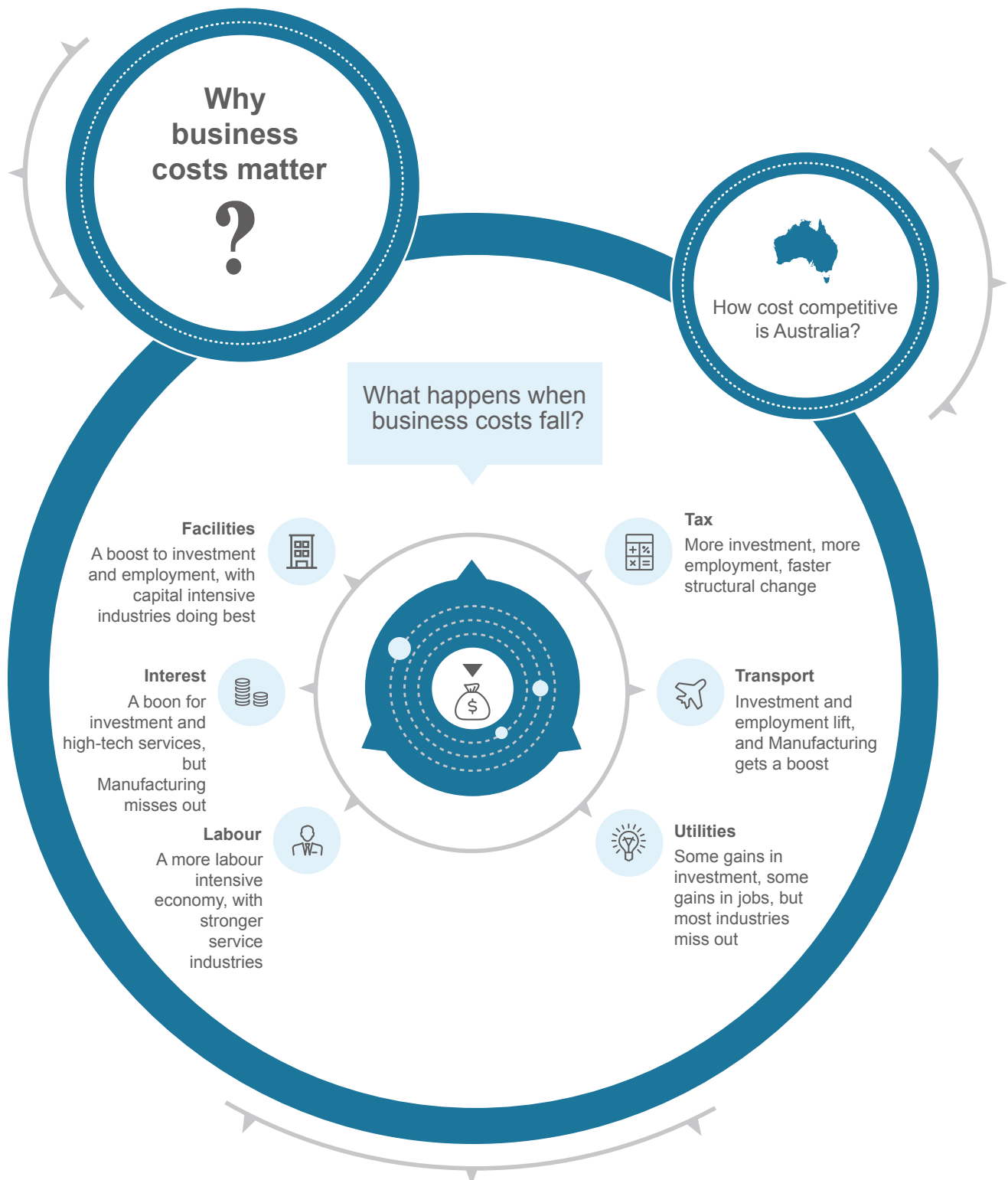


3

Reducing business costs

Examining how reducing business operating costs produce net benefits for the Australian economy, and how different types of cost reductions produce distinct advantages and disadvantages for different industries.





This chapter examines one aspect of competitiveness, namely cost competitiveness, which is the ability of a business to compete on the basis of its cost of production. A competitive advantage is obtained when a business can produce goods or services more cheaply than its competitors.

Business costs can be broken down in various ways. In this chapter we use six cost categories:

- rent and facility charges — payments to property owners for use of building and structures
- labour costs — all employee payments, including social contributions
- interest and debt charges — effectively, the cost of capital determined by the rate of interest
- transportation — costs for transport goods and people by road, rail, pipeline, water or air
- utilities — charges for the provision of electricity, gas and water
- taxes — the aggregate of company and insurance taxes.

Businesses and the wider economy can reap significant benefits if these costs can be restrained. Cost reductions are often seen as a way to create a universal benefit by increasing competitiveness and lowering living costs across the board. Cost reductions improve purchasing power for consumers; they are also regularly described as a way to move the economy toward the global frontier, generating jobs, innovation, and profitability.

This chapter examines the economy-wide impacts of different cost reductions using a Computable General Equilibrium (CGE) model. Not all cost reductions will be equivalent, because each industry has a different cost mix. CGE models are used widely to demonstrate the direct and indirect effects of a change in policy, technology, or some external factor. The purpose of the exercise is to estimate the benefits to individual industries and to the economy as a whole if cost reductions were able to be realised. Of course, for many businesses the reality they face is having to adapt to higher costs.

The department commissioned Cadence Economics to undertake economic modelling to assess the economic impact of particular cost reductions on different industries. Cadence Economics uses the Cadence Economics General Equilibrium Model (CEGEM). It is a multi-commodity, multi-region, dynamic model of the world economy³¹. Modelling for this chapter encompasses direct effects (the shock of the price fall itself) as well as indirect, second-order effects, including changes to capital supply and labour responses. These second order effects may outweigh the direct effects in some cases. Assumptions around the modelling are listed in Appendix 3.1.

The modelling scenarios were derived in the following way.

1. The impacts of a 5 per cent reduction in each of the six input costs was estimated, with reference to the overall cost of supply for each of the ANZSIC sectors.
2. These defined input cost reductions were mapped to the 17 CGE sectors.
3. The CGE model was then used to model the economy-wide impacts of the defined cost reductions.

