3.0), but other functions were also estimated to face significant non-age related fiscal pressure, including transport and communications (0.8 percentage points) and public order and safety (0.6 points).

- Section 8.3 examines historical non-demographic expenditure growth. A key issue is whether projections should be based on past trends.
- Section 8.4 briefly notes the non-demographic growth rate assumptions used in the Intergenerational Report and the ageing analysis by the States. This reveals there is no commonality in the magnitude and scope of non-demographic effects across studies.
- Section 8.5 explains the Commission's approach.

## 8.2 The relative importance of expenditure categories

The impact of non-demographic factors depends on the share of total expenditure by each function.

### *There are quite different profiles for the Australian Government and combined State governments*

There are no major differences in the expenditure profiles of the Australian government and those for the combined States (table 8.1). Social security and welfare expenditure is the largest component of expenditure by the Australian government (35.8 per cent), followed by health (15.5 per cent), other[3] (12.9 per cent), defence (6.7 per cent) and education (6.1 per cent). In contrast, education and health comprise about half the expenditure for the combined States, with significant expenditures also for transport and communications (10.0 per cent) and public order and safety (9.9 per cent). Given these divergent profiles, it is clear that age and non-age factors will have disparate fiscal implications for the Australian and State governments.

### *No significant differences between States*

There is little difference between different States in the relative importance of the six largest government expenditure categories (table 8.2). Accordingly, variations in non-demographic growth rates and of population ageing will be the key determinants of different fiscal pressures in the States, rather than differences arising from the mixes of government services.

[3] Other includes general purpose inter-government transactions and natural disaster relief.

## Table 8.1 **Government expenses by purpose, 2002-03**

General Government Sector

| | *Australian government* | *States and Territories* |
|---|---|---|
| | % | % |
| General public services | 5.4 | 3.6 |
| Defence | 6.7 | 0.0 |
| Public order and safety | 1.0 | 9.9 |
| Education | 6.1 | 26.5 |
| Health | 14.7 | 24.4 |
| Social security and welfare | 35.6 | 6.2 |
| Housing and community amenities | 0.9 | 4.2 |
| Recreation and culture | 1.0 | 2.8 |
| Fuel and energy | 1.7 | 0.8 |
| Agriculture, forestry and fishing | 0.9 | 2.3 |
| Mining, manufacturing and construction | 0.8 | 0.4 |
| Transport and communications | 1.1 | 10.0 |
| Other economic affairs | 1.9 | 2.5 |
| Nominal interest on superannuation | 2.7 | 2.8 |
| Public debt transactions | 2.4 | 2.1 |
| Other | 17.2 | 1.4 |
| **Total** | **100.0** | **100.0** |

*Source*: Estimates based on ABS (*Government Finance Statistics, Australia*, 2002-03, Cat. no. 5512.0, table 31).

## Table 8.2 **Expenditure profile, individual States, 2002-03**

General Government Sector

| | *NSW* | *Vic* | *Qld* | *SA* | *WA* | *Tas* | *NT* | *ACT* |
|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % |
| Education | 27.1 | 26.7 | 26.4 | 25.4 | 27.2 | 26.8 | 19.2 | 22.4 |
| Health | 24.5 | 27.6 | 21.6 | 25.2 | 24.1 | 20.7 | 19.8 | 20.4 |
| Transport and communication | 10.5 | 10.8 | 10.2 | 7.8 | 10.8 | 6.9 | 3.1 | 6.6 |
| Public order and safety | 10.2 | 9.5 | 9.6 | 10.7 | 10.8 | 8.9 | 9.8 | 8.4 |
| Social security and welfare | 7.3 | 7.5 | 4.1 | 6.3 | 4.4 | 6.6 | 3.6 | 5.2 |
| Housing and community amenities | 4.2 | 2.9 | 4.6 | 6.1 | 5.4 | 5.1 | 1.6 | 3.0 |

*Source*: Estimates based on ABS (*Government Finance Statistics, Australia*, 2002-03, Cat. no. 5512.0, table 31).

