

CHAPTER 4

VOLATILITY OF STATE REVENUES

INTRODUCTION

- 1 In any year, a State's total revenue is the sum of:
- its revenue from its own taxes¹ and charges, which in turn depends on its revenue bases, and its decisions on the level and structure of taxes². The revenue base is affected by economic influences that are often outside the control of State governments, such as:
 - economic growth, industry structure and labour productivity that, for example, affect payroll tax;
 - exchange rates and world demand prices for minerals that, for example, affect mining royalty revenues; and
 - property market cycles that, for example, affect revenue from conveyances.
 - its revenue from the pool of GST and health care grants, which can be thought of as the sum of:
 - the average per capita revenue from the pool; and
 - its equalisation payment, which adjusts the State's average per capita revenue from the pool to, among other things, offset the effects of its above or below average revenue raising capacity³; and
 - SPPs from the Australian Government.

¹ In this chapter, unless specified, 'tax' means all forms of revenue raised by the States (including stamp duties, mining royalties and contributions by trading enterprises), but not user charges. No account is taken of SPP and expenses relativities to help focus the discussion on revenues and their effects on the distribution of the GST and HCG pool. Minor taxes like drivers' licence fees are excluded from the analysis and some non-critical simplifying assumptions have been made.

² In 2000-01, revenue was also affected by the arrangements for the introduction of the GST. Under those arrangements, the previous financial assistance grants ceased, the States abolished some taxes and they received all revenue from the GST.

³ Whether a State's revenue raising capacity is above or below the average depends primarily on whether its revenue base is above or below the average.

- 2 In concept, year to year changes in the equalisation payment offset changes in a State's total revenue arising from above or below average changes in its revenue bases. Consequently, each State would have the same fiscal capacity. A shock in one State's revenue base (for example from a mining boom) would be shared by all States in the year it occurs. Volatility in one State's revenue base is therefore transmitted to all States and in the process, reduces the magnitude of that volatility in the State of origin. Potentially this makes it easier for a State to cope with changes in its individual economic circumstances, but it would have to cope with volatility transmitted from other States.
- 3 For individual States who may see the volatility in terms of differences from revenue projections, equalisation tends to reduce the volatility of total revenue if their own revenue bases are highly volatile. Over the period 1998-99 to 2005-06, New South Wales, Western Australia and the ACT have fallen in this group. The opposite is generally the case for the other States which had less volatile revenue bases. That is, equalisation tends to increase the volatility of total revenue because it shifts some of the volatility in the revenue bases of other States to them⁴.
- 4 A change in a State's tax policy does not directly affect volatility because the equalisation process excludes policy induced changes to revenue. So, under equalisation, States' total revenue would vary over time in accordance with changes in the size of the pool, average movements in State revenue bases and changes in their own tax rates.
- 5 In practice, however, equalisation payments for a year cannot be calculated in that year because the data required to measure State revenue bases are not available. Historical data must be used. The greater the volatility in State revenue bases, the less reliable historical data become as a guide to what is needed in the application year and the more difficult is the equalisation task.
- 6 In Australia revenue bases are measured using data covering the most recent completed five years. Thus, equalisation payments are calculated using State revenue bases that existed between two and seven years prior to the year when the equalisation payments are made⁵.
- 7 This lag suggests that equalisation payments are unlikely to precisely offset differences in State revenue raising capacities in the year they are made, but should operate to moderate observed differences. However, the long lags mean that equalisation payments can be predicted by State Treasuries with greater confidence and that is a valued attribute. There is a trade-off between this greater certainty and the extent to which equalisation distributes any shock to State revenue bases among the States. At one extreme, perfectly stable State shares of the available pool would mean that all the shock to a revenue base, upwards as well as downwards, is retained in the State where it occurs.

⁴ For this analysis, volatility has been measured relative to simple straight line projections of State total revenues (comprising their own-source revenue and their equalised share of the GST and HCG pool) and own-source revenues plus an equal per capita share of the pool.

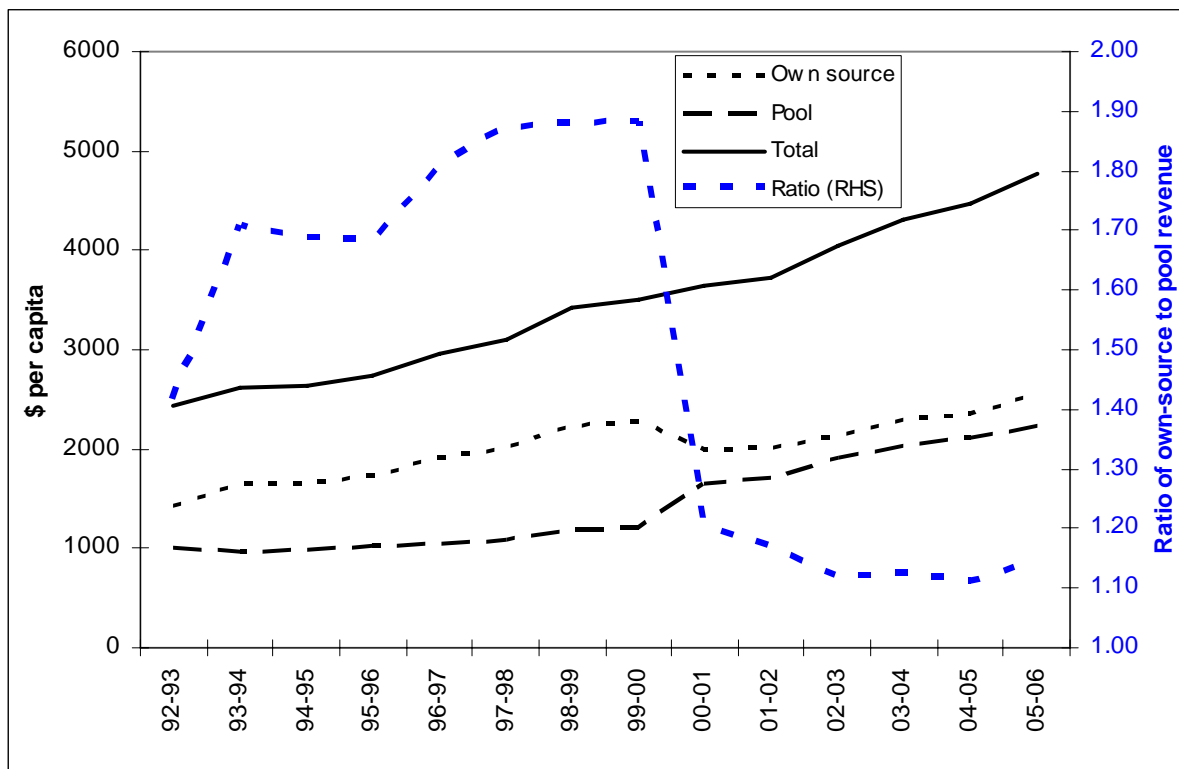
⁵ For example, in this Update, a State's share of the GST and HCG pool for 2007-08 is based on the average of per capita relativity factors calculated using data for the five years 2001-02 to 2005-06.

