

**MODELLING THE ECONOMIC AND
EMPLOYMENT IMPACTS OF VARIOUS
SCENARIOS FOR INCREASES IN MINIMUM
WAGES**

This report was prepared for the
Department of Employment and Workplace Relations
by Econtech Pty Ltd.

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Executive Summary

The Australian Fair Pay Commission (AFPC) has been established to review minimum wages to promote the economic prosperity of Australia. The Commission was established under the *Workplace Relations Amendment (WorkChoices) Act 2005* as a statutory body independent from the Australian Government. The main functions of the AFPC are as follows:

- set and adjust the federal minimum wage;
- set and adjust minimum classification rates of pay in Australian Pay and Classification Scales (i.e. awards);
- set and adjust the federal minimum wage for juniors, trainees (including school-based apprentices) and employees with disabilities;
- set and adjust minimum wages for piece workers; and
- set and adjust casual loadings.

In setting minimum wages the AFPC must have regard to employment and competitiveness across the economy and the capacity for the unemployed and low paid to obtain and remain in employment while at the same time providing a safety net for the low paid.

The AFPC's first minimum wage determination is scheduled for later this year. As well as conducting economic and social research the AFPC is also planning to consult with interested organisations (e.g. business, industry groups, unions, welfare groups, government agencies) and individuals. To this end, AFPC has invited written submissions from both organisations and individuals to help inform its first minimum wage determination.

The Department of Employment and Workplace Relations (DEWR) is preparing to lodge a submission for the Commission's first minimum wage determination. As part of this submission, DEWR commissioned Econtech to estimate the potential economic impacts of four hypothetical minimum wage rate increase scenarios. The economic impacts cover variables such as GDP, employment, unemployment, labour productivity and consumption at the national, industry and regional levels. These national, industry and regional impacts were estimated using Econtech's Murphy Model Regional (MMR) Model, which is multi-region, multi-industry model of Australia. It belongs to the family of Computable General Equilibrium (CGE) models.

The four hypothetical wage increases differ according to whether they take the form of a flat dollar amount or percentage increase, and whether they apply to lower Australian Pay and Classification Scales (APCS) wages or all APCS wages. Importantly, the four scenarios do not represent recommendations by DEWR. Instead they are intended to provide a rule-of-thumb indication of the potential economic impacts of certain types of wage increases. In keeping with this rule-of-thumb approach, the magnitudes of the hypothetical increases are arbitrary. The likely impacts of any proposed increase can be inferred by simply re-scaling the results for the applicable scenario (because MMR's responses are approximately linear).

The hypothetical scenarios are as follows:

- Scenario 1 – the lowest one-third of APCS wages in Australia is increased by 10 cents per hour.
- Scenario 2 – the lowest one-third of APCS wages in Australia are increased by 1 per cent.
- Scenario 3 – all APCS wages in Australia are increased by 10 cents per hour.

- Scenario 4 – like the previous scenario, all APCS wages in Australia are increased under this scenario but this time by 1 per cent.

To undertaken these wage increase scenarios, different estimates of the increase in labour costs for each scenario need to be calculated. These estimates in labour costs are then used as inputs into the modelling to determine the impact on GDP, employment, unemployment, labour productivity and consumption at the national, industry and regional levels. The labour cost increase by industry consists of both direct and indirect contributions.

The direct contributions represent the increase in APCS wages under the four scenarios. It is estimated as the difference between the average APCS wage in each industry and the hypothetical average APCS wage in each industry under the four scenarios. This is weighted by the number of APCS-reliant workers in each industry to get an estimate of the total increase in labour costs by industry for each scenario.

The indirect contributions represent the flow-on effects of higher federal minimum and APCS wages to the wages of employees on agreements. Although the ratio of the flow-on effects varies between industries, in aggregate, it is assumed that each 5 per cent increase in APCS wages translates to a 1 per cent increase in the wages of employees on agreements. This flow-on estimate is based on a study by Dixon, Madden and Rimmer (2005), a report that accompanied last year's Commonwealth Safety Net Review submission.

In determining the individual industry flow-on effects it seems reasonable to assume that the ratio of the flow-on of increases in APCS wages to agreement wages is larger when the gap between the average wages of the two different pay setting methods is smaller. To calculate this flow-on by industry, the variance of the difference in average wages of each industry from the total difference average determines the size of the flow-on for each industry effects.

Table A provides a summary of the estimates of the increase in labour costs for the four scenarios.

Table A
Estimates of Labour Cost Increases by Industry (deviations from Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	0.05%	0.07%	0.13%	0.20%
Mining	0.03%	0.04%	0.10%	0.16%
Manufacturing	0.06%	0.08%	0.15%	0.23%
Electricity, Gas & Water Supply	0.03%	0.05%	0.11%	0.17%
Construction	0.05%	0.07%	0.13%	0.20%
Wholesale Trade	0.07%	0.10%	0.18%	0.30%
Retail Trade	0.14%	0.19%	0.39%	0.59%
Accom., Cafes & Restaurants	0.15%	0.21%	0.54%	0.76%
Transport & Storage	0.05%	0.07%	0.18%	0.29%
Communication Services	0.02%	0.03%	0.06%	0.09%
Finance & Insurance	0.03%	0.04%	0.09%	0.15%
Property & Business Services	0.06%	0.08%	0.19%	0.30%
Government Admin & Defence	0.04%	0.06%	0.13%	0.21%
Education	0.06%	0.08%	0.18%	0.29%
Health & Community Services	0.08%	0.11%	0.24%	0.38%
Cultural & Recreational Services	0.06%	0.09%	0.20%	0.30%
Personal & Other Services	0.06%	0.09%	0.17%	0.23%
Total	0.07%	0.09%	0.20%	0.31%