## 8.3 Historical expenditure growth patterns

### Methodology

A common approach suggested for projecting fiscal pressure is to extrapolate historical trends in the ratio of nominal expenditure to nominal GDP. This ratio removes the common influences of price and population growth, and reveals the extent to which real per capita expenditure growth exceeds growth of GDP.[4] Hence this method is sometimes called the 'excess expenditure growth' (EEG) method.

There are many ways of characterising the EEG and its trends.

- *Method 1:* The New South Wales Treasury measured the EEG as the difference in the percentage growth rates of the *i*th nominal spending category at time t ($E_{i,t}$) and nominal GDP or GSP (Y):

$$EEG_{i,t} = \left(\frac{E_{i,t} - E_{i,t-1}}{E_{i,t-1}} - \frac{Y_t - Y_{t-1}}{Y_{t-1}}\right) \times 100$$ [5]

  The New South Wales Treasury then averaged annual EEGs for a given period (usually 1978-79 to 1997-98) to derive a perspective on typical excess growth.

- *Method 2:* A simple alternative estimate of the EEG is the difference between the compound growth rate of an expenditure category over a given period and the compound growth rate of nominal GDP, but this ignores all data between start and endpoints.

- *Method 3:* Another method for estimating the EEG is to regress the natural logarithm of the ratio of expenditure to GDP on a time trend (and constant) for the relevant period, that is, estimating:

$$\ln\left(\frac{E_{i,t}}{Y_t}\right) = \alpha + \beta t$$

  This has the advantage of providing a statistical test of the significance of any trend (on $\beta$) and revealing misspecification in the relationship. It should be noted that for small changes in expenditure shares, $100*\beta$ is approximately equal to the average percentage change in the spending share. The trend rate shown in tables 8.3 and 8.4 are $100*\beta$.

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[4] Note that $\Delta \log (E/(P*POP) - \Delta \log (Y/(P*POP) = \Delta \log (E/Y)$, where E is nominal expenditure, Y is GDP or GSP, POP is population and P2 is an implicit price deflator for GDP, a measure of general price levels.

[5] This is equal to $\Delta \log (E/Y)$ for small changes in E and Y.

- *Method 4:* An alternative regression model is to assume that expenditure shares move linearly over time, so that the EEG (measured as $\beta$) is estimated by regressing $(\frac{E_{i,t}}{Y_t}) = \alpha + \beta t$.

- *Method 5:* On theoretical grounds, it might be expected that given expenditure shares of GDP may move around for periods, but ultimately neither asymptote to zero or one, as any sustained negative or positive value for the EEG implies. In this context, autoregressive (moving average) time series models of the spending share, may be more satisfactory.[6] The Commission has explored some simple autoregressive models for some key categories of spending.

Results for methods 1 to 3 are shown in tables 8.3 and 8.4, while those of other methods are considered when experimenting and evaluating possible projection methods in section 8.5.

Starting from time *t*, the value of any future spending share of nominal GDP at time *T*, for expenditure category *i* can be calculated using the estimate of EEG derived by any of the above methods. For methods 1 and 2 it is:

$\frac{E_{i,T}}{Y_T} = \frac{E_{i,t}}{Y_t}(\gamma/100 \times \{1+g\}+1)^{T-t} \cong \frac{E_{i,t}}{Y_t}(\gamma/100+1)^{T-t}$ where $\gamma$ is the estimated value of EEG, since g (the average projected annual nominal growth rate of GDP or GSP) is small.

For method 3, it is: $\frac{E_{i,T}}{Y_T} = \frac{E_{i,t}}{Y_t} e^{\beta(T-t)}$ while for method 4 it is: $\frac{E_{i,T}}{Y_T} = \frac{E_{i,t}}{Y_t} + \beta(T-t)$. Results for method 5 depend on the form of the time series model.

## Broad trends

Notwithstanding differences in estimates due to different methods and data (discussed further below), some general patterns are apparent in the ratios of spending to GDP for the combined States (table 8.3).