³¹ Further information on the model can be found in Appendix 3.1.

Key results from modelling the impact of lower input costs

While some economic theories ascribe universal benefit to cost reductions, modelling suggests that the reality of cost reductions is more complex. Modelling outputs show that while the benefits of cost reductions are significant, they also tend to be rivalrous, favouring particular industries at the expense of others. Depending on what is required by the production process, firms will substitute labour for capital, move from one location to another, or otherwise re-structure their affairs in an effort to maximise their competitiveness.

Across the economy, labour costs are by far the largest cost that firms face, at 63 per cent. As a service based economy, this is not surprising. But labour costs are significant for the goods producing industries as well. After wages, transport is the next biggest economy wide outlay at 10.1 per cent. Notably, the relative importance of different costs varies between industries. 31 per cent of Manufacturing costs, for example, are spent on transport. 30 per cent of Agriculture's costs, are interest costs.

Table 3.1 shows the relative importance of different inputs across industries in 2012–13.³² For comparative purposes, it also shows (in parentheses) changes in the relative proportion of costs compared to four years before. Although input-output data should be treated with caution due to high standard errors, some trends can be observed. In particular, energy costs became more significant over the four years to 2012–13, notably in agriculture and manufacturing. Costs for transport and interest payments broadly trended down.

The ultimate outcomes of cost reductions vary widely depending on which cost is reduced.

It shows all forms of cost reduction lead to higher GDP growth. Within that broader picture, lower rent and facility costs provide strong support for employment and investment, although the benefits are concentrated among capital-intensive services and Construction. Lower interest rates support investment, but do little for employment, with the benefits being concentrated in Construction and high-tech services. In contrast, lower labour costs support a more labour-intensive and less capital-intensive economy, with benefits for labour-intensive services and losses for Manufacturing.

Lower business taxes create a solid benefit for investment and employment, with strong gains in Construction and high-tech services. Lower transportation costs support investment and employment, and also yield an unusually strong benefit for Manufacturing. Lower utility costs produce benefits for sectors reliant on electricity, gas and water.

Most cost reductions provide strong benefits to Construction and heavily capitalised services, while Manufacturing tends to record the greatest losses. This in part reflects resource switching between industries. Resource switching can also occur between inputs: reductions in wages and interest rates encourage switches between capital and labour without substantially increasing the overall rate of GDP growth.

The modelling undertaken for this chapter supports two propositions:

1. All kinds of cost reductions produce net benefits for the economy.
2. Each cost reduction produces its own distinct advantages and disadvantages at an industry level, with benefits tending to be rivalrous.

In considering policy to reduce costs, it is worthwhile making changes in accordance with a plan that anticipates side effects and links cost reduction to broader economic goals.

Table 3.2 sets out the macroeconomic effects from a five per cent cost reduction across the six cost types. For example, if transition towards an export-oriented economy is the goal, labour cost reductions would be the best option (although World Bank research suggests there may also be benefit in areas such as reducing port and other costs).³³ If the intent is to ensure primary industries and Manufacturing retain a strong place in the economy,

³² Input cost shares can also change over time. For instance, energy input costs rose faster than other costs in 14 industries since 2008-09.

³³ <http://www.doingbusiness.org/data/exploreeconomies/australia/>

reducing transportation costs should be the focus. Transition to a more capital intensive, high-tech services economy can be accelerated by reducing interest rates and curbing tax-related costs.³⁴ However, job creation is best supported with a focus on compensation of employees, facility costs, and transportation.

Table 3.1: Input cost share by industry, per cent

Industry	Rent	Interest	Labour	Tax	Transport	Utilities
Agriculture, Forestry and Fishing	13.2 (+5.8)	29.8 (−9.9)	31.9 (+2.9)	3.3 (+1.2)	15.0 (−2.5)	6.8 (+2.5)
Mining	13.6 (−1.3)	13.2 (−8.2)	46.8 (+6.7)	3.9 (+1.7)	11.8 (+0.8)	10.6 (+1.8)
Manufacturing	4.5 (+6.6)	6.0 (−0.4)	43.4 (+0.5)	1.8 (−0.7)	30.8 (+2.3)	13.5 (+4.9)
Electricity, Gas, Water and Waste	1.3 (+0.1)	14.1 (−2.0)	21.1 (−8.5)	13.8 (+11.0)	2.5 (−1.1)	47.2 (+0.5)
Construction	9.2 (−2.8)	8.1 (−0.3)	61.5 (+1.0)	3.1 (+0.1)	15.5 (+3.7)	2.6 (−1.8)
Wholesale Trade	17.3 (+8.8)	3.7 (−0.9)	58.0 (−2.3)	2.9 (+0.1)	15.9 (−5.8)	2.2 (+0.0)
Retail Trade	16.0 (+10.0)	2.0 (−2.6)	68.6 (−8.9)	3.7 (−0.1)	4.8 (−0.6)	4.9 (+2.2)
Accommodation and Food Services	16.4 (+8.6)	6.1 (−1.7)	59.6 (−6.3)	4.3 (+0.2)	6.2 (−1.9)	7.4 (+1.2)
Transport, Postal and Warehousing	11.0 (−1.7)	9.6 (−4.0)	49.7 (+2.1)	3.7 (+0.5)	22.9 (+3.4)	2.9 (−0.3)
Information Media and Telecomms	13.7 (−3.4)	13.5 (+1.8)	55.7 (+1.7)	1.9 (+0.2)	8.6 (−3.7)	6.7 (+3.4)
Financial and Insurance Services	6.7 (+0.9)	0.0 (+0.0)	81.7 (−6.6)	6.8 (+2.0)	3.6 (+2.8)	1.2 (+1.1)
Rental, Hiring and Real Estate	31.3 (+20)	17.8 (−36)	33.5 (+16.2)	7.8 (−6.7)	1.6 (−0.2)	8.2 (+6.6)
Professional, Scientific and Technical	9.4 (+0.2)	8.7 (−3.4)	70.1 (+3.5)	3.2 (+0.1)	5.5 (−1.0)	3.2 (+0.5)
Administrative and Support Services	12.8 (+0.1)	3.1 (−1.2)	72.2 (+2.6)	3.5 (+0.2)	6.1 (−2.0)	2.3 (+0.2)
Public Administration and Safety	4.6 (−1.9)	0.8 (−1.6)	80.1 (−0.5)	2.3 (−0.3)	4.8 (−1.8)	7.4 (+6.1)
Education and Training	3.1 (−1.7)	0.9 (−4.3)	90.5 (+5.2)	1.3 (+0.2)	2.8 (+0.2)	1.4 (−0.4)
Health Care and Social Assistance	1.7 (−1.8)	1.2 (−0.9)	92.0 (+4.2)	1.8 (−0.2)	2.0 (−1.4)	1.3 (−0.1)
Arts and Recreation Services	14.3 (+2.3)	3.6 (−2.6)	68.2 (+0.9)	0.5 (−1.4)	9.0 (−1.7)	4.4 (+2.5)
Other Services	6.5 (−4.5)	5.3 (−0.3)	76.2 (+5.3)	4.1 (+0.5)	6.3 (+0.5)	1.6 (−1.5)