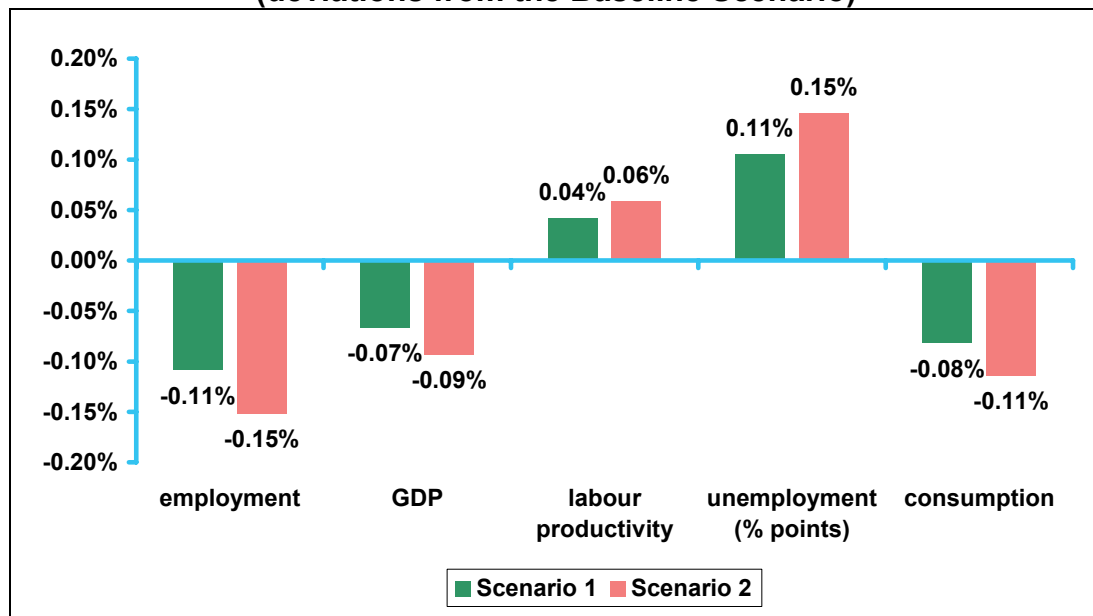
To estimate the impacts of the four alternative wage increase scenarios, MMR was used to generate a Baseline Scenario. The Baseline Scenario includes information on Australia's current wage structure including average wage rates in each industry and incorporates no change in wage rates during the timeframe of the analysis. The Baseline Scenario is the base case against which the four alternative wage increase scenarios are compared.

The first two scenarios involve increasing the lowest third of full-time and part-time APCS hourly wage rates. Increasing the lowest third of APCS wages directly affects about 7 per cent of employees in Australia.

For full-time workers, the cut-off point for the lowest third of APCS hourly wage rates is \$16 per hour. Under this pair of scenarios, this means that all full-time APCS reliant workers earning \$16 per hour or less receive a pay rise. For part-time workers, the cut-off point for the lowest third of APCS hourly wage rates is higher at about \$17.50 per hour. Under this pair of scenarios, this means that all part-time APCS reliant workers earning \$17.50 per hour or less receive a pay rise.

Chart A shows the main national effects for both Scenario 1 and Scenario 2. In general, the modelling results show that increasing the lowest third of APCS wage rates by 10 cents per hour (Scenario 1) has smaller national impacts than increasing the same wage rates by 1 per cent (Scenario 2).

Chart A
National Effects from Increasing Lowest Third of APCS Wage Rates
(deviations from the Baseline Scenario)



Source: MMR Model simulations

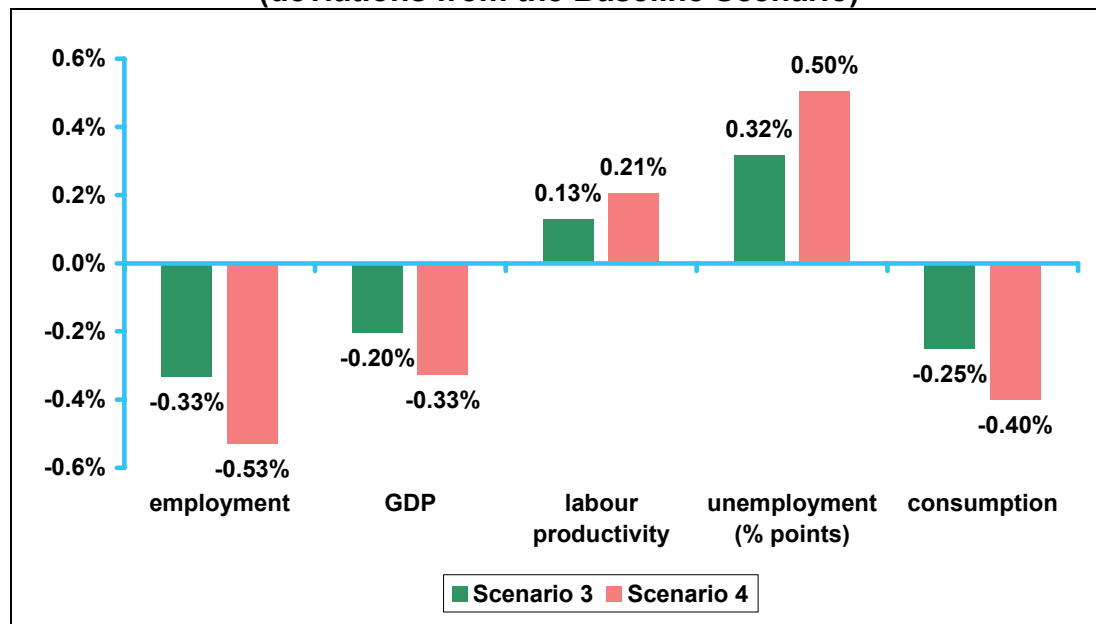
A rise in the wage rates of the lowest third of APCS of 10 cents per hour reduces national employment by about 0.11 per cent (or around 10,700 jobs). The chart also shows that each 1 per cent rise in the wage rates of the lowest third of APCS reduces national employment by 0.15 per cent (or around 15,000 jobs).