- Not surprisingly, the share of total spending in GDP has exhibited greater stability than specific expenditure categories, because trends among the component categories tend to offset each other.
- Some expenditure areas increased very rapidly as a share of GDP between 1978-79 and 1997-98, such as Social security and welfare, Housing and community amenities, and Recreation and culture. It is clear that such increases are from a small base (table 8.1) and, given their magnitude, are not likely to be sustainable.

[6] This would imply co-integration between spending categories and GDP.

- Four areas declined relative to GDP between 1978-79 and 1997-98 — education, general services, transport and communications, and all other.
- There are some significant changes in trends since 1997-98.[7] Growth over the four years (1998-99 to 2002-03) in health, education, public order and safety and transport and communications was much stronger than the preceding twenty year average. At the same time, growth in housing and community amenities and social security and welfare eased relative to the past, and there were significant declines relative to GDP for general services and other.

Table 8.3 **Trends in the ratio of expenditure to output, combined States**[a]

| | *1978-79 to 1997-98 adjusted cash-based series* | | | *1998-99 to 2002-03 accrual series* |
|---|---|---|---|---|
| | Compound growth rate | Trend rate[b] | NSW Treasury[c] | Compound growth rate |
| | points | % | points | points |
| Education | -1.5 | -1.8 | -0.2 | 1.0 |
| Health | 1.0 | 1.0 | 0.9 | 2.0 |
| All other[d] | 0.4 | 0.5 | 0.1 | -2.6 |
| General services | -1.4 | -1.9 | -1.8 | -16.2 |
| Public order and safety | 1.7 | 1.2 | 1.3 | 3.1 |
| Social security and welfare | 3.9 | 4.0 | 3.7 | 2.4 |
| Housing and community amenities | 5.3 | 4.5 | 4.8 | 3.7 |
| Recreation and culture | 3.5 | 2.8 | 2.8 | 1.3 |
| Transport and communications. | -0.6 | -0.4 | -0.3 | 0.8 |
| Other | -0.8 | -0.2 | -0.8 | -7.5 |
| **Total expenditure** | **-0.0** | **-0.1** | **0.2** | **-0.6** |

**a** The results here are shown for two periods. The first, 1978-79 to 1997-98 is based on a cash-based series, adjusted by the ABS to be more consistent with the accrual accounting framework. While data are available from 1962-63, the period from 1978-79 was chosen so that results could be compared with those prepared by the New South Wales Treasury. The second period is based on accrual accounting data. **b** The trend estimate was derived by regressing the natural logarithm of the expenditure ratio against a time trend and constant (intercept). All trends are statistically significant at the 95 per cent level of confidence except for total and other **c** New South Wales Treasury estimates using the average yearly growth method. Some of the data used by the New South Wales Treasury differ from that used for the other estimates shown here. For example, the estimates of non-demographic growth rates for education differ markedly because of different accounting for funding from the Australian Government.**d** The figure shown for the New South Wales Treasury value for all other is based on a weighted average of its estimates of the categories making up All other, using 1988-89 expenditure shares.

*Sources*: ABS (*Government Finance Statistics*, various years, Cat. no. 5501.0; *GDP current price series, D*X data, National Accounts, 5204-1).

[7] The Government Finance Statistics from which the data are drawn were subject to major changes with the replacement of cash estimates from 1962-62 to 1997-98 by accrual accounting in subsequent years. The ABS has adjusted the earlier cash series so that they are more consistent with the later accrual accounting series. However, as the adjustments are incomplete, analysis in this appendix provides separate trend growth estimates for the two periods.

As for the combined States, GDP spending shares on particular categories by the Australian Government have not kept in line with each other (table 8.4). Some categories, like health, have grown significantly since 1978-79, while others, such as defence, have fallen. Over the period 1978-79 to 1997-98, Australian Government spending grew as a share of GDP.