- 8 Understanding the volatility in State revenue bases is therefore of interest in reaching decisions on how equalisation can best be implemented.
- 9 This chapter analyses trends in State own-source and total revenue from 1992-93 to 2005-06⁶. Specifically, it analyses:
- volatility of revenue for individual revenue bases of all States;
 - volatility of revenue for individual States relative to all States; and
 - interaction between State own-source revenue and the distribution of the pool revenue, including the effect of lags inherent in the relativity calculation.

THE VOLATILITY OF THE MAJOR COMPONENTS OF STATE REVENUE

10 Figure 4-1 shows per capita State own-source revenue, pool revenue, and total revenue, for the years 1992-93 to 2005-06. It also shows the ratio of own-source to pool revenue.

Figure 4-1 State own-source revenue and pool revenue



11 Total State revenue grew steadily from about \$2 430 per capita in 1992-93 to about \$4 777 in 2005-06. After peaking at around \$2 282 per capita in 1999-2000, own-source revenue fell sharply by 13 per cent in 2000-01, when a range of State taxes was abolished as part of the

⁶ For this analysis, revenue, revenue bases and pools are those that *actually* prevailed in each year.

arrangements for the introduction of the GST⁷. As a result, the ratio of State own-source to pool revenue fell from 1.88 in 1999-2000 to 1.20 in 2000-01.

- 12 Since 2000-01, State own-source and pool revenues have grown strongly, with average annual increases of 5.6 and 7.0 per cent respectively. Much of the increase in own-source revenue reflected the improved economic conditions which led to growth in payroll tax, land tax and conveyances and, more recently, mining royalties.

THE VOLATILITY OF MAJOR TAXES

- 13 Figure 4-2A shows yearly changes in per capita aggregate State own-source revenue, in pool revenue, contributions from trading enterprises and business franchise fees. It shows that the loss in own-source revenue in 2000-01 was more than matched by an increase in pool revenue in 2000-01.
- 14 It also shows that much of the volatility of State revenues in the period prior to 2001-02 was due to changes in revenue that States received in contributions from State controlled trading enterprises. This was particularly so in Victoria⁸ (in 1993-94 and 1998-99), Queensland (in 1996-97), and, more recently, in the ACT (in 2004-05 and 2005-06).
- 15 Under the IGA, the revenue replacement payments, which had replaced business franchise fees from 1997-98, were abolished in 2000-01⁹. The States also agreed to reform a number of other taxes, such as those on gambling, financial transactions and shares and marketable securities. Figure 4-2B shows the yearly changes in revenue in these categories.
- 16 Figure 4-2C shows year to year changes in major sources of revenues such as payroll tax, land tax, stamp duty on conveyances and mining royalties. In recent years, variability has been more pronounced in the conveyance and mining revenues. Payroll tax exhibited relatively steady growth up to 2000-01, little growth in 2001-02 and a broad upward trend began in 2002-03.
- 17 Since 2001-02, when a 'property boom' started, conveyance duty has caused most of the volatility in State own-source revenue. The slowdown in the growth in own-source revenue in 2004-05 coincided with the end of the boom, particularly along the eastern seaboard¹⁰. Strong property markets in Western Australia and Queensland were a major cause of the increase in 2005-06.

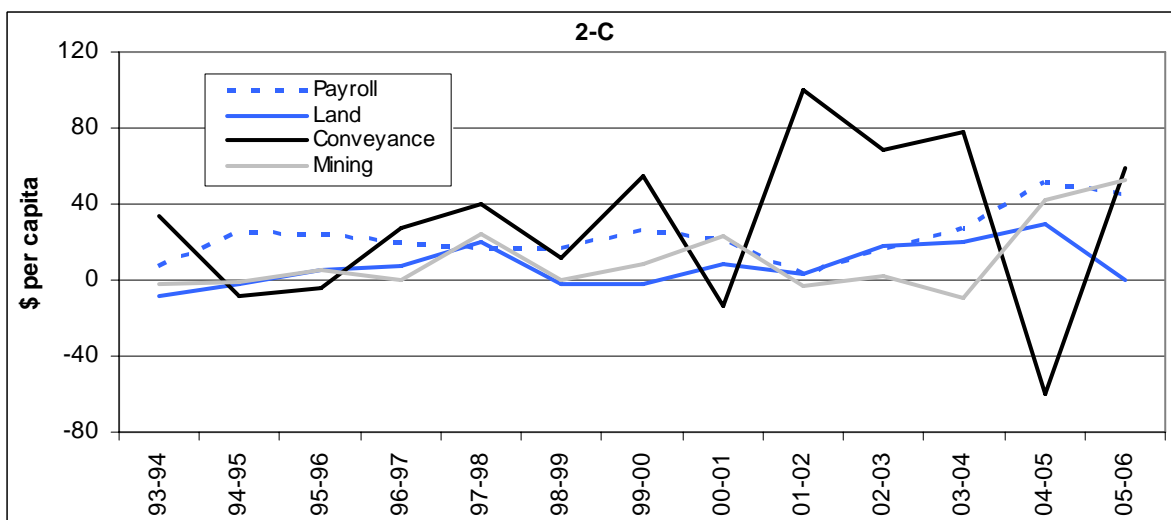
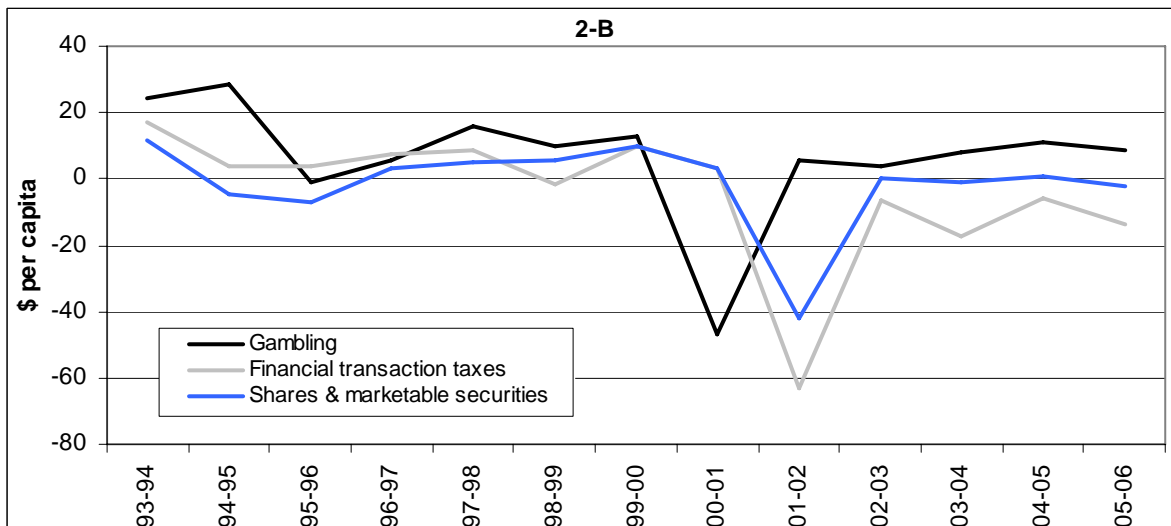
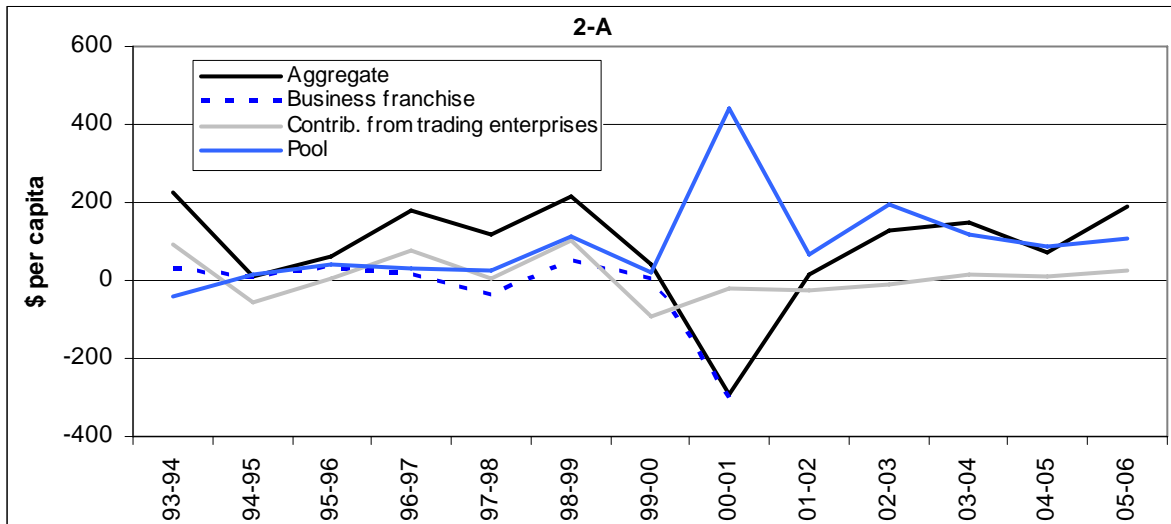
⁷ Under the *Intergovernmental Agreement on the Reform of Commonwealth-State Financial Relations* (IGA), in return for receiving all GST revenues, the States abolished accommodation taxes, financial institution duty, duty on listed share transactions and reduced gambling tax rates. The Commonwealth also ceased collecting business franchise fees for the States.