The falls in employment also lead to falls in real GDP under both wage increase scenarios. Specifically, each rise in the wage rates of the lowest third of APCS of 10 cents per hour

reduces real GDP by about 0.07 per cent. Similarly, each rise in the wage rates of the lowest third of APCS of 1 per cent reduces real GDP by 0.09 per cent.

The second pair of scenarios involves increasing all APCS hourly wage rates. Increasing all APCS wages directly affects about 20 per cent of employees in Australia. In contrast, increasing the lowest-third of APCS wages rates directly affects about 7 per cent of all employees. Therefore, the rule-of-thumb national, industry and regional impacts for Scenarios 3 and 4 will be larger than the corresponding impacts under the first two alternative wage increase scenarios. Chart B shows the main national effects for both Scenario 3 and Scenario 4.

Chart B
National Effects from Increasing All APCS Wage Rates
(deviations from the Baseline Scenario)



Source: MMR Model simulations

Specifically, Chart B shows that each 10 cent per hour increase in APCS wages is estimated to reduce national employment by 0.33 per cent (or 32,800 jobs). This fall is significantly larger than the falls in employment under Scenario 1 (only about 0.11 per cent). This is because there is a significantly larger increase in industry labour costs under Scenario 3 than under Scenario 1. The chart also shows that each 10 cent per hour increase in APCS wages also reduces GDP by 0.20 per cent. Further, Chart B shows that each 1 per cent increase in APCS wages reduces national employment by 0.53 per cent (or 52,300 jobs) and reduces GDP by 0.33 per cent.

Of all the different wage increase scenarios simulated in this report, the national effects are the largest under Scenario 4. This is because increasing all APCS wages by 1 per cent is estimated to increase average labour costs in Australia by about 0.31 per cent, which is a significantly larger increase in average labour costs than the other three alternative scenarios.

In CGE models such as MMR, the wage sensitivity of labour demand is driven by the degree of substitutability between capital and labour. In particular, the wage elasticity of labour demand is equal to (the negative of) the elasticity of substitution between capital and labour (0.5 in MMR) divided by the profit share of national income (0.3 in MMR). This implies a wage sensitivity of employment demand in MMR of -1.67.

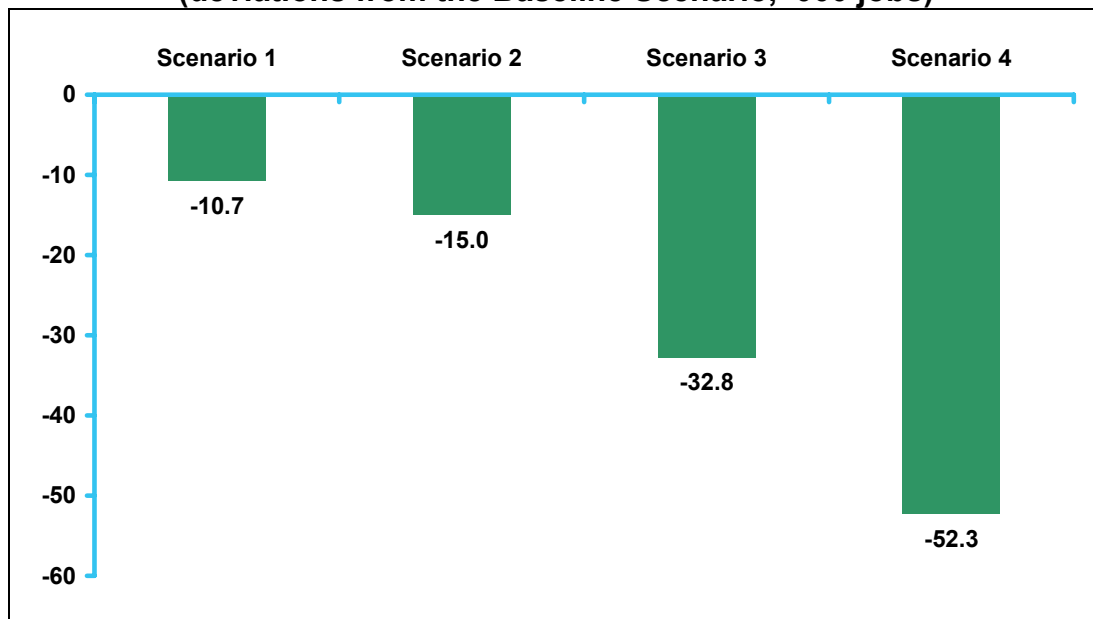
This is borne out in the MMR results. For example, scenario 3 shows a 0.33 per cent fall in employment resulting from a 0.20 per cent rise in real wages (see Table 4.3), implying a wage elasticity of labour demand of -1.65 in MMR, virtually identical to the theoretical value of -1.67.

These results can be compared with those found in empirical studies. Studies of production functions generally find that the elasticity of substitution between capital and labour is between 0.5 and 1.0. This makes the value in MMR of 0.5, and the employment responses that flow from it, appear low. On the other hand, as surveyed in section 2, studies of labour demand in Australia find a wage elasticity of labour demand of -0.6 to -1.0. By this standard, the value in MMR of -1.65 may appear high.

