

FINAL REPORT

ECONOMIC AND BUDGETARY IMPACTS OF THE ALICE SPRINGS - DARWIN RAILWAY PROJECT

prepared for the

Department of Transport and Works

by

ACCESS ECONOMICS



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1. Executive Summary

1.1. Preliminaries

At end April 1999 the Northern Territory Department of Transport and Works commissioned Access Economics to assess the impact of the proposed Alice Springs - Darwin railway on the national, Northern Territory and South Australian economies, and on the corresponding Commonwealth, state and territory budgets.

The assessment must therefore be considered preliminary, in that we have not had time to develop detailed models of the railway's linkages to the NT and SA economies, nor of the road sector's response to the new form of competition. We have however been able to draw on the considerable detailed analysis of the NT transport market, undertaken in particular by the NT Department of Transport and Works¹, and on the commercial and engineering analyses of the railway undertaken most recently by Booz Allen and Hamilton (Australia) Ltd.²

We have also drawn on Access Economics' considerable experience in analysis of economic and budgetary impacts of major development projects, and on the economic models that underpin our regular published economic and budgetary projections³. This has enabled us to produce a report that, we believe, illustrates the main impacts and – subject to the numerous assumptions made in the analysis – provides reasonable quantitative estimates of those impacts. We also point out where sensitivity analyses, or further detailed investigation and model development, might improve the robustness of the analysis.

Our estimates are conservative, in that they ignore possible impacts of the project beyond the year 2024/25.

1.2. Modelling approach

We estimate the national and state/territory economic impacts of the project, by including it in a long-run simulation of Access Economics' AE-MACRO model. The model covers the investment and operating phases of the project over the period to 2024/25. The main scenario chosen corresponds to Booz Allen & Hamilton's *Scenario 1 (base case)*. This "base scenario" includes only general freight, not a possible land bridge, nor any large scale mineral development. We also investigate an alternative scenario ("base scenario + land bridge"), that adds a possible land bridge to the "base scenario".

¹ Department of Transport and Works *Adelaide-Darwin railway: overview of freight estimates*, February 1998, and updates.

² Booz Allen & Hamilton (Australia) Ltd *Alice Springs to Darwin rail project: final report* for the South Australian Development Council and the Northern Territory Government, December 1996; *Financial assessment of the Darwin to Alice Springs Railway: final report* for the South Australian Government and the Northern Territory Government, August 1997

³ Access Economics *Five year business outlook, Commonwealth budget monitor, State & territory budget monitor, AEM Model software/forecasting service*, Canberra quarterly.

In each case the analysis involves comparing two long-term simulations of the AE-MACRO model. The first (“the baseline”) is a standard long-run projection, based on Access Economics assumptions about trends in major economic variables. In the second, we take the model used in the standard projection and add the Alice Springs - Darwin railway. The difference between the two simulations provides an indication of the likely national and state/territory economic impacts of the project.

We estimate the impacts of the project on the Commonwealth, NT and SA budgets using spreadsheet analysis similar to that which underlies Access Economics’ regular published projections of Commonwealth and state budgets.

1.3. National economic impacts: “base scenario” (without land bridge)

The project’s investment temporarily raises aggregate demand economy-wide. There is some leakage to imports, and an increase in output and employment. GDP increases by \$430 million in 2000/01 and employment by 7,000 by 2002/03.

Higher aggregate demand also leads to a \$300 million increase in annual imports and some deterioration in the trade balance.

The increase in demand, employment and government cash grants causes a small rise in inflation, the real wage rate, nominal interest rates and the exchange rate. Governments are assumed to respond with a slight tightening of fiscal and monetary policy. As a result, activity weakens following the end of the investment phase.

The railway’s operations reduce transport costs and generate an overall improvement in efficiency from 2003/04 onwards. The impact on GDP is small initially, but then grows strongly.

The main initial impact is on exports. However, employment and private consumption increase steadily from about 2007/08 onwards. Rising demand after about 2015 causes a slight fall-off in the contribution of exports and an increase in imports.

The best guide available from the national model to the overall impact of the project on Australian economic welfare is the net gains in private consumption and in public net lending over the life of the project. Our projections indicate that, at a 5 percent *real* discount rate, the project would increase the net present value of private consumption by nearly \$0.7 billion, and that of public sector net lending by nearly \$200 million⁴.

Overall, the modeling suggests that the project would have a significant positive impact on the public sector’s finances and on private consumption – and hence on Australian economic welfare. While this finding is conditional on the many assumptions made in the course of the modeling, we would expect it to be reasonably robust to possible changes in the assumptions.

⁴ Net present values at constant (1996/97) prices, as at 1999/2000. Estimates include the impact of \$300 million government grants to the project.

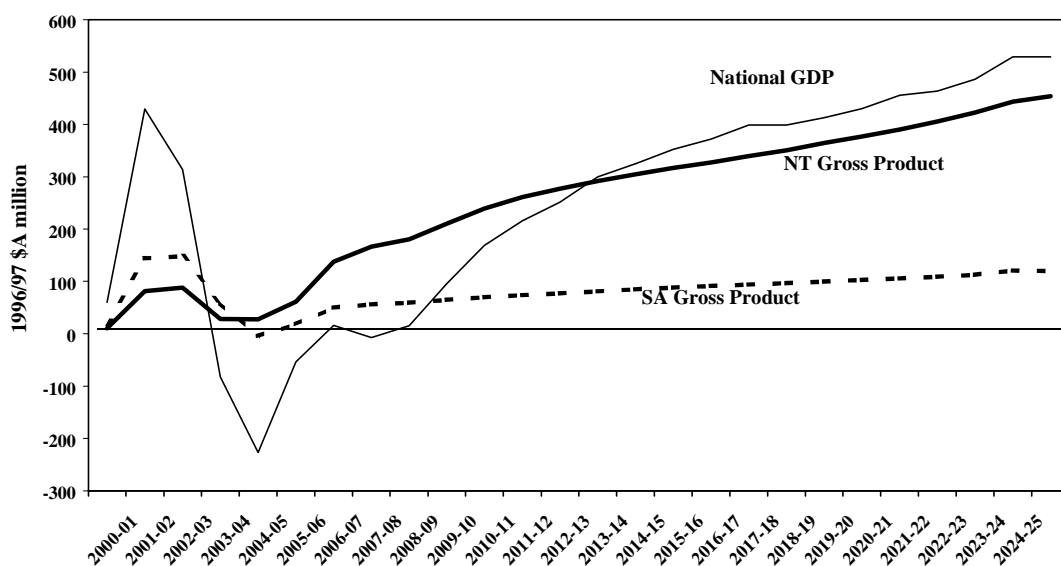
1.4. Economic impacts on the Northern Territory and South Australia: “base scenario” (without land bridge)

Modeling the economic impacts on SA and the NT requires additional assumptions about the location of investment expenditures and impacts during the railway’s operation. Key assumptions in this scenario are:

1. while the benefits will accrue nationally, for the purposes of this analysis, the whole of the resource saving following the opening of the railway is focused on the NT economy. This implies that the territory contributes a large part of the increase in GDP following the opening of the railway; and
2. value added in SA rises somewhat, as a result of changes in the origin of goods destined for the territory, with the amount increasing in line with growth in traffic volumes.

The increases in value added resulting from these assumptions are shown in Chart 1.

Chart 1: Increases in value added resulting from the railway; “base scenario” (without land bridge)



1.4.1. Economic impacts on the Northern Territory

During the investment phase, up till 2002/03, the project contributes some \$0.85 billion (at 1996/97 prices) to final demand in the territory. Much of this demand leaks from the territory, but Gross Territory Product still rises by some \$210 million over the four year period – with flow-on impacts to employment and private consumption.

The opening of the railway reduces costs in the territory. Over time the Gross Territory Product deflator is projected to fall 0.2 percent below that in the scenario

without the railway. Although resources are saved, there is no reduction in the physical transport task. Thus there is no reduction in reported territory product compared to the scenario without the railway.

The reduction in costs increases the competitiveness of territory suppliers. Exports increase, and there is some increase in production for the local market. Higher production increase the demand for labour. Employment rises, in turn inducing additional net migration to the territory. Over the 25 year period to 2024/25, the railway is projected, in this scenario, to raise the average growth rate of territory gross product by about 0.1 percentage point. By the end of the period, gross product is 2.5 percent above the level in the absence of the railway, and employment some 2.7 percent higher.

1.4.2. Impacts on Northern Territory economic welfare

The projected impacts on the territory can be expressed in terms of net present values at 1996/97 prices.

The increase in the net present value of Territory Gross Product is projected to be around \$3 billion at a real discount rate of 5 percent. This, however, is not a particularly good measure of economic welfare – particularly in a small open economy such as the territory – since it includes earnings by capital owned by non-territorians.

Better measures of economic welfare, in our view, are the increases in the net present values of private consumption and public sector budget surplus (under an assumption of constant tax rates). The net present value of the real increase in private consumption is projected at about \$1.2 billion (at a 5 percent real discount rate) over the 25 year horizon. The increase in present value of the budget surplus is around \$0.13 billion (after allowing for the \$100 million grant). The sum of these two measures of net benefit is in the range \$1.0 billion to \$1.9 billion, depending on the choice of discount rate.

We stress that this estimate of net benefit depends on numerous assumptions that could be varied, and on the details of the modeling, which could be improved if more time were available. Growth and composition of economic activity in the territory have also fluctuated widely in the past.

1.4.3. Economic impacts on South Australia

The railway (without the land bridge option) has a smaller potential impact, both absolutely and relatively, on the SA economy than on that of the NT.

The project's investment phase has considerable impacts on SA. On the assumption that the railway has its headquarters in SA, the project may add some \$300 million to SA capital expenditure. Much of this will reflect in SA production and employment. The project is likely to procure rails from Whyalla. Rolling stock may also be sourced in SA, but the locomotives will probably come from elsewhere. SA residents will also form a substantial part of the construction workforce of the whole project. These expenditures will increase value added in SA. We project that Gross State Product during the four construction years may increase by about \$370 million (at

1996/97 prices), compared to the world without the project. This increase partly reflects additional project-related exports to the NT.

Once operation begins, the main potential impact in the current scenario may be from the opportunities for SA to become the source of a larger proportion of NT imports of goods, once traffic is routed through Adelaide on the railway. The stimulus for additional activity therefore shifts from investment demand to demand for additional exports to the NT.

The proportionate impacts on Gross State Product and employment during construction are about twice those during the operation of the railway. During the operational phase, both rise by around 0.15 percent compared to a world without the railway. The additional employment opportunities act first by reducing the unemployment rate and increasing labour force participation in turn. In the longer run there is additional net migration to the state.

On the demand side, the main stimulus is to private consumption and to interstate exports. The contribution of international exports is less.

1.4.4. Impacts on South Australian economic welfare

Expressed in net present values at 1996/97 prices, the increase in Gross State Product is projected to be around \$1.1 billion at a real discount rate of 5 percent. The net present value of the real increase in private consumption is projected at about \$0.7 billion over the 25 year horizon; the increase in the net present value of the budget surplus at about \$0.12 billion (after allowing for the \$100 million grant). Combining the two measures of net benefit gives a total that lies between \$0.7 billion and \$1.0 billion, depending on the choice of discount rate.

As with the results for the NT, we emphasise that the estimates depend on a long chain of assumptions. They could be improved given further detailed analysis. Nevertheless we believe that they provide some guide to the likely economic and budgetary implications of the modeling scenario.

1.5. Budget impacts: “base scenario” (without land bridge)

As part of the brief we have obtained estimates of the possible impacts of the railway project on the Commonwealth, Northern Territory and South Australian budgets. The projected impacts (i.e. the deviations in budget outcomes resulting from the project) are summarised in the following two charts. Each shows the position, relative to the “baseline simulation”, after allowing for a \$100 million capital grant towards the project’s investment cost.

The change in the Commonwealth revenues and expenditures tracks changes in the overall macroeconomy, whereas the SA and NT budgets are more strongly influenced by the project’s direct impacts. The Commonwealth’s budget balance improves early in the period, and stays broadly in balance thereafter. The state and territory budget balances improve in the middle of the period. They subsequently deteriorate relative to the position without the project, as a result of the pressures on outlays resulting from population increase, and a projected reduction in Grants Commission relativities.

At a 5 percent real discount rate the net present values of the improvements (in 1996/97 dollars) in the budget balances of the Commonwealth, SA and the NT are \$130 million, \$120 million and \$130 million respectively.

Chart 2: Commonwealth budget aggregates: “base scenario” (without land bridge), 1996/97 \$ million

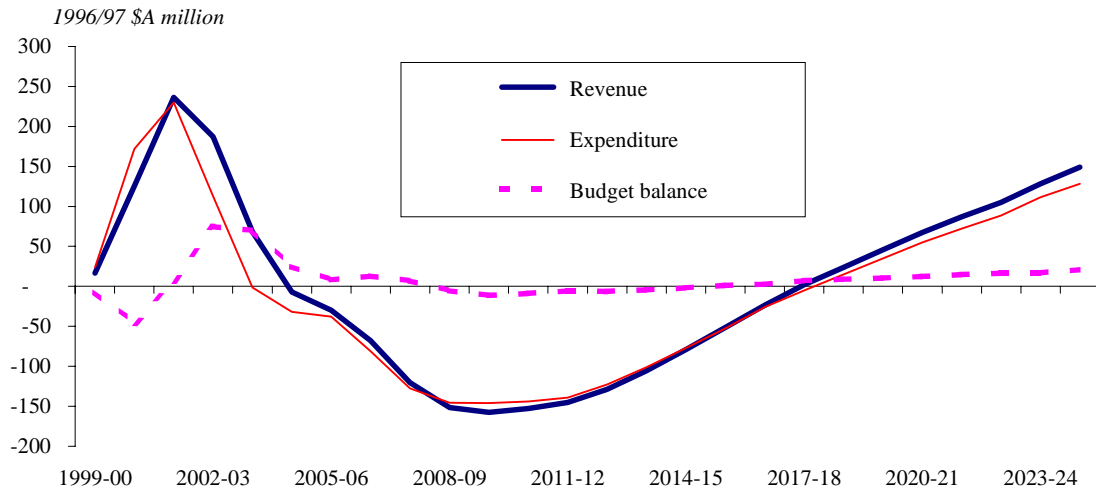
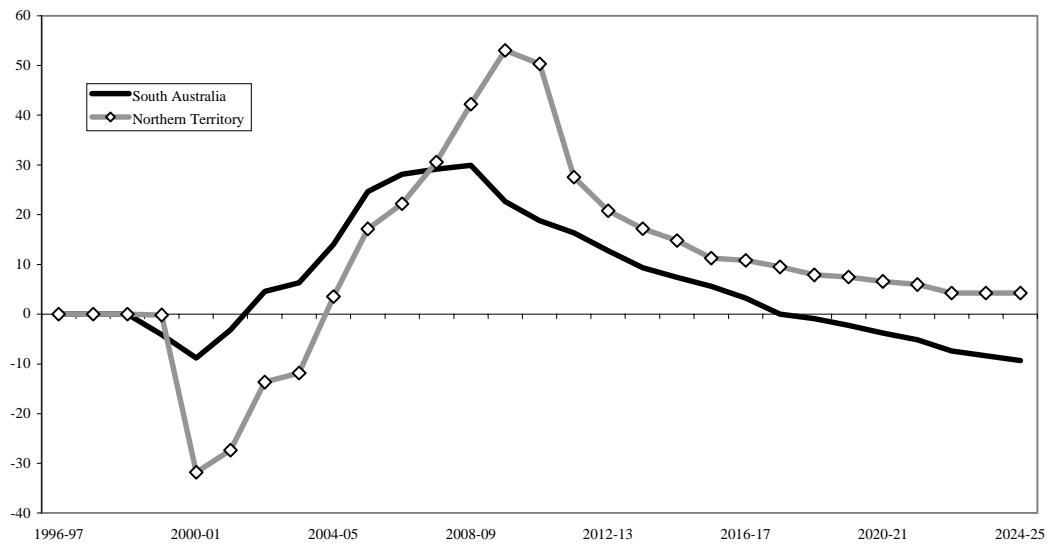


Chart 3: Impacts on State and Territory Budget deficits (1996-97 \$ million)



1.6. Alternative scenarios

While there has been little time for such analysis, we have explored two types of alternative scenario:

3. variations to the level of government grants. The base scenario is based on an assumption that the Commonwealth, SA and NT governments each contribute a \$100 million cash grant to the project. Alternative scenarios involve cash contributions of \$150 million or \$200 million by each government;
4. development of a land bridge involving transport of exports particularly from SA, via the railway for on-shipment from Darwin to Asian destinations. The scenario also involves some import of manufactures by the same route. If commercially viable, the land bridge might offer the possibility of substantial economic gains, especially to SA. We also examined the impact, in the land bridge scenario, of varying the levels of government grants, as in alternative scenario (1).

1.6.1. Variations to the level of government grants in the “base scenario”

These scenarios suggest that raising the level of government grant funding, under the conditions of the model, has small negative impacts on the net economic benefit generated by the project – and rather larger negative impacts on individual government budgets. This is mainly because the larger up-front borrowing by governments generates an ongoing stream of net interest payments.

In the case with the largest grants (\$200 million from each government), the net present values of the impacts on SA and NT budgets are negative, whereas the impact on the Commonwealth budget is still slightly positive.

1.6.2. “Base scenario + land bridge”

Results of this alternative scenario are sensitive to the precise assumptions about the degree of cost saving and extent of market penetration of the land bridge. The scenario focused on improving costs and access between South Australian and Asia.

In economic terms, the land bridge, as portrayed in the model, generates a sustained improvement in Australia’s terms of trade. This has an immediate marked impact on Australian real incomes, and creates an incentive to expand exports. Under the assumptions made, the economic impact is larger in absolute terms - and occurs earlier – than the impact of the cost reduction in the base scenario. By assumption, the impact is focussed on South Australia, whose budget also moves more strongly into surplus in net present value terms.

In this scenario, the overall national impacts are more positive. The net benefits to South Australia also become larger in absolute terms than those accruing to the NT – though the proportionate impacts are still in many cases more substantial in the (smaller) territory.

Increasing the size of the government grants in this scenario has similar relative impacts to those in the “base scenario”. The overall economic impacts are slightly reduced, and there are larger impacts on individual government budgets. With \$200 million grants, the net present value of the impact on the NT budget is projected to become negative, whereas that of the SA and Commonwealth budgets is still projected to be positive.

We again stress that the results are conditional on the many assumptions made in the course of the analysis.

Summary tables showing net welfare and budgetary impacts for all scenarios are in Appendix D.

2. Approach to the task

To estimate the project's economic and budgetary impacts we employ a sequence of modelling steps.

(1) We develop an annual projection of the project's capital and recurrent expenditures, freight volumes and revenues, together with the annual savings in road transport costs. This base scenario is similar in its assumptions to Booz Allen & Hamilton's *Scenario 1 (base case)*, updated (on the advice of the Department of Transport and Works) to take account of the latest estimates of potential freight task; capital and operating costs; and timing. Key features of this scenario are summarised in Box 1.

Box 1: Key features of the base scenario (without land bridge)

Initial capital investment of \$1.19 billion (at 1996/97 prices), including locomotives and rolling stock.

Investment phase: from 1999/2000 to 2002/03, with peak expenditure of \$0.46 billion in 2001/02.

Operation: full operation from 2003/04. Modeling extends to 2024/25.

Freight task comprises general freight only: no specific allowance for land bridge operations nor for additional large scale mineral development.

Freight task projected from a base of 1.251 million tonnes in 1996/97. Average haul length and volume growth rates as assumed by Booz Allen & Hamilton (4 percent per annum till 2004/05; 3 percent thereafter).

Operating costs 1.91 cents per ntk (net tonne kilometre) (in 1996/97 prices).

Rail revenues: 4 cents per ntk. Direct road costs 6 – 7.5 cents per ntk (1996/97 prices). Prices lower for backhaul. The Department of Transport and Works estimates that this would have been equivalent to a \$62.4 million saving on freight costs in 1996/97. The estimates of rail revenues are not critical to the analysis in this report, since the focus is on resource costs.

Net reduction in diesel fuel usage: 14.3 million litres annually at 1996/97 freight volumes.

(2) We estimate the national economic impacts of the project (base scenario) over a 25 year horizon, by including it in a long-run simulation of Access Economics' AE-MACRO model.

AE-MACRO is a relatively small (16 stochastic equations – 84 behavioural and accounting identities) dynamic model of the Australian economy. It was developed in 1992 by Access Economics, and is based on standard modeling practice. It has a stable long-term growth path that accords with neoclassical economic theory, together with short-term dynamics derived from Australian economic experience over the past 20 years.

The analysis involves comparing two long-term simulations of the AE-MACRO model. The first (“the baseline”) is a standard long-run projection, based on Access Economics assumptions about trends in major economic variables. In the second, we take the model used in the standard projection and add the Alice Springs - Darwin railway. The difference between the two simulations provides an indication of the likely national economic impacts of the project.

(3) To estimate the economic impacts on the Northern Territory and South Australia, we employ the state and industry modules of AE-MACRO. These allocate a national simulation of the model to states and industries, in line with average historical experience. We adjust the initial results from AE-MACRO to take account of the particular features and location of the project, drawing on insights from state-level computable general equilibrium and input-output analysis.

(4) We estimate the impacts of the project on the Commonwealth, NT and SA budgets using spreadsheet analysis similar to that which underlies Access Economics' regular published projections of Commonwealth and state budgets. The analysis involves using a long-run version of these spreadsheets; economic parameters generated by the AE-MACRO model; and assumptions about reactions of state/territory and federal policy makers; in order to compare the development of budgets in the presence or absence of the project.

The modelling relies heavily on project information supplied by the client – and on Access Economics' assumptions about macroeconomic trends, exchange rates etc. We have accepted the information from the client in good faith, and our results are conditional upon it. Given the limited time for the study, we have not been able to develop our own economic models to take account of the full detail of the project, particularly as it relates to state/territory and budget impacts. Nevertheless we believe that the main conclusions are sufficiently robust to form a credible basis for policy discussion. Our estimates are in any case conservative, in that they ignore possible impacts of the project beyond the year 2024/25.

3. Nature of the railway's impacts

The project's economic impacts will be felt in the Northern Territory and South Australia, and throughout Australia.

The project's direct impacts include the expenditure on labour and other inputs during the construction and operational phases; a reduction in freight costs to and from the NT; and payments to state, territory and Commonwealth governments.

Indirect impacts include flow-on effects as those who receive payments from the project themselves purchase inputs, invest and consume. They include market responses to the reduction in freight rates, and economy-wide responses as the exchange rate and other prices adjust to changed circumstances, and responses by governments to changing revenues and demands for government services. Key impacts, on which we hope to throw light with our modeling, include:

- the impact of lower freight costs on the potential economic development of the territory; and
- the potential for SA to supply an increased proportion of the goods imported into the territory, as supply routes become focused on the railway.

3.1. The investment phase

The investment phase involves substantial expenditure, without offsetting revenues. Governments (Commonwealth, SA and NT) have each promised to contribute \$100 million in cash grants towards the cost of the project. We have assumed that this is contributed equally and progressively by the three governments in line with the profile of investment expenditure. We have assumed that the remainder of the expenditure is financed equally by Australian and foreign investors.

Nearly 30 percent of the initial capital expenditure is recorded as occurring in SA, and the remainder in the NT. A significant proportion of the SA expenditure is locomotives, which are assumed to be sourced from elsewhere in Australia. Based on Access Economics' analyses⁵ of other major Australian investment projects, we assume that only about a quarter of the NT investment expenditure reflects in an increase in NT Gross Product, with the remainder being imports to the territory. Half of those imports are assumed to come from SA. Of the additional demand on the SA economy, two thirds is assumed to reflect in increased SA Gross Product.

For the economy as a whole, some of the expenditure will flow offshore, and the capital contributed by foreign investors will add to the availability of investment funds in Australia. At this stage the net impact on government revenues will flow mainly from the project's expenditures, since the project does not at this stage generate any savings in freight costs.

⁵ At this point, as elsewhere in this study we have relied on rules of thumb, that we believe represent appropriate orders of magnitude. At a later date it would be possible to explore the impact of varying such assumptions, or to conduct more detailed analysis to verify their accuracy.

The investment expenditures provide a classic Keynesian stimulus to final demand. Governments' cash grants represent a fiscal stimulus. These will increase the overall level of demand, activity and employment in the economy, as well as stimulating imports. Governments are assumed to respond: to increased inflationary pressures by raising interest rates; and to the increased public sector borrowing requirement by raising average tax rates. These effects are illustrated in the simulation using the AE-MACRO model.

3.2. Operational phase

During the operational phase, the project's direct expenditures (on employment and the purchase of goods and services) are much smaller than at the peak of the construction phase. The main economic contribution comes from the resource savings, and resulting lower freight costs, in transport of goods to and from the territory.

The main initial impact will be to reduce the price of goods and services in the territory, and the overall resources required to service the territory's transport needs. In economic terms, this is equivalent to a one-off increase in productivity in the transport sector, with its impacts concentrated in the NT. This increases the competitiveness of NT and overall Australian economic development. Over time, this will increase the level of economic activity in the territory, and nationwide. In the long run, territory employment and population are likely to increase their share of the Australian total, compared to a world without the railway.

Following the initial increase in transport productivity, the impact will grow in line with the economic growth of the territory – and hence the freight task. In the base scenario, we have used the growth of the freight task projected by Booz Allen & Hamilton. This is broadly in line (but a little below) the long run economic growth rates projected by Access Economics. An obvious variant of our analysis would be to explore the impact of changing the assumed growth rate of the freight task.

3.3. Impacts beyond the modelling horizon

The analysis in this report covers the period to 2024/25. Provided there is adequate replacement and upgrade investment, the railway will have an economic life extending well beyond that date.

It would be possible to build into the analysis a terminal asset value, or some other allowance for the potential contribution beyond the modeling horizon. Even at a real discount rate as high as 7 or 8 percent, a terminal value could still have quite a significant impact on the project's net present value. Nevertheless we have made no allowance for this in the current study.

4. National economic impacts: “base scenario” (without land bridge)

In this segment of the analysis we investigate the national economic impacts of the Alice Springs - Darwin railway using the AE-MACRO model of the Australian economy.

The analysis involves comparing two long-term simulations of the AE-MACRO model. The first (“the base scenario”) is a standard long-run projection, based on Access Economics assumptions about trends in major economic variables. In the second, we take the model used in the standard projection and add the Alice Springs - Darwin railway. The difference between the two simulations provides an indication of the likely macroeconomic impact of the project.