⁸ Contributions from trading enterprises as a share of Victoria's own-source revenue increased from 14 per cent in 1992-93 to 25 per cent in 1993-94 but returned to 14 per cent in 1994-95.

⁹ In 1999-2000, income from revenue replacement payments totalled \$5.75 billion, or around \$300 per capita, and represented 13 per cent of own-source revenue.

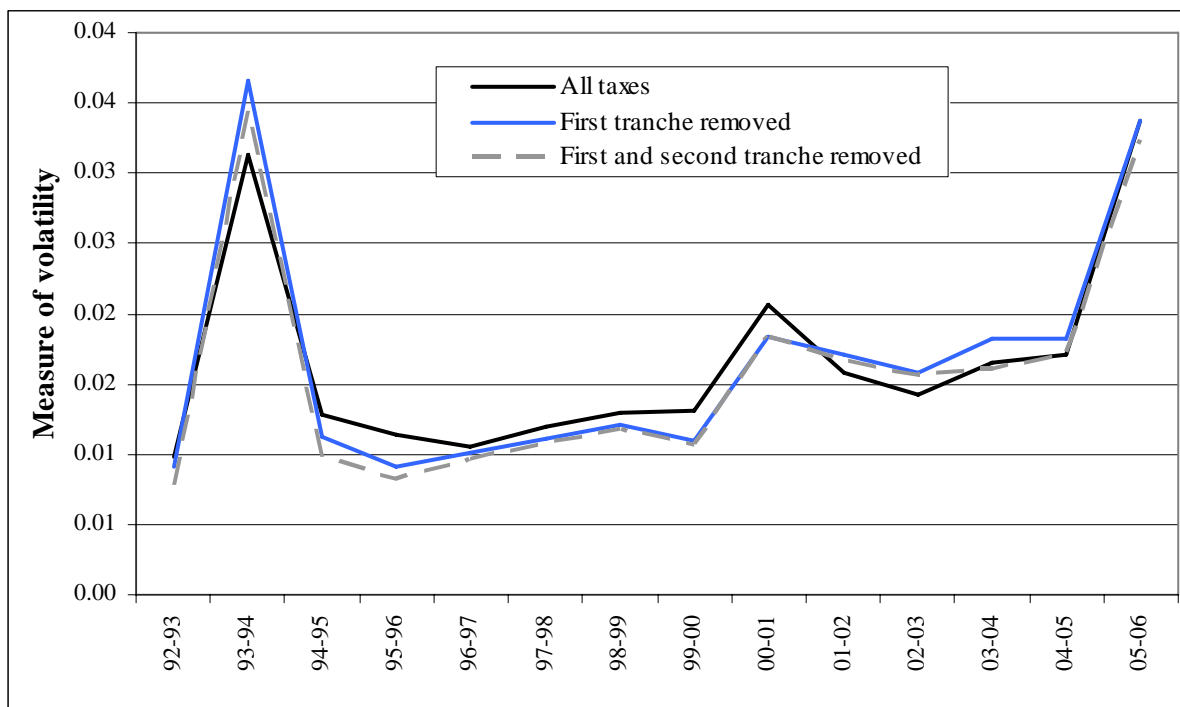
¹⁰ New South Wales, for instance, experienced a 17 per cent decline in conveyance revenue between 2003-04 and 2005-06.

Figure 4-2 Year to year per capita changes in State revenue by source



- 18 When the IGA came into effect in July 2000, States reduced gambling taxes and removed business franchise taxes, accommodation taxes, wholesale sales taxes, financial institution duty, duty on listed shares and marketable securities, and bank account debit tax. Figure 4-3 shows the effect on volatility of State revenue if these taxes had not existed. Those taxes generally added to the volatility in State revenues in historical period before the IGA.
- 19 The figure also shows the effect of removing several business taxes currently agreed for abolition (financial transaction taxes and duty on unlisted shares and marketable securities). If these taxes were removed from State own-source revenues, the volatility of State revenues since 2000-01 would have increased slightly.

Figure 4-3 Effect of abolition of taxes on volatility of own-source revenue



Note: The measure of volatility is calculated in the same way as the dispersion in revenue effort (see footnote 14).

THE VOLATILITY OF OWN-SOURCE REVENUE FOR INDIVIDUAL STATES

- 20 Figure 4-4 shows the yearly changes in per capita own-source revenue for the four largest States, and the Australian average. Figure 4-5 shows the same changes for the other States, and the Australian average line.
- 21 These figures indicate that the yearly changes to State own-source revenue show a broadly common pattern of volatility, although:
- the peaks tend to be spread in time, with Western Australia sometimes exhibiting a different pattern; and

- there was slightly less volatility among the smaller States (excluding the Northern Territory) in the earlier years.