Table 8.4 **Trends in the ratio of expenditure to output, Australian Government**[a]

| | *1978-79 to 1997-98 adjusted cash-based series* | | | *1998-99 to 2002-03 accrual series* |
|---|---|---|---|---|
| | *Compound rate* | *Trend rate*[b] | *NSW Treasury* | *Compound growth rate* |
| | points | % | points | points |
| Education | -0.7 | -0.3 | 0.5 | -5.2 |
| Health | 2.3 | 2.6 | 3.7 | -0.2 |
| Social security and welfare | 1.3 | 1.6 | 0.9 | 1.1 |
| All Other[c] | -0.9 | -0.8 | -0.7 | 3.0 |
| General services | 1.4 | -1.3 | -1.6 | -2.0 |
| Defence | -2.2 | -2.3 | -2.3 | -3.6 |
| Public order and safety | 2.6 | 3.1 | 1.7 | 6.0 |
| Housing and community amenities | 3.7 | 2.1 | 4.3 | -5.2 |
| Recreation and culture | 0.0 | -0.0 | -0.2 | -1.2 |
| Transport and communications | -4.7 | -3.5 | -3.7 | -4.9 |
| Other (excluding general grants) | 0.1 | 0.1 | 0.1 | -4.8 |
| **Total (excluding general grants)** | **0.5** | **0.7** | **0.4** | **1.3** |

**a** The different growth rate methods are described in the main text and in the notes to the previous table. The data exclude the Australian Government general purpose payments to the States (see a discussion of this in section 8.5). However, for the accrual accounting period from 1998-99 to 2002-03, data on social security and welfare, all other and other *include* any inter-government General Purpose Payments. Due to this and the short period involved, estimates for this period should be treated with caution. **b** The trends for education, housing and community amenities, recreation and culture and other were not statistically significant at the 95 per cent level of confidence except. **c** The figure shown for the New South Wales Treasury value for all other is based on a weighted average of its estimates of the categories making up all other, using 1988-89 expenditure shares.

*Sources*: ABS (*Government Finance Statistics*, various years, Cat. no. 5501.0; *GDP current price series, D*X data, National Accounts, 5204-1).

## Separating ageing and non-demographic influences

Since the purpose of this technical paper is to consider the extent to which *non*-demographic factors have been and will be important for government spending, it is necessary to gauge, and if necessary adjust for, ageing influences on the excess expenditure growth rates shown in tables 8.3 and 8.4. The Commission's analysis has shown the importance of ageing for health, aged care and education generally

and for personal benefit payments by the Australian Government (chapters 6, 7, 8 and 9). Analysis by the States confirms this picture, but also suggests modest ageing effects are present for housing and community amenities, public order and safety, and social security and welfare (at the State level).

Table 8.5 presents estimates by the New South Wales Treasury of the ageing and non-demographic components of excess expenditure growth for the period 1978-79 to 1997-98. The non-demographic growth rate for different areas of government spending is derived by subtracting the ageing component from the excess expenditure growth rate. For example, using GFS data, health (including aged care) expenditure grew faster than GDP by an average of 0.9 percentage points per year, consisting of an estimated 0.6 percentage points because of ageing and 0.3 percentage points for non-demographic reasons. In contrast, ageing eased budgetary pressure in the areas of education and public order and safety.

While there are some ageing effects apparent for particular spending categories *within* the combined 'all other' group, the estimates suggest that, overall, ageing has a negligible effect on the aggregate expenditure share of this combined group. This reflects the offsetting influences of ageing within spending categories in this group.

## 8.4 Non-demographic growth rate assumptions in other studies

In their projections of fiscal pressure, the Australian and State Governments have made provision for non-demographic factors to compound or relieve pressures that result from ageing (box 8.1). However, reflecting the inherent subjectivity in such exercises and uncertainty about the robustness of historical estimates, there is no commonality in either the magnitude or scope of non-demographic assumptions.