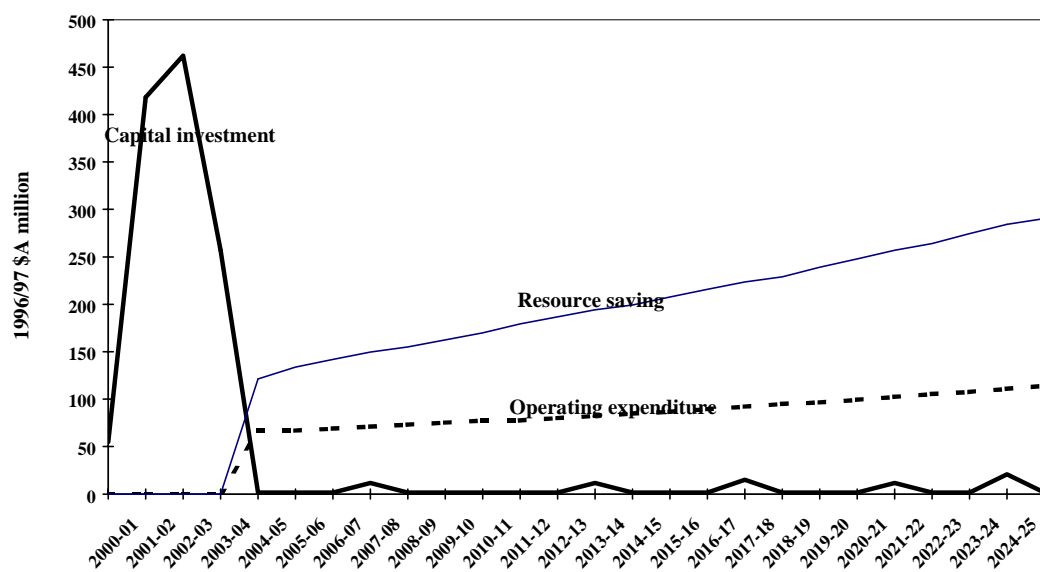
We consider an alternative scenario, including the possible impact of a land bridge, in Section 6.

Key results of the modelling are summarised in the following charts. Further details are given in Appendix A.

4.1. Direct impacts

The project’s two main direct impacts on the macroeconomy are on business investment and via its operating expenditure. As shown in Chart 4 the project provides a substantial boost to overall business investment between 1999/2000 and 2002/03.

Chart 4: Alice Springs-Darwin Railway - direct impacts: “base scenario” (without land bridge)

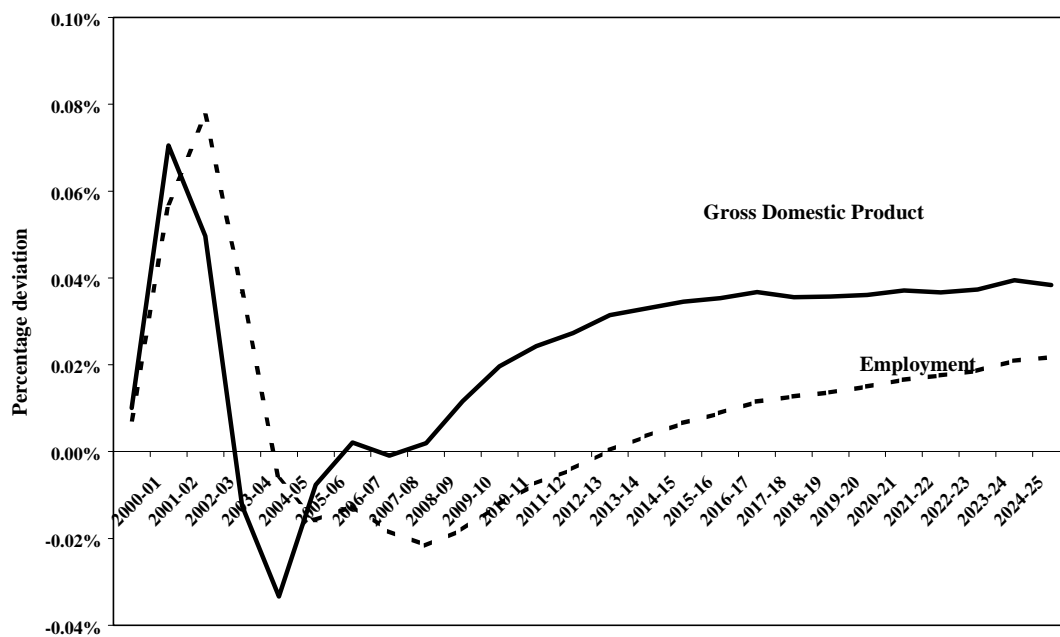


Operating expenditure rises gradually in real terms from 2003/04 onwards. Also shown in the chart is the estimate of resource saving fed into the AE-MACRO simulation.

4.2. Flow-on impacts

The project's investment temporarily raises aggregate demand economy-wide. There is some leakage to imports, and an increase in output and employment. GDP increases by \$430 million in 2000/01 and employment by 7,000 by 2001/02. (See Chart 5).

Chart 5: Impacts on national GDP and employment: “base scenario” (without land bridge)



Higher aggregate demand also leads to a \$300 million increase in annual imports and some deterioration in the trade balance. (See Chart 6)

Chart 6: Impacts on imports and the trade balance: “base scenario” (without land bridge)

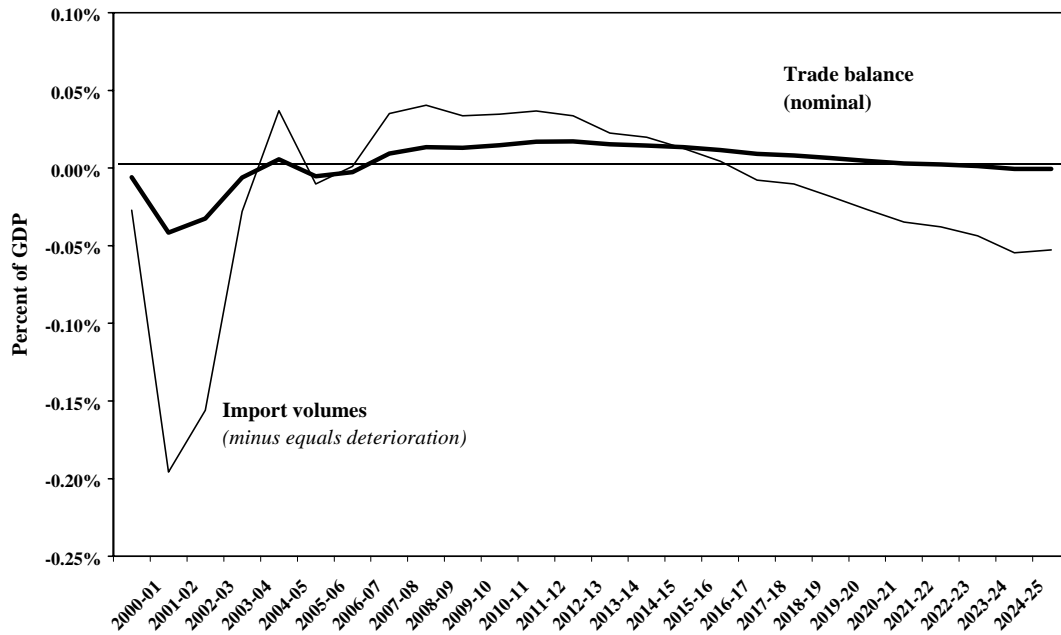


Chart 7: Project's resource saving and consequent GDP impact: “base scenario” (without land bridge)

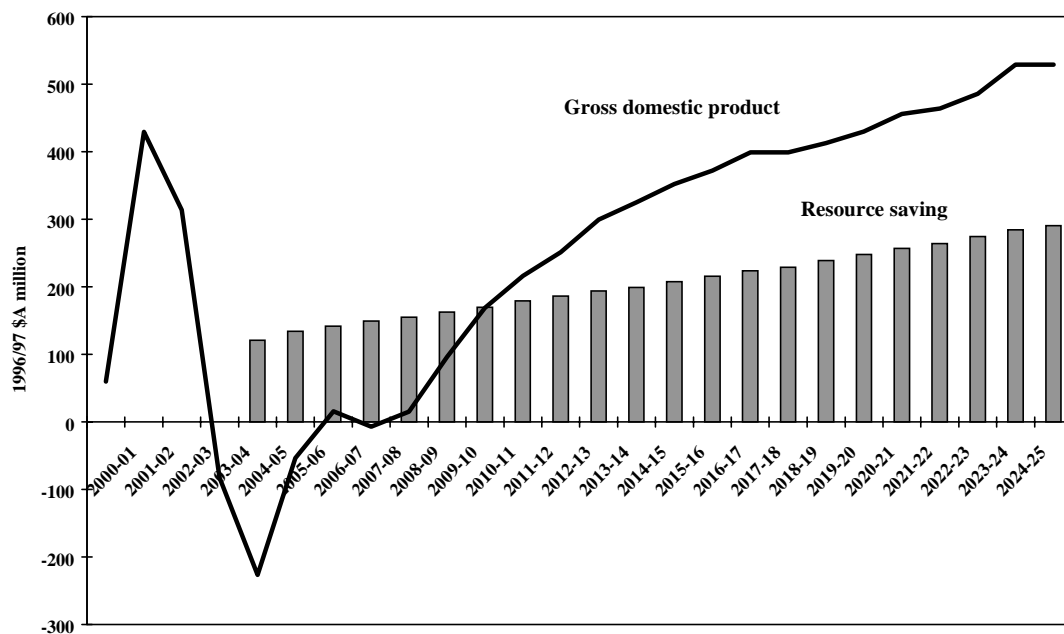
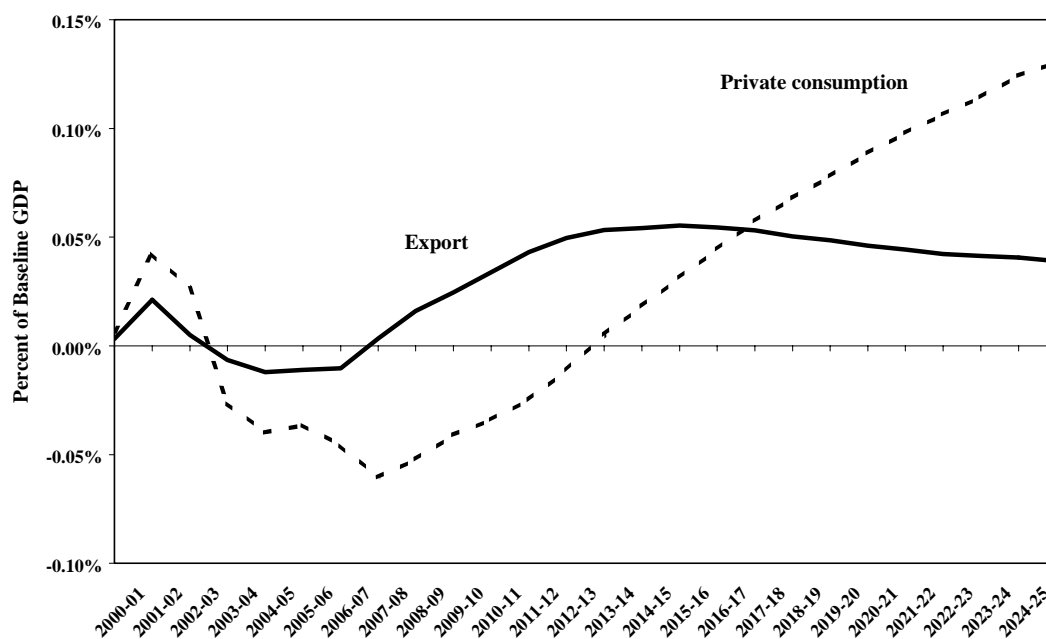


Chart 8: Impact on exports and private consumption: “base scenario” (without land bridge)



The increases in demand, employment and government cash grants cause a rise in inflation, the real wage rate, nominal interest rates and the exchange rate. Governments are assumed to respond with a slight tightening of fiscal and monetary policy. As a result, activity weakens following the end of the investment phase.

The project’s resource saving kicks in at the start of operations in 2003/04. The impact on GDP is small initially, but then grows strongly. (See Chart 7)

The main initial impact is on exports. (See Chart 8) However, employment and private consumption increase steadily from about 2007/08 onwards. Rising demand after about 2015 causes a slight fall-off in the contribution of exports and an increase in imports.

4.3. Net present values

The best guide available from the model to the overall impact of the project on Australian economic welfare is the sum of the impacts on the public sector’s net lending and on private consumption.

It is possible to express the net gains in private consumption and in public net lending over the life of the project in the form of net present values at constant (1996/97) prices, in 1999/2000. These are shown for a selection of real discount rates in Table 1.

Table 1: Net present values; 1999/2000 to 2024/25: “base scenario” (without land bridge)

Deviations from baseline simulation levels

Real discount rate	Public sector net lending	Private consumption	Total net benefit
<i>1996/97 \$ million</i>			
3%	300	1,120	1,420
5%	180	670	850
7%	90	380	470

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

As might be expected, the net present values decline as the real discount rate increases, but are all positive. The net present value of the impact on the public sector’s net lending (i.e. the overall public sector surplus) is in the range \$90 million to \$300 million, depending on the choice of discount rate. The net present value of private consumption increases by between \$0.4 billion and \$1.1 billion.

The combined improvement varies between \$0.5 billion and \$1.4 billion, depending on the choice of real discount rate.

Overall therefore, the modelling suggests that the project has a significant impact on the public sector’s finances and on private consumption – and hence on Australian economic welfare.

4.4. The results reflect the assumptions and parameter estimates

These results reflect the specific assumptions about the railway project, together with the assumptions and parameter estimates built into AE-MACRO. In turn, these assumptions and estimates reflect the actual experience of the Australian economy in the past twenty years. They can provide only an approximate guide to the likely impact of a long-lived project such as the Alice Springs - Darwin railway.

The economy itself will change, and the overall economic environment will certainly not be as smooth as that implied by the baseline scenario. The effectiveness and emphasis of Australian economic policy may fluctuate.

5. The project's economic impact on South Australia and the Northern Territory

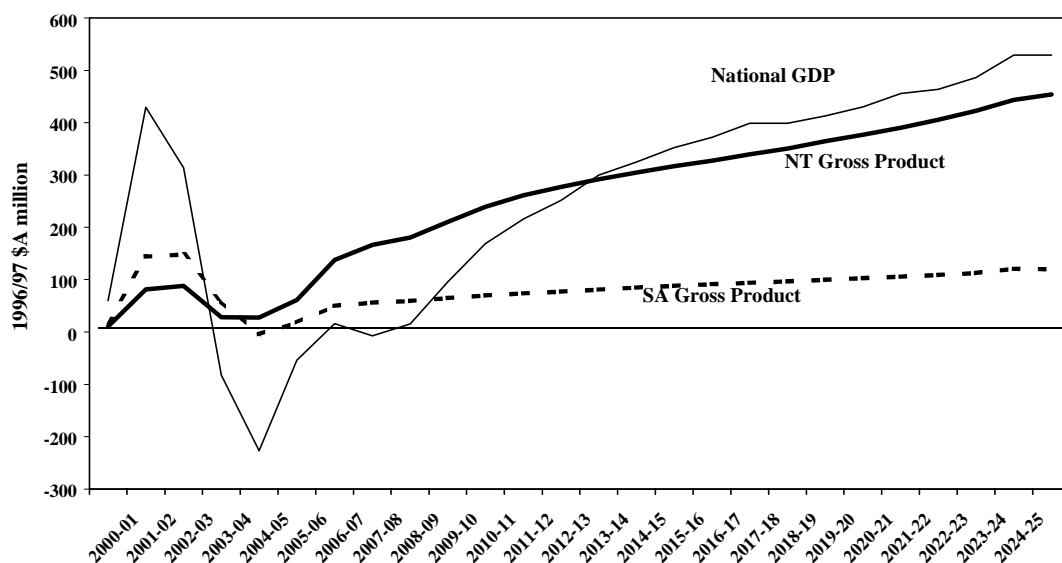
5.1. Modeling approach: “base scenario” (without land bridge)

The AE-MACRO model allows us to illustrate the implications of a shock to the national economy at the level of an individual state. The state module of AE-MACRO illustrates the effects of differing industry structures and population dynamics, and of assumptions concerning the location of a particular exogenous shock to the model.

Modelling the economic impacts on SA and the NT requires additional assumptions about the location of expenditures; the geographical distribution of the impacts of transport cost reductions; and the value of additional supplies to the NT from SA following the opening of the railway. The assumptions about the allocation of investment expenditures were mentioned in Section 3.1 above. In relation to the other two issues, the key assumptions in this scenario are:

1. while some of the resource savings in fact occur in SA and elsewhere - for the purposes of the modelling, the whole of the resource saving following the opening of the railway is assumed to have its impact on the NT economy. This implies that the territory contributes a large part of the increase in GDP following the opening of the railway; and
2. value added in SA rises by \$60 million annually as a result of changes in the origin of goods destined for the territory, with the amount increasing in line with growth in traffic volumes.

Chart 9: Increases in value added resulting from the railway; “base scenario” (without land bridge)



Further details of the modelling approach are in Appendix A, Section 8.3

The increases in value added resulting from these assumptions are illustrated in Chart 9.

5.2. Economic impacts on the Northern Territory: “base scenario” (without land bridge)

The rail project dominates the economic impacts on the territory. Wider macroeconomic reactions have only a muted effect. The territory feels strong effects, first of the investment phase, and then of the railway’s operation. The impacts are illustrated in the following charts, with further details in Appendix A.

During the investment phase, up till 2002/03, the project contributes some \$0.85 billion (at 1996/97 prices) to final demand in the territory. Much of this demand leaks from the territory, but Gross Territory Product still rises by some \$210 million over the four year period – with flow-on impacts to employment and private consumption.

The opening of the railway reduces costs in the territory. Over time the Gross Territory Product deflator is projected to fall 0.2 percent below that in the scenario without the railway. Although resources are saved, there is no reduction in the physical transport task. Thus there is no reduction in reported territory product compared to the scenario without the railway.

Chart 10: Impacts on Northern Territory production, employment and population: “base scenario” (without land bridge)

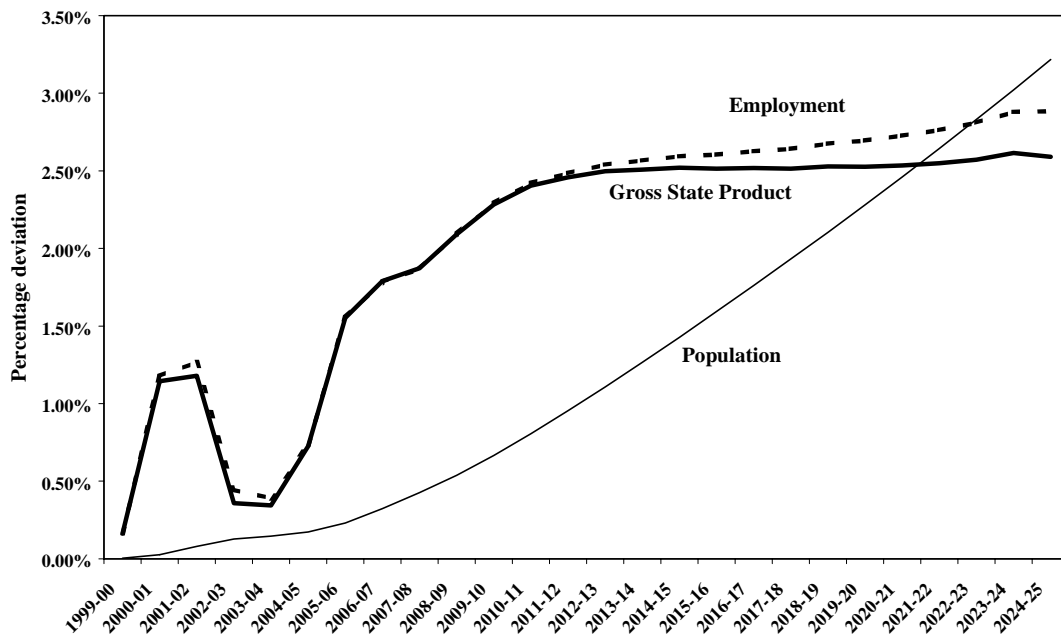
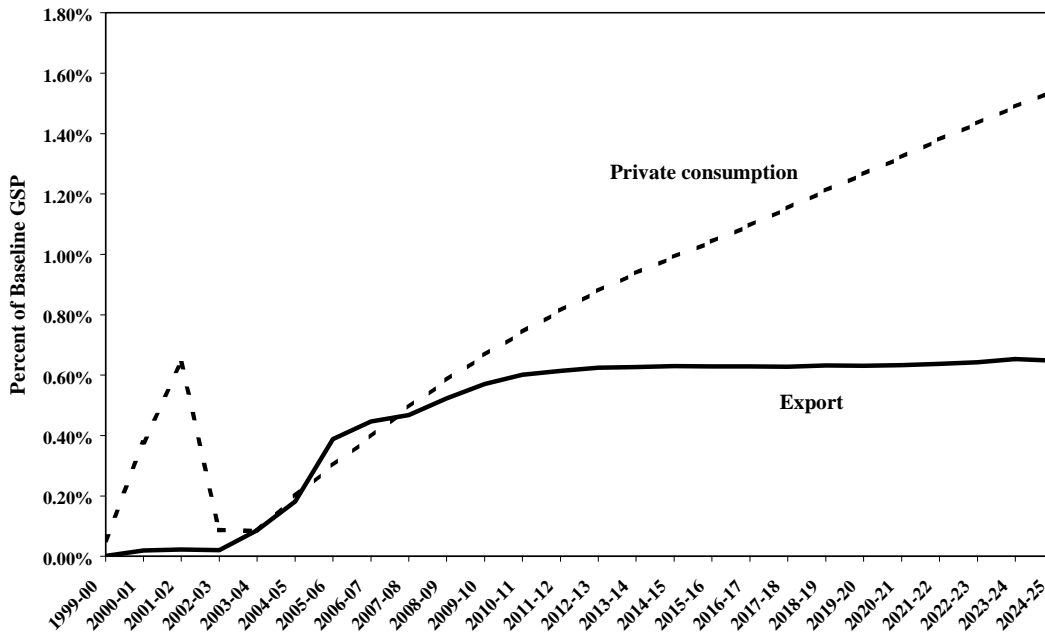


Chart 11: Impacts on Northern Territory exports and private consumption: “base scenario” (without land bridge)



The reduction in costs increases the competitiveness of territory suppliers. Exports increase, and there is some increase in production for the local market. Higher production increase the demand for labour. Employment rises, in turn inducing additional net migration to the territory. Over the 25 year period to 2024/25, the railway is projected, in this scenario, to raise the average growth rate of territory gross product by about 0.1 percentage point. By the end of the period, gross product is 2.5 percent above the level in the absence of the railway, and employment some 2.7 percent higher.

5.2.1. Impacts on Northern Territory economic welfare

The projected impacts on the territory can be expressed in terms of net present values at 1996/97 prices. (See Table 2).

The increase in the net present value of Territory Gross Product is projected to be around \$3 billion at a real discount rate of 5 percent. This, however, is not a particularly good measure of economic welfare – particularly in a small open economy such as the territory – since it includes earnings by capital owned by non-territorians.

Table 2: Net present values of Northern Territory impacts: “base scenario” (without land bridge)

Deviations from baseline simulation levels

	Public sector budget surplus	Private consumption	Total net benefit	Territory Gross Product
	<i>1996/97 \$ million</i>			
3%	180	1,710	1,890	4,100
5%	130	1,240	1,370	3,080
7%	90	930	1,020	2,360

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

Better measures of economic welfare, in our view, are the increases in the net present values of private consumption and public sector budget surplus (under an assumption of constant tax rates). The net present value of the real increase in private consumption is projected at about \$1.2 billion over the 25 year horizon. The increase in present value of the budget surplus is around \$0.13 billion⁶. The sum of these two measures of net benefit (shown in the fourth column of the table) is in the range \$1.0 billion to \$1.9 billion, depending on the choice of discount rate.

We stress that this estimate of net benefit depends on numerous assumptions that could be varied, and on the details of the modeling, which could be improved if more time were available. Growth and composition of economic activity in the territory have fluctuated widely in the past. There is every reason to expect such volatility to continue in future. A projection of the kind we have undertaken cannot expect to predict year-to-year variations over the long term with any accuracy. Nevertheless, we believe that the results provide some guidance about the possible impact of the project on the territory’s economy.

5.3. Economic impacts on South Australia: “base scenario” (without land bridge)

5.3.1. Nature of the impact

The railway (in the base scenario, without the land bridge option) has a smaller potential impact, both absolutely and relatively, on the SA economy than on that of the NT. The SA economy is larger, and draws few imports from the NT. Its exports to the NT are more substantial, but still only a small proportion of SA production.

The project’s investment phase has considerable impacts on SA. On the assumption that the railway has its headquarters in SA, the project may add some \$300 million to recorded SA capital expenditure. Much of this will reflect in SA production and

⁶ For further details of the budget projection see Section 7.

employment. The project is likely to procure rails from Whyalla. Rolling stock may also be sourced in SA, but the locomotives will probably come from elsewhere. SA residents will also form a substantial part of the construction workforce of the whole project. These expenditures will increase value added in SA. We project that Gross State Product during the four construction years may increase by about \$370 million (at 1996/97 prices), compared to the world without the project. This increase partly reflects additional project-related exports to the NT.

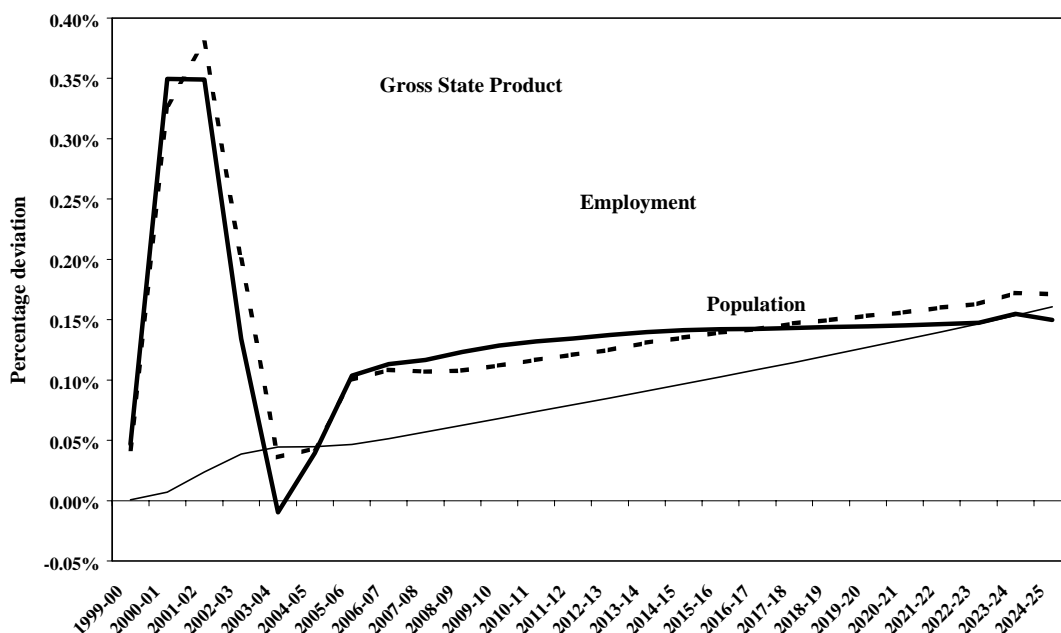
Once operation begins, there will be some impact from lower costs of importing from the territory – though these already tend to attract favourable backhaul rates. If a land bridge develops, it should benefit some high value, time-sensitive trade with Asian counterparts. However, this aspect is excluded from the current scenario.

The main potential impact may be from the opportunities for SA to become the source of a larger proportion of NT imports of goods, once traffic is routed through Adelaide on the railway. The size of this impact depends on details of relative competitive positions and likely market responses that are outside the scope of this study. As discussed in more detail in Appendix A, Section 8.3, we illustrate the potential impact on the SA economy, on the assumption that SA can achieve \$60 million additional value added (at 1996/97 prices), based on initial traffic flows. The impact grows over time as traffic on the railway increases.

5.3.2. State economic impacts

The projected overall economic impacts are illustrated in the following charts, with additional details in Appendix A.