Figure 4-4 Yearly changes in own-source revenue — New South Wales, Victoria, Queensland and Western Australia

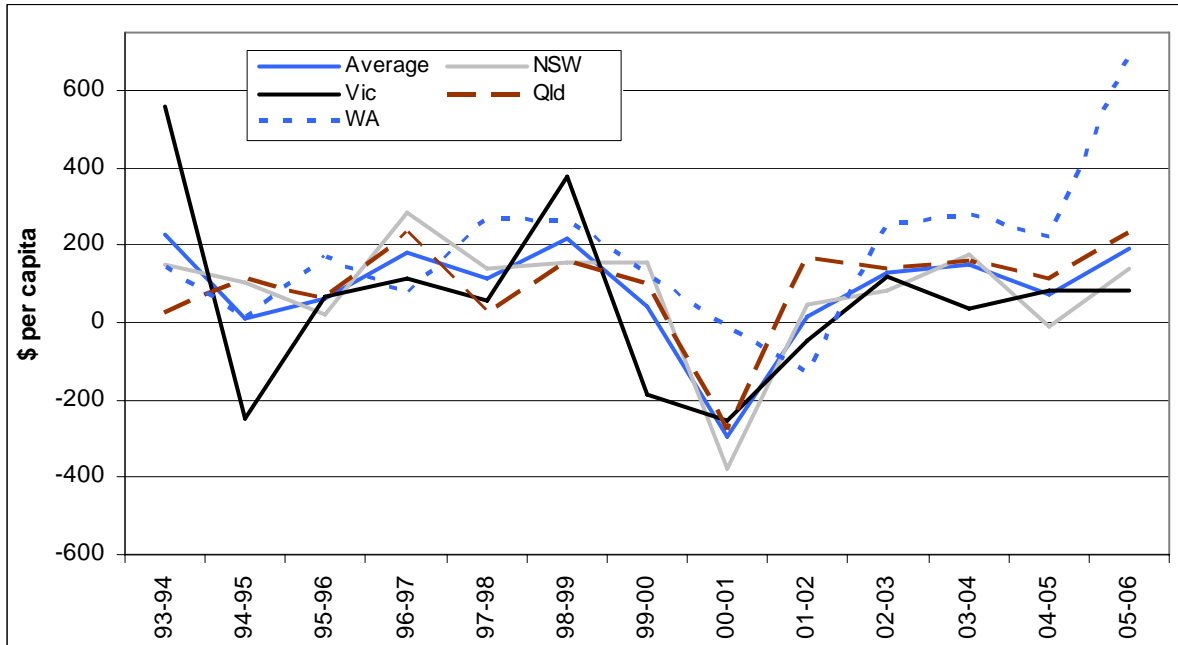
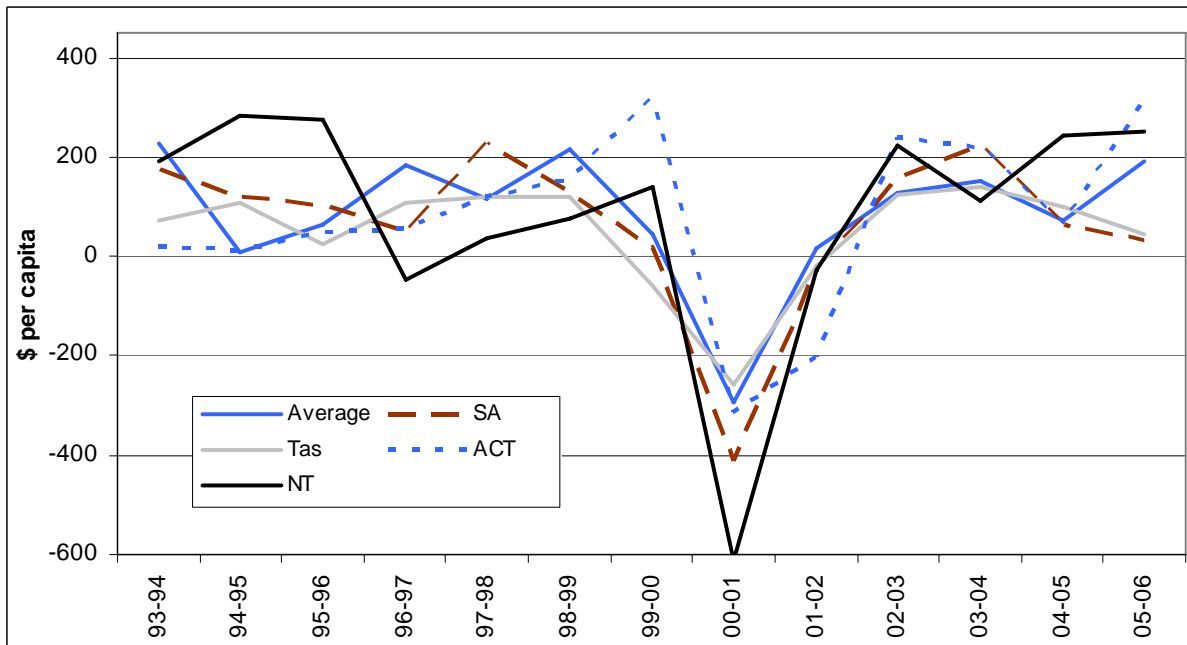


Figure 4-5 Yearly changes in own-source revenue — South Australia, Tasmania, the ACT and the Northern Territory



- 22 This commonality in revenue patterns appears to have become stronger since 2000-01, with there being a lesser spread over time in the peaks, suggesting possible integration of the States' economies and business cycles¹¹. Also, since 2000-01, the States have become more reliant on fewer but more substantial sources of revenue. For example, the States made fewer calls on trading enterprises for one-off dividend payments.
- 23 Nevertheless, there have been some important differences in the experiences of individual States. New South Wales, for example, was most affected by the removal of the financial institutions duty and the reduction in gambling taxes in 2000-01 following the introduction of the GST. However, the State benefited the most from the property boom in the mid-1990s and again since 2000-01. Conveyance duty contributed most substantially to the positive growth in own-source revenue for New South Wales between 2000-01 and 2003-04 before the downturn in 2004-05. The modest increase in its revenue in 2005-06 was due to payroll tax and contributions from trading enterprises.
- 24 The volatility for Victoria and Queensland in the nineties was largely attributable to the changes in contributions from State-owned trading enterprises. Western Australia's revenue bases were comparatively strong throughout the period, but there was some volatility in mining royalty revenue in the mid-nineties. Its rapid increase in 2005-06 (up 24 per cent) was primarily due to a large increase in revenue from conveyances (up 56 per cent) and to a lesser extent mining revenue (up 35 per cent).

STATE REVENUE RAISING CAPACITIES

- 25 The revenue raising capacity of a State measures its per capita revenue base endowment relative to the average per capita endowment of all States¹². A revenue raising capacity above one indicates the State's revenue base is larger than the average.
- 26 Figure 4-6 shows movements in the overall revenue raising capacities of the four largest States, with those for the other States shown in Figure 4-7. General trends over the whole period include:
- increased dispersion in the State revenue raising capacities since the introduction of the GST, particularly between the extremes of Western Australia and Tasmania;
 - a decline in the revenue raising capacity of Victoria, South Australia and Tasmania, notwithstanding some increases in the years 2002-03 to 2004-05;
 - an increase in the revenue raising capacity of Western Australia; and

¹¹ See *Co-movement of State Business Cycles*, Norman D and Walker T, Research Discussion Paper, Reserve Bank of Australia, October 2004.

¹² Revenue raising capacity is calculated as the ratio of a State's per capita assessed revenue (revenue it would raise if it applied the average tax policy) and the per capita average revenue for all States.

- volatility in the Northern Territory’s revenue raising capacity — its relatively high capacity of the mid-nineties reflected the levels of mining activity and payrolls at that time.