Source: Custom ABS data

³⁴ Economy-wide Modelling for the 2016–17 Budget, Treasury, May 2016, http://www.treasury.gov.au/~media/Treasury/Publications%20and%20Media/Publications/2016/Budget%20Modelling/Downloads/PDF/160503_Economy-wide%20modelling.ashx

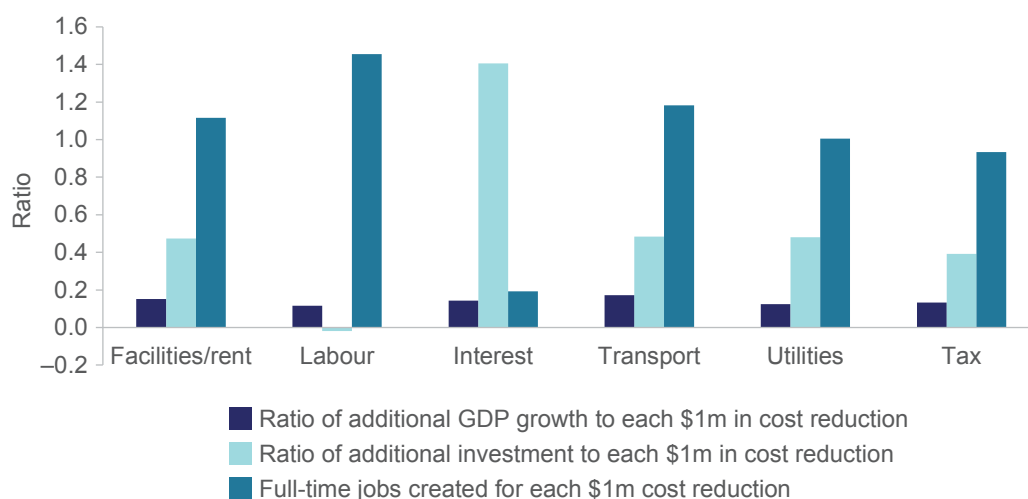
Table 3.2: Macroeconomic effects from a five per cent reduction in costs

	Variable	Facilities/ rent	Interest	Labour	Tax	Transport	Utilities
Outcomes	Share of total costs (per cent)	9.6	6.6	63.0	3.7	10.1	6.9
	Modelled cost reduction (\$m)	5,334	3,671	35,082	2,079	5,632	3,848
	Variable	Facilities/ rent	Interest	Labour	Tax	Transport	Utilities
Impact on economic variables	GDP (\$m)	807	523	4,087	277	971	544
	Consumption (\$m)	249	-730	2,673	120	379	170
	Investment (\$m)	2,525	5,158	-676	815	2,729	1,848
	Government (\$m)	-186	44	1,172	-55	-221	74
	Exports (\$m)	-1,090	-2,272	911	-303	-1,253	-1,146
	Imports (\$m)	692	1,676	-7	300	664	469
	Employment (FTE)	5,948	705	51,017	1,939	6,658	3,996

Source: Modelling results obtained from Cadence Economics

Figure 3.1 shows the proportional (as opposed to absolute) effect of cost changes on GDP, investment and employment from different cost reductions.

Figure 3.1: Ratio of economy-wide impact to cost reduction



Source: Modelling results obtained from Cadence Economics

As an example, if a cost reduction of \$1 million produces \$150,000 in additional GDP, the multiplier is 0.15. Among the various input costs, transportation inputs produce the strongest proportionate benefits to GDP (at 0.17), while tax and utility reductions produce relatively weaker outcomes.

The jobs measure for this chart also records the number of full-time equivalent jobs created for each \$1 million in cost reductions. All cost reductions produce increased employment, although the range of impacts is wide. Unsurprisingly, labour cost reductions are the most effective means to promote job growth, with interest rate cuts doing little in this regard. However, investment follows the opposite profile, being strongly supported by interest rate cuts, but actually reduced by labour cost reductions.

The following sections outline the effects of reductions in each of the six modelled costs in greater detail. Each section will outline how the results of cost reduction play out across industries, with tables recording industry-specific data for each cost input. These tables include changes to costs, industry value added, and employment for each individual industry.

Box 3.1: Australia's global cost profile

International cost data provide some context to the analysis in this chapter.

KPMG data³⁵ provide a breakdown of labour, transport, utility, facility, tax and finance costs for a range of countries. The data suggest business costs in Australia rose sharply during the resource boom as wages increased strongly without a congruent rise in productivity. Costs were also pushed up by electricity grid upgrades, when investment aimed at improving grid resilience lead to higher energy costs. After falling to 8th position (out of 10 measured countries) in 2014, Australia has subsequently recovered to 5th place in 2016. This reflects a combination of three factors:

- Wage growth has slowed, with recent quarters showing effectively nil growth in real terms. High-wage jobs connected to the Mining industry have diminished at the same time that jobs have been created in lower-wage areas such as healthcare
- Utility costs have stabilised as upward pressure on energy prices has reduced
- Record-low interest rates have reduced the cost of capital.

Australia's overall cost competitiveness increased by 9.9 per cent between 2014 and 2016. This improvement was heavily influenced by the fall of the Australian dollar relative to the value of the US dollar over this period. Figure 3.2 shows Australia's current cost profile compared to competing economies.