Chart 12: Impacts on South Australian production, employment and population: “base scenario” (without land bridge)

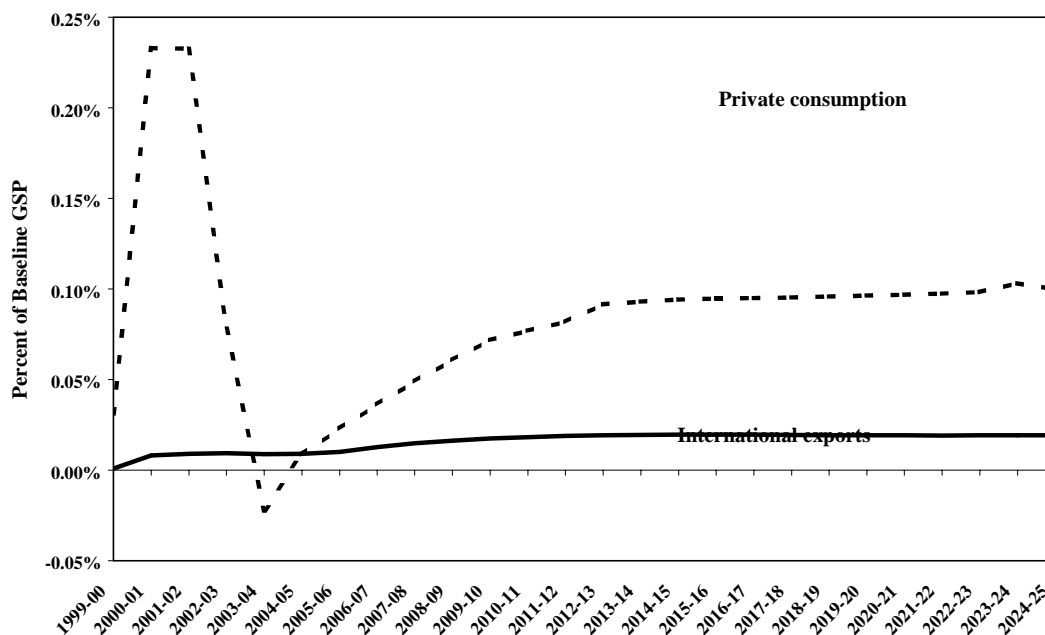


Over time, the stimulus for additional activity shifts from investment demand to demand for additional exports to the NT. The proportionate impacts on Gross State

Product and employment during construction are about twice those during the operation of the railway. During the operational phase, both rise by around 0.15 percent compared to a world without the railway. (See Chart 12). The additional employment opportunities act first by reducing the unemployment rate and increasing labour force participation in turn. In the longer run there is additional net migration to the state.

On the demand side, the main stimulus is to private consumption and to interstate exports. The contribution of international exports is less. (See Chart 13).

Chart 13: Impacts on South Australian exports and private consumption: “base scenario” (without land bridge)



5.3.3. *Impacts on South Australian economic welfare*

As with the NT, the projected impacts on the state can be expressed in terms of net present values at 1996/97 prices. (See Table 3).

The increase in the net present value of Gross State Product is projected to be around \$1.1 billion at a real discount rate of 5 percent. Our preferred measures of economic welfare are the increase in private consumption and in the cumulative state budget surplus (under an assumption of constant tax rates). The net present value of the real increase in private consumption is projected at about \$0.7 billion over the 25 year horizon; the increase in the net present value of the budget surplus at about \$0.12 billion. Combining the two measures of net benefit gives a total that lies between \$0.7 billion and \$1.0 billion, depending on the choice of discount rate.

Table 3: Net present values of South Australian impacts: “base scenario” (without land bridge)

Deviations from baseline simulation levels

Real discount rate	Public sector budget surplus	Private consumption	Total net benefit	Gross State Product
<i>1996/97 \$ million</i>				
3%	130	880	1,010	1,450
5%	120	700	820	1,160
7%	110	570	680	950

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

As with the results for the NT, we emphasise that the estimates depend on a long chain of assumptions. They could be improved given further detailed analysis. Nevertheless we believe that they provide some guide to the likely economic and budgetary implications of the modelling scenario.

6. Alternative scenarios: economic impacts

In this section we explore the economic impacts of two types of alternative scenario:

1. variations to the level of government grants. The base scenario is based on an assumption that the Commonwealth, SA and NT governments each contribute a \$100 million cash grant to the project. Alternative scenarios involve cash contributions of \$150 million or \$200 million by each government;
2. development of a land bridge involving transport of exports particularly from SA, via the railway for on-shipment from Darwin to Asian destinations. The scenario also involves some import of manufactures by the same route. If commercially viable, the land bridge might offer the possibility of substantial economic gains, especially to SA.

6.1. Alternative levels of government grant

In these alternative scenarios, the level of government contribution varies, from the 3 by \$100 million in the base scenario, to 3 by \$150 million, and to 3 by \$200 million.

The overall economic impacts of increasing the size of the grants, relative to private funding, are small but negative. Comparing the welfare impacts in Table 1 (for the base scenario with 3 by \$100 million grants) with those in Table 4 (for the base scenario with 3 by \$200 million grants), we see that the net present values of the total net benefit are some \$150 million to \$200 million lower in the alternative with the larger grant.

Table 4: Base scenario (Government grants 3X\$200 million); national net present values

Deviations from baseline simulation levels

Real discount rate	Public sector	Private	Total
	net lending	consumption	net benefit
	<i>1996/97 \$ million</i>		
3%	370	840	1,210
5%	220	450	670
7%	110	210	320

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

Further details of the economic impacts of this alternative scenario are at Appendix A. Details of the net impacts of these alternatives on Commonwealth and state budgets are in Appendix B and Appendix C, and in Section 7 of the main report.

6.2. Development of a land bridge

6.2.1. Nature of the scenario

The base scenario expressly excludes the development of any land bridge. It is not therefore surprising that the economic benefits of the railway are more substantial in the NT than in SA in that scenario. This alternative scenario explores the impact of adding a possible land bridge development involving:

- progressive provision of additional capacity on the railway, requiring to additional capital expenditure of some \$0.2 billion (at 1996/97 prices) over a 25 year horizon. Operating costs are also higher;
- achievement of 10 percent reductions in overall costs on \$830 million of manufactured exports from SA and \$130 million of agricultural exports (both in 1996/97 levels). In addition, manufactured import costs are reduced by an additional \$27 million (again at 1996/97 volumes and prices). In total export and import costs are assumed to be reduced by \$110 million in the base year.

These assumptions have been provided by the client, and should be seen as illustrative of the possibilities, not as a proven commercial opportunity. Access Economics has undertaken no work to verify the plausibility of these assumptions.

We added the land bridge to the base scenario of the AE-MACRO model by making appropriate adjustments to export and import prices. We assumed that the full benefit of the cost saving is available to existing exporters and importers, and that any induced changes in export and import volumes could be achieved without giving away any of the benefit of the cost reduction. We also made allowance for the additional capital and operating costs of the railway, but not for any associated investment such as port development.

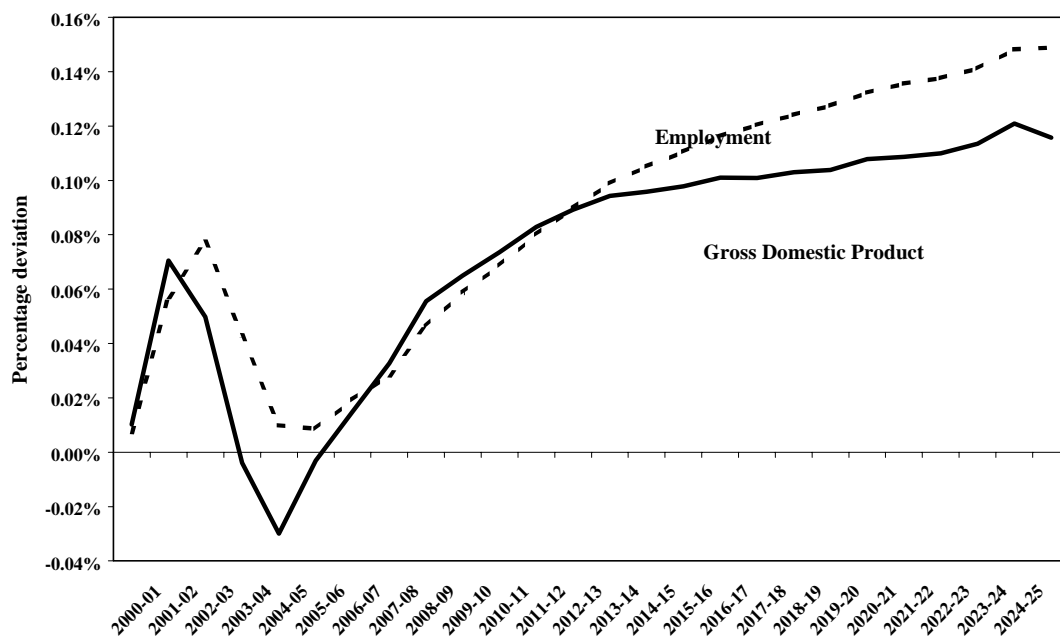
As in the base scenario, we conducted experiments with our linked national/state computable general equilibrium models to ascertain how much of the impact of the land bridge might be assigned to SA. On the basis of these experiments, we assigned most of the additional GDP and export impact during the operational phase to SA. However, other states share in the resultant improvement in private consumption expenditure.

6.2.2. National economic impacts

National economic impacts of the base scenario + land bridge are illustrated in the following charts. Further details are provided in Appendix A.

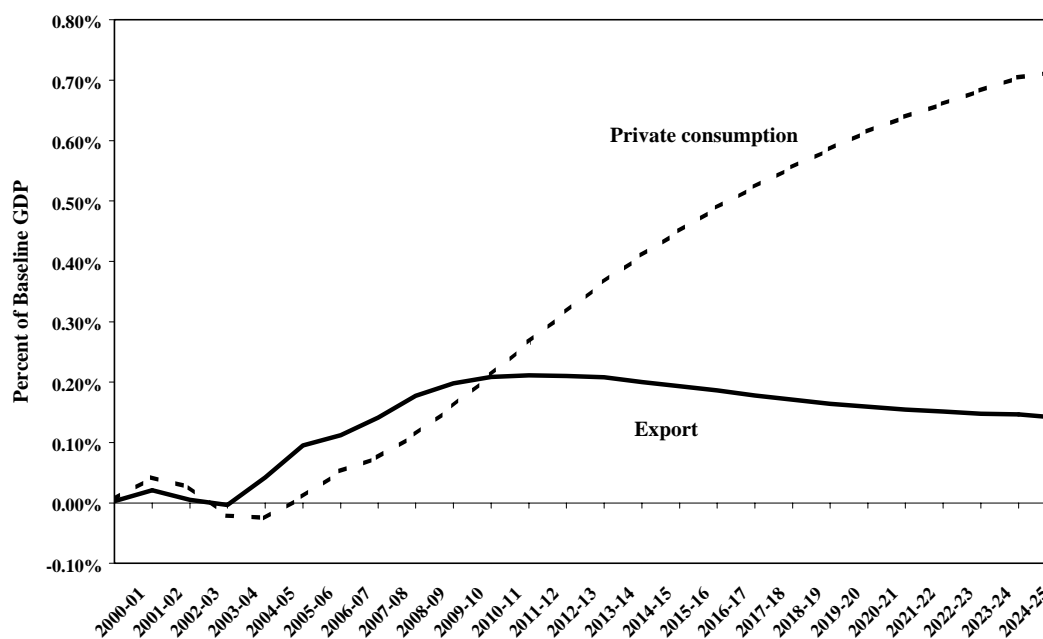
The impacts of the land bridge are small during the investment phase of the project. Once it is operational, the land bridge results in an improvement in export prices relative to import prices – in other words, and improvement in Australia’s average terms of trade.

Chart 14: Base scenario + land bridge; impacts on national GDP and employment



Exports become more profitable and increase in volume. At the same time the balance of payments becomes less of a constraint, as export incomes rise relative to the cost of imports. GDP and employment both rise quite sharply, rapidly reaching a plateau nearly 0.1 percentage points above the corresponding levels in the base scenario. Thereafter, both grow in line with the trend growth of the economy, but at a higher level.

Chart 15: Base scenario + land bridge; impacts on national exports and private consumption



As a percentage of baseline GDP, the increase in exports is three times that in the base scenario. Private consumption rises strongly throughout the model horizon. By the end of the period is some 0.6 percentage points of baseline GDP ahead of that in the base scenario.

6.2.3. National welfare impact

Table 5 shows the impact of the “base scenario + land bridge scenario” on national economic welfare.

Table 5: Base scenario + Land bridge; net present values

Deviations from baseline simulation levels

Real discount rate	Public sector net lending	Private consumption	Total net benefit
<i>1996/97 \$ million</i>			
3%	1,080	14,130	15,210
5%	920	9,970	10,890
7%	780	7,150	7,930

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

Compared to comparable estimates for the base scenario alone (See Table 1 above), the estimated impacts are quite large – dominated by the impact on private

consumption. The net present value of the increase in private consumption ranges from \$7.1 billion to \$14.1 billion, depending on the discount rate. Adding the increase in public sector net lending raises the estimate of welfare impact by up to \$1 billion.

6.2.4. *State/territory economic impacts*

Consistent with the assumptions underlying the scenario, the principal impact is on South Australia. Comparing Chart 16 and Chart 1, we see that SA has substantially improved its share of the national increase in GDP. In absolute terms (1996/97 \$ million), SA gross product now increases more than twice as much as that of the NT. However, in proportionate terms the position is reversed.

Comparing the estimates of welfare impact shown in Table 6 and Table 7, the estimated net present values of the increases in private consumption and in budget surpluses are substantially larger for SA than for the NT in this scenario. Further details of the derivation of the budget impacts in this scenario are in Appendix C.

We emphasise that the results obtained in this scenario reflect the externally supplied assumptions underlying the scenario, and the characteristics of the AE-MACRO model. Nevertheless, the simulations do suggest that a land bridge, provided it offered substantial sustained commercial benefits, might also generate substantial net economic benefits in excess of the immediate cost savings.

Chart 16: Base scenario + land bridge; impacts on national, SA and NT Gross Product

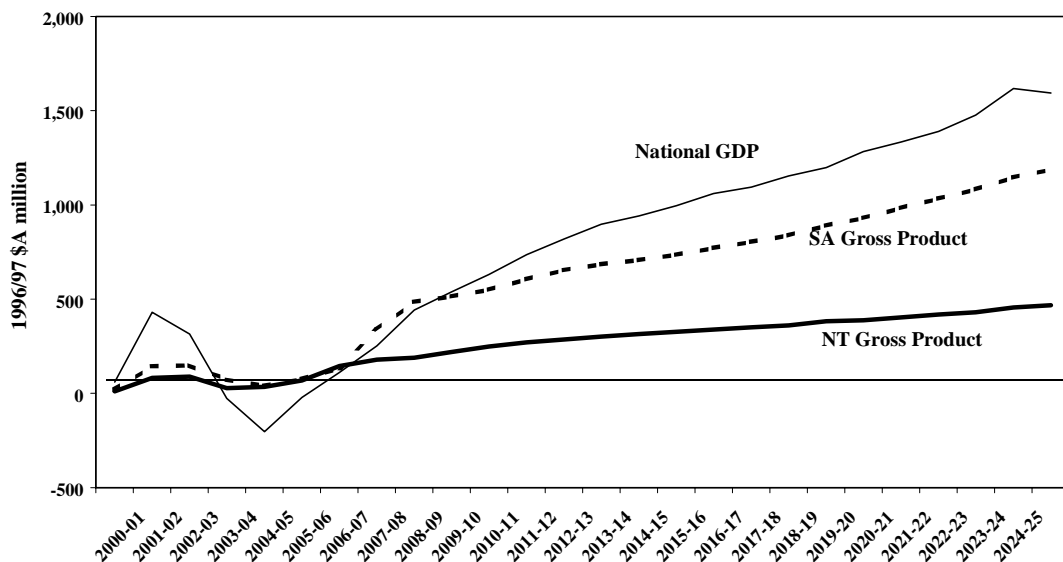


Table 6: Base scenario + land bridge; South Australian net present values

Deviations from baseline simulation levels

Real discount rate	Public sector budget balance	Private consumption	Total net benefit	Gross State Product
<i>1996/97 \$ million</i>				
3%	1,350	6,080	7,430	9,570
5%	1,100	4,500	5,600	7,100
7%	900	3,400	4,300	5,370

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

Table 7: Base scenario + land bridge; Northern Territory net present values

Deviations from baseline simulation levels

Real discount rate	Public sector budget balance	Private consumption	Total net benefit	Territory Gross Product
<i>1996/97 \$ million</i>				
3%	230	1,790	2,020	4,250
5%	170	1,310	1,480	3,190
7%	130	980	1,110	2,440

Note: The 10 year Commonwealth bond rate is currently 5.91 percent

7. Budget impacts

The brief calls for Access Economics to assess the impact of the railway on Commonwealth, South Australian and Northern Territory budgets. In doing so, we have drawn on the spreadsheet frameworks underlying our regular published forecasts of Australian government budgets. The spreadsheets link budget items to relevant national and state economic and demographic variables, tax rates and other parameters.

The first step in the analysis has been to use the relationships underlying the budget forecasts to extend the horizon out to 2024/25 – based on the projected long-term development of economic aggregates in the AE-MACRO model. The projections incorporate the effects of the changes to indirect taxation arrangements and Commonwealth-state financial relations, announced by the Commonwealth and agreed by the Premiers Conference. They include implementation of the tax reform package as set out in *A New Tax System*.

Were the proposed tax reforms not to proceed in the announced form, it might be necessary to adjust the methodology underlying the budget projections to ensure that, in all jurisdictions, revenues kept pace with the trend growth in outlays. However, we would not expect any such adjustments to alter the relativities between the outcomes in the various scenarios, that are the focus of the present analysis.

Full details of the budget projections are contained in Appendices B and C. A full set of summary tables and charts is in Appendix D.

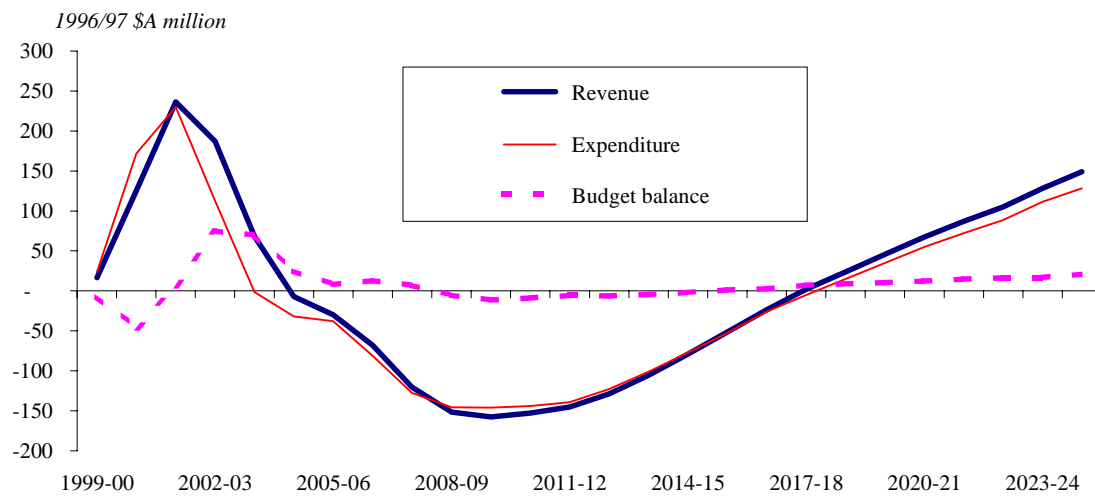
7.1. Impact on the Commonwealth Budget

The overall impact of the Alice Springs-Darwin railway is to expand the national economy. A growing economy implies growth in tax revenues either through higher wages feeding through to the likes of PAYE tax payments, the Medicare levy, fringe benefits tax and sales tax, or higher profits feeding into company tax and withholding tax payments, or a combination of these. The forecasts effectively assume indexation of personal tax brackets beyond 2001-02.

Expenditure on government services can also be expected to grow with a larger economy, though this will be tempered by any cyclical improvements, such as a lowering of the unemployment rate.

Chart 17 shows that Commonwealth government revenues and expenditures do indeed follow the pattern of national benefits for the economy for the base scenario (no land bridge). The boost to employment and domestic demand through the investment phase produces growth in revenue, peaking in 2001-02 at \$236 million above baseline or 0.04% of GDP. The strength of the economy creates a similar call on a lift in government service provision, as many government payments are linked to price and wage changes (such as pensions), translating to a rise in the amount of underlying government expenditure. After 2001-02 both revenue and expenditure falls away as the investment phase of the project comes to a halt and the boost to domestic demand is turned off. In addition, growth in real wages eats away some of the gains to employment, producing a fall in PAYE revenue.

Chart 17: Commonwealth budget aggregates, deviation from baseline; “base scenario” (without land bridge)



The benefits from the operating phase of the project commence from 2003-04. These are initially benefits in the form of lower costs and take longer to attribute to improvements in activity (with a further lag to improvements in employment). Thus revenues and expenditure continue to move down until 2009-10, from which point the growing economy sees them trend up over the rest of the forecast period.

Through the early years of the project there is a lower cyclical expenditure component as construction related employment lowers unemployment. This creates a wedge between overall Government revenues and expenditures. This is despite the additional expenditure of a government grant, which has a direct impact on the Commonwealth Budget of \$100 million (nominal), over the years 1999-00 to 2002-03. In the first two years the government grant is enough for the boost to expenditure to exceed that to revenue collections. Thereafter the revenue benefits through the boost to domestic demand create a Budget surplus for the next seven years summing to \$203 million (1996/97 dollars, not discounted).

From that point revenues and expenditures move closely in alignment with one another, with a small surplus opening up towards the end of the forecast period. The Budget balance being in surplus over the long term can be mostly attributed to lower unemployment benefit expenditure, as the project has created a national benefit which delivers a lower unemployment rate. This is offset to a degree through lower petroleum excise receipts due to the fuel saving created by the project. The sum of Budget impacts are shown at various discount rates in Table 8.

Table 8: Net Present Value of Budget Aggregates, deviation from baseline

1996/97 \$A million	Revenue	Expenditure	Expenditure including grant	Budget balance
Discount rate				
3%	20.6	-220.2	-134.1	154.6
5%	51.8	-160.1	-76.5	128.3
7%	89.9	-100.2	-19.1	109.0

7.1.1. Impact of varying the level of government grant

The impact on the Commonwealth budget balance will change with different levels of project financing provided by governments. These changes occur mainly in the early years of the project when grants are being paid. Second round impacts on revenue and expenditure aggregates are less significant.

If each level of government contributes an extra \$50 million to the project the NPV of the Commonwealth budget balance becomes \$80.7 million (1996/97 prices; 5% discount rate), rather than the base scenario of \$128.3 million. Increase that amount to an additional \$100 million each and the NPV of the budget balance becomes just \$30.4 million.

7.1.2. Impact of the land bridge scenario

The addition of land bridge exports to the base scenario has a profound impact on the Commonwealth budget balance. The stronger economy produces higher revenues, and to a lesser extent, a higher expenditure requirement. These changes commence with the operation phase of the project in 2003/04 and accumulate over the forecast period. By 2024/25 the benefit to the budget balance is \$208 million, compared to just \$21 million in the base scenario.

7.1.3. Combining the land bridge scenario with variation to government grants

Compared to the base scenario the addition of the land bridge terms of trade improvement is positive for the Budget bottom line, while a higher government financing component for the project is a negative. However the deviations from the land bridge addition are of a much larger scale and dominate the budget impact where the two are combined.

7.2. Impacts on State/Territory budgets

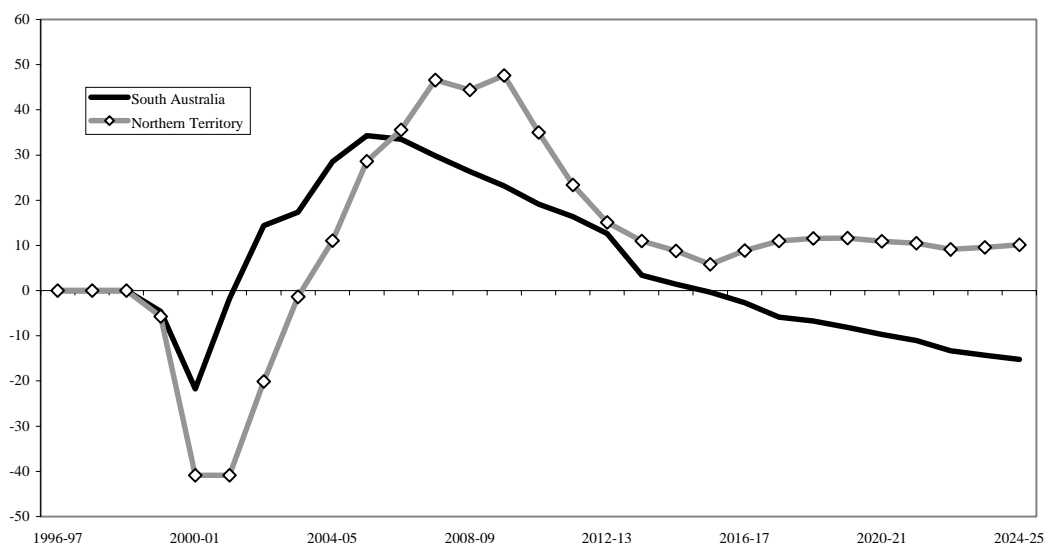
The charts and tables in Appendix C show the deviations from the baseline analysis resulting from the addition of the railway to the Northern Territory and South Australian economies. In summary, in the “base scenario” (without land bridge), revenue rising faster than outlays means that public sector net debt is lower throughout the scenario. The impacts on State debt are of similar magnitudes to the end of the next decade, although somewhat lower in South Australia than in the Northern Territory. The impacts are relatively more significant in the case of the smaller Northern Territory economy.

The most significant changes to debt levels occur in around fifteen years. The relative improvements over the baseline are somewhat decreased in the longer term in South Australia as population increases lead to rises in State Government spending. In the Northern Territory, the improvement in debt relative to GSP stabilises, although the absolute improvement continues to rise marginally.

Improvements to revenues appear likely to be smaller than improvements to overall economic output in the short to medium term. In the longer term, increased population levels in the Northern Territory lead to increased GST receipts, driving revenue up more quickly than output growth.

The net impacts on NT and SA budget deficits are summarised in Chart 18.

Chart 18: Impacts on State and Territory Budget deficits (\$1996-97 million); “base scenario” (without land bridge)



Net present values of the impacts on major budget items are summarised in Table 9. At a real discount rate of 5 percent, the projected improvement in the underlying balance is over \$130 million in the NT and about \$120 million in SA. Both results are also close to the corresponding improvement in the Commonwealth’s budget balance shown in Table 8. Because most of the benefits would occur in the latter part of the period, following a significant up-front payment, the net present value estimates decline sharply at higher projected discount rates.

Table 9: Net present values of State and Territory budget impacts (\$1996-97 million)

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	712.8	528.9	183.9	173.2	50.9	134.1
5%	514.5	382.4	132.2	135.5	22.7	122.3
7%	378.9	285.8	93.1	109.0	7.2	109.5

7.2.1. Impacts of differing scenarios

Sensitivity analyses were undertaken on these results to determine the impact of additional State Government grants on the construction of the railway. As this increases the initial expenditure, the net present value of the improvement in the budget balance is reduced, and becomes negative at the highest level of grant.