Figure 4-6 State revenue raising capacities – New South Wales, Victoria, Queensland and Western Australia

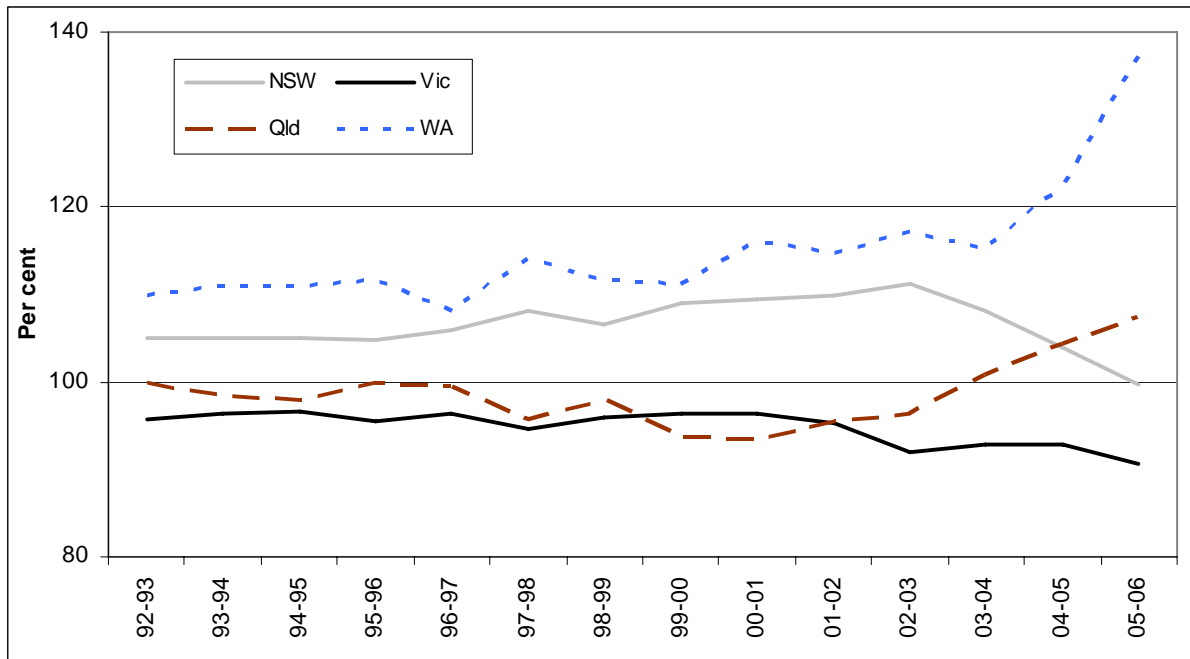
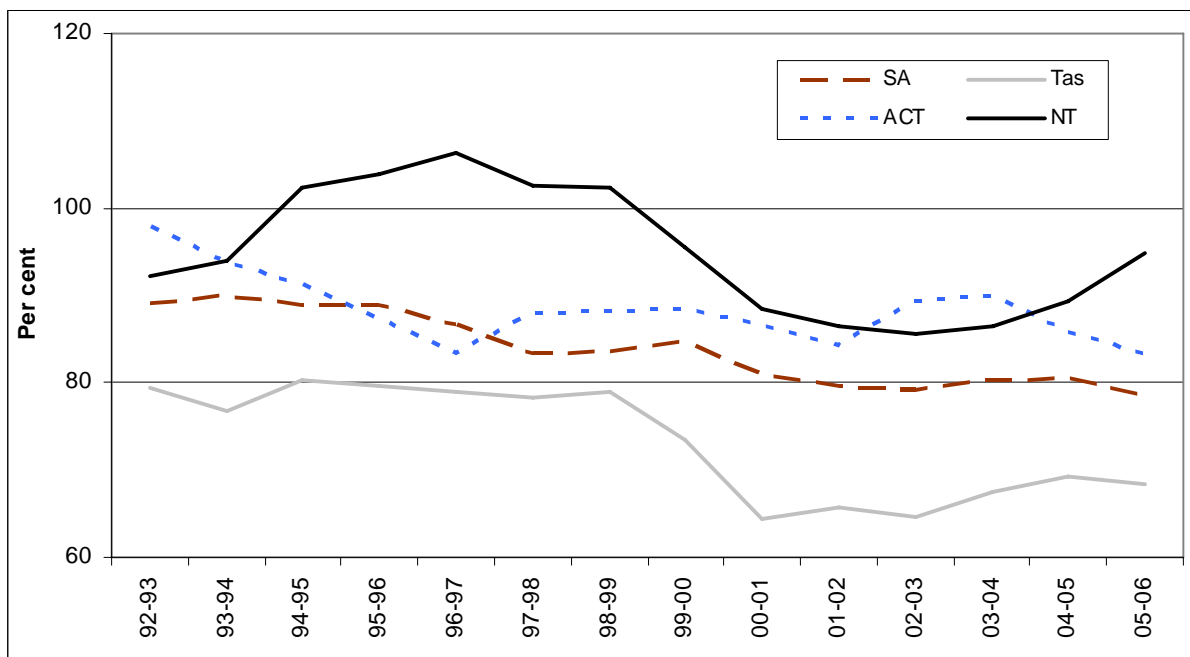


Figure 4-7 State revenue raising capacities – South Australia, Tasmania, the ACT and Northern Territory



- 27 Notable observations for the years since 2001-02, which are reflected in the relativities assessed in this update, include:
- declines in the relative revenue raising capacities of New South Wales and Victoria to their lowest levels in the period under review. In New South Wales, this was largely due to the collapse in conveyance activities. In Victoria, it was primarily due to the decline in revenue from financial transaction taxes (as these taxes have been abolished) and below average changes for payroll and land tax and conveyance duty;
 - rapid increases in the revenue raising capacities of Queensland and Western Australia because of increases in the value of production of mining and property market activity;
 - stability in South Australia's revenue raising capacity;
 - a general upward trend in Tasmania's revenue raising capacity that was heavily influenced by property market and mining activity. The decline in 2005-06 was mainly a reflection of the large increases in the capacity of Western Australia and Queensland to raise revenue from conveyances; and
 - increases in the revenue raising capacity of the Northern Territory since 2002-03 because of increases in activity in the property market plus increased revenues from payroll taxes and gambling.
- 28 The revenue bases of States are not independent because the economies of different States are connected either through trade in goods and services or flows of mobile resources. This means that shocks to the economic base of one State flow through to other States with an effect on State revenue raising capacity. To the extent that this occurs it can either increase or reduce the need for deliberate equalisation payments. The box below suggests that in the case of a mining boom these economic linkages reduce the need for equalisation adjustments.