However, as pointed out by Webster (2000), some of these studies of labour demand treat output as a separate influence on employment yet “one of the main ways relative factor prices (including wages) can affect employment is through its effect on the profit maximising level of production”. Hence these studies may capture the direct effect of higher wages on employment but not the indirect effect that operates via lower output. MMR captures both.

Overall, using an elasticity of substitution between labour and capital of 0.5 seems a reasonable trade-off between the apparently conflicting empirical studies on the elasticity of substitution between labour and capital, and the wage elasticity of labour demand. This is especially the case given that some studies of the wage elasticity of labour demand ignore indirect effects operating through output. For further discussion of the wage-employment relationship and how it is reflected in the MMR results, see Box 6.1.

Chart D
Employment Effects from Increasing Wage Rates
(deviations from the Baseline Scenario, '000 jobs)



Source: MMR Model simulations

Detailed industry and regional results from each scenario are contained in the body of the report.

1 Introduction

The Australian Fair Pay Commission (AFPC) has been established to review minimum wages. The Commission was established under the *Workplace Relations Amendment (WorkChoices) Act 2005* as a statutory body independent from the Australian Government. The main functions of the AFPC are as follows:

- set and adjust the federal minimum wage;
- set and adjust minimum classification rates of pay in Australian Pay and Classification Scales (i.e. awards);
- set and adjust the federal minimum wage for juniors, trainees (including school-based apprentices) and employees with disabilities;
- set and adjust minimum wages for piece workers; and
- set and adjust casual loadings.

The AFPC's first minimum wage determination is scheduled for later this year. In setting the minimum wage, the AFPC is planning to conduct economic and social research to help inform its first minimum wage determination. The AFPC is also planning to consult with interested organisations (e.g. business, industry groups, unions, welfare groups, government agencies) and individuals. To this end, AFPC has invited written submissions from both organisations and individuals to help inform its first minimum wage determination.

The Department of Employment and Workplace Relations (DEWR) is preparing to lodge a submission to the Commission's first minimum wage determination. As part of this submission, DEWR commissioned Econtech to estimate the potential economic impacts of four hypothetical minimum wage rate increases scenarios. The economic impacts cover variables such as GDP, employment, unemployment, labour productivity and consumption at the national, industry and regional levels. The estimates are intended to be used as a rule-of-thumb as an input into policy discussion when analysing the potential economic impacts of minimum wage rate increases.

The four hypothetical wage increase scenarios, which are discussed in more detail in Section 3, cover two qualitatively different wage changes: increasing the lowest third of Australian Pay and Classification Scales (APCS) wages; and increasing all APCS wages. Importantly, the four scenarios do not represent specific policy changes being considered by the AFPC or suggested by DEWR but are intended to provide a rule-of-thumb indication of the potential economic impacts of increasing wages.

The national, industry and regional impacts were estimated using Econtech's Murphy Model Regional (MMR) Model, which is a multi-region, multi-industry model of Australia.

This report is structured as follows.

- Section 2 provides a literature review that examines the relationship between employment and minimum wages. The review includes both international and Australian literature on the subject.
- Section 3 outlines methodology that was used to estimate the economic impacts of increasing the minimum wage including a discussion of the four hypothetical wage increase scenarios.

- Section 4 presents the estimates of the effects of increasing minimum wages on average earnings in each industry, which are used as an input into MMR to simulate the national, industry and regional effects of higher minimum wages.
- Section 5 outlines the simulated rule-of-thumb national, industry and regional impacts of increasing the bottom third of APCS wages.
- Section 6 presents the simulated rule-of-thumb national, industry and regional impacts of increasing all APCS wages.

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of the Department of Employment and Workplace Relations and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this work or information contained within it for another purpose, please contact us.

The specific purpose of this report is to estimate the national, industry and regional impacts of four alternative wage increase scenarios. The estimates are intended to be used as a rule-of-thumb as an input into policy discussion when analysing the potential economic impacts of increasing minimum wage rates.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be used whenever using this information. This report only takes into account information available to Econtech up to the date of this report and so its findings may be affected by new information. Should you require clarification of any material, please contact us.

2 Literature Review

In the absence of studies that examine the wider economic impacts of a minimum wage, this section includes a review of studies that examine the relationship between employment and minimum wages. This review includes international and Australian literature on the subject.

Most studies before the mid-1990s found a small negative employment effect from a rise in the minimum wage. Brown, Gilroy and Kohen (1982) present a comprehensive survey of the early literature. The authors show that most of the studies in their review reach the same conclusion: that there is a negative relationship between employment and wages. Moreover, their literature survey shows that estimates of the size of the elasticity of employment with respect to the minimum wage fall within the range from -0.1 to -0.3 . This means that a 10 per cent rise in the minimum wage results in a 1 to 3 per cent fall in employment.

Other studies not included in Brown et al.'s literature review, such as Neumark and Wascher (1992), also report negative employment effects for teenagers from a rise in the minimum wage. Furthermore, the elasticities reported were between -0.1 and -0.2 . These results correspond to the law of demand. That is, as labour becomes more expensive less labour is demanded.

The conventional view of the law of demand was challenged when Card and Krueger (1994) reported their results. Card and Krueger undertook a 'natural experiment' to examine the effect of changes in the minimum wage on the fast food industry in the United States. The authors examined the employment effects of a rise in the minimum wage in New Jersey in 1992 compared to the minimum wage in Pennsylvania where the minimum wage remained unchanged. They found a small positive relationship between wages and employment. That is, an increase in the minimum wage resulted in a rise in employment.