The addition of the land bridge option to the base scenario would have a relatively greater impact on SA than the NT. The net present value of the improvement in the budget balance for both the NT and SA is significant, particularly in the case of SA,

where improvements proportional to GSP relative to the baseline case are similar to those for the NT.

8. Appendix A: Application of the AE-MACRO Model

This appendix describes how the Alice Springs - Darwin railway has been included as an exogenous shock to the equilibrium growth path of the AE-MACRO model of the Australian economy. It provides details that complement the predominantly graphical approach in the main report.

8.1. Introduction to AE-MACRO

AE-MACRO is a relatively small (16 stochastic equations – 84 behavioural and accounting identities) dynamic model of the Australian economy. It was developed in 1992 by Access Economics, and is based on standard modeling practice. It has a theoretically-consistent long-term open-economy growth path, together with short-term dynamics derived from Australian economic experience over the past 20 years.

AE-MACRO is a ‘new Keynesian’ model with neoclassical long run properties. It features:

- ❑ a deregulated financial sector, with a floating exchange rate and market-determined bond rate;
- ❑ an integrated treatment of the investment, jobs, production, importing, exporting and pricing decisions of firms;
- ❑ it is data consistent - most of the model’s parameters are estimated using quarterly data extending from 1976 to the present. Special attention is paid to dynamics and diagnostic testing.

A complete description of AE-MACRO and its properties is contained in *The AEM in Detail: A Manual*, Access Economics, Canberra, 1998.

The predominant use of the model is as an aid to forecasting and policy analysis. Its record in this is good – though in our experience, substantial elements of judgement are required in any short-term practical application, given the extensive structural changes in Australia in recent years, and the degree of “noise” in the short-term statistical data. The model has also been used to assess the long-term economic impacts of major investment projects and other structural changes.

A model such as AE-MACRO cannot reliably predict the future course of the Australian economy over a 25-year horizon. Instead the model is used to explore the possible medium-term economic impact of the exogenous shocks to investment, exports and tax receipts provided by the project, measured as deviations from a control simulation about the model’s long-run growth path. The focus of the analysis is the aggregate economic response over periods from one to ten years, rather than on the long-run growth path of the overall economy.

Simulations using AE-MACRO help throw light on the possible economic impacts of the project. They can also throw light on the validity of estimates generated by other modeling techniques, such as input-output multiplier analysis and general equilibrium modeling.

8.2. Modelling approach

The AE-MACRO model required modification to cover the longer time horizon, and to include the Alice Springs - Darwin railway. The changes include:

- extending the time horizon of the model and of the exogenous variables (growth of population, productivity and some expenditure aggregates and policy parameters, as well as foreign interest rates, inflation rates etc.);
- modifying the equations for business investment and production, government outlays, and domestic and foreign financing to accommodate the project.

In addition we included in the simulations a module that allows us to explore the impact of a shock at the level of an individual state – in this case the NT and SA.

8.2.1. Economic assumptions

Beyond Access Economics' normal ten-year forecasting horizon⁷, we assume that the Australian and international economies develop along steady long-run paths. Key long-run economic assumptions and/or results underlying our analyses are shown in Table 10.

Table 10: Long-run economic assumptions

	Growth rates <i>Percent per annum</i>
Australia	
Working age population	0.9
Labour productivity	1.6
Real GDP	3.1
Inflation	2.8
Gross Product - SA	2.5
Gross Product - NT	3.5
United States	
Inflation	2.5
10-year bond yield (level)	5.4

Australian Gross Domestic Product grows at an average rate of about 3 percent, underpinned by growth in the working age population, trend growth in labour productivity and the participation rate. The former slows as the baby boomer demographic retires, and the new population cohorts coming through reflect the lower birth and net migration rates of recent decades. Growth in the world economy is sufficient to maintain the demand for Australian exports.

⁷ Access Economics, *AEM Forecast Report*, Canberra, published quarterly.

In the long run, inflation continues at low levels in Australia and the US. The bilateral exchange rate adjusts to offset the difference in inflation between the two countries. Nominal interest rates start higher in Australia than in the US, in the main the result of a real interest rate differential attributable to Australia's relative external indebtedness. Over time the difference is eliminated. The real interest rate on Australian 10-year bonds is about 3 ½ percent in the long run, compared with a real yield in the US of around 3 percent.

These assumptions are stylised and abstract from the many disturbances that will affect the Australian and world economies in coming decades. There is an implicit assumption that governments will follow sound fiscal and monetary policies, and that current views on policy objectives (e.g. for inflation) will continue. The future will no doubt deviate from the stylised assumptions in ways that are difficult to predict.

8.3. Assumptions relating to the Alice Springs – Darwin Railway

8.3.1. Assumptions about the railway project

The detailed assumptions about the project are summarised in Section 2 of the main report. We have accepted unchanged the market assessments, and assumptions about costs and traffic growth made by the NT Department of Transport and Works and Booz Allen & Hamilton (Australia) Ltd. We have updated some of the estimates in light of the revised timing of the project, but have not sought to revise the basic commercial assessment.

We do note that the forecast rate of traffic growth in the commercial assessment is slightly below the average long-run growth of NT Gross Product contained in our projection. A conservative growth rate assumption is no doubt commercially prudent, but could be made the subject of a sensitivity analysis if required.

8.3.2. Assumptions for the national AE-MACRO model

Equally important in the current exercise are the assumptions made about how the project meshes with the modelling of the national, SA and NT economies.

In the national AE-MACRO model we have assumed that:

3. the project's investment expenditures represent a net addition to business investment expenditure – that is, there is no direct crowding out of other transport investment. The project's investment expenditures do not directly interact with the mechanisms in the model that determine the business capital stock, economic depreciation or the distribution of profits. However, the addition to investment is partly 'crowded out' of total national output in a broader sense via several channels – its impact on the exchange rate, its impact on personal tax rates (see below), its impact on imports (via demand factors, as well as the aforementioned exchange rate effect), and its impact on interest rates most notably;
4. government grants (\$100 million from each of the Commonwealth, SA and NT governments) are set in money terms and are paid in the same proportion as initial capital expenditure each year. The grants add to reported budget outlays, and are financed by additional net borrowing in the first instance. The national model contains a reaction function adjusting the income tax rate in order to approach a

desired public debt/GDP ratio. However, there is little change to the average tax rate under the conditions of this simulation;

5. the remaining investment is financed half by foreigners and half by Australian residents. Foreigners are assumed to contribute funds through an unrequited transfer in the balance of payments, and Australian residents through a once-off reduction in the nominal value of wealth holdings. The net effect of the assumptions is to require the investment to be financed through additional saving at the margin.

Alternative assumptions could have been made, for example that foreigners contributed by means of a loan, or Australians through increased foreign borrowing. However, sensitivity analysis suggested that varying the financing assumption made only a small difference to the results;

6. during operation the railway contributes a net resource saving set equal to the difference between total freight costs using existing transport and the sum of:
 - freight costs of freight still travelling by road; plus
 - operating costs and depreciation costs of the railway.

The value of this resource saving is estimated to be some \$167 million (in 1996/97 prices) in 2003/04.

While this accurately represents the resource costs of the railway (given that the initial investment is financed through an increase in saving), it may not be the case that road freight costs accurately reflect the resource costs of road haulage. This is an issue that could be pursued further if required;

7. the resource saving is included in the model as an equivalent improvement in total factor productivity, growing in line with the projected increase in freight volumes.

8.3.3. *Impact of transport cost reductions in the NT*

Further assumptions are required to model the impact of the railway's operating phase on the NT and SA economies.

The AE-MACRO model contains a state module that distributes the results of a national simulation by state/territory and by industry. However, further specific adjustments are necessary to model a project that has its impacts geographically focussed.

In the current scenario, the main impact of the resource savings generated by the railway is on the cost of transport into and within the NT. Ideally we should investigate the likely extent of these impacts using a specially tailored model of the territory's economy and transport systems. This would incorporate more detailed market studies of the potential market, and would link these to wider economic parameters generated by the AE-MACRO model. The results would however be dependent on the detailed assumptions made in the course of the modelling, and might prove a poor guide to the possible impact of structural changes in the territory economy over the course of the next 25 years. Also there has not been time to undertake this work in the current study.

Instead, we have based our assumptions in the current modelling on experiments specially conducted using Access Economics' linked (AE-CGE) computable general

equilibrium models of the Australian and WA economies. We have used these models to explore the relationships between the national and WA impacts of an improvement in transport productivity, focused on inter- and intra-state transport of goods.

The WA economy is larger and more diverse than that of the territory, but has a broadly similar composition. Both focus on resource development and import a high proportion of goods and services from elsewhere in Australia. However, WA has a higher proportion of resource-based manufacturing and a smaller government sector than the territory. It represents a structure towards which the territory may evolve in the next century. We therefore judge that simulations based on a model of WA provide some guidance to the likely impacts of a similar shock to the NT economy.

While the results from such simulations depend on the precise assumptions, we find that:

- the absolute increase in state/territory GSP is of the same order of magnitude as that in national GDP, and could be larger, if the demand impact induces net migration from the rest of Australia;
- the increase in state/territory exports is of similar proportion to that in GSP (despite the fact that in our simulations, the transport cost savings do not impact directly on export transport costs);
- depending on the modelling assumptions, the proportionate increase in private consumption can be larger than that in GSP, but there is considerable variation across scenarios.

As a result of these experiments, we assume in the baseline scenario that:

1. the whole of the impact of the resource saving associated with the opening of the railway is concentrated in the NT economy; and
2. in the long run, the increases in territory exports and private consumption are proportional to the increase in GSP.

These assumptions could be varied in sensitivity analyses.

8.3.4. Increase in SA supply of goods to the NT market

According to estimates provided by the Department of Transport and Works, the opening of the railway might cause the re-routing of some 269,000 tonnes of freight (based on 1996/97 traffic flows) to the NT from NSW, QLD and WA. This freight currently travels directly by road to the NT. Once the railway opens, it should travel by rail through SA. There is the potential for some of this to shift its point of supply to SA.

Without further detailed market research, the amount that might actually shift, and the consequent impact on value added in SA are uncertain. Escalating the tonnage estimate to 2003/04 and applying an average value of \$3,500 per tonne, the total cost of goods rerouted is of the order of \$0.94 billion annually. If we further assume that 20 percent of this quantity is in fact newly sourced from SA, and that the interstate export/value added multiplier is a low 0.33, we obtain an estimate of \$60 million of

additional value added in SA in 2003/04, increasing thereafter in line with the growth in freight volumes.

We have factored this estimate into our modelling – acknowledging the arbitrary nature of the assumptions involved.

8.4. Results for the national economy: “base scenario” without land bridge

Results from introducing the Alice Springs - Darwin railway as an exogenous shock to the AE-MACRO model are summarised in Table 11 and Table 12. The tables provide additional detail to supplement the description and charts given in the main text. The years 1999/2000 to 2002/3 span the initial investment phase. Operations commence in 2003/04.

Table 11: National economic impacts; “base scenario” (Percentages)

	Deviations from baseline simulation levels					
	years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
Aggregate expenditures	(Real terms; percentage deviation)					
Private consumption	0.02%	0.01%	-0.01%	-0.02%	0.00%	0.03%
Business investment	0.64%	0.60%	0.17%	-0.01%	0.03%	0.03%
Public final demand	0.06%	0.04%	0.00%	0.01%	0.03%	0.02%
Domestic final demand	0.10%	0.09%	0.01%	-0.01%	0.01%	0.03%
Exports	0.03%	0.01%	-0.01%	0.00%	0.05%	0.05%
Imports	0.23%	0.17%	0.03%	-0.02%	-0.03%	0.03%
GDP	0.07%	0.05%	-0.01%	0.00%	0.03%	0.04%
	(Number; thousands)					
Employment	5.1	7.1	3.5	-1.6	-0.2	2.1
	(Percentage deviation)					
Employment	0.06%	0.08%	0.04%	-0.02%	0.00%	0.02%
Prices & wages:						
Price level	0.05%	0.13%	0.12%	-0.03%	-0.09%	-0.01%
Nominal wage rate	0.03%	0.09%	0.10%	-0.01%	-0.06%	0.00%
Inflation rate	0.05%	0.08%	-0.01%	-0.04%	0.01%	0.01%
Interest rate, tax rate & exchange rate:						
Interest rate (Bill rate)	0.04%	0.10%	0.03%	-0.04%	0.00%	0.01%
Income tax rate	-0.01%	0.00%	0.01%	0.01%	0.01%	-0.01%
Exchange rate (TWI)	0.01%	0.02%	0.01%	0.01%	0.01%	0.00%
	(Ratio to nominal GDP; percentage points)					
Public sector borrowing	0.02%	0.03%	0.01%	0.00%	-0.01%	0.00%
Balance of payments:						
Trade balance	-0.04%	-0.03%	-0.01%	0.01%	0.02%	0.00%
Current account balance	-0.02%	-0.02%	0.01%	0.01%	0.02%	0.01%

Note: Interest rate, inflation rate and tax rate deviations expressed in percentage points

Table 12: National economic impacts; “base scenario” (1996/97 \$ million)

	Deviations from baseline simulation levels					
	Years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages</i>					
	<i>(1996/97 \$ million)</i>					
Private consumption	65	42	-44	-87	-3	283
Business Investment	453	490	155	-9	36	44
Public final demand	80	49	-6	15	52	58
Domestic final demand	599	565	50	-70	86	392
Exports	32	8	-11	5	114	138
Imports	288	298	247	46	-44	-61
GDP	430	314	-83	-27	269	448
Public sector borrowing	81	152	75	-22	-55	-41
Current account balance	-185	-161	3	78	182	87

8.5. State/Territory economic impacts

Table 13 and Table 14 provide further detail of the impact of the railway on the SA and NT economies.

Table 13: Alice Springs - Darwin Railway; Northern Territory economic impacts; “base scenario”

	Deviations from baseline simulation levels					
	Averages (years ending June)					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages (1996/97 \$ million)</i>					
Private consumption	27	48	7	32	97	199
Business Investment	357	395	141	41	41	56
Exports	1	2	2	33	70	97
Gross Territory Product	81	88	28	131	282	388
	<i>Thousands</i>					
Employment	1.1	1.3	0.5	1.7	3.6	4.9
Population	0.1	0.2	0.3	0.7	2.4	6.1
	<i>Percentage deviations</i>					
Private consumption	0.6%	1.1%	0.1%	0.6%	1.3%	2.0%
Business Investment	11.4%	10.7%	3.4%	0.9%	0.7%	0.7%
Exports	0.1%	0.1%	0.1%	1.2%	2.1%	2.3%
Gross Territory Product	1.1%	1.2%	0.4%	1.4%	2.5%	2.5%
Employment	1.2%	1.3%	0.4%	1.4%	2.5%	2.7%
Population	0.0%	0.1%	0.1%	0.3%	1.0%	2.4%

Table 14: Alice Springs - Darwin Railway; South Australian economic impacts; “base scenario”

	Deviations from baseline simulation levels					
	Averages (years ending June)					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages (1996/97 \$ million)</i>					
Private consumption	96	99	34	13	50	70
Business Investment	102	113	141	6	9	11
Exports	3	4	4	6	11	14
Gross State Product	144	148	59	41	79	105
	<i>Thousands</i>					
Employment	2.2	2.6	1.4	0.6	1.0	1.3
Population	0.1	0.4	0.6	0.8	1.3	2.1
	<i>Percentage deviations</i>					
Private consumption	0.38%	0.39%	0.13%	0.04%	0.14%	0.15%
Business Investment	2.90%	2.84%	3.25%	0.12%	0.16%	0.17%
Exports	0.06%	0.06%	0.06%	0.08%	0.13%	0.15%
Gross State Product	0.35%	0.35%	0.13%	0.08%	0.14%	0.15%
Employment	0.33%	0.38%	0.20%	0.08%	0.12%	0.16%
Population	0.01%	0.02%	0.04%	0.05%	0.08%	0.13%

8.6. Alternative scenarios

8.6.1. Varying the level of government grants

The following tables provide further details of the economic impacts in the base scenario, with the level of government grants doubled to \$200 million per government.

Table 15: Base scenario (3X\$200 million government grants); national economic impacts (percentages)

	Deviations from baseline simulation levels					
	years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
Aggregate expenditures	(Real terms; percentage deviation)					
Private consumption	0.02%	0.01%	-0.01%	-0.02%	-0.01%	0.03%
Business investment	0.64%	0.60%	0.17%	-0.01%	0.03%	0.03%
Public final demand	0.06%	0.04%	0.00%	0.01%	0.03%	0.03%
Domestic final demand	0.10%	0.09%	0.01%	-0.01%	0.00%	0.03%
Exports	0.03%	0.01%	-0.01%	0.00%	0.05%	0.05%
Imports	0.23%	0.17%	0.03%	-0.03%	-0.03%	0.02%
GDP	0.07%	0.05%	-0.01%	-0.01%	0.03%	0.04%
	(Number; thousands)					
Employment	5.2	7.1	3.5	-1.7	-0.6	2.0
	(Percentage deviation)					
Employment	0.06%	0.08%	0.04%	-0.02%	-0.01%	0.02%
Prices & wages:						
Price level	0.05%	0.13%	0.12%	-0.04%	-0.10%	-0.02%
Nominal wage rate	0.03%	0.09%	0.10%	-0.01%	-0.07%	0.00%
Inflation rate	0.05%	0.08%	-0.01%	-0.04%	0.00%	0.01%
Interest rate, tax rate & exchange rate:						
Interest rate (Bill rate)	0.04%	0.10%	0.03%	-0.04%	0.00%	0.01%
Income tax rate	0.00%	0.00%	0.02%	0.02%	0.01%	-0.01%
Exchange rate (TWI)	0.01%	0.02%	0.01%	0.01%	0.01%	0.00%
	(Ratio to nominal GDP; percentage points)					
Public sector borrowing	0.04%	0.04%	0.01%	-0.01%	-0.01%	0.00%
Balance of payments:						
Trade balance	-0.04%	-0.03%	-0.01%	0.01%	0.02%	0.01%
Current account balance	-0.03%	-0.03%	0.00%	0.01%	0.02%	0.01%

Note: Interest rate, inflation rate and tax rate deviations expressed in percentage points

Table 16: Base scenario (3X\$200 million government grants); national economic impacts (1996/97 \$ million)

	Deviations from baseline simulation levels					
	Years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages</i> <i>(1996/97 \$ million)</i>					
Private consumption	66	46	-37	-101	-39	272
Business Investment	453	491	155	-12	35	45
Public final demand	81	50	-5	17	55	60
Domestic final demand	601	571	59	-85	51	383
Exports	33	8	-10	4	115	143
Imports	305	298	249	49	-51	-83
GDP	431	320	-76	-36	256	453
Public sector borrowing	178	239	77	-54	-69	-45
Current account balance	-239	-223	-25	79	201	99

8.6.2. Base scenario + land bridge

The following tables provide details of the national and state/territory economic impacts of the “Base scenario + land bridge” defined in Section 6.2 .

Table 17: National economic impacts; “base scenario + land bridge”; 3X\$100 million grants (percentages)

	Deviations from baseline simulation levels					
	years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
Aggregate expenditures	(Real terms; percentage deviation)					
Private consumption	0.02%	0.01%	-0.01%	0.03%	0.13%	0.23%
Business investment	0.64%	0.60%	0.24%	0.01%	0.08%	0.11%
Public final demand	0.06%	0.04%	0.00%	0.01%	0.03%	0.03%
Domestic final demand	0.10%	0.09%	0.02%	0.02%	0.10%	0.17%
Exports	0.03%	0.01%	0.00%	0.13%	0.22%	0.18%
Imports	0.23%	0.17%	0.06%	0.13%	0.26%	0.42%
GDP	0.07%	0.05%	0.00%	0.02%	0.09%	0.11%
	(Number; thousands)					
Employment	5.1	7.1	4.0	2.9	10.5	17.3
	(Percentage deviation)					
Employment	0.06%	0.08%	0.04%	0.03%	0.09%	0.13%
Prices & wages:						
Price level	0.05%	0.13%	0.12%	0.03%	0.16%	0.37%
Nominal wage rate	0.03%	0.09%	0.10%	0.02%	0.14%	0.32%
Inflation rate	0.05%	0.08%	-0.01%	-0.02%	0.04%	0.02%
Interest rate, tax rate & exchange rate:						
Interest rate (Bill rate)	0.04%	0.10%	0.04%	-0.01%	0.04%	0.02%
Income tax rate	-0.01%	0.00%	0.01%	0.00%	-0.05%	-0.11%
Exchange rate (TWI)	0.01%	0.02%	0.02%	0.02%	-0.02%	-0.04%
	(Ratio to nominal GDP; percentage points)					
Public sector borrowing	0.02%	0.03%	0.01%	-0.02%	-0.02%	0.00%
Balance of payments:						
Trade balance	-0.04%	-0.03%	-0.01%	0.06%	0.04%	0.00%
Current account balance	-0.02%	-0.02%	0.00%	0.06%	0.06%	0.02%

Note: Interest rate, inflation rate and tax rate deviations expressed in percentage points

Table 18: National economic impacts; “base scenario + land bridge”; 3X\$100 million grants (1996/97 \$ million)

	Deviations from baseline simulation levels					
	Years ending June					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages</i>					
	<i>(1996/97 \$ million)</i>					
Private consumption	64	41	-35	130	800	1,888
Business Investment	453	491	215	13	99	175
Public final demand	81	50	3	11	58	68
Domestic final demand	599	565	128	160	968	2,208
Exports	32	8	-6	247	480	481
Imports	1,998	297	247	88	235	641
GDP	430	315	-26	187	838	1,321
Public sector borrowing	81	152	65	-147	-209	54
Current account balance	-184	-161	-10	443	396	-164

Table 19: Northern Territory economic impacts; “base scenario + land bridge”; 3X\$100 million grants

	Deviations from baseline simulation levels					
	Averages (years ending June)					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages (1996/97 \$ million)</i>					
Private consumption	27	48	7	37	103	206
Business Investment	357	395	141	23	43	59
Exports	1	2	2	35	73	100
Gross Territory Product	81	88	28	139	291	400
	<i>Thousands</i>					
Employment	1.1	1.3	0.5	1.9	3.9	5.2
Population	0.1	0.2	0.3	0.7	2.5	6.3
	<i>Percentage deviations</i>					
Private consumption	0.6%	1.1%	0.1%	0.7%	1.4%	2.0%
Business Investment	11.4%	10.7%	3.4%	0.5%	0.7%	0.7%
Exports	0.1%	0.1%	0.1%	1.3%	2.2%	2.4%
Gross Territory Product	1.1%	1.2%	0.4%	1.5%	2.5%	2.6%
Employment	1.2%	1.3%	0.4%	1.6%	2.6%	2.9%
Population	0.0%	0.1%	0.1%	0.3%	1.1%	2.5%

Table 20: South Australian economic impacts; “base scenario + land bridge” ; 3X\$100 million grants

	Deviations from baseline simulation levels					
	Averages (years ending June)					
	2001	2002	2003	2004-09	2010-15	2016-25
	<i>Annual averages (1996/97 \$ million)</i>					
Private consumption	96	99	43	157	419	622
Business Investment	102	113	202	22	58	86
Exports	3	4	11	118	300	445
Gross State Product	144	149	73	265	656	967
	<i>Thousands</i>					
Employment	2.2	2.6	1.6	4.1	9.7	13.7
Population	0.1	0.4	0.6	1.4	5.5	13.6
	<i>Percentage deviations</i>					
Private consumption	0.38%	0.39%	0.16%	0.52%	1.16%	1.32%
Business Investment	2.90%	2.84%	4.64%	0.47%	1.05%	1.26%
Exports	0.06%	0.06%	0.17%	1.54%	3.55%	4.83%
Gross State Product	0.35%	0.35%	0.17%	0.54%	1.13%	1.34%
Employment	0.33%	0.38%	0.23%	0.56%	1.22%	1.59%
Population	0.01%	0.02%	0.04%	0.09%	0.36%	0.87%

9. Appendix B: Commonwealth Budget Impacts

9.1. Forecast Framework

The impacts on the Commonwealth Budget of the Darwin-Alice Springs railway were analysed within the framework used for Access Economics' *Commonwealth Budget Monitor* publication.

Commonwealth Budget Monitor operates over a four year forecasting horizon and has a well known track record for accurately assessing the Commonwealth budgetary position and outlook. The forecasts have been made on a cash rather than an accrual basis.

For the purposes of analysing the Darwin-Alice Springs railway Access' standard short term Budget forecasting horizon to 2001-02 has been maintained. This includes implementation of the tax reform package as set out in *A New Tax System*. Longer term projections have been established using relevant relationships to macroeconomic variables for major revenue and expenditure items.

On the revenue side for example, the largest item is PAYE income tax revenue. PAYE revenue follows the economy's nominal wage bill, though due to fiscal drag PAYE revenue growth does tend to exceed nominal growth in the wage bill. Fiscal drag operates such that wage inflation pushes income earners into higher tax brackets. Over history, fiscal drag earnings by governments have been handed back in the form of tax cuts. As the timing and nature of such 'corrections' are highly uncertain in the future, the longer term Budget forecasts do not include the revenue benefits of fiscal drag i.e. the forecasts effectively assume indexation of tax brackets beyond 2001-02.

The second largest revenue item is company tax collections. Over the longer term these are expected to closely follow the profit level in the economy. However, there is a bring forward effect for company tax receipts in 2000-01 associated with the implementation of the tax package, an effect which will have a short term effect on cash revenues. After that time company tax receipts are expected to follow an average lag after profit generation of 6 months. Tax receipts from superannuation funds and some receipts from individuals (essentially, taxes on the likes of dividends, rental earnings, interest and small business and farm profits in the hands of individuals) are also projected to continue to lag economic activity over the forecast horizon.

The expenditure side of the Commonwealth Budget is more difficult to project in detail as expenditure tends to be more discretionary in nature (programs and initiatives are added and removed from the Budget each year). While discretionary expenditure will change from year to year and is difficult to project, there is an underlying structural expenditure component required to fulfil government functions. After the standard forecast period this is projected to grow in line with the wider nominal economy. In addition, some components of the Commonwealth's expenditure are clearly cyclical, such as movements in unemployment benefit payments tracking changes in the level of the unemployment rate. Accordingly there is a component of cyclical expenditure maintained through the forecast horizon.

Section 7.1 of the main report provided a description of the overall impact of the project on the Commonwealth Budget. The following section describes the revenue impacts in greater detail.

9.2. Project Impacts on Budget Revenue Items

Table 24 shows Budget aggregates for the base scenario (no land bridge) in more detail over time. All revenue items tend to follow the trend of aggregate revenue displayed in Chart 17, though their significance does vary.

PAYE tax is the major component of income tax paid by individuals and in turn largely explains overall movements in Commonwealth revenue. It tracks changes in the wage bill, or in real terms, changes in employment quite closely. Chart 19 shows it has a much more significant impact than the next most significant revenue item, company tax. Company tax has a closer relationship with overall economic activity and profits. It peaks at a deviation of \$48 million in 2001-02, compared to individuals income tax of \$124 million. Chart 20 shows that the percentage deviation peak in company tax receipts is marginally higher than the peak in PAYE due to the tax package bringing some company tax receipts forward at that time.