Effect of changes in mining revenue bases in mining States on the revenue bases of non-mining States

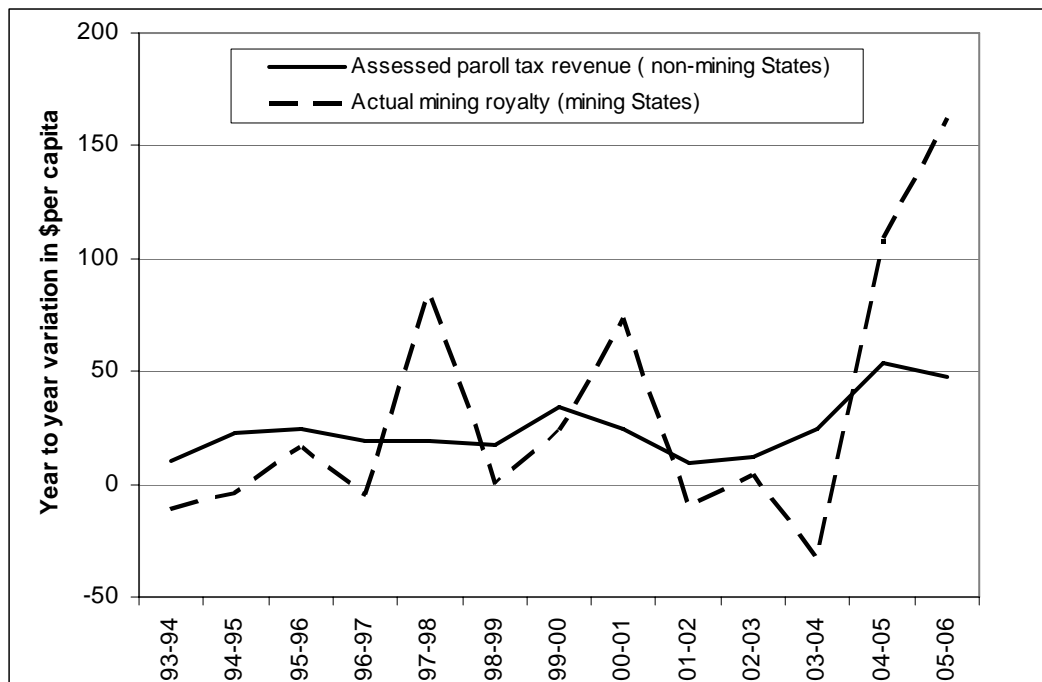
The effect of an expansion in the mining industry, which is concentrated in some States, on non-mining States is subject to some debate.

Some argue an expansion of the mining industry dampens economic growth in non-mining States, partly because labour and capital is attracted to the mining States — economic growth in one activity substitutes for growth in another. Others say growth in the mining industry creates a high demand for some services such as financial and business services, and thereby increases economic growth in the States where those activities are centred — growth in one activity complements growth in another.

While both are generally true, we have examined the data to see if one effect dominates. To do that, Western Australia and Queensland were defined as the ‘mining’ States and the others as ‘non-mining’ States. This is because the mining royalty revenue collected in the two ‘mining’ States has increased from 70 per cent of total mining royalties in the early 1990s to currently over 80 per cent. For this exploratory analysis, payroll tax revenue was taken as a proxy for general economic growth.

The following figure shows yearly changes in actual mining revenue in the mining States against yearly changes in assessed revenue for payroll tax for the non-mining States.

Changes in actual mining revenue of mining States and the assessed payroll tax revenue of the non-mining States



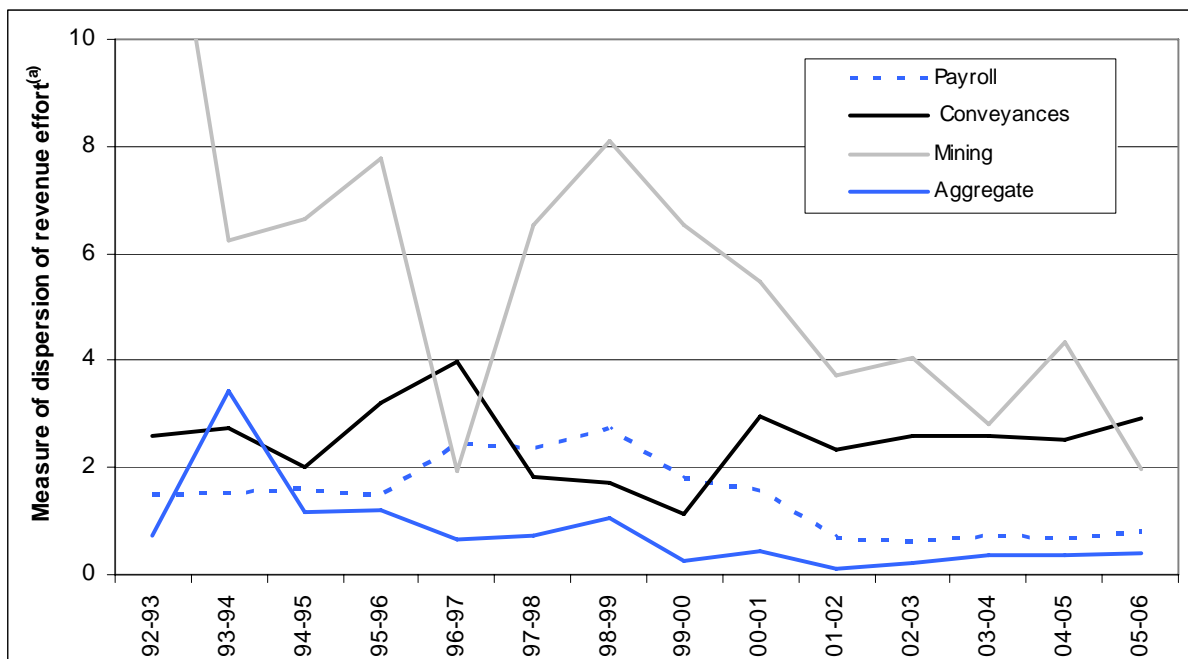
It suggests a positive correlation between changes in mining revenue in the mining States and changes in the payroll tax base in the non-mining States^(a), and a possibility that a mining boom creates a positive increase in demand for goods and services in the other States, leading to growth in their revenue bases. It may therefore indirectly reduce the effect on State GST shares of mining royalties.

(a) A simple regression between the two series has a R^2 value of 59%.

STATE REVENUE EFFORTS

- 29 A State's revenue effort indicates the extent to which its effective tax rates differ from the average¹³. A revenue effort above one indicates the State is either taxing at higher rates than average or achieving greater levels of compliance with the tax — or both.
- 30 For the States as a group, an aggregate measure of dispersion in revenue effort for a revenue base can be measured as the sum of the difference, in absolute terms, between each State's revenue effort and the average¹⁴. This measure would be zero if all States pursued a common policy, and relatively high if they had widely different policies.
- 31 There have been large variations in effort for individual revenue categories.
- 32 Figure 4-8 shows the aggregate dispersion for the major taxes covering payroll, conveyances and mining (the aggregate for all taxes is also shown). For these taxes, the differences in revenue raising effort have been relatively small, possibly because the revenue bases for these taxes are relatively mobile and subject to interstate or international competition. Conveyance duty shows moderate variation because investors are sensitive to the level of stamp duty in different States¹⁵.

Figure 4-8 Deviations of revenue effort between States for revenue bases that show a lower spread in effort



(a) See footnote 14 for explanation of how the measure of dispersion is calculated.