In their Princeton study, Card and Krueger (1995) conducted similar research for other states using time series data and also found a positive correlation between a higher minimum wage and employment.

The authors argued that such a result is possible when firms have monopsony power over wages. In a monopsony market, there is only one buyer and that buyer can exert significant power over wages and output. Initially, the monopsonist sets the wage below the market-clearing wage in order to maximise profits. An increase in the minimum wage increases the wage rate for all workers and increases employment by attracting additional workers.

There has been an extensive critique of Card and Krueger's work. Some of the criticism relates to the time horizon used. Hammermesh (1995) argues that Card and Krueger are picking up the short-run response to changes in the minimum wage and that a negative employment effect would be returned if the experiment was conducted over a longer time horizon. Indeed, Partridge and Partridge (1999) found that raising the minimum wage has a positive short-term effect on employment and a negative long-term effect. Further, the size of this long-term effect is significantly larger than the short-term effect.

In addition, issues have been raised about the data used by Card and Krueger. Card and Krueger's data in their 1994 work was based on a telephone survey, which was subject to measurement error. Neumark and Wascher (1995) re-examined their data and re-estimated Card and Krueger's model using actual payroll records from a sample of the same New Jersey and Pennsylvania restaurants. Neumark and Wascher (1995) concluded that

employment had not risen after an increase in the minimum wage, as Card and Krueger had claimed, but in fact had fallen.

Issues have also been raised about the lack of adequate controls in the equations used by Card and Krueger (1995). For example, Burkhauser, Couch and Wittenburg (1999) claimed that Card and Krueger failed to control for macroeconomic conditions. The absence of such controls meant that the employment effect from a rise in the minimum wage was mitigated by economic factors such as the teenage unemployment rate. Burkhauser et al (1999) re-estimated Card and Krueger's model controlling for the economic cycle and found that an increase in the minimum wage led to a fall in employment. They concluded that the "*elasticity of teenage employment with respect to the minimum wage lies in the range of -0.2 and -0.6* ".

Bazen and Marimoutou (2002) also took into account economic factors when examining the relationship between teenage employment and minimum wages over time. They used a different model to other studies. The model used was a structural time series model that fully accounted for the cyclical and seasonal variations in teenage employment. They found that the estimated effect of minimum wages on employment is negative and statistically significant.

Some studies have used the same approach as Card and Krueger (1994) using more recent data. Mills et al. (1999) used this 'natural experiment' approach and found a negative relationship between teenage unemployment and minimum wages, though this effect was not significant. Furthermore, Mills et al (1999) found a positive effect in the "eating and drinking" industry, but found that the methodology used was not robust.

The previous literature on minimum wages also includes cross-country studies. For example, Neumark and Wascher (1999) estimated the impact of minimum wages on youth employment using pooled cross section data for 16 OECD countries. There are two general results from this study. Firstly, rises in minimum wages result in job losses in most countries, but there is wide variation across countries. Specifically, the unemployment effect was smaller for countries in which collective agreements determined the wage floor and for countries that had a sub-minimum wage for youths. In addition, the authors found that countries with active labour market policies designed to bring non-employed people into the workforce had lower unemployment effects from a rise in the minimum wage. Secondly, the size of this effect depends on the level at which minimum wages are set. For example, the effect is smaller for countries where the minimum wage is set at a low level, such as in the United States.

However, there is some support for Card and Krueger. For instance, Dickens et al. (1999) find a positive employment effect from a rise in the minimum wages in Great Britain, which they also attributed to employers exerting their monopsony power. In addition, Card and Krueger (2000) re-estimated their original 1995 study using different data and still found no employment loss arising from an increase in the minimum wage.

Other studies have attempted to examine the sensitivity of increases in the minimum wage across industries. For example, Belman and Wolfson (1999) examined the impact of changes in the US minimum wage on employment in 32 industries. These industries had a high proportion of less skilled and younger workers and thus were expected to be particularly sensitive to changes in the minimum wage. The authors found a negative

employment-minimum wage effect in only a small number of these industries, which they attributed to the fact that the minimum wage was not binding in a lot of these industries.

In summary, most studies find employment losses from a rise in the minimum wage but there are some studies that report no employment losses. Where negative effects are reported, these effects tend to be in the range of -0.1 to -0.6 . Other studies have examined the employment impacts on several types of labour and find that the employment of unskilled and younger workers are more elastic to changes in the minimum wage than skilled and older workers.

It has been argued that the results from the US and other countries with low minimum wages should not be used to make inferences about the employment effects of a change in a minimum award wage in Australia. There are two reasons for this.

1. The minimum wage is significantly higher in Australia compared to other countries.
2. The Australian minimum wage is set by industrial tribunals, which set a range of minimum award rates compared to one minimum wage in the United States. Thus, the minimum award wage affects a wider distribution of workers in Australia compared to only the lowest paid workers in the United States.

The ratio of the minimum award wage to the median wage is almost 60 per cent in Australia compared to 36 per cent for the United States. This is relevant because the rate at which the minimum wage rate is set determines its economic impacts. For example, a minimum wage set at a high level is more likely to have a bigger effect on employment compared to a wage that is set at a low level. As mentioned, Neumark and Wascher (1999) found that countries in which the minimum wage was set at a low level experience less employment losses than countries where the minimum wage was set at a high level. Indeed, Card and Krueger also stress in their 1995 work that the magnitude of employment losses depends on the rate at which the minimum wage is set.

The second reason listed above implies that the economic impacts of a change in the minimum wage will be greater in Australia compared to the United States because award wages affect relatively more people in Australia compared to the United States. Only 3 per cent of the American workforce are affected by the minimum wage¹. This compares to 20 per cent of the Australian workforce who are award reliant.