Chart 19: Individuals income tax and company tax, ratio to GDP deviation

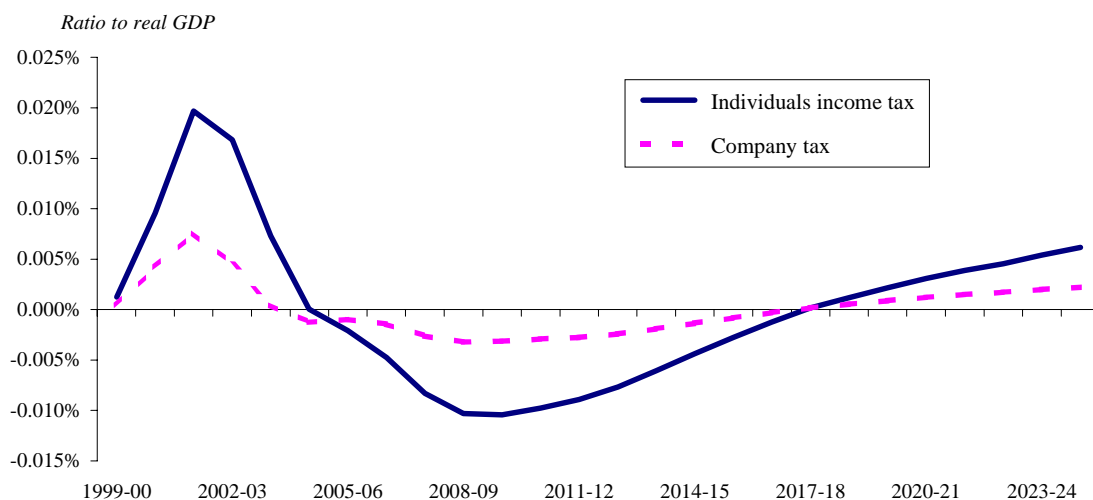
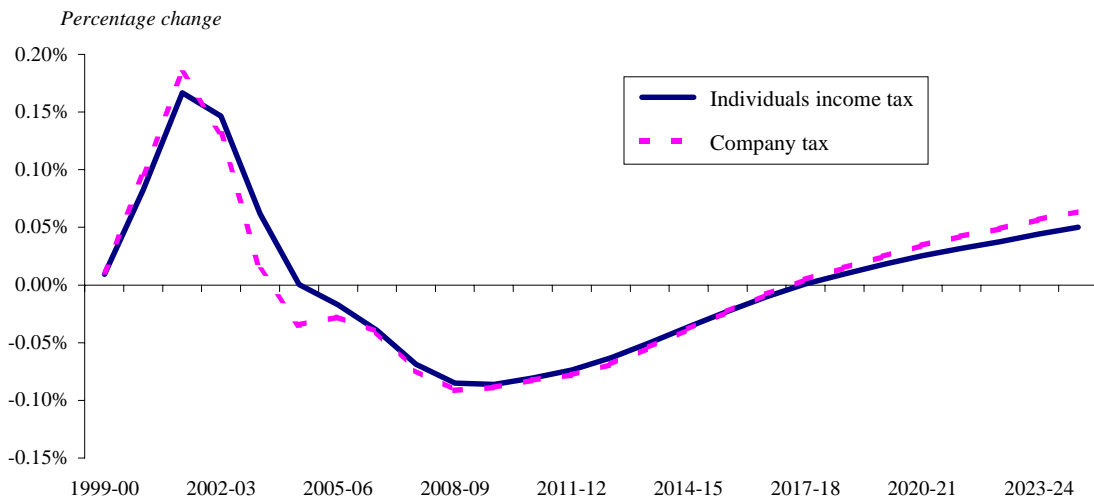
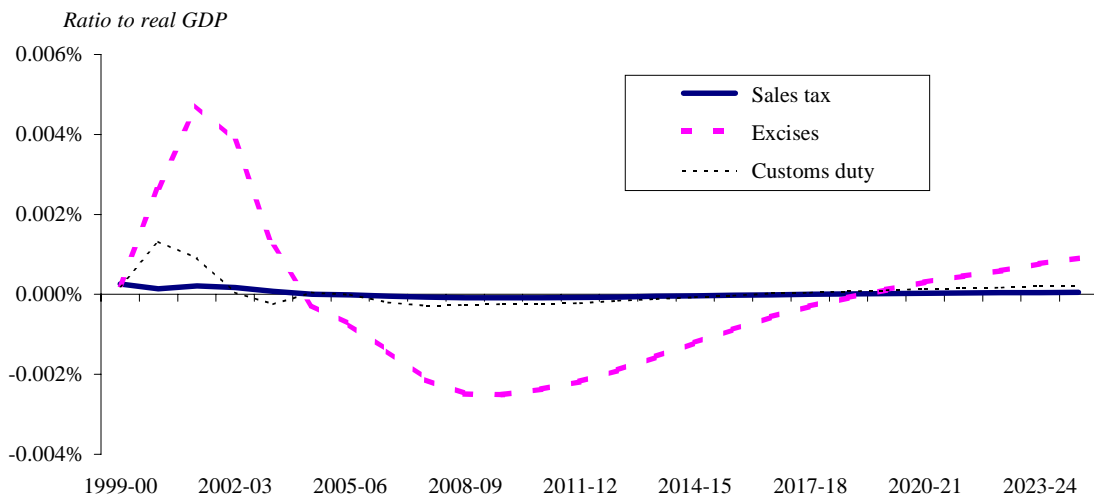


Chart 20: Individuals income tax and company tax, percentage deviation

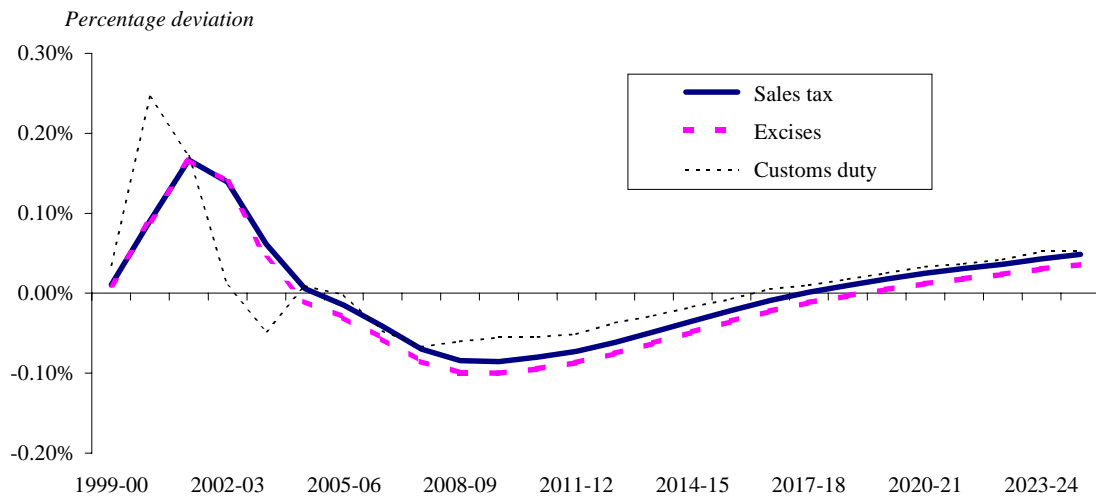


Excise receipts are also expected to follow consumer spending through movements in the wage bill, forming a similar pattern to PAYE tax. However, there is a direct reduction in petroleum excise revenue as a result of the project with the switch from road to rail. This reduces excise revenue by an average amount of \$4.7 million over the operating phase of the project (1996/97 dollars, not discounted).

Chart 21: Sales tax, excise and customs duty, ratio to GDP deviation



Customs duty receipts take off in the early phase of the project as the boost to domestic demand spills over into a higher level of imports. Thereafter receipt changes remain negligible as a share of GDP. The project’s impact on sales tax at the Commonwealth level is very small as a share of GDP as these projections include the introduction of the tax reform package, with GST revenue becoming a State budget outcome. The Commonwealth’s collection of sales tax revenue therefore falls dramatically from 2000-01, leaving only a handful of small items such as wine and luxury cars under this head of revenue.

Chart 22: Sales tax, excise and customs duty, percentage deviation

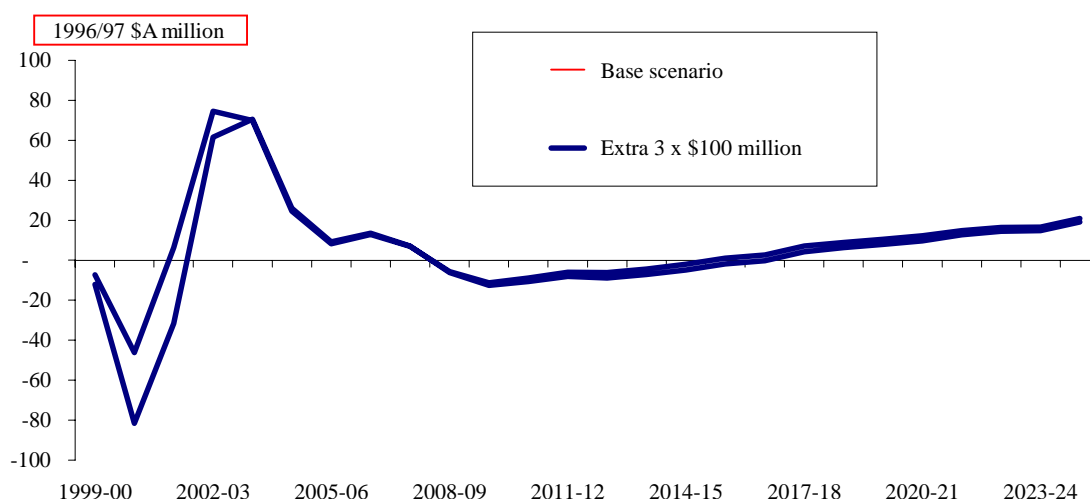
9.3. Varying Government Grants

The improvement in the Commonwealth's budgetary position which occurs in the base scenario does depend on the amount of money the Commonwealth is contributing to the project.

The base scenario allows for the Commonwealth to contribute \$100 million (nominal) over the years 1999-00 to 2002-03 as part of a \$300 million contribution by governments (Commonwealth, South Australia and Northern Territory). Varying that contribution by an additional \$50 million from each government in the first instance (\$150 million total) and \$100 million in the second instance (\$300 million total) does have an impact on the Budget bottom line.

Chart 23 shows that the Budget surplus through the early years of the project does indeed fall away the higher the level of government grant. However, by 2004-05 the budget balance impacts of the two scenarios are virtually identical. Note that the scenario of an additional \$50 million contribution from each government does not appear on the chart but falls in between the two scenarios shown here where they diverge.

Chart 23: Commonwealth Budget balance, deviation from baseline



In net present value terms, all scenarios still produce a positive Budget outcome over the 25 years, though with the additional \$100 million from each government, at a high discount rate the benefits appears more marginal.

Table 21: Net Present Value of Budget Balances, deviation from baseline

1996/97 \$A million	Base scenario	Additional 3 x \$50 million	Additional 3 x \$100 million
Discount rate			
3%	154.6	103.4	48.1
5%	128.3	80.7	30.4
7%	109.0	64.4	17.8

Outside the direct contribution of the grant to the Budget bottom line, the different financing structure for the project (more Government finance and less from the private sector and overseas) does impact on macroeconomic variables. These will in turn influence Budget aggregates.

For example, the higher grants add to government debt which crowds out some private consumption, thereby lowering government revenue receipts. The largest revenue item, PAYE receipts, falls both with lower employment and wages growth. Overall, the sum of revenues collected by the Commonwealth is \$139 million lower (NPV at 5% discount rate) as a result of the 3 x \$100 million higher government financing requirement, a relatively minor impact over 25 years.

As a balance to the lower revenue the crowding out impacts of the higher government financing produce marginally slower economic growth. This produces a lower structural spending requirement, offset marginally by higher cyclical spending. The sum of expenditures by the Commonwealth is \$124 million lower (NPV at 5% discount rate) as a result of the 3 x \$100 million higher government financing requirement, again a relatively minor change.

As the minor changes to revenue and expenditure largely balance each other out, it leaves the impact on the Budget balance largely explained by the different level of grants.

Detailed Budget aggregates for scenarios with higher government contributions are shown in Table 25 and Table 26.

9.4. Examining the Land Bridge

The land bridge scenario as modelled here provides significant longer term benefits to the national economy, exceeding the benefits provided by the railway itself. Deviations reported here refer to the base scenario project and land bridge combined unless stated.

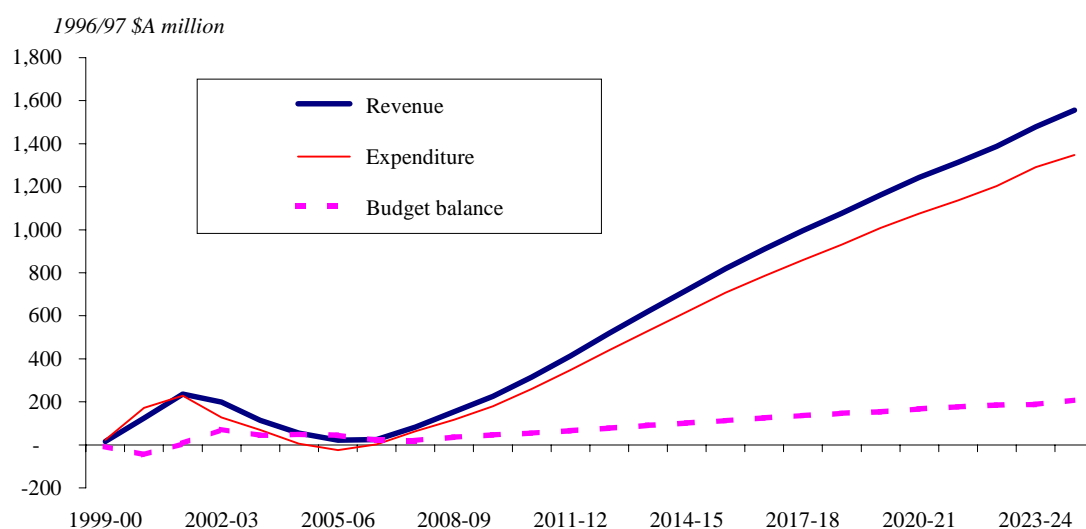
These benefits flow through to Commonwealth budget aggregates, producing a much stronger Budget surplus than is the case in the base scenario. The stronger economy manifests itself in higher revenue receipts, as well as (to a lesser extent) a higher expenditure requirement, to maintain government services in line with GDP growth.

Table 22: Net Present Value of Budget Aggregates, deviation from baseline

1996/97 \$A million	Revenue	Expenditure	Expenditure including grant	Budget balance
Discount rate				
3%	9,251.6	7,808.9	7,895.1	1,356.5
5%	6,647.7	5,578.4	5,661.9	985.8
7%	4,878.3	4,067.0	4,148.0	730.2

Chart 24 displays Commonwealth budget aggregates from the combined project and land bridge over time. There is still a decline in the Budget balance at first in accordance with the Government’s grant expenditure (held at \$100 million for the Commonwealth). However, once operations commence in 2003/04 and business and consumers have time to adjust to the terms of trade benefit (business in allocating more of its production for export; consumers taking advantage of cheaper import prices), the benefits to the Budget bottom line appear.

Chart 24: Commonwealth Budget aggregates, deviation from baseline

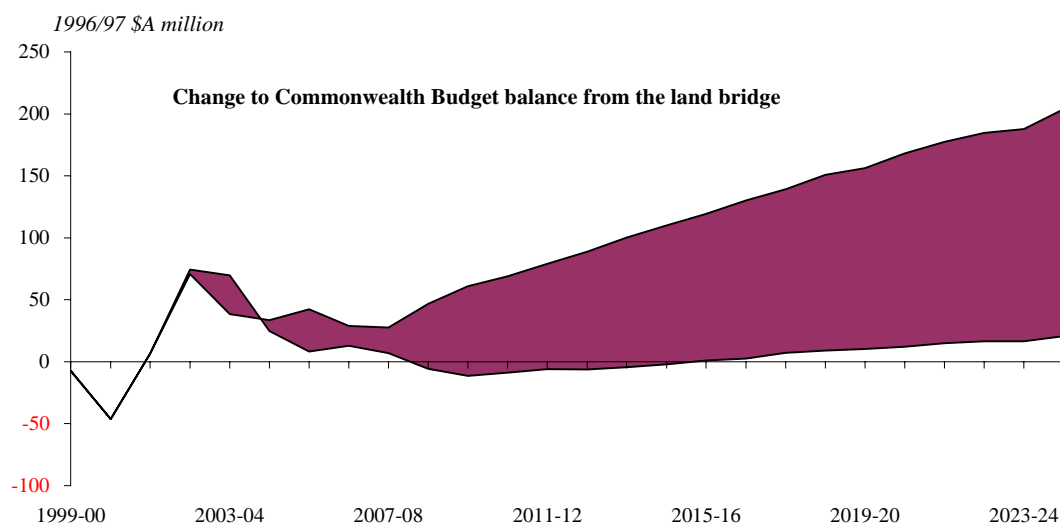


Growth in employment and the wage bill sees PAYE tax collections surge as time goes on. By 2024/25 they are \$794 million higher (1996/97 dollars, not discounted), compared to a deviation of just \$75 million from the base scenario. Not

unexpectedly, business profits also benefit from cheaper imports and the rising volume of export production. This translates itself into higher company tax receipts, \$285 million ahead at 2024/25, compared to \$31 million previously.

Other revenue items also fare well on the back of stronger profits, greater disposable income, and in the case of customs duty, the greater volume of imports. Many government expenditures also grow in line with the larger economy. However there are structural improvements in the economy which have a permanent effect on the Budget balance. As the unemployment rate falls with the growth of land bridge exports, fewer people collect from government coffers and more people contribute. The additional impact of the land bridge on the Commonwealth budget balance (excluding the impact of the base scenario project) is shown in Chart 25.

Chart 25: Commonwealth Budget balance, deviation due to land bridge



As with the other results obtained in this report, the outcomes for the Commonwealth budget balance are heavily dependent on the many assumptions made in the course of the modelling.

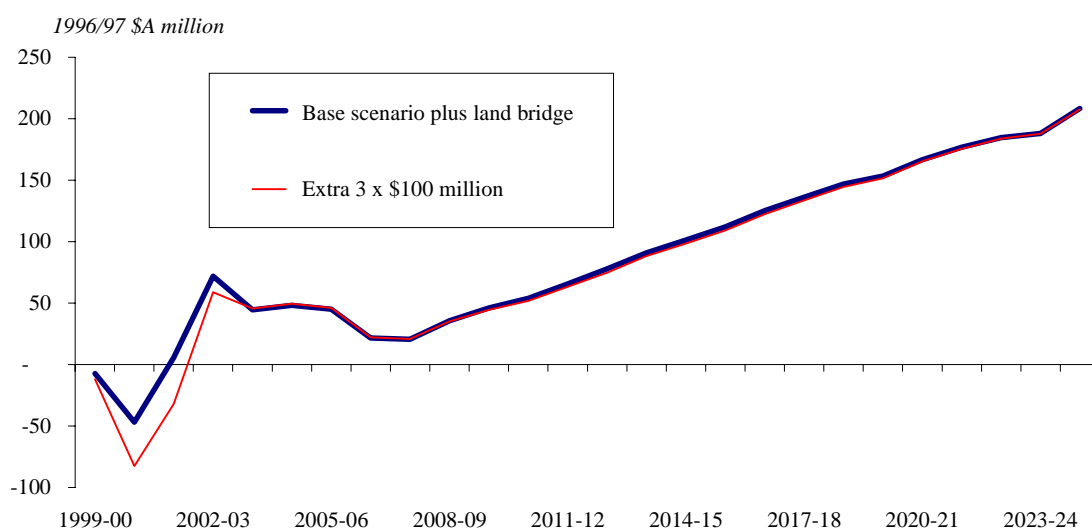
Detailed Budget aggregates for the base scenario including land bridge are shown in Table 27.

9.5. Land Bridge and Changes to Government Grants Combined

The variations from the base scenario are combined here. Compared to the base scenario the addition of the land bridge terms of trade improvement is positive for the Budget bottom line, while a higher government financing component for the project is a negative. However the deviations from the land bridge addition are of a much larger scale and dominate the combined scenario.

Chart 26 displays the Commonwealth Budget balance from the base scenario plus land bridge compared with an extra \$100 million of Commonwealth financing. The extra public financing increases the deficit in the short term but from 2002-03 the Budget remains in positive territory, leveraging off the terms of trade benefits. Again, the scenario of an additional \$50 million contribution from each government does not appear on the chart but falls in between the two scenarios shown where they diverge.

Chart 26: Commonwealth Budget balance, deviation from baseline



In net present value terms the addition to the budget balance is strongly positive in all three scenarios involving the land bridge.

Table 23: Net Present Value of Budget Balances, deviation from baseline

1996/97 \$A million	Base scenario plus land bridge	Additional 3 x \$50 million	Additional 3 x \$100 million
Discount rate			
3%	1356.5	1311.0	1253.6
5%	985.8	942.0	890.3
7%	730.2	688.0	640.6

Detailed Budget aggregates for the additional combined scenarios are shown in Table 28 and Table 29.

Table 24: Base Scenario (no land bridge), Detailed Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.1	112.1	95.7	44.4	4.4	-53.3	-61.5	26.9
Total individuals income tax	7.5	58.1	124.3	110.9	49.6	0.3	-58.6	-69.2	30.2
Companies	2.5	25.7	47.9	29.6	2.9	-8.8	-18.6	-21.3	12.0
Superannuation funds	0.2	2.1	5.5	6.6	4.7	1.7	-2.8	-4.1	1.3
Withholding tax	0.3	1.8	2.3	0.6	-0.3	-0.3	-0.8	-0.8	0.5
Petroleum resources rent tax	0.2	1.1	1.3	0.4	-0.3	-0.2	-0.6	-0.6	0.4
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.6	187.5	154.1	58.8	-6.9	-84.4	-99.4	46.0
Sales tax	1.5	0.8	1.4	1.1	0.5	0.0	-0.5	-0.6	0.2
Excise:									
- Petroleum products	1.2	10.8	20.0	17.0	4.9	-1.8	-11.3	-12.9	0.9
- Other	0.3	5.6	9.8	8.2	3.5	0.3	-3.5	-4.1	1.8
Customs duty	1.2	8.0	5.7	0.3	-1.7	0.3	-1.6	-1.5	1.4
Other taxes, fees and fines	0.3	2.4	4.0	2.7	0.5	-0.3	-2.1	-2.2	1.2
Total non-income taxation	4.5	26.2	40.8	30.8	10.2	-0.3	-18.0	-20.2	6.7
Non-taxation revenue	0.9	5.8	7.9	4.2	0.8	-0.4	-2.4	-2.6	1.4
Total revenue	16.4	125.6	236.2	187.1	68.1	-7.2	-105.4	-122.3	53.3
Total Budget expenditure	18.9	136.6	192.2	99.8	-1.7	-31.9	-107.6	-116.8	42.2
Government grant	4.8	35.3	37.6	12.8	0.0	0.0	0.0	0.0	0.0
Total expenditure	23.7	171.9	229.8	112.6	-1.7	-31.9	-107.6	-116.8	42.2
Budget balance	-7.3	-46.3	6.4	74.5	69.8	24.7	2.2	-5.5	11.1

Table 25: Base Scenario (extra 3x\$50 million Govt contribution), Detailed Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.0	112.4	96.3	44.9	4.6	-56.3	-68.1	24.6
Total individuals income tax	7.5	58.1	124.6	111.7	50.3	0.6	-61.9	-76.6	27.4
Companies	2.5	25.7	48.1	30.0	3.2	-8.8	-19.7	-24.0	10.7
Superannuation funds	0.2	2.1	5.5	6.6	4.7	1.7	-2.9	-4.5	1.1
Withholding tax	0.3	1.8	2.3	0.6	-0.3	-0.3	-0.8	-0.9	0.5
Petroleum resources rent tax	0.2	1.1	1.3	0.4	-0.2	-0.2	-0.6	-0.7	0.4
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.6	188.1	155.3	59.8	-6.6	-89.3	-110.5	41.5
Sales tax	1.5	0.8	1.4	1.1	0.5	0.0	-0.5	-0.6	0.2
Excise:									
- Petroleum products	1.2	10.8	20.1	17.1	5.0	-1.8	-11.7	-13.9	0.6
- Other	0.3	5.5	9.8	8.3	3.6	0.3	-3.7	-4.5	1.6
Customs duty	1.2	8.0	5.7	0.3	-1.7	0.3	-1.6	-1.5	1.4
Other taxes, fees and fines	0.3	2.4	4.0	2.8	0.5	-0.3	-2.2	-2.5	1.1
Total non-income taxation	4.5	26.2	40.9	31.0	10.3	-0.2	-18.8	-22.1	6.1
Non-taxation revenue	0.9	5.8	7.9	4.2	0.8	-0.4	-2.6	-2.9	1.3
Total revenue	16.4	125.6	236.9	188.5	69.3	-6.9	-111.3	-135.4	48.2
Total Budget expenditure	18.9	136.8	193.2	101.3	-0.9	-32.2	-113.5	-128.8	38.0
Government grant	7.2	53.0	56.4	19.1	0.0	0.0	0.0	0.0	0.0
Total expenditure	26.1	189.7	249.6	120.4	-0.9	-32.2	-113.5	-128.8	38.0
Budget balance	-9.7	-64.1	-12.7	68.1	70.2	25.3	2.2	-6.5	10.2

Table 26: Base Scenario (extra 3x\$100 million Govt contribution), Detailed Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.2	112.7	96.8	45.4	4.7	-59.4	-74.7	22.8
Total individuals income tax	7.5	58.2	125.0	112.2	50.9	0.8	-65.3	-84.0	25.3
Companies	2.5	25.7	48.2	30.2	3.4	-8.8	-20.9	-26.4	10.1
Superannuation funds	0.2	2.1	5.5	6.7	4.8	1.7	-3.1	-4.9	1.0
Withholding tax	0.3	1.8	2.3	0.6	-0.3	-0.3	-0.9	-1.0	0.5
Petroleum resources rent tax	0.2	1.1	1.3	0.4	-0.2	-0.2	-0.7	-0.7	0.4
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.8	188.6	156.2	60.8	-6.4	-94.4	-121.2	38.6
Sales tax	1.5	0.8	1.4	1.1	0.5	0.0	-0.6	-0.7	0.2
Excise:									
- Petroleum products	1.2	10.8	20.1	17.2	5.1	-1.8	-12.2	-15.0	0.3
- Other	0.3	5.6	9.9	8.3	3.6	0.3	-3.9	-4.9	1.5
Customs duty	1.2	8.0	5.7	0.3	-1.7	0.3	-1.6	-1.5	1.4
Other taxes, fees and fines	0.3	2.4	4.0	2.8	0.6	-0.3	-2.4	-2.8	1.1
Total non-income taxation	4.5	26.2	41.0	31.1	10.5	-0.2	-19.7	-23.9	5.6
Non-taxation revenue	0.9	5.8	7.9	4.2	0.8	-0.4	-2.7	-3.2	1.3
Total revenue	16.4	125.9	237.5	189.6	70.5	-6.7	-117.3	-148.1	44.7
Total Budget expenditure	18.9	136.9	193.8	102.5	0.1	-32.7	-119.5	-140.2	36.0
Government grant	9.6	70.6	75.2	25.5	0.0	0.0	0.0	0.0	0.0
Total expenditure	28.5	207.6	269.0	128.0	0.1	-32.7	-119.5	-140.2	36.0
Budget balance	-12.1	-81.7	-31.5	61.6	70.5	26.0	2.2	-7.9	8.7