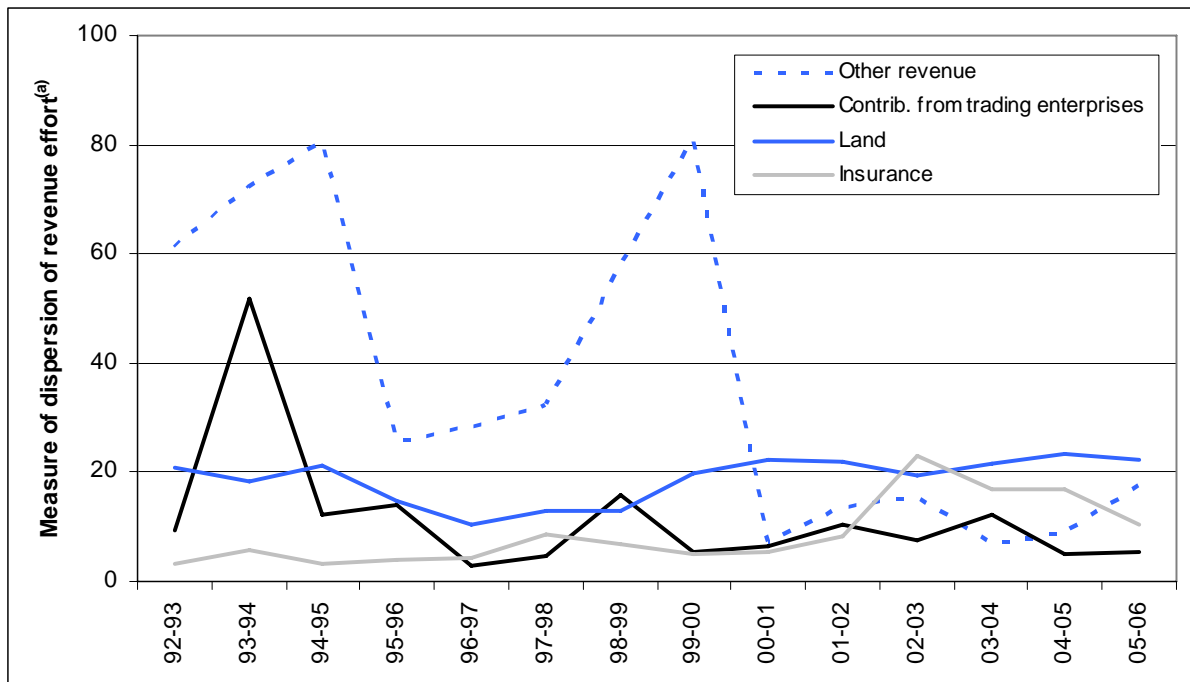
¹³ A State's revenue effort is calculated as the ratio of its actual revenue to its assessed revenue.

¹⁴ Specifically, the measure is constructed using the definition of statistical variance. The aggregate measure is calculated by squaring for each State the deviations of revenue effort from one, weighting it by the population share of that State and then summing it across all States.

¹⁵ Some commentators suggest the imposition of a vendor duty in New South Wales between April 2004 and August 2005 may have contributed to the down turn in its conveyance revenue in 2004-05.

- 33 In aggregate, State revenue efforts have converged in recent years. This is consistent with the possibility that increased integration of State economies and broader economic forces limit the ability of States to pursue widely different policies.
- 34 Figure 4-9 shows the aggregate dispersion for ‘other’ revenues, contributions from trading enterprises, land and insurance taxes. For these revenue categories, differences in effort have been relatively large, possibly because these bases are relatively immobile and less subject to interstate competition. Some, such as contributions from trading enterprises and the other revenues, are heavily influenced by State policy decisions. They are therefore assessed EPC, implying differences between States in collections from these revenues do not affect the distribution of GST and HCG pool.
- 35 The differences between States in their actual revenues can be split into those due to revenue capacities and policies. Since the Commission calculates assessed revenues by applying the average tax policies to each State’s revenue base¹⁶, differences between States in assessed revenues reflect the differences in revenue bases that are beyond the control of an individual State. These differences in ‘circumstances’ arise mainly because of differences in the State’s economic characteristics or resource endowments.

Figure 4-9 Deviations of revenue effort between States for revenue bases that show a higher spread in effort



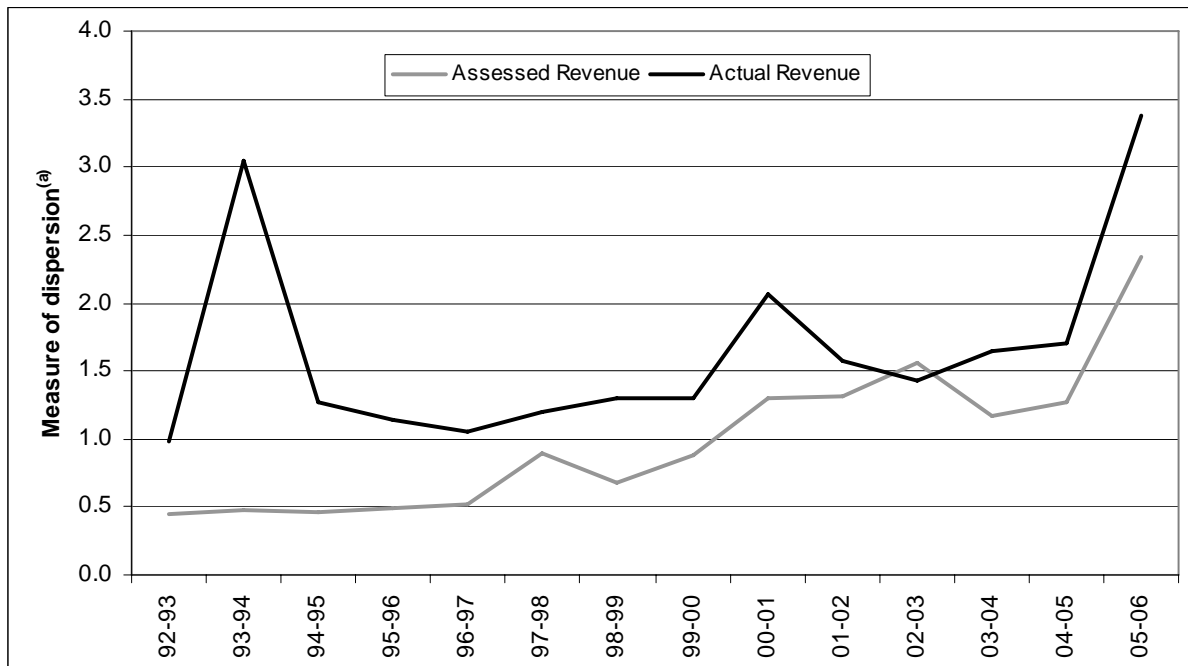
(a) See footnote 14 for explanation of how the measure of dispersion is calculated.

- 36 Figure 4-10 shows the dispersion of actual and assessed revenue for all own-source revenues combined.

¹⁶ Consequently, differences between States in their policies on the tax rates they impose or on exemptions and concessions given do not affect shares of the GST and HCG pool.

- 37 It shows a sharp difference between the dispersion of actual and assessed revenues in the first half of the 1990s. This indicates the dispersion in actual revenues was driven largely by policy differences, especially policies that required trading enterprises to contribute to State budgets.
- 38 More recently, a different pattern has emerged. The dispersion of actual and assessed revenues has moved closer together, indicating that differences in revenue bases rather than revenue raising effort had more influence on differences in actual revenue.