There are several empirical studies that attempt to estimate the effect wage changes have on employment using Australian data. For example, Lewis and Kirby (1988) found that a 10 per cent fall in real wages brought about a rise in employment of 8 per cent. This implies employment elasticity with respect to real wages of -0.80 . Pissarides (1991) estimated a three-equation model of the Australian labour market. The three equations were for employment, real wages and the labour force and estimated a long-run real wage elasticity with respect to labour demand of -0.79 .

Debelle and Vickery (1998) adopted an error-correction framework. The labour demand equation is estimated over two time horizons. The first time horizon is from 1978 to 1997 where labour demand is measured by aggregate hours worked in the non-farm economy. Since this series is not available prior to 1978 a second time horizon from 1969 to 1997 is used, where labour demand is measured by aggregate hours worked in the whole economy adjusted for the share of non-farm output in total output. The estimate of the long-run wage

¹ American Bureau of Labour Statistics, <http://www.bls.gov/cps/minwage2002tbls.htm>.

elasticity of employment for the period from 1978 to 1997 is -0.4 and for the period from 1967 to 1997 period is -0.67 . The authors claim the difference is due, in part, to the non-farm economy being less volatile than the whole economy. Debelle and Vickery use the lower estimate of -0.4 to estimate the effect real wages have on unemployment and find that a 2 per cent fall in real wages could result in a fall in unemployment of one percentage point.

A summary of these Australian studies is shown in Table 2.1. It shows that the overall wage elasticity of labour demand using Australian data varies from -0.03 to -1.04 with the majority of studies giving an estimate of about -0.80 . This is despite the fact that different methodologies, estimation periods and definitions were used in these studies.

Table 2.1: Australian studies on the overall wage elasticity of demand

Author	Time Period	Coefficient on the real wage
Lewis and MacDonald (2002)	1961/1 – 1998/3	-0.80
Bernie and Downes (1999)	1971/2 – 1998/3	-0.84
Bernie and Downes (1999)	1969/1 – 1997/4	-1.04*
Pissarides (1991)	1966/3 – 1986/2	-0.79
Russell and Tease (1991)	1969/3 – 1987/4	-0.61
Lewis and Kirby (1988)	1967/3 – 1987/1	-0.78
Debelle and Vickery (1998)	1978/1 – 1997/4	-0.40/-0.67
Valentine (1980)	1959/4 – 1977/2	-0.03

*re-estimation of Debelle and Vickery (1998) using private sector data and vacancies.

Source: Webster (2000).

Some of these studies are likely to understate the full impact of wages on employment for the reason given by Webster. In particular, some studies include output as an explanatory variable alongside wages yet “one of the main ways relative factor prices (including wages) can affect employment is through its effect on the profit maximising level of production”. Hence these studies may capture the direct effect of higher wages on employment but not the indirect effect that operates via lower output.

Further, returning to the issue of minimum wages, the overall wage elasticity with respect to labour demand cannot be used alone to infer the impact that minimum wages have on employment. This is because workers on minimum wages tend to be relatively less skilled and research has shown that employment of less skilled workers is more responsive to wage changes than for other workers. For example, Hammermesh (1993) found that less educated and less skilled workers have higher wage elasticities of demand than other workers.

A study was recently conducted on the effects of a minimum wage in Australia. Leigh (2003) examined the effects of increases in the minimum wage by conducting a natural experiment based on six increases in the Western Australian statutory minimum wage using the remainder of Australia as a control group. Using a similar methodology to Card and Krueger (1994), Leigh (2003) found that,

“relative to the rest of Australia, the employment to population ratio in Western Australia fell following each of the six rises, twice by a statistically significant margin.”

Leigh aggregated these six changes in the minimum wage and found that the elasticity of labour demand with respect to the Western Australian statutory minimum wage is estimated to be -0.13 . This implies that a 10 per cent increase in minimum wages in Western Australia will cause a 1.3 per cent fall in total employment in Western Australia.

Further analysis showed that the employment impact is larger among young employees, with the elasticity of labour demand for workers aged between 15 and 24 estimated at -0.39 .

Leigh concludes that his result can be compared to US estimates, because the proportion affected by the statutory minimum wage in Western Australia is similar to that reported in the American studies. He concluded that,

“the elasticity of the Western Australian statutory minimum wage appears similar to that of US minimum wages. Australian minimum wages do ‘bite’, but it is not clear that they bite more fiercely, than in America’.

Leigh points out that there may be some concerns about using the rest of Australia as a control group. This is because there are no controls included in the model for state policy changes that occurred during the period when the minimum wage increased in Western Australia. This may have affected the employment impacts in the model. In addition, similar to the criticisms of Card and Krueger’s work, there may also be some concerns about the lack of adequate controls for the differences in the Western Australian economy to the economies in the remaining States. For example, the Western Australian economy is more exposed to developments in the world economy than other states because of its reliance on the mining industry.

In any case, it is necessary to point out that the wage elasticity with respect to the minimum wage is lower than the aggregate wage elasticity estimates. The reason for this is what is known as the “fallacy of the inflated denominator” (James, Wooden and Dawkins, 2001). This relates to when the effect of an increase in the minimum wage is averaged over the subgroups resulting in lower wage elasticities for employees affected by the minimum wage. For example, Leigh examines the wage elasticity for all employees and 15-24 years olds and not the award reliant employees in this population group. Thus, the estimated effect would be larger if the elasticity for minimum wage reliant employees only were estimated.