Like most countries, Australia's largest inputs are labour costs, which account for 62 per cent of total costs. This ratio is broadly consistent with labour costs elsewhere, although there is a notable gap between developed and developing countries (Mexico's labour costs account for only 36 per cent of the total).

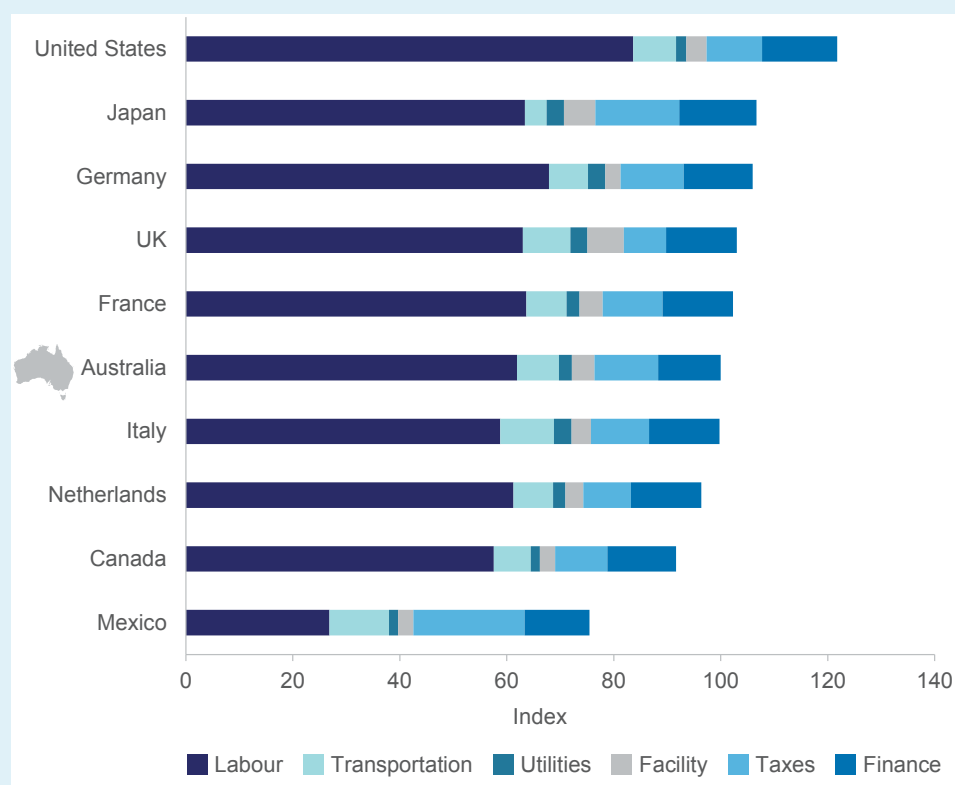
KPMG data suggest that Australia pays a slight premium on transport costs (at 8 per cent of total costs), reflecting the natural disadvantages of a large land area and thinly spread population. Taxes make up 12 per cent of business costs in Australia — behind only Japan and Mexico as a share.

While Australia is a low-taxing country overall, there is an unusually high proportion of tax levied on industry (as opposed to consumption and land). Most industries pay a relatively high cost for facility leasing — this has a particular impact on the Manufacturing industry, which is the largest user of these services. Finance and

³⁵ KPMG (2016) *Competitive Alternatives*, p. 12

utility costs sit at roughly the median level for all measured industries including digital services, corporate services, and manufacturing.

Figure 3.2: Business input cost profiles by country, 2016



Source: KPMG Competitive Alternatives Database, 2016

Work by the World Bank³⁶ provides alternative indicators that are tracking Australia's cost performance. This research suggests that Australia has a mixed and middling performance in terms of business costs. Australia remains relatively close to the leading nations in terms of ease of starting a business, although some ground was lost in 2016 when Australia's ranking dropped from 7th to 11th (out of 189 economies). Australia enjoys an efficient and cheap process for obtaining construction permits (ranking 4th), while access to credit also remains cheap (ranking 5th).

However, business costs are pushed up by border compliance, which is a significant item for many exporters. Australia ranks 89th in its ease of trading across borders. This is partly due to the distance of Australia from many trading partners. However, it also reflects issues with some port facilities and regulation.

Getting electricity is not especially fast or easy for business in Australia: the survey ranks Australia at 39th for this measure. However, supply and distribution are reliable and well-monitored once access has been established. While wages are relatively high, World Bank data suggest labour market regulation is quite well constructed and efficient in Australia relative to many other nations.³⁷

³⁶ <http://www.doingbusiness.org/data/exploreeconomies/australia/>

³⁷ *Doing Business 2016*, Australian Economy Profile, World Bank, pp. 91–92
<http://www.doingbusiness.org/data/exploreeconomies/australia/~media/giawb/doing%20business/documents/profiles/country/AUS.pdf?ver=3>

Lower rent and facility costs create solid employment and investment benefits

Facilities and rent are the aggregate of payments to Rental, Hiring and Real Estate Services. They cover all payments to property owners for the use of building and structures.

A five per cent reduction in facilities and rent creates solid benefits for value added, investment and employment. Reductions in facility costs are also the second most effective means for stimulating employment, with 1.12 full-time equivalent jobs created for each million dollars in cost reductions.

As Table 3.3 shows, the benefits are uneven at the industry level. A reduction in rent and facility costs leads to significant cost reductions across all primary industries. The cost reduction for Mining is particularly significant (–\$391 million) due to that industry's unusual dependence on fly-in fly-out workers, which requires upkeep of a large amount of temporary accommodation. Manufacturing and Agriculture, Forestry & Fishing, being capital intensive, record a marked benefit from lower facility costs as well.