Table 27: Base Scenario plus land bridge, Detailed Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.0	111.9	101.8	63.8	28.8	53.8	264.5	607.5
Total individuals income tax	7.5	58.0	124.1	116.7	70.3	34.5	57.7	292.5	678.2
Companies	2.5	25.5	47.8	31.7	15.9	8.8	17.9	95.9	221.1
Superannuation funds	0.2	2.1	5.5	6.8	5.5	3.1	2.8	14.9	36.4
Withholding tax	0.3	1.8	2.3	0.7	0.5	0.1	0.9	4.1	8.8
Petroleum resources rent tax	0.2	1.1	1.3	0.5	0.4	0.1	0.7	3.1	6.6
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.4	187.2	162.9	96.3	48.1	83.1	425.6	986.1
Sales tax	1.5	0.8	1.4	1.2	0.7	0.3	0.5	2.5	5.6
Excise:									
- Petroleum products	1.2	10.7	20.0	18.1	8.3	2.3	6.0	39.8	94.7
- Other	0.3	5.5	9.8	8.7	5.1	2.1	3.5	17.4	40.0
Customs duty	1.1	7.2	5.1	1.3	-1.2	0.2	2.7	9.6	19.7
Other taxes, fees and fines	0.3	2.4	4.0	3.1	2.0	0.7	2.2	10.6	23.7
Total non-income taxation	4.4	25.5	40.3	33.6	17.2	6.9	15.9	80.7	184.8
Non-taxation revenue	0.9	5.8	7.8	4.7	2.9	0.9	2.6	12.3	27.6
Total revenue	16.2	124.5	235.2	199.5	114.9	54.4	101.5	517.4	1194.2
Total Budget expenditure	18.7	136.2	191.9	115.1	70.4	6.3	67.7	439.5	1034.4
Government grant	4.8	35.3	37.6	12.8	0.0	0.0	0.0	0.0	0.0
Total expenditure	23.5	171.5	229.5	127.8	70.4	6.3	67.7	439.5	1034.4
Budget balance	-7.3	-47.0	5.7	71.7	44.5	48.1	33.8	77.9	159.8

Table 28: Base Scenario plus land bridge (extra 3x\$50 million Govt contribution), Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.0	112.2	102.4	64.3	28.7	50.5	257.4	605.1
Total individuals income tax	7.5	58.1	124.5	117.4	71.0	34.5	54.0	284.3	674.9
Companies	2.5	25.6	48.0	32.0	16.2	8.8	16.5	92.8	218.9
Superannuation funds	0.2	2.1	5.5	6.8	5.6	3.2	2.6	14.4	36.3
Withholding tax	0.3	1.8	2.3	0.8	0.5	0.1	0.8	3.9	8.7
Petroleum resources rent tax	0.2	1.1	1.3	0.6	0.4	0.1	0.6	3.0	6.6
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.5	187.8	164.0	97.3	48.1	77.5	413.3	980.1
Sales tax	1.5	0.8	1.4	1.2	0.7	0.3	0.5	2.4	5.6
Excise:									
- Petroleum products	1.2	10.8	20.1	18.2	8.4	2.3	5.5	38.6	94.3
- Other	0.3	5.5	9.8	8.8	5.1	2.1	3.3	16.9	39.9
Customs duty	1.1	7.2	5.2	1.4	-1.2	0.2	2.6	9.3	19.7
Other taxes, fees and fines	0.3	2.4	4.0	3.1	2.0	0.7	2.1	10.3	23.6
Total non-income taxation	4.4	25.5	40.4	33.8	17.3	6.9	14.8	78.5	184.1
Non-taxation revenue	0.9	5.8	7.9	4.7	2.9	0.9	2.4	12.0	27.4
Total revenue	16.2	124.7	236.0	200.9	116.0	54.3	94.7	502.6	1187.5
Total Budget expenditure	18.7	136.6	192.9	116.5	71.1	5.6	60.9	425.8	1027.5
Government grant	7.2	53.0	56.4	19.1	0.0	0.0	0.0	0.0	0.0
Total expenditure	25.9	189.6	249.3	135.6	71.1	5.6	60.9	425.8	1027.5
Budget balance	-9.7	-64.9	-13.3	65.3	44.9	48.7	33.8	76.9	159.9

Table 29: Base Scenario plus land bridge (extra 3x\$100 million Govt contribution), Budget Aggregates, deviation from baseline

REAL DEVIATIONS	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years av to 2009-10	5 years av to 2014-15	10 years av to 2024-25
1996/97 \$A million									
Gross PAYE instalments	7.6	58.0	112.4	102.9	65.0	29.0	47.7	250.7	603.1
Total individuals income tax	7.5	58.1	124.6	118.0	71.8	34.7	50.9	276.8	672.5
Companies	2.5	25.7	48.1	32.2	16.3	8.6	15.2	90.2	218.3
Superannuation funds	0.2	2.1	5.5	6.9	5.6	3.2	2.5	14.0	36.1
Withholding tax	0.3	1.8	2.3	0.8	0.5	0.1	0.8	3.8	8.7
Petroleum resources rent tax	0.2	1.1	1.3	0.6	0.4	0.1	0.6	2.9	6.6
Fringe benefits tax	0.4	4.2	7.9	6.6	2.9	0.4	-3.2	-3.8	1.5
Total income tax	10.9	91.5	188.1	164.8	98.3	48.2	72.8	402.2	976.8
Sales tax	1.5	0.8	1.4	1.2	0.7	0.3	0.4	2.3	5.6
Excise:									
- Petroleum products	1.2	10.8	20.1	18.3	8.6	2.4	5.0	37.5	94.0
- Other	0.3	5.5	9.8	8.8	5.2	2.1	3.1	16.5	39.7
Customs duty	1.1	7.2	5.2	1.4	-1.2	0.1	2.5	9.1	19.6
Other taxes, fees and fines	0.3	2.4	4.0	3.1	2.0	0.7	2.0	10.1	23.5
Total non-income taxation	4.4	25.5	40.5	34.0	17.6	6.9	13.9	76.4	183.4
Non-taxation revenue	0.9	5.8	7.9	4.7	3.0	0.9	2.3	11.7	27.3
Total revenue	16.2	124.7	236.3	201.8	117.3	54.4	88.9	489.2	1183.5
Total Budget expenditure	18.7	136.7	193.1	117.5	71.8	4.9	55.2	414.0	1025.4
Government grant	9.6	70.6	75.2	25.5	0.0	0.0	0.0	0.0	0.0
Total expenditure	28.3	207.3	268.3	143.0	71.8	4.9	55.2	414.0	1025.4
Budget balance	-12.1	-82.6	-32.0	58.9	45.6	49.5	33.7	75.3	158.1

10. Appendix C: Impact on the Northern territory and South Australian Budgets

10.1. Key findings: “base scenario” (without land bridge)

The charts and tables in Appendix C show the deviations from the baseline analysis resulting from the addition of the railway to the Northern Territory and South Australian economies. In summary, revenue rising faster than outlays means that public sector net debt is lower across the period of the scenario. As the charts indicate, the impacts on State debt are of similar magnitudes to the end of the next decade, although somewhat lower in South Australia than in the Northern Territory. The impacts are relatively more significant in the case of the smaller Northern Territory economy.

The results indicate that the most significant changes to debt levels occur in around fifteen years, and the relative improvements over the baseline situation are somewhat decreased in the longer term as population increases lead to rises in State Government spending.

Improvements to government revenues appear likely to be smaller than improvements to overall economic output in the short to medium term. In the longer term, increased population levels in the Northern Territory lead to increased GST receipts, driving revenue up more quickly than output growth.

10.2. Determinants of Northern Territory budget impacts

It is probably best to examine the effects of the railway in three phases:

1. railway construction (1999/2000 to 2002/03);
2. initial operating phase (2003/04 to about 2009/10);
3. mature operating phase (2010/11 onwards)

The first phase sees an initial increase in outlays during the construction of the railway. Part of the impact on spending of the grants for the railway is offset by higher per capita incomes, which reduce the demand for publicly-funded services. Revenue rises less quickly than GSP (lowering the ratio in the first few years), in part because GST receipts do not rise as quickly.

The second phase is the most obviously positive in terms of the impact on public finances. While there is some decrease in revenue from the Commonwealth as grants relativities decrease slightly, the increases in nominal output, employment, wages and population all help to increase revenue. Total revenue is higher, but the growth is not as large as the growth in output. Increasing per capita incomes also moderate the growth in government expenditures. As a result, debt levels decrease relative to the baseline projections.

In the longer run, the increase in population begins to eat away at some of the relative gains. Increasing population places increased demands for government expenditure and outlays begin to rise in the longer run. Also, the increasing prosperity of the Northern Territory and South Australia sees lower growth in GST revenues from the

Commonwealth as relativities decline (relative to the baseline). In the case of the Northern Territory, the increase in population begins to outweigh the lower GST relativities towards the end of the scenario and revenue increases again begin to be more significant than rises in outlays. The improvement in debt relative to the baseline scenario begins to stabilise in absolute terms, but declines relative to GSP.

This gives the pattern seen in the charts for the Northern Territory (in relative terms and in terms of real absolute deviations) of an improvement in relative debt which gradually stabilises. This does not imply a stabilisation in the debt level - in all cases debt to GSP ratios are declining throughout the scenario - but no further improvements are made relative to the baseline case.

Chart 27: Impacts on the Northern Territory (relative to GSP); “base scenario” (without land bridge)

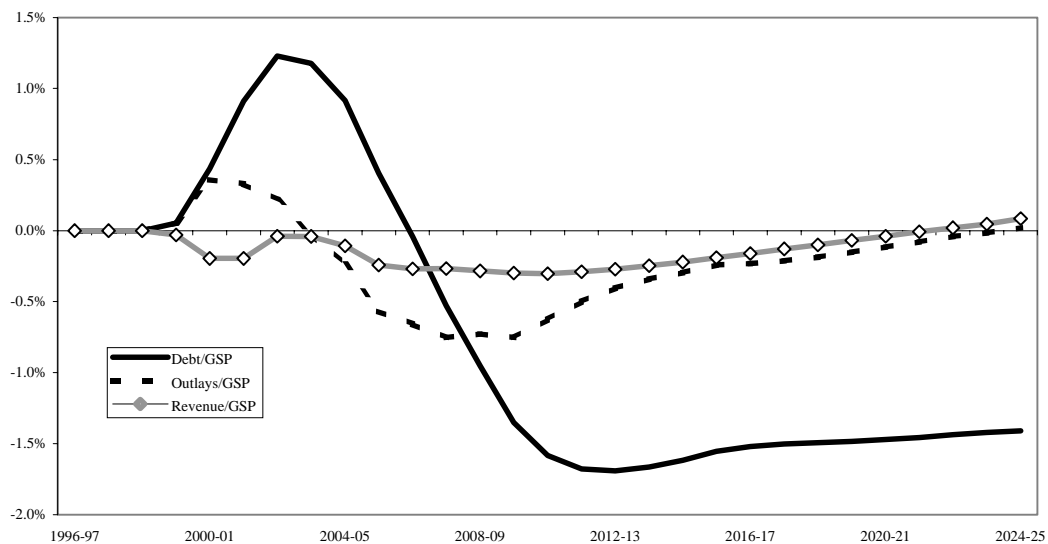
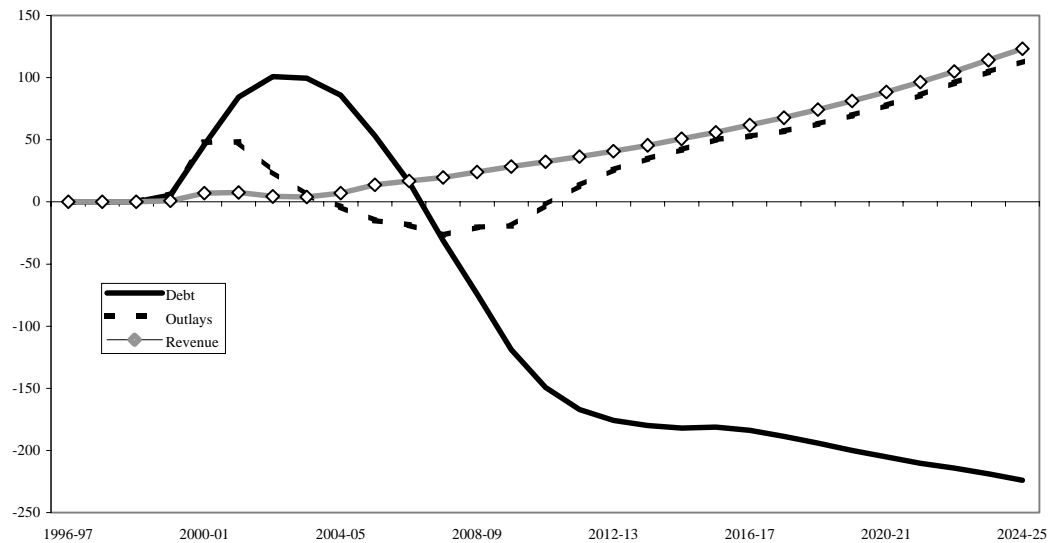


Chart 28: Impacts on the Northern Territory (\$96-97 million) “base scenario” (without land bridge)



10.3. Determinants of South Australian budget impacts; “base scenario” (without land bridge)

The general pattern for South Australia is generally similar to that seen in the Northern Territory, although as a proportion of State output the effects are relatively modest.

Given the much smaller deviations in population in South Australia (0.16% in 2024/25 compared with 3.22% in the Northern Territory) and the smaller GST relativity of the State, changes in revenue from the Commonwealth are relatively small. Lower population growth also avoids significant increases in outlays in the medium term. As a result, increases in outlays due to higher population do not outweigh the declines due to increasing per capita output over the projection horizon.

In the longer term, the lower increase in population prevents South Australia from increasing revenue to quite the extent seen in the Northern Territory. Revenue to GSP ratios remain below their baseline values, indicating that revenue increases are marginally less than increases in real output. Debt remains lower than in the baseline case, but the net benefits to the budget are gradually eaten away in the later years of the projection.

Chart 29: Impacts on South Australia (relative to GSP); “base scenario” (without land bridge)

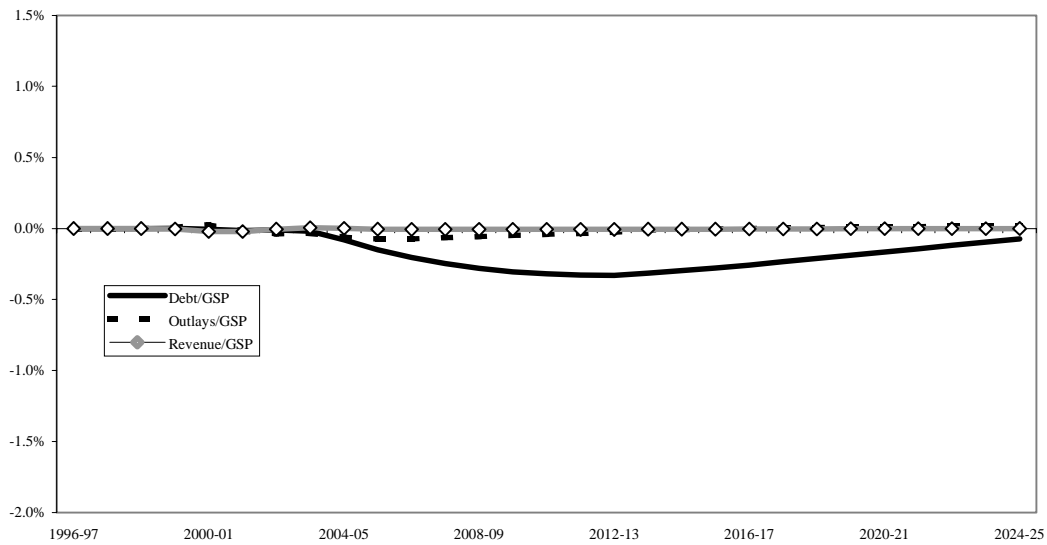


Chart 30: Impacts on South Australia (\$96-97 million); “base scenario” (without land bridge)

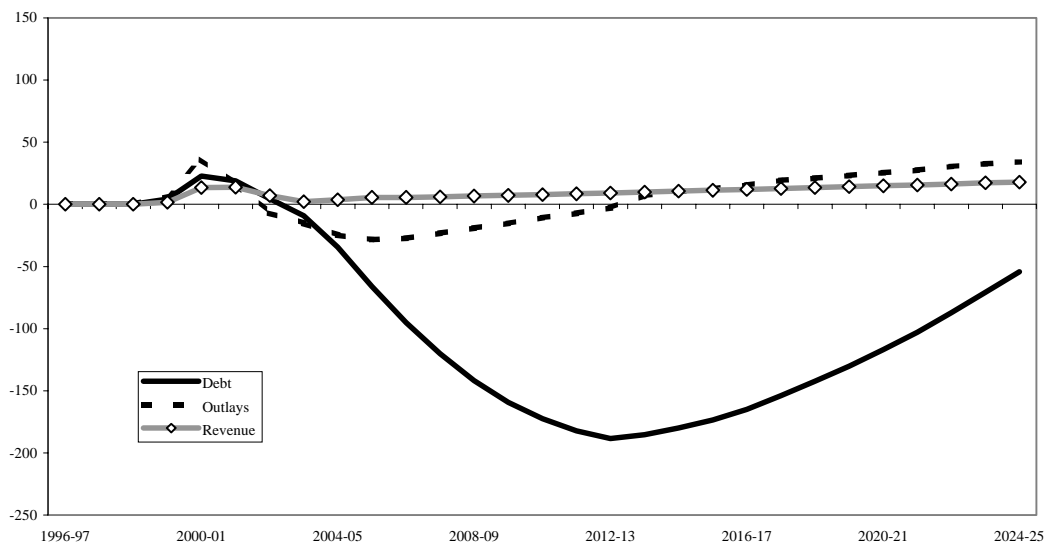


Table 30: Impacts on the Northern Territory (relative to GSP); “base scenario” (without land bridge)

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	10 years ave to 2024-25
RELATIVE TO GSP									
Debt	0.053%	0.435%	0.912%	1.229%	1.177%	0.916%	-0.532%	-1.647%	-1.470%
Revenue	-0.030%	-0.196%	-0.196%	-0.039%	-0.042%	-0.107%	-0.274%	-0.265%	-0.047%
Outlays	0.054%	0.359%	0.329%	0.218%	-0.024%	-0.237%	-0.696%	-0.427%	-0.118%
Budget balance	-0.085%	-0.563%	-0.533%	-0.259%	-0.019%	0.127%	0.415%	0.157%	0.067%

Table 31: Impacts on South Australia (relative to GSP); “base scenario” (without land bridge)

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	10 years ave to 2024-25
RELATIVE TO GSP									
Debt	0.002%	-0.007%	-0.014%	-0.011%	-0.019%	-0.080%	-0.240%	-0.316%	-0.171%
Revenue	-0.003%	-0.023%	-0.022%	-0.005%	0.006%	0.002%	-0.006%	-0.006%	-0.002%
Outlays	0.008%	0.028%	-0.020%	-0.038%	-0.033%	-0.061%	-0.064%	-0.024%	0.010%
Budget balance	-0.011%	-0.051%	-0.003%	0.033%	0.039%	0.062%	0.058%	0.018%	-0.012%

Table 32: Impacts on the Northern Territory (\$1996-97 million); “base scenario” (without land bridge)

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	10 years ave to 2024-25
REAL DEVIATIONS (1996-97 \$million unless otherwise indicated)									
Output	11	81	88	28	28	61	187	290	388
Share of national output	0.002%	0.013%	0.013%	0.004%	0.005%	0.009%	0.023%	0.030%	0.031%
Population ('000s)	0	0	0	0	0	0	1	3	6
Employment ('000s)	0	1	1	0	0	1	2	4	5
Debt	6	46	84	101	99	86	-31	-171	-202
Revenue	1	7	7	4	4	7	20	41	87
Outlays	7	48	48	24	5	-4	-20	23	77
Budget balance	-6	-41	-41	-20	-1	11	41	19	10

Table 33: Impacts on South Australia (\$1996-97 million); “base scenario” (without land bridge)

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	10 years ave to 2024-25
REAL DEVIATIONS (1996-97 \$million unless otherwise indicated)									
Output	19	144	148	59	-4	18	60	81	105
Share of national output	0.003%	0.019%	0.020%	0.010%	0.002%	0.003%	0.007%	0.007%	0.006%
Population ('000s)	0	0	0	1	1	1	1	1	2
Employment ('000s)	0	2	3	1	0	0	1	1	1
Debt	4	23	19	4	-9	-34	-117	-182	-120
Revenue	2	13	14	7	2	4	6	9	15
Outlays	6	36	17	-7	-15	-25	-23	-1	24
Budget balance	-5	-22	-2	14	17	29	29	11	-9

Table 34: Detailed impact on the Northern Territory budget (\$1996-97 million); “base scenario” (without land bridge)

REAL DEVIATIONS										
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25	
Payroll tax	0.2	1.8	2.0	0.8	0.9	1.6	4.7	6.5	8.2	
Other taxes (including GST)	0.2	1.9	2.9	2.6	5.0	5.7	11.2	27.6	68.1	
Other revenue	0.5	3.6	3.0	1.5	1.9	3.5	9.2	13.4	21.2	
Total revenue	0.9	7.3	7.9	4.9	7.8	10.9	25.1	47.5	97.4	
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	0.8	2.0	6.5	10.2	13.6	
Other capital expenditure	4.8	35.4	37.9	13.0	0.0	0.1	0.1	0.1	0.0	
Interest payments	0.8	6.2	11.2	11.7	12.0	12.1	17.5	23.5	30.0	
Other current expenditure	0.8	4.3	-2.6	-0.3	-3.6	-14.4	-39.9	-5.1	43.6	
Total outlays	6.6	48.4	49.1	25.2	9.2	-0.2	-15.9	28.6	87.2	
Adjusted budget balance	-5.7	-40.8	-40.9	-20.1	-1.4	11.0	40.5	18.6	9.9	

Table 35: Detailed impact on the South Australian budget (\$1996-97 million); “base scenario” (without land bridge)

REAL DEVIATIONS										
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25	
Payroll tax	0.3	2.5	2.8	1.5	0.4	0.5	1.2	1.3	1.7	
Other taxes (including GST)	0.7	6.4	6.9	3.3	1.7	2.3	2.9	5.2	9.7	
Other revenue	0.6	4.5	4.1	2.2	0.0	0.8	2.1	2.6	3.2	
Total revenue	1.7	13.4	13.8	7.0	2.1	3.6	6.2	9.2	14.5	
Gross fixed capital expenditure	0.3	2.4	2.5	1.0	-0.1	0.3	1.0	1.4	1.8	
Other capital expenditure	4.8	35.1	37.5	12.8	0.0	0.0	0.0	0.0	0.0	
Interest payments	0.6	4.4	9.9	12.1	8.8	5.8	7.1	10.6	13.3	
Other current expenditure	0.7	-5.7	-33.1	-32.8	-23.9	-30.9	-30.8	-12.7	9.1	
Total outlays	6.4	36.2	16.7	-6.9	-15.2	-24.8	-22.7	-0.8	24.1	
Adjusted budget balance	-4.6	-21.7	-1.8	14.4	17.3	28.6	29.4	10.6	-8.7	

10.4. Other scenarios

10.4.1. Increased grants from State Governments

The two charts below indicate the range in relative impacts on net debt relative to GSP caused by differing levels of grants in the base scenario (without landbridge). In each case, the relative impact decreases over time. Further, in all cases the net debt position relative to GSP is improved (compared with the baseline) at the end of the projection.

Chart 31: Impacts on NT net debt of differing grants levels (share of GSP); “base scenario” (without land bridge)

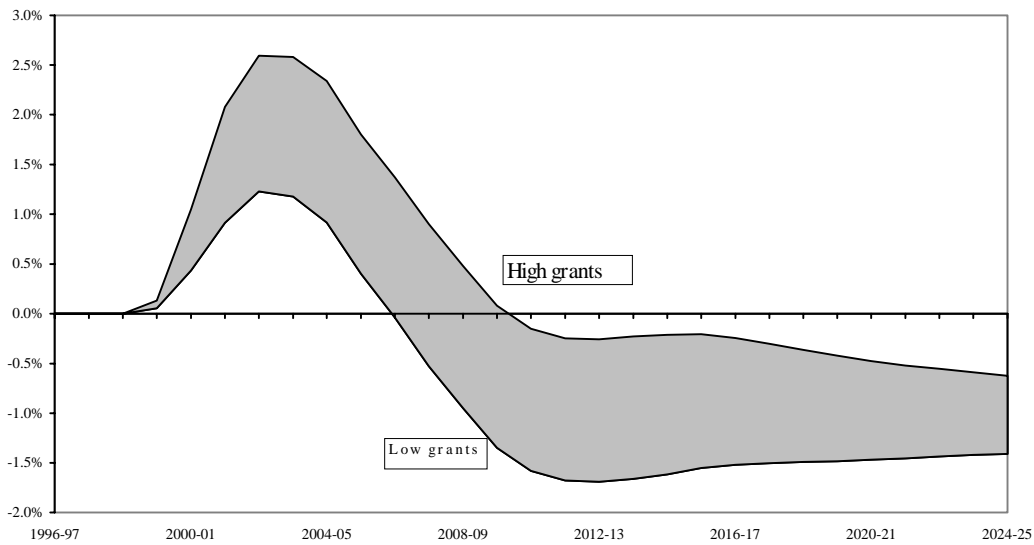


Chart 32: Impacts on SA net debt of differing grants levels (share of GSP); “base scenario” (without land bridge)

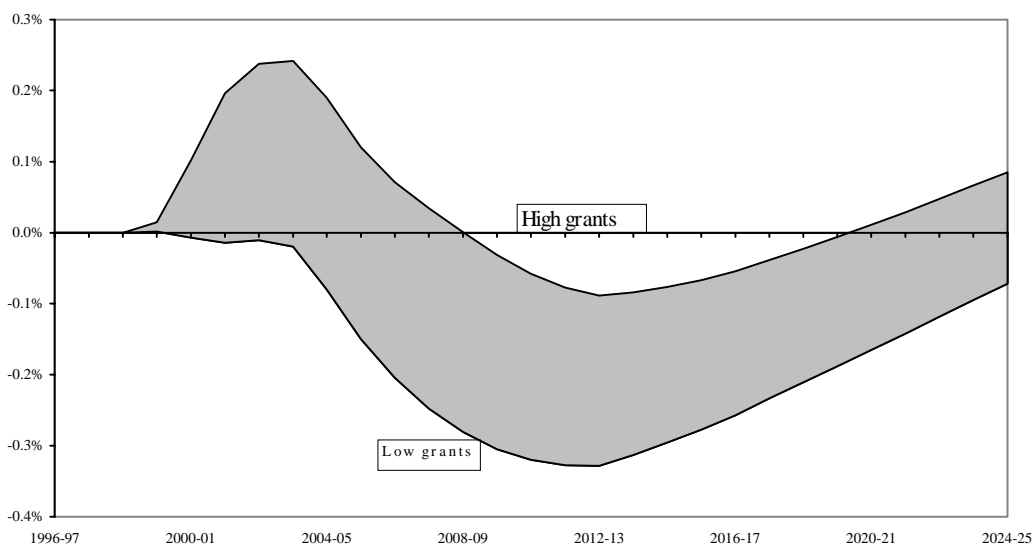


Table 36: Net present values of State and Territory budget impacts under assumption of \$150 million grants expenditure (\$1996-97 million); “base scenario” (without land bridge)

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	712.0	642.3	69.8	171.6	147.0	36.3
5%	514.0	483.7	30.3	134.2	110.0	33.6
7%	378.5	377.3	1.2	107.9	87.5	28.1

Table 37: Net present values of State and Territory budget impacts under assumption of \$200 million grants expenditure (\$1996-97 million); “base scenario” (without land bridge)

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	711.2	745.0	-33.7	169.8	242.3	-60.8
5%	513.4	576.8	-63.4	132.8	196.9	-54.7
7%	378.0	462.4	-84.4	106.8	167.4	-52.9

The increased expenditure in the initial phases, under the assumption of higher government grants, shows up as a significant fall in the estimated improvement in the budget balance (relative to the baseline). The difference is more than the increase in expenditure due to the increase in interest payments that would be incurred, relative to the assumptions of the base scenario. These repayments continue throughout the modelling horizon. However, as Chart 31 and Chart 32 indicate, the impact decreases slightly over time.