In summary, most international studies show that a higher minimum wage reduces employment. However, there are some studies that reach the opposite conclusion. The Australian studies are more consistent as all of these studies show that higher wages result in employment losses. Because our award system produces higher minimum wages than in most other countries, it has been argued that higher minimum wages are likely to have a more negative effect on employment in Australia than for other countries. On balance, the literature leads us to expect that higher minimum wages would lead to lower employment, especially in Australia.

3 Methodology

This section describes the methodology used to model the economic impacts of increasing the minimum wage. Figure 3.1 shows the six main steps in simulating the national, industry and regional impacts of increasing the minimum wage.

3.1 Four Wage Increase Scenarios

DEWR commissioned Econtech to estimate the impacts of four hypothetical wage increase scenarios on economic aggregates such as GDP, employment, unemployment, labour productivity, consumption and wages. In this report, GDP, employment, labour productivity and consumption are also analysed at the industry and regional level. Importantly, the four scenarios do not represent specific wage recommendations by DEWR. Instead, because estimates produced by MMR are broadly linear, these estimates are intended to be used as a rule-of-thumb as an input into policy discussion when analysing the potential economic impacts of minimum wage rate increases.

To estimate the impacts of the four alternative wage increase scenarios, MMR was used to generate a Baseline Scenario. The Baseline Scenario includes information on Australia's current wage structure including average wage rates in each industry and incorporates no change in wage rates during the timeframe of the analysis. The Baseline Scenario is the base case against which the four alternative wage increase scenarios are compared, as discussed in more detail below.

DEWR commissioned Econtech to use MMR to estimate the impacts of four different wage increase scenarios. The hypothetical scenarios, which cover two qualitatively different wage changes, are as follows:

- Scenario 1 – a scenario in which the lowest one-third of APCS wages in Australia is increased by 10 cents per hour. The impact of this scenario on the average wage rate of each industry will vary because of the differences in average APCS wages across industries. For example, the average APCS wage is significantly higher in the Mining Industry than in the Retail Trade Industry. This means that increasing the lowest one-third of APCS wages will not impact on the average wage rate of the Mining Industry but will impact on the average wage rate of the Retail Trade Industry.
- Scenario 2 – a scenario in which the lowest one-third of APCS wages in Australia are increased by 1 per cent. As discussed above, the impact of this scenario on the average wage rate of each industry will vary because of the differences in average APCS wages across industries.
- Scenario 3 – a scenario in which all APCS wages in Australia are increased by 10 cents per hour. The impact of this scenario on the average wage rate of each industry will vary because of the differences in APCS coverage of each industry. For example, workers in the Accommodation, Cafes and Restaurants and Retail Trade industries are more APCS reliant than the Mining Industry and so will experience greater percentage increases in labour costs under the wage increase scenarios.
- Scenario 4 – like the previous scenario, all APCS wages in Australia are increased under this scenario but this time by 1 per cent. As discussed above, the impact of this scenario on the average wage rate of each industry will vary because of the differences in APCS coverage of each industry.

The deviations between each of these four wage increase scenarios and the Baseline Scenario shows the national, industry and regional effects of various increases in wage rates. For example, the difference between Scenario 1 and the Baseline Scenario shows the national, industry and regional effects of increasing the lowest one-third of APCS wages by 10 cents per hour.

Increasing APCS wages will indirectly lead to higher wages for employees on collective and individual agreements. Therefore, all four wage increase scenarios incorporate flow-on effects of higher non-agreement wages to the wages of employees on agreements. Specifically, in this report, it is assumed that, in aggregate, each 5 per cent increase in wages translates to a 1 per cent increase in the wages of employees on agreements. This estimate is based on Dixon et al. (2005), a report that accompanied last year's Commonwealth Safety Net Review submission. Dixon et al. (2005) found that a 4.2 per cent increase in award wage rates would lead to a 0.85 per cent increase in non-award wage rates (i.e. a 5:1 or 20 per cent flow-on).

The wage gap between average weekly APCS wages and average weekly agreement wages (both collective and individual combined) varies considerably between industries from about \$120 in Retail Trade to over \$600 in Communication Services. Therefore, it is reasonable to assume that the ratio of the flow-on of increases in APCS wages to agreement wages is larger when the gap between the average wages of the two different pay setting methods is smaller. For example, when applying this assumption, there would be larger flow-on effects from the increases in APCS wages to agreement wages in the Retail Trade Industry than in the Communication Services Industry. Specifically, instead of the aggregate ratio of 5:1 (i.e. 5 per cent increase in APCS wages triggers a 1 per cent increase in agreement wages) for all industries, the ratio for the Retail Trade Industry would be larger (say about 2½:1) compared to the ratio for the Communication Services Industry (say about 1½:1). This means that the wage increases will have larger indirect impacts on the average wage rate of the Retail Trade Industry than the average wage rate of the Communication Services Industry. Importantly, although the size of the flow-on effects will vary between industries, in aggregate, each 5 per cent increase in APCS wages translates to a 1 per cent increase in the wages of employees on agreements.²