Table 3.3: Industry changes from a five per cent reduction in rent/facility costs

Industry	Cost reductions (\$m)	Value added (\$m)	Employment (FTE)
Agriculture, Forestry & Fishing	–153	–63	–415
Mining	–391	–190	–285
Manufacturing	–212	–298	–2,052
Electricity, Gas, Water & Waste	–35	–33	–99
Construction	–482	599	4,971
Wholesale Trade	–596	153	1,131
Retail Trade	–526	135	999
Accommodation & Food Services	–291	75	552
Transport, Postal & Warehousing	–398	37	201
Information Media & Telecommunications	–178	14	38
Financial and Insurance Services	–190	–118	–688
Rental, Hiring & Real Estate	–630	496	2,572
Professional, Scientific & Technical	–432	340	1,764
Administrative & Support Services	–295	232	1,207
Public Administration & Safety	–187	–195	–1,819
Education & Training	–103	–107	–1,000
Health Care & Social Assistance	–78	–81	–757
Arts & Recreation Services	–73	–88	–172
Other Services	–85	–102	–201
Total	–5,334	807	5,948

Source: Modelling results obtained from Cadence Economics

Among service industries, the largest cost reductions flow to Rental, Hiring & Real Estate³⁸, reflecting a greater benefit from higher use of its services. Industries with large floor space — notably Wholesale Trade and Retail Trade — are also expected to benefit from a substantial cost saving. Given the competitive, consumer-facing nature of these industries, such benefits are likely to be passed on rapidly, leading to lower consumer prices. Other service industries such as Professional, Scientific & Technical Services also record a notable cost reduction due to their capital intensity.

While the cost reduction is nearly universal, the benefit for value added tends to favour service industries at the expense of primary industries. The model suggests that initial benefits translate into a higher Australian dollar, which then produces the fall in exports of around \$1 billion annually. The model predicts that investment flows subsequently divert away from primary industries due to lower trade competitiveness.

Construction records notable benefits to both input costs and value-added. The model estimates that higher investment encourages greater spending on buildings and structures by a range of industries. In effect, this creates a broader and more resilient uplift for construction relative to the narrow, resource or housing-based demand that has characterised the past 10 years. There may also be a 'virtuous cycle' occurring, in which lower facility costs encourage greater construction, leading to further falls in rent and facility costs as the supply of fitted-out premises increases.

Labour cost reductions encourage a pronounced resource shift between capital and labour

Labour costs represent the total remuneration to employees in return for work done by employees during the accounting period. They include wages and salaries as well as social contributions. The model also counts the additional statutory labour costs created by labour and payroll taxes. Compensation of employees accounts for just over 60 per cent of total input costs. Accordingly, even small changes create significant flow-on effects throughout the economy.

A reduction in labour costs creates powerful incentives for a shift in resources between capital and labour. Overall, a five per cent fall in labour costs would be expected to create more than 50,000 jobs. Although full-time equivalent jobs pick up strongly (with growth of 1.45 full-time equivalent jobs per \$1 million in cost reductions), there is far less benefit for overall value added (+\$0.12 million per \$1 million in cost reductions). In effect, resource switching between capital and labour changes the source of economic output without necessarily increasing it.³⁹

As Table 3.4 shows, while employment growth is significant, it is not homogenous across industries. Growth is expected to concentrate in industries that are growing most rapidly to begin with. Strong growth in employment for labour intensive sectors such as Healthcare, Education and Other Services reduces the pool for hiring in other industries. At the same time, lower capital spending leads to a net loss in value added for Manufacturing and Construction, who typically supply capital inputs.

³⁸ Results for Rental, Hiring & Real Estate should be treated with caution. Changes in rent costs are not fully accounted for in the model, and changes to rental costs are likely to affect this industry differently from others. It is likely that value-added benefits to Rental, Hiring & Real Estate are overstated.

³⁹ Labour elasticity within the model is at the lower end of typical estimates for this measure.

Table 3.4: Industry changes from a five per cent reduction in employee compensation costs

Industry	Cost reductions (\$m)	Value added (\$m)	Employment (FTE)
Agriculture, Forestry & Fishing	-367	-267	-2,756
Mining	-1,345	644	1,775
Manufacturing	-2,033	-427	-9,434
Electricity, Gas, Water & Waste	-575	55	153
Construction	-3,231	-178	-4,126
Wholesale Trade	-2,002	206	2,895
Retail Trade	-2,254	232	3,260
Accommodation & Food Services	-1,054	109	1,524
Transport, Postal & Warehousing	-1,794	173	1,740
Information Media & Telecommunications	-726	108	531
Financial and Insurance Services	-2,313	37	-3,584
Rental, Hiring & Real Estate	-674	95	2,227
Professional, Scientific & Technical	-3,215	454	10,617
Administrative & Support Services	-1,665	235	5,499
Public Administration & Safety	-3,275	343	4,419
Education & Training	-3,098	325	4,180
Health Care & Social Assistance	-4,116	431	5,553
Arts & Recreation Services	-351	394	6,919
Other Services	-996	1,117	19,623
Total	-35,082	4,087	51,017

Source: Modelling results obtained from Cadence Economics

Employment outcomes are mixed, although the lack of strong output growth is virtually universal across industries. Reduced labour costs create a large cost saving for primary industries and labour-intensive service industries including Construction, Health Care, Education, Public Administration, and Retail Trade. However none of these industries (except Mining and Other Services, who face minimal risk of being crowded out) appear to gain much benefit to production.

Consumer behaviour changes subtly under a lower wage outcome, with a shift away from imported goods towards domestic consumption. This is a product of the high degree of cost reduction received by domestic industries, which improves the competitiveness of domestically produced items.

The predictions of this modelling are reflected by various current trends in the economy. Wage growth has effectively been zero in real terms over the past 12 months⁴⁰: a time when investment also has been lacklustre⁴¹ and employment growth has picked up more rapidly than broader economic conditions would have ordinarily implied⁴². Should labour input costs start to fall, this existing trend would be magnified.

⁴⁰ ABS cat. no. 6345.0 (March 2016), *Wage Price Index*, key figures

⁴¹ ABS cat. no. 5625.0 (March 2016), *Private New Capital Expenditure and Expected Expenditure*, Australia, key figures

⁴² ABS cat. no. 6202 (May 2016), *Labour Force Survey*, key figures

Lower interest rates support investment, but produce only a muted benefit for employment

Lower interest costs effectively model a small cut (of around 8 basis points) in official interest rates. This variable is under the control of the RBA and can be affected only in highly indirect ways through traditional policy measures.

Changes in interest rates create an unusual benefit profile, overwhelmingly favouring investment, which is expected to rise by \$1.4 million for each \$1 million in cost reduction. This reflects the fact that lower interest rates directly reduce the cost of capital. In effect, this creates the opposite outcome to that brought about by lower labour costs.