Table 8.5 **Growth in expenditure relative to output, non-demographic and age components, 1978-79 to 1997-98**

Average percentage points per year

| | *Combined States* | | | *Australian Government* | | |
|---|---|---|---|---|---|---|
| | *Average excess growth (1)* | *Age component (2)* | *Non-demographic component (3) = (1) - (2)* | *Average excess growth (1)* | *Age component (2)* | *Non-demographic component (3) = (1) - (2)* |
| | points | points | points | points | points | points |
| Education | -0.2 | -0.9 | 0.7 | 0.5 | -0.6 | 1.1 |
| Health | 0.9 | 0.6 | 0.3 | 3.7 | 0.7 | 3.0 |
| Social security and welfare | 3.7 | 0.9 | 2.8 | 0.9 | 0.8 | 0.1 |
| All other | | | | | | |
| General services | -1.8 | 0.0 | -1.8 | -1.6 | 0.0 | -1.6 |
| Defence | na | na | na | -2.3 | 0.0 | -2.3 |
| Public order and safety | 1.3 | -0.3 | 1.6 | 1.7 | -0.2 | 1.9 |
| Housing and community amenities | 4.8 | 0.5 | 4.3 | 4.3 | 0.6 | 3.7 |
| Recreation and culture | 2.8 | -0.1 | 2.9 | -0.2 | 0.0 | -0.2 |
| Transport and communications. | -0.3 | 0.1 | -0.4 | -3.7 | 0.1 | -3.8 |
| Other | -0.8 | 0.0 | -0.8 | 0.1 | 0.0 | 0.1 |
| **Total expenditure** | **0.2** | **-0.1[a]** | **0.3** | **0.4** | **0.2[a]** | **0.2** |

**a** Commission estimates using 1988-89 expenditure shares.

*Source*: New South Wales Treasury.

A comparison of the assumptions revealed:

- no study included non-demographic pressures for all functions, or even, most functions;
- jurisdictions used different non-demographic growth rates for the same function (such as health);
- non-demographic growth effects for health were included in most base cases, but other non-demographic effects were mostly included in scenarios separate from the base case; and
- some estimates were set according to historical trends, while in other cases, a degree of judgement was often employed, or hypothetical, illustrative values were used.

Box 8.1 **Non-demographic growth rate assumptions in other studies**

The NSW Government applied (non-zero) non-demographic growth rates in six expenditure areas (public order and safety, education, health, social security and welfare, housing and community amenities, and transport and communications), based on historical estimates.[8]

The Victorian, South Australian and ACT Governments applied a non-demographic growth rate only to Health.

- The Victorian Government (sub. 29, p.15) assumed in the base case that (non-aged care) health prices rise one percentage point more than the general price level.
- The South Australian Government (sub. 23, p.25) assumed unit health costs increase by 2.6 per cent per year in real terms for the Australian government and 1 per cent per year in real terms for State governments.
- The ACT Government (sub. 21, p.19) assumed nominal health expenditure grew at 7 per cent per annum (comprising 3 per cent for wage growth, 1.9 per cent for demographic factors and 2.1 per cent for non-demographic factors).

The Queensland Government (sub. 17, table A4.1) incorporated 'additional cost factors' for Health, Education and Public order and safety into two of its ten scenarios, based partly on historical trends.

The Western Australian Government (sub. 39, p.36) set the demographic growth rates for Public order and safety and for sub categories of Health and Education according to estimates for 1978-79 to 1997-98.

The Tasmania Government (sub. 40, p.43) compared the effects of three hypothetical excess expenditure scenarios (zero excess, 0.5 per cent per year and 1.0 per cent per year).[9]

In the Intergenerational Report, expenditure on health, personal benefit payments, education and superannuation grows at a different rate to GDP after accounting for the effects of changing age structures. All other expenditures (such as defence) were assumed to grow in line with GDP.

[8] The non-age expenditure growth rate for education, health public order and safety, and transport and communications were set according to estimates for 1978-79 to 1997-98. For both social security and welfare and housing and community amenities the rate was set according to estimates for 1988-89 to 1997-98 (resulting in lower growth rates). The much higher growth rates for the longer sample period were said to reflect the rapid (policy) expansion in these functions at the State level during the early and mid-1980s, and 1980's inflation, and judged as unlikely to be sustained over the next 40 years.