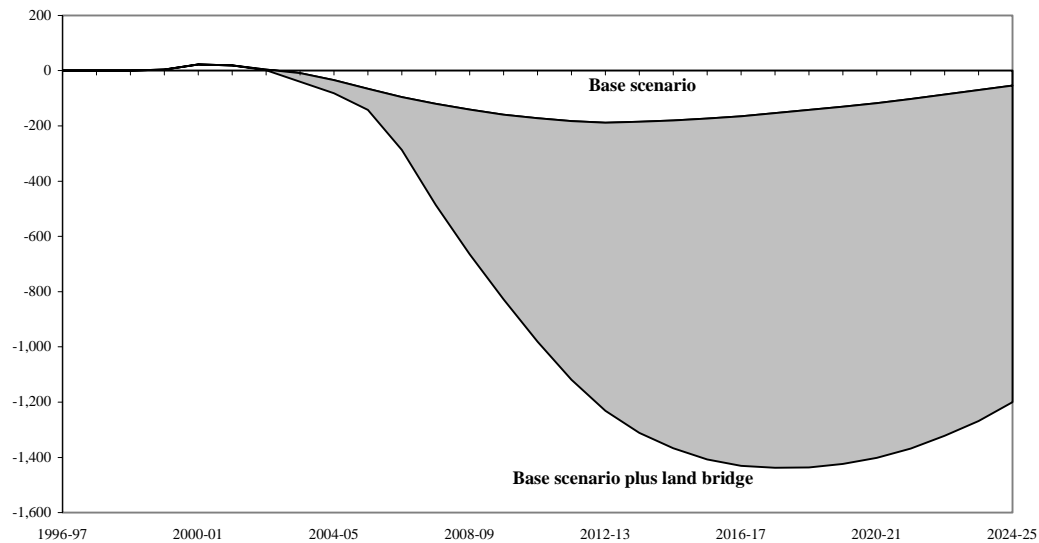
10.4.2. Base scenario + land bridge

The projected additional impact of the land bridge is significant, particularly in the case of SA. An increase in economic activity of this magnitude would have a strong impact on the State’s finances.

Given such an outcome, the change in forecast results compared with the base scenario (with no land bridge) falls more heavily on SA, with only a marginal further impact on the NT. Under the assumptions of the land bridge option, the overall improvement in South Australia’s net debt position is of a similar magnitude relative to GSP as is the overall improvement in the net debt of NT.

The charts show the impact on net debt in South Australia (relative to the baseline case) of the base scenario and the base scenario and land bridge option. The impact on the Northern Territory of the land bridge scenario is basically indistinguishable from that outlined in Chart 28 above.

Chart 33: Impacts of different scenarios on SA net debt (\$96-97 million); “base scenario + land bridge”



Relative to GSP, the decreases in debt in both SA and the NT are now relatively similar. The projected sharp increases in economic activity in SA would tend to outweigh the costs of grants required to construct the railway. As a result, SA would tend not to suffer the initial increase in debt incurred by the NT - at least relative to GSP.

Chart 34: Relative impacts on net debt of the land bridge scenario (share of GSP) ; “base scenario + land bridge”

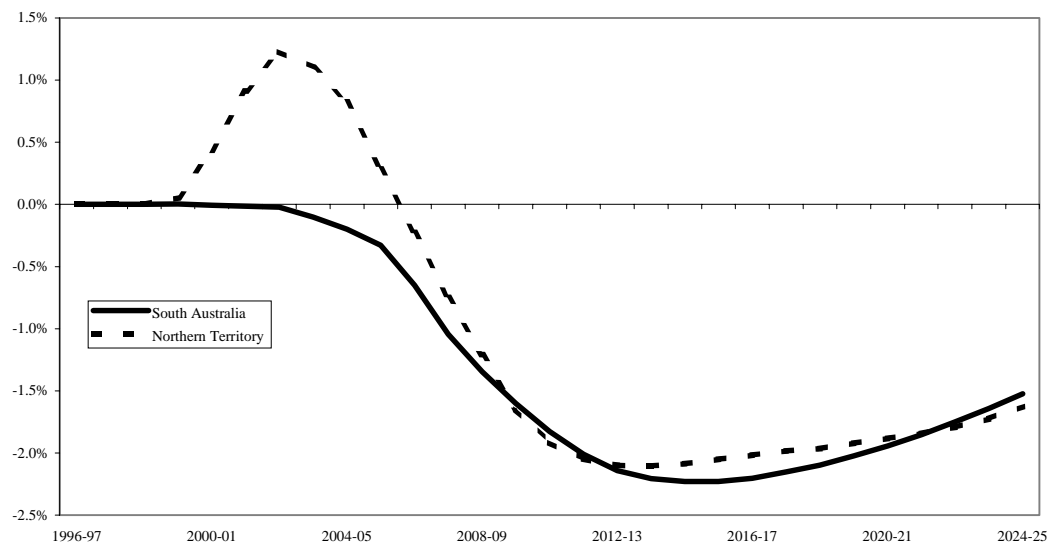


Table 38: Net present values of State and Territory budget impacts under assumption of the base scenario with a land bridge (1996-97 \$ million) ; “base scenario + land bridge”

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	679.7	446.8	231.1	851.6	-421.2	1350.5
5%	487.2	313.8	172.0	614.8	-427.8	1100.2
7%	356.0	228.3	126.6	452.6	-406.4	902.5

Table 38 shows the estimated increase net present value of changes in State finances relative to the baseline under the assumption of the land bridge. In both cases the projection gives a higher net present value to the improvements in estimated budget balances relative to the base scenario (and the baseline), especially in the case of South Australia. Our estimates suggest a modest improvement in each year for the NT (which over the three decades of the simulation adds up to around \$50 million in present value terms) and a large increase in the results for South Australia.

Given the projected increase in output in South Australia under the land bridge scenario, government expenditure in the early years after the construction of the railway would be expected to decline as relatively wealthier South Australians would require a lower level of Government expenditure. This improvement would be expected to decline over time as the population increased relative to the baseline. As Chart 34 suggests, the reduction in State debt (as a proportion of GSP) relative to the baseline scenario would begin to decline in the out-years.

As Table 39 and Table 40 indicate, there could be significantly different budgetary impacts under the assumption of a land bridge, with South Australia benefiting more strongly. South Australia would benefit both from lower levels of required expenditure (due to higher incomes in the State) and higher revenues - although lower GST receipts might be expected due to lowering of relativities for South Australia.

Table 39: Detailed impacts of the base scenario with a land bridge on the Northern Territory budget (\$1996-97 million)

REAL DEVIATIONS									
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.2	1.8	2.0	0.8	1.1	1.8	4.9	6.8	8.6
Other taxes (including GST)	0.2	1.9	2.9	2.7	4.8	5.7	12.7	32.0	76.5
Other revenue	0.5	3.6	3.0	1.5	2.2	3.8	9.6	14.1	22.2
Total revenue	0.9	7.3	7.9	4.9	8.0	11.4	27.3	52.9	107.3
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	1.1	2.2	6.8	10.5	14.0
Other capital expenditure	4.8	35.4	37.9	13.0	0.0	0.1	0.1	0.0	0.0
Interest payments	0.8	6.2	11.2	11.7	12.3	12.8	18.2	24.5	30.7
Other current expenditure	0.8	4.3	-2.6	-0.3	-6.1	-17.2	-43.9	-8.3	52.8
Total outlays	6.6	48.4	49.1	25.2	7.3	-2.1	-18.9	26.7	97.6
Adjusted budget balance	-5.7	-40.8	-40.9	-20.0	0.5	13.2	45.6	25.7	9.4

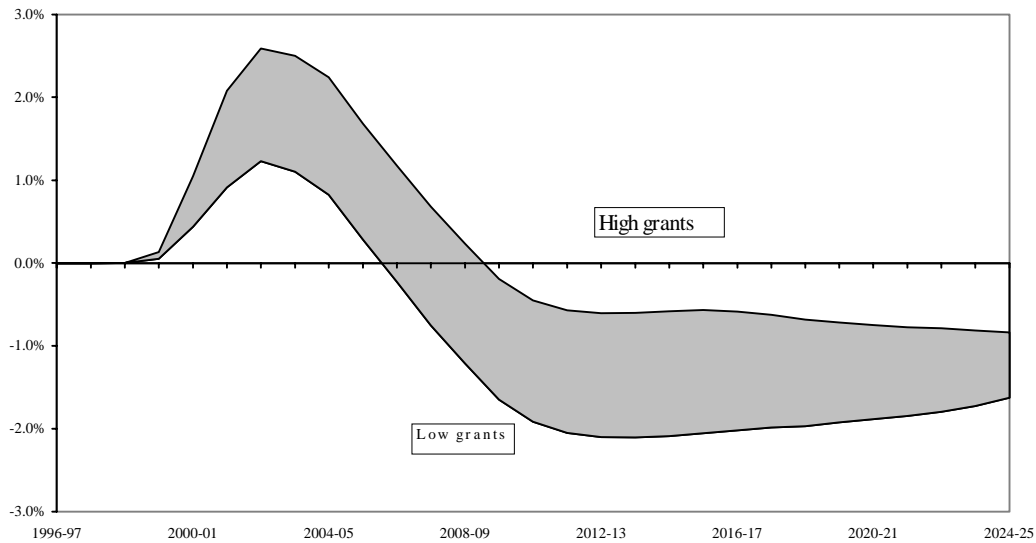
Table 40: Detailed impacts of the base scenario with a land bridge on the South Australian budget (\$1996-97 million)

REAL DEVIATIONS									
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.3	2.5	2.8	1.7	0.0	0.5	6.3	10.2	14.4
Other taxes (including GST)	0.7	6.4	6.9	3.7	-4.3	-3.7	6.3	25.7	63.3
Other revenue	0.6	4.5	4.1	2.7	-0.9	0.3	11.0	17.9	24.8
Total revenue	1.7	13.4	13.8	8.2	-5.2	-2.9	23.5	53.8	102.4
Gross fixed capital expenditure	0.3	2.4	2.5	1.2	0.7	1.3	6.8	11.3	16.2
Other capital expenditure	4.8	35.1	37.5	12.8	0.0	0.0	0.0	0.0	0.0
Interest payments	0.6	4.4	9.9	12.4	10.1	8.8	15.5	24.6	30.6
Other current expenditure	0.7	-5.7	-33.1	-34.8	-46.5	-59.3	-156.7	-125.5	39.1
Total outlays	6.4	36.3	16.7	-8.5	-35.8	-49.3	-134.4	-89.5	85.9
Adjusted budget balance	-4.6	-21.7	-1.8	17.2	30.9	47.0	161.3	148.8	24.4

10.4.3. Land bridge and increased grants from State Governments

As the following two charts indicate, the changes to State finances in South Australia by the introduction of the land bridge would tend to be more significant than the changes caused by an increase in grants.

Chart 35: Impacts on NT net debt of differing grants levels under the assumption of a land bridge (share of GSP)



For South Australia under the assumption of a land bridge, increasing grant levels at the outset delays the benefits to the State, with a stabilisation in the gap between the two scenarios in the medium to long term.

Chart 36: Impacts on SA net debt of differing grants levels under the assumption of a land bridge (share of GSP)

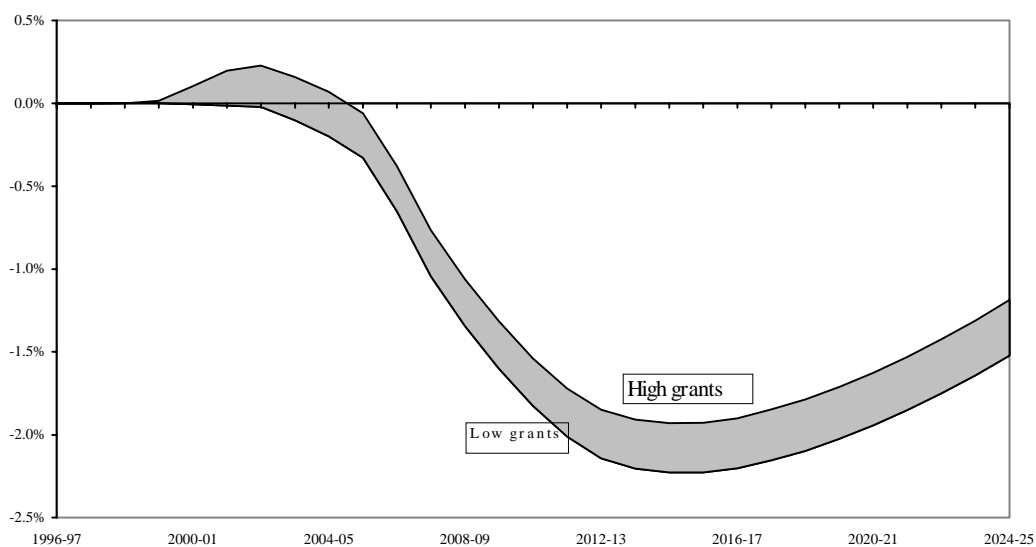


Table 42 and Table 42 show the estimated net present values of impacts on State and Territory budgets over the period 1999-00 to 2024-25 in the land bridge case given differing levels of grants. Under the assumptions of a land bridge South Australia does significantly better. The difference is caused primarily by the relatively stronger increase in the South Australian economy lowering required government expenditure. This decrease in expenditure outweighs (in present value terms) the increase caused by higher grants at the start of the projection (unlike in the Northern Territory) and the increase caused by relatively higher State population.

Table 41: Net present values of State and Territory budget impacts under assumption of a land bridge and \$150 million grants (1996-97 \$ million)

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	679.5	559.1	118.6	851.7	-273.4	1203.0
5%	487.0	415.5	70.1	614.8	-303.5	976.0
7%	355.8	320.7	34.0	452.5	-299.4	795.5

Table 42: Net present values of State and Territory budget impacts under assumption of a land bridge and \$200 million grants (1996-97 \$ million)

	Northern Territory			South Australia		
	Revenue	Expenditure	Budget balance	Revenue	Expenditure	Budget balance
Discount rate						
3%	678.7	672.3	4.6	849.4	-123.9	1051.0
5%	486.3	516.7	-31.7	613.0	-177.7	848.3
7%	355.3	412.2	-57.9	451.1	-191.0	685.6

10.5. Changes in results if the GST is not introduced

As the detailed State and Territory budget tables indicate, the results include an assumption of the introduction of a GST. The modelling assumes, in line with agreements reached at the April 1999 Premiers' Conference, that no State would be worse off following the introduction of the GST. If the GST were not introduced, the results of these simulations would alter.

Assuming that State and Commonwealth financial relations continued as they are now, the resultant changes to the model would see less State and Territory income being driven by population weighted relativities, and more driven by economic growth. Where a State is growing relatively strongly there are offsetting forces on finances. Economic and population growth lift the revenue streams directly related to them. But population growth is also assumed to affect Grants Commission relativities.

In the GST case a higher proportion of revenue comes from sources affected by the relativities, whereas under current financial arrangements, a higher proportion of revenue is own-source revenue affected by population growth.

The scenarios could be reworked if desired on the basis of existing financial arrangements. However, we would expect that there would be little change to the differences between budget outcomes across the various scenarios.

10.6. Tables showing the impact of varying levels of government grants

The final eight tables detail the budgetary changes caused by the higher grants scenarios, both in relation to the base scenario and the base scenario with a land bridge. Table 43 to Table 46 outline the results in the medium (\$150 million) grants case, while Table 47 to Table 50 give the projections in the case of the highest (\$200 million) level of grants.

Table 43: Detailed impacts of the base scenario and \$150 million grants on the Northern Territory budget (\$1996-97 million)

REAL DEVIATIONS							5 years ave	5 years ave	10 years ave
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	to 2009-10	to 2014-15	to 2024-25
Payroll tax	0.2	1.8	2.0	0.8	0.9	1.6	4.7	6.5	8.2
Other taxes (including GST)	0.2	1.9	2.9	2.6	5.0	5.7	11.1	27.5	68.0
Other revenue	0.5	3.6	3.0	1.5	1.9	3.5	9.2	13.4	21.2
Total revenue	0.9	7.3	7.9	4.9	7.8	10.9	25.0	47.4	97.4
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	0.8	2.0	6.5	10.1	13.6
Other capital expenditure	7.1	53.1	56.8	19.5	0.0	0.1	0.1	0.1	0.0
Interest payments	1.0	8.2	15.3	16.7	17.3	17.5	23.7	31.0	39.6
Other current expenditure	0.8	4.3	-2.6	-0.3	-3.6	-14.4	-40.1	-5.7	34.8
Total outlays	9.2	68.0	72.2	36.7	14.5	5.2	-9.8	35.5	87.9
Adjusted budget balance	-8.3	-60.3	-63.7	-31.4	-6.6	5.7	34.5	11.8	9.2

Table 44: Detailed impacts of the base scenario and \$150 million grants on the South Australian budget (\$1996-97 million)

REAL DEVIATIONS							5 years ave	5 years ave	10 years ave
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	to 2009-10	to 2014-15	to 2024-25
Payroll tax	0.3	2.5	2.8	1.5	0.4	0.5	1.2	1.3	1.7
Other taxes (including GST)	0.7	6.4	6.9	3.3	1.7	2.2	2.8	5.0	9.6
Other revenue	0.6	4.5	4.1	2.2	0.0	0.8	2.1	2.6	3.2
Total revenue	1.7	13.4	13.8	7.1	2.1	3.5	6.1	8.9	14.5
Gross fixed capital expenditure	0.3	2.4	2.5	1.0	-0.1	0.3	1.0	1.3	1.8
Other capital expenditure	7.1	52.7	56.3	19.2	0.0	0.0	0.0	0.0	0.0
Interest payments	0.9	6.9	14.3	17.3	14.4	11.2	13.2	17.5	21.5
Other current expenditure	0.7	-5.7	-33.2	-32.8	-24.0	-30.9	-32.0	-18.2	2.2
Total outlays	9.1	56.2	39.9	4.7	-9.7	-19.4	-17.8	0.7	25.5
Adjusted budget balance	-7.2	-41.7	-24.9	2.8	11.8	23.1	24.3	8.9	-10.2

Table 45: Detailed impacts of the land bridge scenario and \$150 million grants on the NT budget (\$1996-97 million)

REAL DEVIATIONS									
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.2	1.8	2.0	0.8	1.1	1.8	4.9	6.8	8.6
Other taxes (including GST)	0.2	1.9	2.9	2.7	4.8	5.7	12.7	31.9	76.5
Other revenue	0.5	3.6	3.0	1.5	2.2	3.8	9.6	14.1	22.2
Total revenue	0.9	7.3	7.9	4.9	8.0	11.4	27.2	52.8	107.3
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	1.1	2.2	6.8	10.5	14.0
Other capital expenditure	7.1	53.1	56.8	19.5	0.0	0.1	0.1	0.0	0.0
Interest payments	1.0	8.2	15.3	16.7	17.6	18.2	24.5	32.1	40.3
Other current expenditure	0.8	4.3	-2.6	-0.3	-6.1	-17.2	-44.0	-8.4	42.9
Total outlays	9.2	68.0	72.2	36.6	12.6	3.3	-12.6	34.2	97.2
Adjusted budget balance	-8.3	-60.3	-63.7	-31.3	-4.7	7.9	39.4	18.3	9.8

Table 46: Detailed impacts of the land bridge scenario and \$150 million grants on the SA budget (\$1996-97 million)

REAL DEVIATIONS									
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.3	2.5	2.8	1.7	0.0	0.5	6.3	10.2	14.4
Other taxes (including GST)	0.7	6.4	6.9	3.7	-4.3	-3.7	6.2	25.6	63.4
Other revenue	0.6	4.5	4.1	2.7	-0.9	0.3	11.0	17.9	24.8
Total revenue	1.7	13.4	13.8	8.2	-5.2	-2.9	23.5	53.7	102.6
Gross fixed capital expenditure	0.3	2.4	2.5	1.2	0.7	1.3	6.8	11.3	16.2
Other capital expenditure	7.1	52.7	56.3	19.2	0.0	0.0	0.0	0.0	0.0
Interest payments	0.9	6.9	14.3	17.6	15.7	14.3	21.6	31.7	39.0
Other current expenditure	0.7	-5.7	-33.2	-34.9	-46.6	-59.4	-157.3	-126.5	38.2
Total outlays	9.1	56.2	39.9	3.1	-30.3	-43.9	-128.9	-83.5	93.4
Adjusted budget balance	-7.2	-41.7	-24.9	5.7	25.4	41.5	155.7	142.7	17.0

Table 47: Detailed impacts of the base scenario and \$200 million grants on the Northern Territory budget (\$1996-97 million)

REAL DEVIATIONS										
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25	
Payroll tax	0.2	1.8	2.0	0.8	0.9	1.6	4.7	6.5	8.2	
Other taxes (including GST)	0.2	1.9	2.9	2.6	5.0	5.7	11.1	27.4	68.0	
Other revenue	0.5	3.6	3.0	1.5	1.9	3.5	9.2	13.4	21.2	
Total revenue	0.9	7.3	7.9	4.9	7.8	10.9	24.9	47.3	97.3	
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	0.8	2.0	6.5	10.1	13.6	
Other capital expenditure	9.5	70.7	75.8	26.0	0.0	0.1	0.1	0.1	0.0	
Interest payments	1.2	10.2	19.4	21.6	22.6	22.9	30.0	38.6	49.1	
Other current expenditure	0.8	4.3	-2.6	-0.3	-3.7	-14.4	-40.9	-8.2	25.4	
Total outlays	11.9	87.7	95.2	48.1	19.8	10.6	-4.3	40.6	88.1	
Adjusted budget balance	-10.9	-79.8	-86.5	-42.6	-11.9	0.3	29.0	6.7	9.0	

Table 48: Detailed impacts of the base scenario and \$200 million grants on the South Australian budget (\$1996-97 million)

REAL DEVIATIONS										
1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25	
Payroll tax	0.3	2.5	2.8	1.5	0.4	0.5	1.1	1.3	1.7	
Other taxes (including GST)	0.7	6.4	6.9	3.3	1.7	2.2	2.6	4.8	9.6	
Other revenue	0.6	4.5	4.1	2.2	0.0	0.8	2.1	2.6	3.2	
Total revenue	1.7	13.4	13.8	7.1	2.1	3.5	5.9	8.7	14.4	
Gross fixed capital expenditure	0.3	2.4	2.5	1.0	-0.1	0.3	1.0	1.3	1.8	
Other capital expenditure	9.5	70.2	75.0	25.6	0.0	0.0	0.0	0.0	0.0	
Interest payments	1.2	9.3	18.8	22.5	19.9	16.7	19.2	24.5	29.8	
Other current expenditure	0.7	-5.7	-33.2	-32.9	-24.0	-30.9	-33.1	-23.8	-4.8	
Total outlays	11.8	76.2	63.1	16.3	-4.2	-13.9	-12.9	2.0	26.8	
Adjusted budget balance	-9.9	-61.7	-48.1	-8.7	6.3	17.5	19.3	7.3	-11.5	

Table 49: Detailed impacts of the land bridge scenario and \$200 million grants on the NT budget (\$1996-97 million)

REAL DEVIATIONS 1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.2	1.8	2.0	0.8	1.1	1.8	4.9	6.8	8.6
Other taxes (including GST)	0.2	1.9	2.9	2.7	4.8	5.7	12.6	31.8	76.5
Other revenue	0.5	3.6	3.0	1.5	2.2	3.8	9.6	14.1	22.2
Total revenue	0.9	7.3	7.9	4.9	8.0	11.4	27.1	52.7	107.2
Gross fixed capital expenditure	0.3	2.5	2.7	0.8	1.1	2.2	6.8	10.5	14.0
Other capital expenditure	9.5	70.7	75.8	26.0	0.0	0.1	0.1	0.0	0.0
Interest payments	1.2	10.2	19.4	21.6	23.0	23.6	30.8	39.6	49.8
Other current expenditure	0.8	4.3	-2.6	-0.4	-6.1	-17.2	-44.2	-9.0	34.0
Total outlays	11.9	87.7	95.2	48.1	18.0	8.7	-6.6	41.1	97.8
Adjusted budget balance	-10.9	-79.8	-86.5	-42.5	-10.0	2.5	33.3	11.4	9.2

Table 50: Detailed impacts of the land bridge scenario and \$200 million grants on the SA budget (\$1996-97 million)

REAL DEVIATIONS 1996/97 \$million	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	5 years ave to 2009-10	5 years ave to 2014-15	0 years ave to 2024-25
Payroll tax	0.3	2.5	2.8	1.7	0.0	0.5	6.3	10.2	14.4
Other taxes (including GST)	0.7	6.4	6.9	3.7	-4.3	-3.8	6.0	25.3	63.3
Other revenue	0.6	4.5	4.1	2.7	-0.9	0.3	11.0	17.9	24.8
Total revenue	1.7	13.4	13.8	8.2	-5.2	-3.0	23.3	53.4	102.5
Gross fixed capital expenditure	0.3	2.4	2.5	1.2	0.7	1.3	6.8	11.3	16.2
Other capital expenditure	9.5	70.2	75.0	25.6	0.0	0.0	0.0	0.0	0.0
Interest payments	1.2	9.3	18.7	22.8	21.2	19.8	27.7	38.7	47.4
Other current expenditure	0.8	-5.7	-33.2	-34.9	-46.6	-59.3	-157.5	-127.1	37.2
Total outlays	11.8	76.2	63.1	14.7	-24.7	-38.3	-123.0	-77.0	100.8
Adjusted budget balance	-9.9	-61.7	-48.1	-5.9	19.8	35.9	149.6	136.0	9.6

10.7. Modeling approach

The approach used in the calculation of the estimates is based on the model used for the Access Economics Publication *State and Territory Budget Monitor*. However, due to the long-run nature of the simulation, a number of modifications have had to be made to allow for longer-term effects that are likely to impact on State and Territory finances. All public finance estimates are based on the non-financial public sector, which incorporates the general government sector and public trading enterprises. These and other definitions are consistent with Australia Bureau of Statistics definitions contained in the publication *Government Financial Estimates* (Catalogue No. 5501.0). All estimates have been prepared on a cash basis.

The modeling can broadly be split into four sections, outlays, revenue, external financing and long-term adjustment factors.

10.7.1. Outlays

Modeling of outlays covers growth in government current and capital expenditure. In broad terms, final consumption expenditure is influenced by long-term historic trends in per capita GSP levels, and forecasts of population growth and nominal GSP growth.