There is a far more muted benefit to job creation, with hiring rising by only 0.19 FTE per \$1 million in cost savings. This makes reductions in interest rates the least effective means to stimulate job creation among the various input costs.

As Table 3.5 shows, the vast bulk of gain is to the Construction industry, largely because lower interest rates encourage development of buildings and structures by other industries and consumers. Industries with a close connection to Construction — notably Rental, Hiring & Real Estate — draw a spill-over benefit as the number of business and residential premises under management increase.

Table 3.5: Industry changes from a five per cent reduction in interest costs

Industry	Cost reductions (\$m)	Value added (\$m)	Employment (FTE)
Agriculture, Forestry & Fishing	-343	62	-97
Mining	-380	-801	-806
Manufacturing	-279	-249	-2,429
Electricity, Gas, Water & Waste	-385	56	-411
Construction	-428	1,645	7,763
Wholesale Trade	-129	117	-229
Retail Trade	-66	60	-118
Accommodation & Food Services	-108	98	-193
Transport, Postal & Warehousing	-347	129	-1,397
Information Media & Telecommunications	-176	-12	58
Financial and Insurance Services	0	-333	1,216
Rental, Hiring & Real Estate	-358	398	-1,305
Professional, Scientific & Technical	-397	442	-1,447
Administrative & Support Services	-71	79	-258
Public Administration & Safety	-33	-36	-85
Education & Training	-30	-33	-77
Health Care & Social Assistance	-54	-58	-136
Arts & Recreation Services	-18	-218	137
Other Services	-70	-823	518
Total	-3,671	523	705

Source: Modelling results obtained from Cadence Economics

The model suggests that the additional capital investment spurred by lower interest rates is directed overwhelmingly to the industries with the most existing capital intensity. Highly capital-intensive industries such as Professional, Scientific & Technical Services and Agriculture, Forestry & Fishing are well placed to benefit from a lower cost of capital. However, there are negligible-to-poor outcomes for other industries. These modelling outcomes offer a partial explanation as to why recent interest rate cuts may have yielded minimal benefit for manufacturing and labour-intensive service industries.

Investment demand leads to a surge in imports. This reflects the greater demand for imported capital, spurred on by the lower capital cost. However, exports record little immediate benefit, and the consequent deterioration in net trade leads to a lower benefit to GNP than might have been expected. Over time, interest rates may affect economic growth and inflation more generally, but there is a notable lag due to this initial worsening in net trade.

Reductions in transport costs support investment and employment, with strong manufacturing benefits

Transportation inputs include business use of road, rail, pipeline, water, air, port handling and transport insurance, as well as the margin on supply of these facilities. Transportation inputs are used most significantly by primary industries and Construction.

Reductions in transportation costs are linked to a significant profile of benefits. Cheaper transportation inputs produce a strong employment outcome (1.18 full-time equivalent jobs per \$1 million in cost savings), as well as solid benefits for investment. The value-add benefit is slightly more muted, but only because benefits up and down the supply chain are not captured by the model, meaning benefits to GDP are probably understated. Higher investment also leads to higher capital imports, which national accounts statistics treat as a detraction from GDP.

Cheaper transportation costs support a structural shift towards a more investment and export driven growth model. This helps to accelerate economic shifts already underway, and insulates Australia somewhat from domestic economic shocks.

Unlike other input cost reductions, a lowering of transportation costs creates striking and clear benefits for the Manufacturing industry. Manufacturing is a high user of transport, and lower transport input costs offset the 'tyranny of distance' and improve export competitiveness. They also allow for more rapid movement of goods, easing bottlenecks and increasing the ability to respond to changes in demand. Improvements in the supply chain are non-rivalrous and do not create risks of Manufacturing being 'crowded out' by other sectors. Benefits are likely to grow over time as the supply chain used by manufacturers becomes more globally integrated and complex.

As Table 3.6 shows, public investment to remove bottlenecks and improve transport infrastructure also produces benefits to Mining value added. However, it also allows Mining to reduce its employment, likely through a reduction of resources to its specialised transport functions.

Table 3.6: Industry changes from a five per cent reduction in transport costs

<i>Industry</i>	<i>Cost reductions (\$m)</i>	<i>Value added (\$m)</i>	<i>Employment (FTE)</i>
Agriculture, Forestry & Fishing	-172	-36	-219
Mining	-341	-483	-616
Manufacturing	-1,443	669	3,578
Electricity, Gas, Water & Waste	-67	-2	-55
Construction	-813	722	5,026
Wholesale Trade	-547	188	978
Retail Trade	-158	54	283
Accommodation & Food Services	-109	37	194
Transport, Postal & Warehousing	-827	726	3,500
Information Media & Telecommunications	-112	-12	-103
Financial and Insurance Services	-103	-270	-1,530
Rental, Hiring & Real Estate	-32	29	96
Professional, Scientific & Technical	-253	231	769
Administrative & Support Services	-141	129	429
Public Administration & Safety	-196	-292	-2,423
Education & Training	-97	-145	-1,202
Health Care & Social Assistance	-90	-134	-1,110
Arts & Recreation Services	-47	-160	-338
Other Services	-82	-282	-597
Total	-5,632	971	6,658

Source: Modelling results obtained from Cadence Economics

Construction, which is a large user of transportation infrastructure (particularly road transport) benefits strongly both in value added and employment terms. This is partly due to the direct advantages created by cost reductions. However, it also reflects the likelihood that cost reductions created by greater public investment leave more room and funds for private spending on infrastructure. Both public and private spending support construction directly by increasing demand.

Transport, Postal & Warehousing also attains significant (and unsurprising) benefits, being the primary users of economic infrastructure. Other service industries gain in smaller amounts, since much of the product of such industries is delivered digitally or in other ways that require less direct use of traditional transport.

Lower utility costs produce benefits in energy-intensive sectors

Utility costs encompass all forms of spending by businesses on electricity, gas and water supply. While this is a relatively small input cost overall (6.9 per cent), it comprises a more significant share of input costs for Mining (10.6 per cent) and Manufacturing (13.5 per cent), and, for obvious reasons, makes up the highest share of costs in Electricity, Gas and Water (47.2 per cent).

Changes to utility costs appear to yield a relatively muted benefit for the economy. A five per cent reduction in utility costs is estimated to increase total employment by just under 4,000 full-time equivalent jobs across the entire economy.