[9] The Tasmania Government noted that it had undertaken preliminary research to determine historical rates of excess expenditure growth for health, education and public order and safety in Tasmania. The results were highly sensitive to assumptions concerning the appropriate measure of real per capita income growth and the time period. This, together with lack of long term (future) data for certain variables, led it to illustrate the potential effects of non-age factors by using the three hypothetical assumptions.

## 8.5 The Commission's approach

The Commission included non-demographic factors in projections of several key spending areas — most particularly health, aged care, education and various social welfare payments (chapters 6 to 9). For example, the Commission has incorporated 0.6 percentage points of excess growth per annum in health above GDP growth. For some spending areas, the Commission has also allowed for a period of temporary wages catch-up where wage pressures were significant (such as in aged care).

For all remaining areas of expenditure, the Commission considered the option of assuming a non-demographic expenditure growth rate for each portfolio area (and each jurisdiction) separately. However, since trends appear more erratic at the disaggregated level for these residual items, a simpler approach is to model and project a single non-demographic growth rate for aggregate 'residual' expenditure. This residual expenditure category is the relevant 'all other' group shown in tables 8.3 and 8.4 — encompassing spending categories for each level of government that, as a whole, have little or no relationship to ageing. Accordingly, the degree to which these residual categories exacerbate or relieve fiscal pressure will largely depend on non-demographic factors.

The Commission used estimation methods 3 to 5 to assess excess expenditure growth for this residual (all other) spending category (table 8.6).[10] These three methods have the advantage of providing some measure of the statistical significance of the historical trends and of providing evidence about potential misspecification (for example, significant serial correlation of the regression residuals would suggest model misspecification).

The estimates suggest very different possible additional fiscal pressures from non-demographic growth for the residual spending categories (table 8.7).

[10] Only data up to the introduction of accrual accounting were used.

Table 8.6 **Trends in the share of 'All Other' government spending to GDP[a]**

| **Combined States** | *1961-62 to 1997-98* | *1978-79 to 1997-98* | *1982-83 to 1997-98* |
|---|---|---|---|
| *Method 3 (log share regression)* | | | |
| β estimate | 0.00702 | 0.004503 | -0.00242 |
| t statistic | 4.8 | 2.0 | 1.0 |
| Durbin-Watson statistic | 0.55 | 0.53 | 0.59 |
| *Method 4 (share regression)* | | | |
| β estimate | 0.000463 | 0.000308 | -0.000167 |
| t statistic | 4.8 | 2.0 | 1.0 |
| Durbin-Watson statistic | 0.49 | 0.54 | 0.59 |
| *Method 5 (first order autoregressive model)* | | | |
| α estimate | -1.099 | -0.648 | -1.419 |
| β estimate | 0.586 | 0.755 | 0.459 |
| t statistic | 8.0 | 5.5 | 2.2 |
| Durbin-Watson statistic | 1.55 | 1.46 | 0.77 |
| **Australian Government (excluding general purpose grants)** | *1961-62 to 1997-98* | *1974-75 to 1997-98* | *1986-87 to 1997-98* |
| *Method 3 (log share regression)* | | | |
| β estimate | 0.00877 | 0.0117 | -0.0173 |
| t statistic | 2.3 | 2.6 | 2.1 |
| Durbin-Watson statistic | 0.34 | 0.28 | 0.72 |
| *Method 4 (share regression)* | | | |
| β estimate | 0.000260 | 0.000342 | -0.000634 |
| t statistic | 2.1 | 2.2 | 2.2 |
| Durbin-Watson statistic | 0.31 | 0.28 | 0.69 |
| *Method 5 (first order autoregressive model)* | | | |
| α estimate | -0.586 | -0.588 | -0.963 |
| β estimate | 0.826 | 0.826 | 0.721 |
| t statistic | 10.1 | 9.7 | 4.0 |
| Durbin-Watson statistic | 1.37 | 1.11 | 1.05 |

**a** Social security and welfare is included in all other for the combined States and excluded for the Australian government (as per tables 8.3 and 8.4). For all regressions starting in 1961-62, a dummy was included for the sustained shift in spending that occurred after the Whitlam Government. The constant shown for the autoregressive model in method 5 includes the value of that dummy as well as the constant. The value of β shown in method 5 is the coefficient on the lagged log spending share. The t-statistic is used to test whether the estimate is significantly different from zero. The Durbin-Watson statistic is used to test first order serial correlation. Other than the full period regressions, the time periods selected for the Australian Government estimates are different from those for the combined States, reflecting different apparent breaks in the data.