Figure 4-10 Comparison of dispersion of actual and assessed revenue



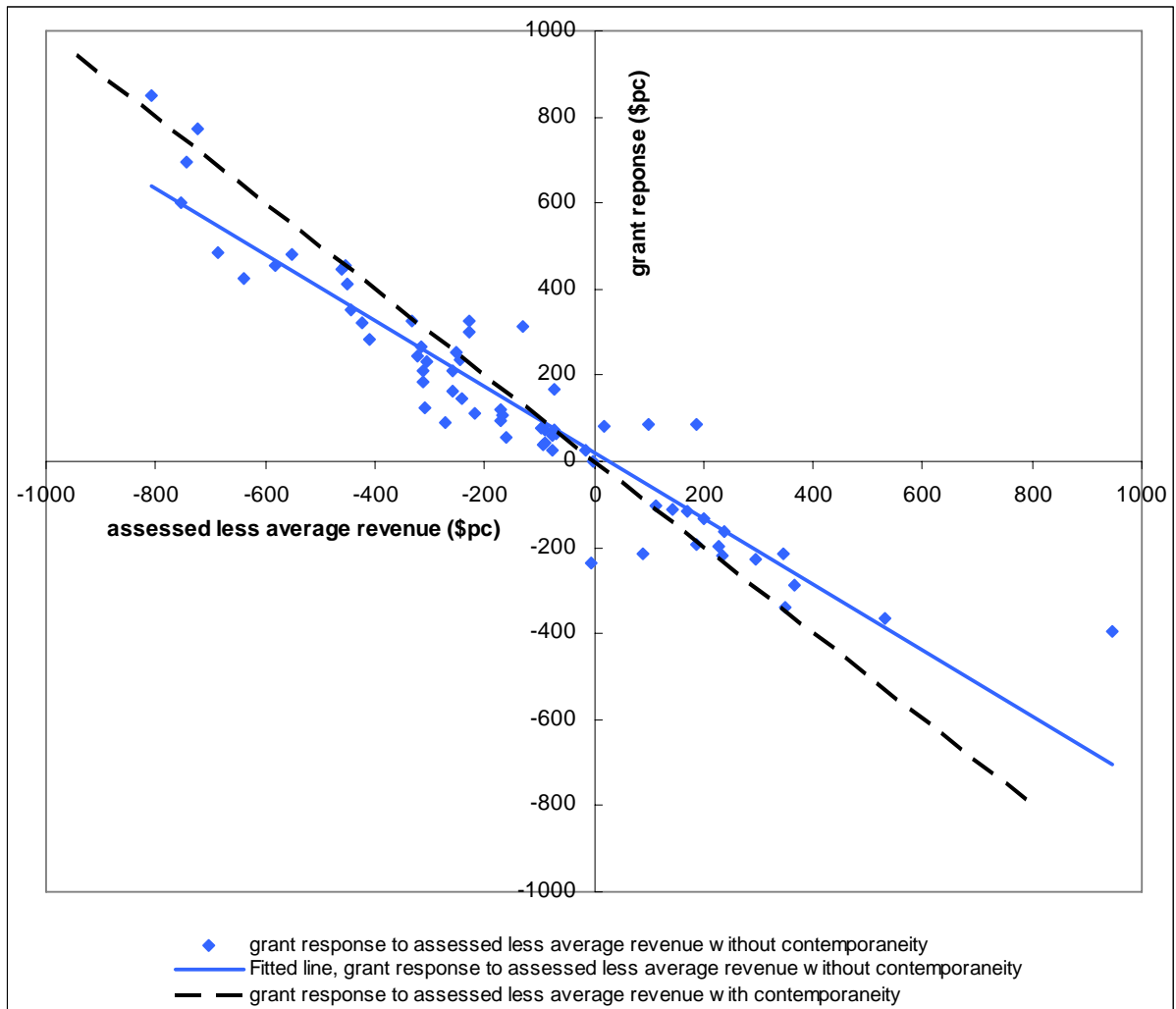
(a) See footnote 14 for explanation of how the measure of dispersion is calculated.

INTERACTION BETWEEN STATE REVENUE AND DISTRIBUTION OF THE POOL

- 39 Some commentators have suggested that the lags in the current equalisation system can exaggerate, rather than dampen, the movements in revenue from a State's own taxes. For example, the share of the GST and HCG pool received by rapidly growing States may be larger than that required to offset the effects of the above average growth in their revenue raising capacity. Overall, their total revenue would grow at an above average rate and they would have more revenue than is required to provide average services.
- 40 Figure 4-11 illustrates how equalisation payments responded to above or below average State revenue bases over the period 1998-99 to 2005-06.
- 41 The broken line represents the situation where the equalisation payments precisely offset the effects of above or below average revenue raising capacities, assuming there were no differences between States in their revenue-raising efforts.

42 The solid line represents a simple fitted line for the relationship between the actual equalisation payments to the States and the effects of their above or below average revenue raising capacities¹⁷ given the lags in the process (often called the lack of contemporaneity). It suggests that the direction of the equalisation payments is generally correct, and it proxies the full offsetting situation reasonably well.

Figure 4-11 Grants or equalisation payments response to the difference between assessed revenue and average revenue, 1998-99 to 2005-06



43 However, because equalisation payments rely on historical data, the difference between these lines suggest there are times when the equalisation payments turn out to be larger or smaller than required. The flatter nature of the fitted line suggests that in the period observed there was a tendency for the equalisation payments to be smaller on average.

¹⁷ In terms of the Commission's processes, this is defined as assessed differences and is measured as the difference between a State's assessed revenue (what it would raise if it applied the average revenue raising effort to its own revenue base) and the average revenue.

- 44 This outcome is consistent with the existence of medium term trends in the revenue raising capacities of some States (see Figure 4-6 and Figure 4-7). Such trends mean the lags in the equalisation processes can result in equalisation payments being smaller than those required to achieve equalisation. The existence of some large changes in revenue raising capacities for some States, together with the lags in the equalisation process, result in a few cases where the equalisation payment increased a State's total revenue when the circumstances of the year indicate it should have reduced it.
- 45 Further analysis of this decomposition over the period 1998-99 to 2005-06 suggests that:
- the growth in the pool and average revenue capacities have had a larger effect than either changes due to tax policy or equalisation lags on the volatility of State revenue, but less so in 2005-06; and
 - the volatility in total State revenue caused by lags in the equalisation process is of a similar order to that caused by State policies, although the lag effect is larger in 2004-05 and 2005-06.

CONCLUSIONS

- 46 The main conclusions that can be drawn from this chapter are:
- since the introduction of the GST, the volatility of State own-source revenues arising from contributions to State budgets by trading enterprises has declined;
 - State revenues from mining and conveyancing have become more volatile in total and in the case of conveyancing this volatility has affected different States at different times;
 - the first tranche of State taxes abolished under the terms of the IGA generally added marginally to the volatility of State own-source revenue in the historical period before their abolition;
 - the business taxes the States have recently agreed to phase out by 2010-11 added marginally to the overall volatility of State tax revenue in most years;
 - the larger States and the Northern Territory experienced slightly more volatility in own-source revenue per capita, especially during the 1990s;
 - recent changes in revenue bases have been a bigger source of volatility in State own-source revenue than changes in tax policy;
 - since 1998-99, hindsight suggests the lack of contemporaneity in the equalisation processes has tended to result in equalisation payments being smaller than those required to offset differences in State revenue raising capacities; and
 - equalisation has generally moderated volatility in State total revenue for States that have experienced high volatility in their own revenue bases.