Lower utility costs create a slightly stronger benefit for investment, although this is less than gains through reductions in rent and facilities, transport, and interest rates. While cheaper energy leads to higher capital imports, there is no offsetting benefit to exports, which leads to a deterioration in net trade.

As Table 3.7 shows, economic benefits are highly concentrated in energy intensive sectors including Manufacturing, Construction, and Electricity, Gas and Water. Energy costs have been elevated in recent years by an increase in investment aimed at improving grid resilience, and to a lesser extent, through emission reduction programmes.

Table 3.7: Industry changes from a five per cent reduction in utility costs

Industry	Cost reductions (\$m)	Value added (\$m)	Employment (FTE)
Agriculture, Forestry & Fishing	-78	-29	-181
Mining	-305	-127	-128
Manufacturing	-631	306	1,741
Electricity, Gas, Water & Waste	-1,284	204	485
Construction	-138	412	3,066
Wholesale Trade	-78	24	130
Retail Trade	-160	50	269
Accommodation & Food Services	-131	41	219
Transport, Postal & Warehousing	-106	-19	-166
Information Media & Telecommunications	-87	1	-28
Financial and Insurance Services	-34	-163	-938
Rental, Hiring & Real Estate	-164	77	272
Professional, Scientific & Technical	-145	68	240
Administrative & Support Services	-54	25	88
Public Administration & Safety	-303	-35	-371
Education & Training	-48	-6	-58
Health Care & Social Assistance	-59	-7	-72
Arts & Recreation Services	-23	-146	-301
Other Services	-21	-131	-271
Total	-3,848	544	3,996

Source: Modelling results obtained from Cadence Economics



Lower utility prices create significant benefits to the Construction industry, although the benefit to employment appears to outweigh the benefit to value added. This suggests that the Construction industry could respond to lower utility costs by engaging in less capital intensive and more labour intensive techniques. This behavioural response was also noted in the resources industry at a time when high global demand encouraged the use of less efficient methods for resource extraction.

Most other industries record little to no change in their costs, output or employment.

Tax reductions support services and divert resources away from primary industries

For the purposes of the Cadence CGE model, 'taxes' are company and insurance taxes. Income and payroll taxes are modelled as a labour cost, while tariff costs are not captured. The relationship between taxes and economic growth is highly complex, and modelling results in this area should be taken as indicative only. The tax reduction modelled in this chapter is a simple cut in tax revenue collected by the government.

Company taxes are a relatively small input cost, but are notable for being a cost entirely created by government. Reductions in company tax lead to improved value added by removing deadweight costs. Company taxes deter foreign investors, and also reduce the pool of domestic funds a business has available to invest in itself. This leads to lower capital investment and less ability for firms to capitalise on economies of scale. Taxes also encourage firms to structure themselves to minimise tax rather than most efficiently meet the demands of a market.

As Table 3.8 shows, a reduction in these distortions is expected to yield a balanced and beneficial result, with payoffs to employment and investment. This is similar to results suggested by Treasury modelling, which looked at the incidence of company tax in Australia.⁴³ Most research suggests that company tax has an impact first and foremost on wage and salary earners. The modelling results indicate that a small (5 per cent) reduction in business taxes leads to an increase in employment by around 2,000 full-time equivalent jobs, with 1.45 jobs created for each \$1 million saved.

⁴³ Treasury (2014) The incidence of company tax in Australia, *Economic Roundup*, issue 1



Table 3.8: Industry changes from a five per cent reduction in tax costs

Industry	Cost reductions (\$m)	Value added (\$m)	Employment (FTE)
Agriculture, Forestry & Fishing	-38	-19	-115
Mining	-112	-67	-86
Manufacturing	-82	-68	-394
Electricity, Gas, Water & Waste	-376	82	222
Construction	-162	211	1,681
Wholesale Trade	-99	22	174
Retail Trade	-123	28	215
Accommodation & Food Services	-76	17	133
Transport, Postal & Warehousing	-134	14	98
Information Media & Telecommunications	-25	-2	2
Financial and Insurance Services	-192	27	174
Rental, Hiring & Real Estate	-156	75	398
Professional, Scientific & Technical	-146	70	373
Administrative & Support Services	-81	39	207
Public Administration & Safety	-95	-58	-498
Education & Training	-45	-28	-237
Health Care & Social Assistance	-79	-48	-414
Arts & Recreation Services	-2	-1	0
Other Services	-53	-17	5
Total	-2,079	277	1,939

Source: Modelling results obtained from Cadence Economics

The model suggests that existing issues around job losses in Manufacturing and Agriculture, Forestry & Fishing are exacerbated by the change. This is because primary industries, which have relatively low levels of profitability, gain relatively less from a lower profits tax. When resource switching to other industries is factored in, these industries face a small net negative outcome from lower taxes. This resource switching comes about because industries that were already the most profitable — notably Construction, Utilities, Rental, Hiring & Real Estate, and Professional, Scientific & Technical Services — inherently gain the most from a lower tax on profits, which enhances their relative competitive advantage. Modelling suggests they are subsequently able to attract a greater share of total investment and a greater choice of qualified employees.

Government-linked sectors including Health Care & Social Assistance, Education & Training, and Public Administration & Safety also gain little from a lowering of tax on private profit.

As with most other input cost reductions, Construction is a key beneficiary. While the Construction industry is not among the most profitable at present, the model predicts significant flow-on benefits from the higher rate of investment by other, more profitable industries. Building and structure investment by Professional, Scientific & Technical services, Utilities, and Rental, Hiring & Real Estate services is already providing significant benefit to Construction: this benefit is enhanced as more of this kind of investment becomes feasible. The results suggest that a company tax cut would bolster frontier industries and industries connected to them, accelerating the pre-existing resource and structural shifts already underway in the economy.

What measures can be applied to reduce costs?

Cost reductions in any of the six business input costs examined in this chapter improve the workings of the economy, leading to increases in economic activity and employment.

There is no magic wand to wave that can reduce business costs by five per cent as we have hypothetically modelled. Indeed, the reality that businesses face on a day-to-day basis is one of *rising* costs and working out how they might adapt to these. It is precisely in this adaptation process that some businesses find ways of containing costs — for example, by embracing new digital technologies — and this is sufficient to give them an edge over their competitors and seize some additional market share and increase revenues and profits.