*Source*: Commission estimates.

## For the Combined States

For the combined States, the additional fiscal pressure (in GDP percentage points) from 2003-04 to 2044-45 associated with the growth of such expenditure categories could be, depending on the estimation method and period selected:

- effectively no change (+0.01 to 0.06 points change, according to method 5 for any period);
- moderate decreases (-0.6 to -0.7 points change, according to either method 3 or 4 for 1982-83 to 1997-98); or
- even large increases (1.3 to 2.4 points change, according to other combinations of method and period).

Table 8.7 **Implications for fiscal pressure of non-demographic growth in residual spending**

Percentage points change in share of GDP, 2003-04 to 2044-45

| **Combined States** | *Estimation period for non-demographic growth rate used in projections* | | |
|---|---|---|---|
| | *1961-62 to 1997-98* | *1978-79 to 1997-98* | *1982-83 to 1997-98* |
| | points | points | points |
| *Method 3* | 2.36 | 1.42 | -0.63 |
| *Method 4* | 1.90 | 1.27 | -0.69 |
| *Method 5* | 0.01 | 0.06 | 0.00 |
| **Australian Government** | *Estimation period for non-demographic growth rate used in projections* | | |
| | *1961-62 to 1997-98* | *1974-75 to 1997-98* | *1986-87 to 1997-98* |
| | points | points | points |
| *Method 3* | 1.34 | 1.94 | -1.35 |
| *Method 4* | 1.07 | 1.40 | -2.60 |
| *Method 5* | 0.17 | 0.15 | 0.03 |

*Source*: Commission estimates.

Statistical tests of the regression residuals point to problems with using methods 3 and 4, and suggest the trends may be spurious — the result of sporadic shifts in spending patterns. The autoregressive model (method 5) appears to better characterise past patterns (with the least evidence of specification error, as suggested by the relative absence of serial correlation). Method 5 predicts that residual spending categories will grow in approximate parity with GDP. This suggests that for the combined States, fiscal pressures are likely to mostly depend on intergovernmental fiscal relations and on the growth of age-related health and education spending. But clearly, significant uncertainty remains about the future expenditure pressures in other portfolios.

## The Australian Government

For the Australian Government, data on the residual items are even more erratic than for the combined States. Policy shifts and unexpected factors have significantly influenced the pattern of spending. With the advent of the GST and new intergovernmental fiscal relations, past trends in overall residual spending to GDP ratios provide a particularly poor guide to the future. In particular, past untied grants to the States muddy the identification of trends for other spending items. Consequently, general purpose payments were removed from residual Australian Government spending in the estimates and projections shown in tables 8.6 and 8.7. The most appropriate depiction of past long-run patterns (method 5, 1961-62 to 1997-98) suggests that from 2003-04 to 2044-45, there could be a 0.17 percentage points rise in fiscal pressure from Australian Government spending areas over and above the pressure listed in tables 13.1 to 13.3 (chapter 13). But, given the data problems and the small magnitude of the estimate, this is probably best characterised as zero, plus or minus some error.

## The bottom line

As noted in section 8.4, there is no commonality in the magnitude and scope of non-demographic fiscal impact in other studies of ageing. The Commission has found that a wide range of possible non-demographic fiscal impacts in the residual spending areas could arise if past trends continued. However, the most plausible results favour ascribing zero additional fiscal pressure to non-demographic factors for this residual category. This assumption has been adopted in the Commission's base case.