Other outlays growth occurs in line with growth in nominal GSP. Grants to other governments increase in line with grants to the State (or Territory), while interest payments are affected by changes in interest rates and debt.

There are a number of adjustments that have been made to the basic modeling methodology to handle the extended forecast period. Firstly, adjustments are made to final consumption expenditure when State debt levels move outside certain ranges. When State debt to GSP is above 5%, and is not falling sufficiently quickly, governments are assumed to aim for a lower debt ratio by making modest cuts to final consumption expenditure. Conversely, when States have no debt, governments are assumed to increase expenditure slightly.

A second adjustment is made to take account of the impact of government spending of higher per capita real incomes during and after construction of the railway. It is assumed that increasing real GSP per head eliminates the need for some Government payments (because there is less of a need for some publicly provided services). This effect lowers final consumption expenditure slightly, and is phased in the initial years of the scenario.

10.7.2. Revenues

Modeling of revenue covers State and Territory own-source revenues (the effects of Commonwealth Grants and GST revenue are discussed below). Payroll tax receipts are assumed to rise in line with employment and wage growth (that is, growth in the wage bill). Stamp duties are assumed to rise in relation to growth in nominal dwelling and non-dwelling investment (partially affected by changes in relative State GSP deflators).

Surpluses from public trading enterprises are assumed to rise with nominal GSP (although they are adjusted in the short-run due to asset sales). General grants from the Commonwealth (which will largely be replaced by GST receipts) are discussed below. 'Other' grants (besides general revenue assistance) are assumed to rise in relation to a combination of nominal GSP and nominal wages.

The remaining sources of revenue rise in relation to mining output (reflecting royalty payments) in the State, as well as nominal GSP.

10.7.3. External financing

External financing covers revenue derived from the Commonwealth, as well as debt financing by the State and Territory. The major effect that has had to be incorporated into the model is the impact of the change to a GST, and the consequent abolition of a number of other taxes and payments.

10.7.4. Long term adjustments

We have assumed that the introduction of the GST has no net impact on State and Territory finances in the initial years of its implementation. This is consistent with the agreement reached at the April 1999 Premiers' Conference. GST revenue is split according to the Commonwealth Grants Commission relativities multiplied by State population. The relativities are adjusted over time, both in the baseline case (to reflect both current trends and the expectation that the disadvantages that the Northern Territory currently faces, and is being compensated for through the higher relativity, will lessen over time) and in the scenarios. In the scenarios, the GST relativities fall so that 50% of the extra income (over the baseline case) that is created by additional population is eliminated by an adjustment to the NT's relativity. The same is true in the case of South Australia, although the effect is only significant in the scenarios that include a land bridge.

11. Appendix D: Summary tables and charts

11.1. Economic and budgetary impacts

Table 51: Net present values of economic and budgetary impacts; "base scenario" (without land bridge)

Deviations from baseline simulation (1996/97 \$ million)

Discount rate	National impacts				Northern Territory impacts			South Australian impacts		
	Public sector lending	Private consumption	Total net benefit	Commonwealth budget balance	Budget balance	Private consumption	Total net benefit	Budget balance	Private consumption	Total net benefit
Base scenario (without land bridge); \$100 million grants										
3 percent	300	1,120	1,420	150	180	1,710	1,890	130	880	1,010
5 percent	180	670	850	130	130	1,240	1,370	120	700	820
7 percent	90	380	470	110	90	930	1,020	110	570	680
Base scenario (without land bridge); \$150 million grants										
3 percent	330	980	1,310	100	70	1,710	1,780	40	880	920
5 percent	200	550	750	80	30	1,240	1,270	30	690	720
7 percent	100	290	390	60	0	930	930	30	560	590
Base scenario (without land bridge); \$200 million grants										
3 percent	370	840	1,210	50	-30	1,700	1,670	-60	880	820
5 percent	220	450	670	30	-60	1,240	1,180	-50	690	640
7 percent	110	210	320	20	-80	930	850	-50	560	510

Table 52: Net present values of economic and budgetary impacts; "base scenario + land bridge"

Deviations from baseline simulation (1996/97 \$ million)

Discount rate	National impacts				Northern Territory impacts			South Australian impacts		
	Public sector lending	Private consumption	Total net benefit	Commonwealth budget balance	Budget balance	Private consumption	Total net benefit	Budget balance	Private consumption	Total net benefit
Base scenario + land bridge; \$100 million grants										
3 percent	1,080	14,130	15,210	1360	230	1,790	2,020	1,350	6,080	7,430
5 percent	920	9,970	10,890	990	170	1,310	1,480	1,100	4,500	5,600
7 percent	780	7,150	7,930	730	130	980	1,110	900	3,400	4,300
Base scenario + land bridge; \$150 million grants										
3 percent	1,130	14,000	15,130	1310	120	1,800	1,920	1,200	6,090	7,290
5 percent	950	9,870	10,820	940	70	1,310	1,380	980	4,500	5,480
7 percent	790	7,070	7,860	690	30	980	1,010	800	3,400	4,200
Base scenario + land bridge; \$200 million grants										
3 percent	1,160	13,860	15,020	1250	0	1,800	1,800	1,050	6,080	7,130
5 percent	970	9,760	10,730	890	-30	1,310	1,280	850	4,500	5,350
7 percent	800	6,980	7,780	640	-60	980	920	690	3,400	4,090

Note: in these two tables, all estimates have been rounded to the nearest \$10 million

11.2. Charts of net impacts on the Commonwealth budget

Chart 37: Base Scenario (no land bridge); \$100 million grants

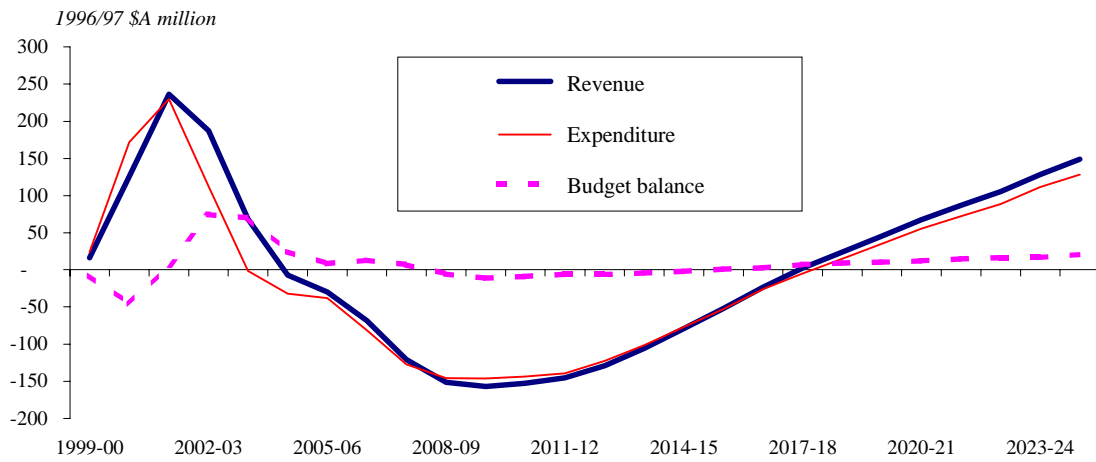


Chart 38: Base Scenario (no land bridge); \$150 million grants

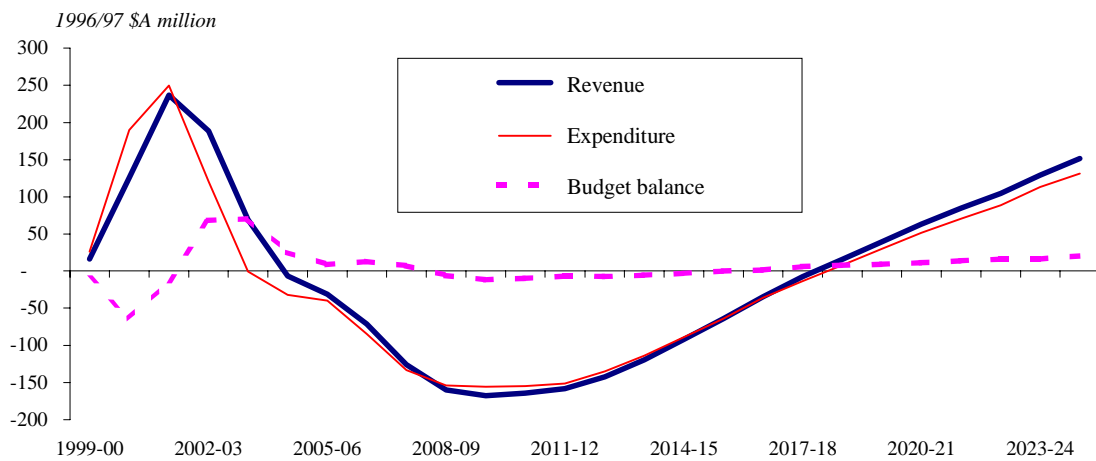


Chart 39: Base Scenario(no land bridge); \$200 million grants

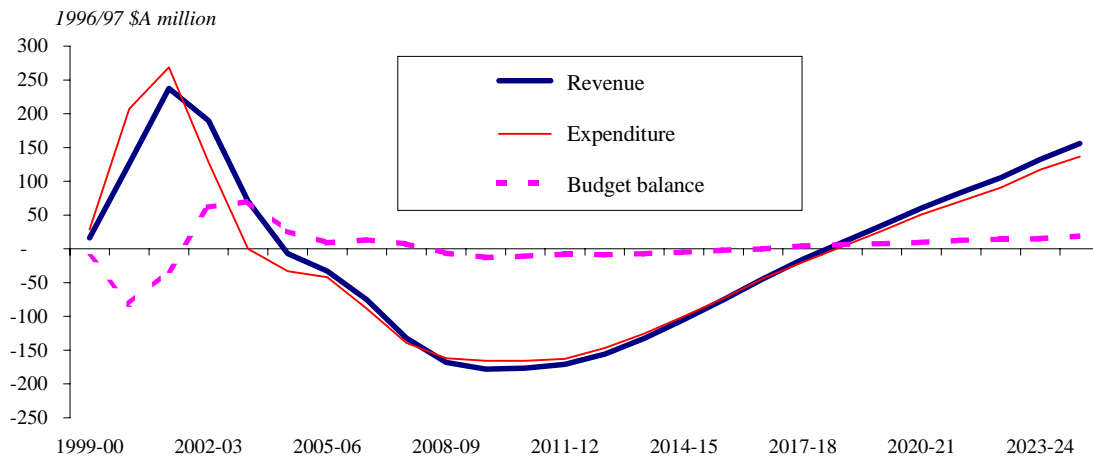


Chart 40: Base Scenario + land bridge; \$100 million grants

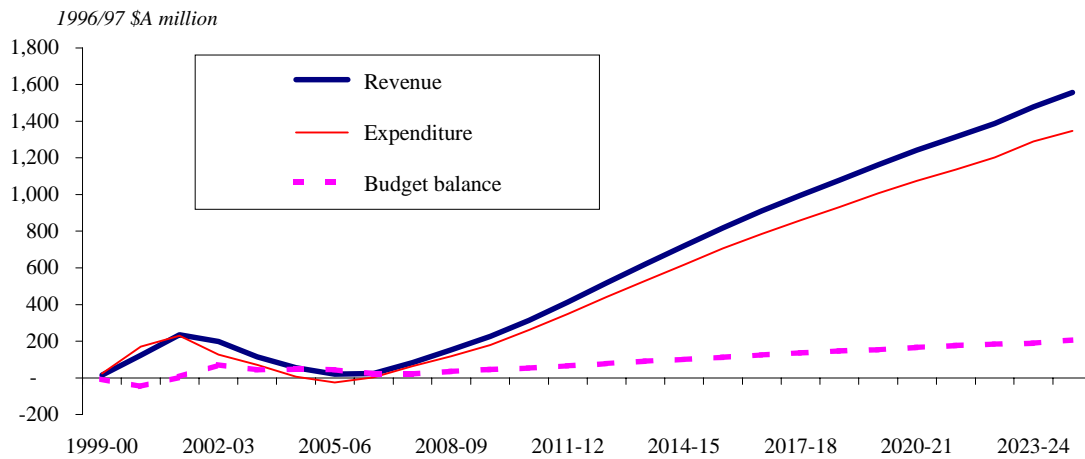


Chart 41: Base Scenario + land bridge; \$150 million grants

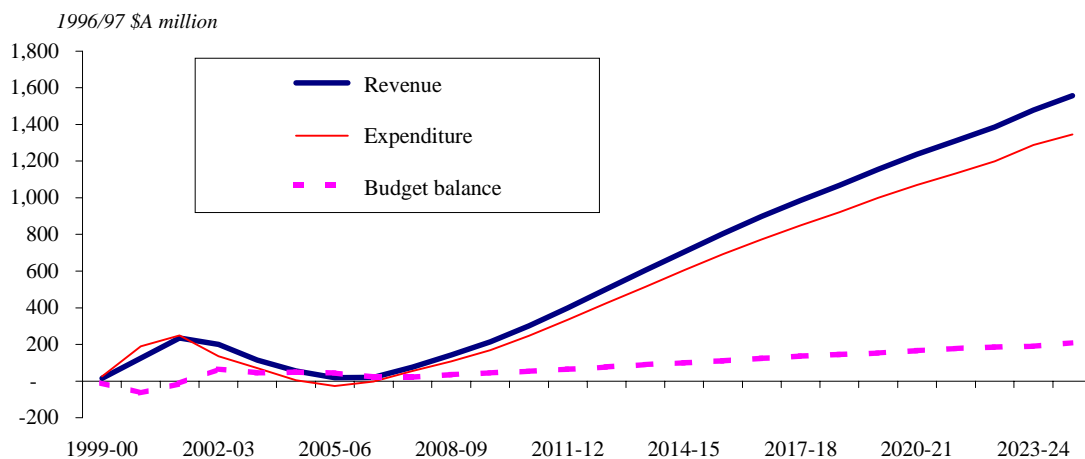
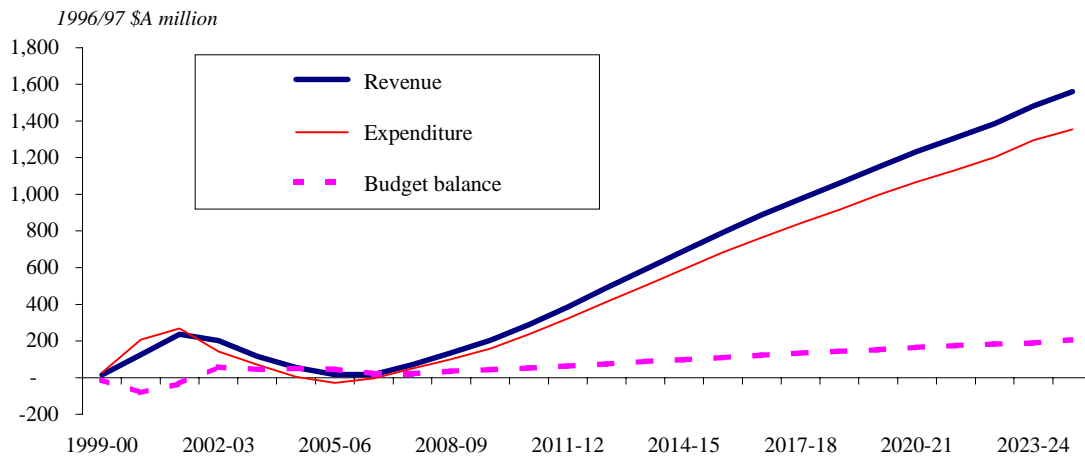


Chart 42: Base Scenario + land bridge; \$200 million grants



11.3. Charts of net impacts on SA and NT budgets

Chart 43: Impacts on State and Territory Budget deficits in the base scenario with \$100 million grants (\$1996-97 million)

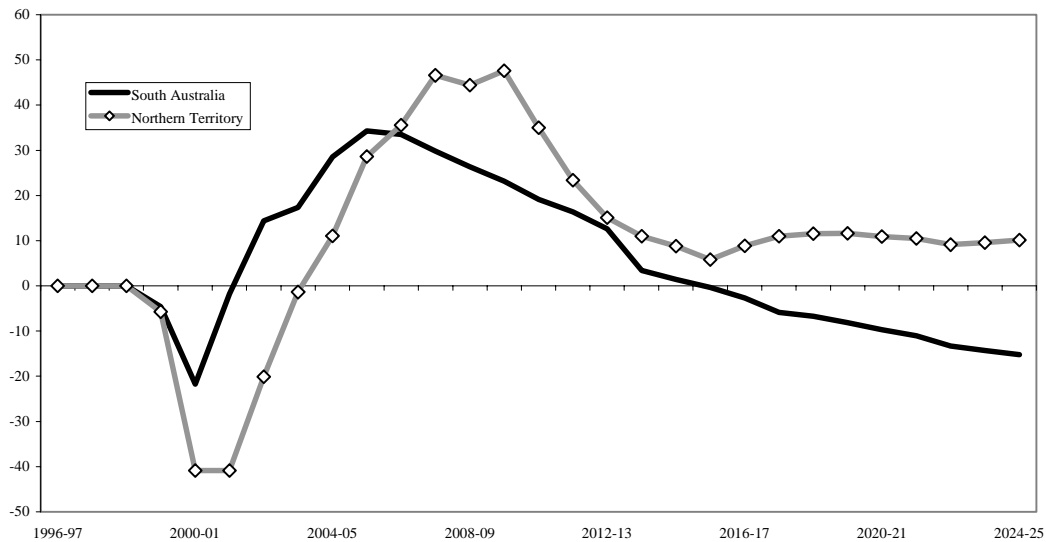


Chart 44: Impacts on State and Territory Budget deficits in the base scenario with \$150 million grants (\$1996-97 million)

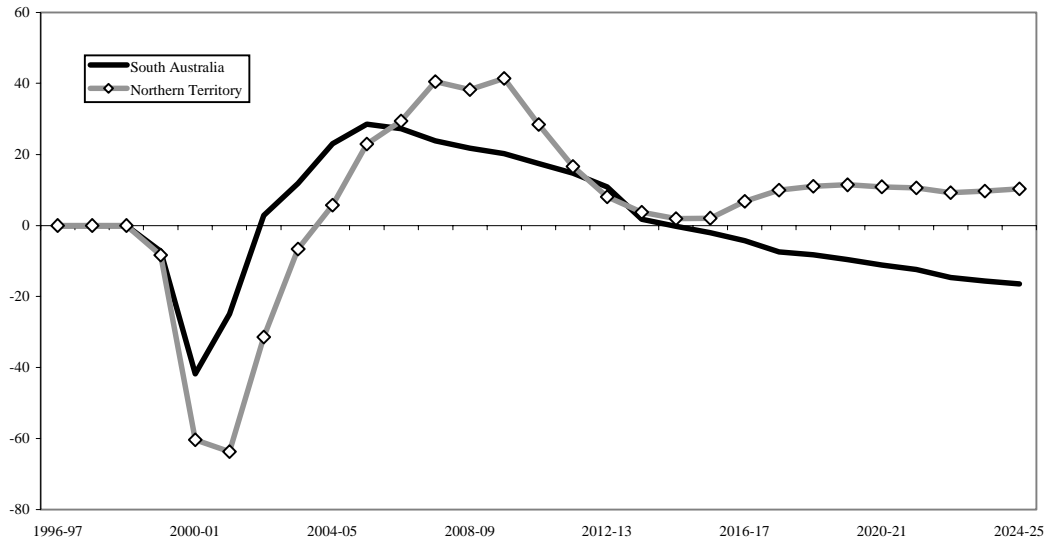


Chart 45: Impacts on State and Territory Budget deficits in the base scenario with \$200 million grants (\$1996-97 million)

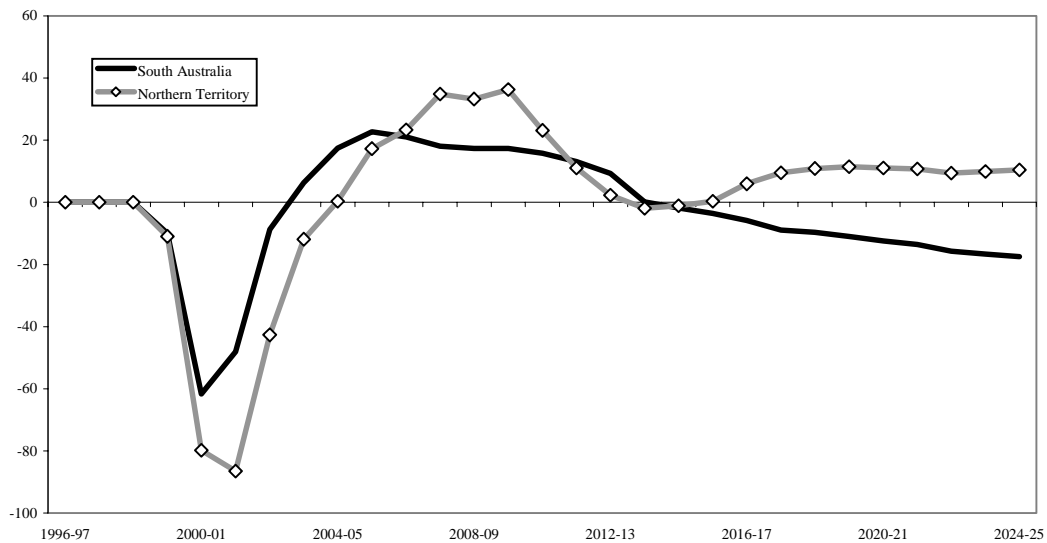


Chart 46: Impacts on State and Territory Budget deficits in the base scenario with a land bridge and \$100 million grants (\$1996-97 million)

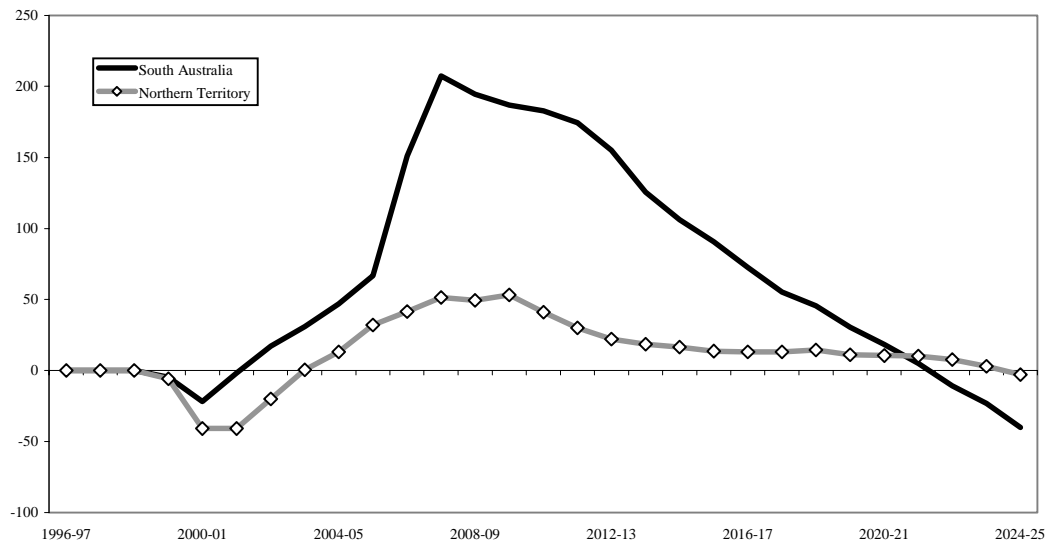


Chart 47: Impacts on State and Territory Budget deficits in the base scenario with a land bridge and \$150 million grants (\$1996-97 million)

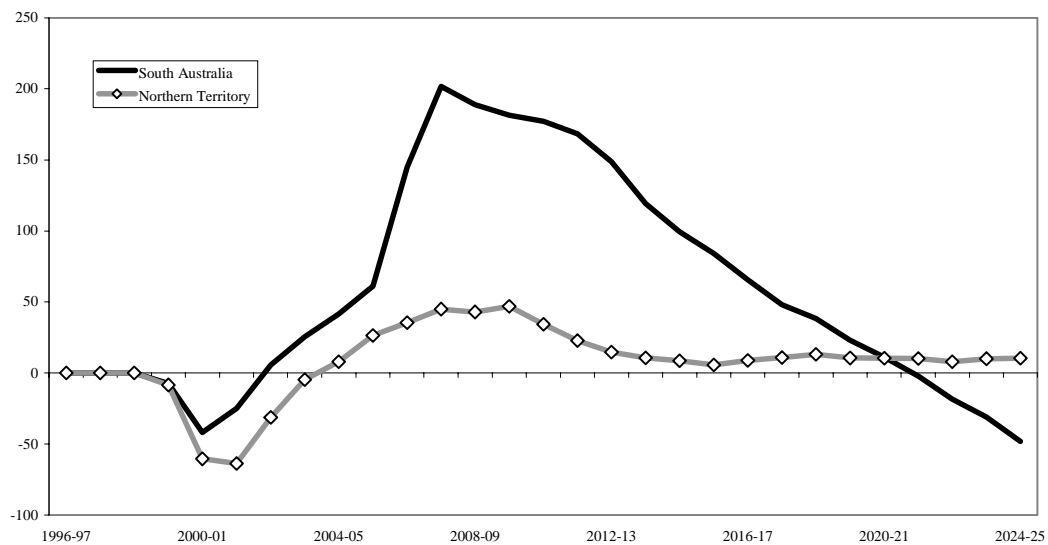
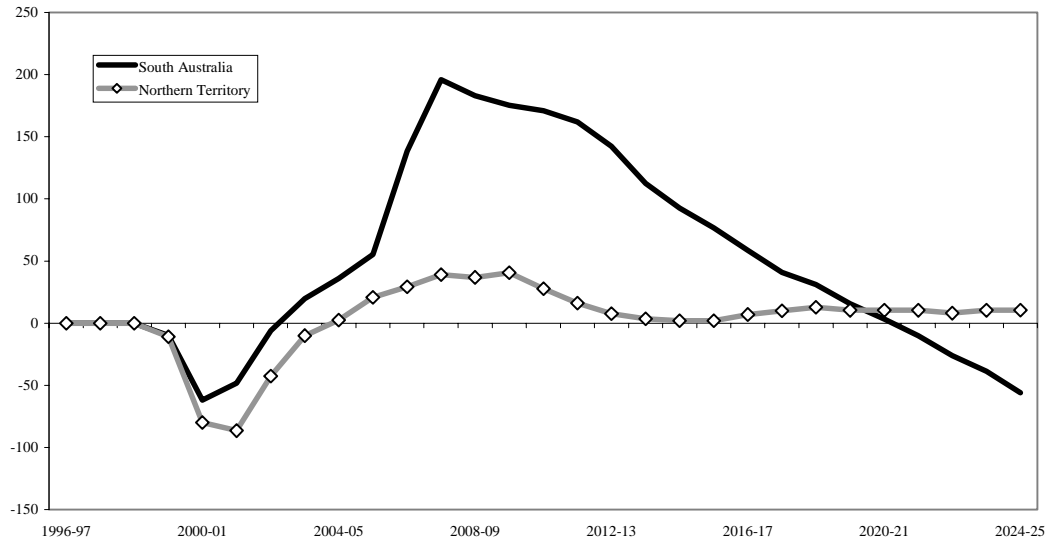


Chart 48: Impacts on State and Territory Budget deficits in the base scenario with a land bridge and \$200 million grants (\$1996-97 million)



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