When we add up all of the instances where this occurs across the more than two million businesses in Australia, what we see is the underlying dynamic of competitive pressures generating productivity growth. It is productivity growth that foremost puts downward pressure on business costs and generates gains for consumers through lower prices and better quality goods and services. All else equal, growth in labour productivity will reduce labour costs, improvements in energy efficiency will reduce utilities costs, and innovations in business processes will reduce facilities costs.

Government plays a direct role in certain input costs. For instance, public institutions set the cash interest rate and the national minimum wage. The provision of infrastructure by government can lower transport and other costs by removing bottlenecks. But by far the most important role for government is to set an institutional environment in which competition flourishes. That means understanding the impact that company taxes and payroll taxes have on the incentives for businesses to grow, and striking the right balance in regulation between protection (of consumers, the environment and from predatory behaviour of other businesses) and promotion of entrepreneurship and innovation.

Appendix 3.1: The CEGEM model

CEGEM is a multi-commodity, multi-region, dynamic model of the world economy. Like all economic models, CEGEM is based on a range of assumptions, parameters and data that constitute an approximation to the working structure of an economy. Its construction has drawn on the key features of other economic models such as the global economic framework underpinning models such as Global Trade Analysis Project (GTAP) and Global Trade and Environmental Model (GTEM), with state and regional modelling frameworks such as Monash-MMRF and TERM.

Labour, capital, land and a natural resource comprise the four factors of production. On a year-by-year basis, capital and labour are mobile between sectors, while land is mobile across agriculture. The natural resource is specific to mining and is not mobile.

A representative household in each region owns all factors of production. This representative household receives all factor payments, tax revenue and interregional transfers. The household also determines the allocation of income between household consumption, government consumption and savings.

Capital in each region of the model accumulates by investment less depreciation in each period. Capital is mobile internationally in CEGEM where global investment equals global savings. Global savings are made available to invest across regions. Rates of return can differ to reflect region specific differences in risk premiums.

The model assumes that regional labour markets operate in an environment where employment and wages adjust in each year so that, for example, if there is an increase in the demand for labour, the real wage rate increases in proportion to the increase in employment from its base case forecast level. The coefficient of adjustment is chosen so the employment effects of a shock are largely eliminated after about ten years. Labour supply is determined by demographic factors. The modelling scenarios used a labour supply elasticity of 0.1, which suggests a relatively tight labour market.

CEGEM determines regional supplies and demands of commodities through optimising behaviour of agents in perfectly competitive markets using constant returns to scale technologies. Under these assumptions, prices are set to cover costs and firms earn zero pure profits, with all returns paid to primary factors. This implies that changes in output prices are determined by changes in input prices of materials and primary factors.

The advantage of a global model such as CEGEM is that it accounts for bilateral trade flows of all commodities between regions. Goods are imperfect substitutes, implemented through the Armington assumption. The model does not require the regional current account to be in balance as the capital account can adjust to maintain balance of payments equilibrium.

The following should be taken into account when assessing modelling outputs:

- Benefits up and down supply chain aren't captured by the model. This likely leads to understating the benefits of changes to transportation costs
- Limitations may occur to the underlying features of the model (fixed vs. relative prices, fixed ratios of intermediate inputs etc.)
- There is a risk that some labour costs and fuel costs could be double counted between 'transport' and 'utilities/labour'.
- Materials as an input is not captured. For industries such as Manufacturing and Accommodation & Food Services, this is the most important input.

Base data

The starting point for the base data in CEGEM is the global database produced by the GTAP. This database is comprised of 140 country and regional groups and 57 production sectors. The Australian component of this database was supplied by the Productivity Commission, and is based on Australian input-output tables produced by the ABS.

For the purposed of this exercise, the database has been aggregated to the 17 sectors and two modelling regions shown in Table 3.9.

Table 3.9: Sectors and Regions in CEGEM

<i>Number</i>	<i>Sector</i>	<i>Number</i>	<i>Region</i>
1	Agriculture	1	Australia
2	Coal	2	Rest of the world
3	Oil		
4	Gas		
5	Other minerals		
6	Manufacturing		
7	Iron		
8	Electricity		
9	Water		
10	Construction		
11	Trade		
12	Transport		
13	Communications		
14	Finance		
15	Other business services		
16	Recreation and other Services		
17	Government, Education and Health		

Source: Obtained from Cadence Economics

Scenario development

To develop the cost reduction scenarios as described in the chapter the following procedure was implemented:

1. Estimated the impact a 5 per cent reduction in each of the defined input costs had on the overall cost of supply for each of the ANZSIC sectors (using the scope of costs as set out in Table 3.10).
 2. Mapped these defined input cost reductions to the 17 CGE sectors described in Table 3.9.
 3. Used the CGE model to model the economy-wide impacts of the defined cost reductions.
- Table 3.10 provides an account of how each of the defined inputs costs were defined. Generally, they were assessed using the latest input-output table as provided by the ABS. For example, wages were defined as the Compensation of Employees for each of the industries as defined in the input-output table. Results from the model are not scalable. It may be possible to infer the impact of a small deviation (say 5.5% or 6%) from the 5% modelled reduction. But some variables are too elastic or inelastic to respond with perfect scalability if the price shock was substantially different (i.e., doubled to 10 per cent, or reversed to a 5 per cent increase).

Where the defined cost is not well-specified in the input-output table, we used the *Australian Industry* (ABS publication) to attain more detail.

Table 3.10: Cost reduction scenarios and the impact on cost reductions

Defined input cost	Scope of cost
Facilities	ANZSIC Division L: Rental, Hiring & Real Estate services
Finance/ interest costs	Interest Expenses [^]
Taxes	Other taxes less subsidies on production
Transportation	All transportation inputs including margin on supply **
Utilities	All utilities inputs including the margin on supply***
Wages	Compensation of Employees in the 2012–13 Input Output table*

* Source: cat. no. 5209.0.55.001 *Australian National Accounts: Input-Output Tables — 2012–13*

** Transport margins on supply include, road, rail, pipeline, water, air, port handling and marine insurance

*** Utilities margins on supply include gas and electricity

[^] Source: cat. no. 8155.0 *Australian Industry*, 2013–14 (Table 4)