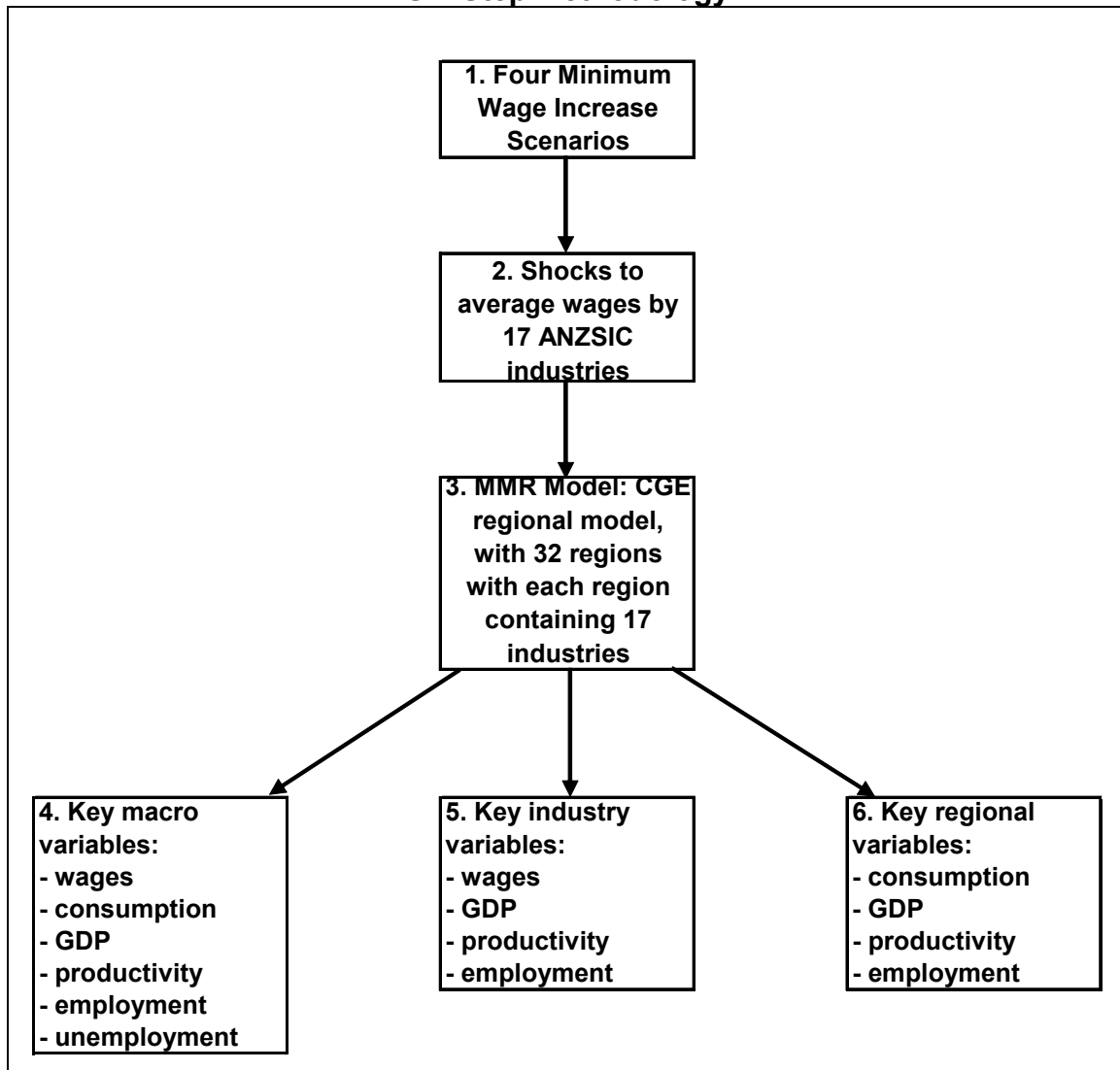
As discussed above, estimates produced by MMR are broadly linear. This means that the estimates for each of the four different wage increase scenarios can be used as a rule-of-thumb to help inform policy discussion about the potential economic impacts of wage increases. For example, for Scenario 1, the results in this report show the impact on employment, unemployment, GDP, labour productivity and consumption of increasing the lowest one-third of APCS wages by 10 cents per hour. These estimates can be extrapolated to estimate the impact on the same variables of other increases in the lowest one-third of APCS wages such as 20 cents per hour, 30 cents per hour etc.

3.2 Six-step Procedure

Estimating the economic impacts of alternative wage increase scenarios involves undertaking a six-step procedure, as illustrated in Figure 3.1. The steps include gathering data, estimating coverage factors, estimating the impact of wage increases on average earnings in each industry and modelling the national, industry and regional impacts of these wage increases.

² The ratio of flow-on effects for each industry, as well as discussion about the methodology, is outlined in Attachment A.

**Figure 3.1
Six Step Methodology**



The first step was to obtain data on the number of employees in each industry by method of setting pay and the average earnings for each method. A distinction was made between full-time and part-time employees in each industry. The earnings data was obtained from the 2004 survey on Employee Earnings and Hours (EEH) conducted by the Australian Bureau of Statistics (ABS)³. This survey covers variables such as earnings according to industry, method of pay setting (APCS reliant, individual agreement, collective agreement) and full-time and part-time employment.

The second step involved estimating the impact of each of the four different wage increase scenarios on average earnings in each industry. This included estimating the direct average industry wage impacts under each scenario using the APCS wage coverage of each industry. This also included estimating the indirect average industry wage impacts under each scenario using the collective and individual agreement coverage of each industry. The basis for these estimates is discussed in more detail in Section 4.

These first two steps – collecting data on earnings of APCS reliant, collective agreement and individual agreement employees and estimating the impact of the wage changes on the

³ Cat no. 6306.0, May 2004.

average wage rate of each industry – are undertaken in Section 4 of this report. The resulting estimates of changes in average earnings in each industry are then fed into the economy-wide modelling of steps 3, 4, 5 and 6. This economy-wide modelling is undertaken in Sections five and six of this report. Steps 3, 4, 5 and 6 are now briefly outlined.

The third step in the wage rate increase analysis illustrated in Figure 3.1 is to feed the inputs (i.e. the labour cost savings by industry) for each of the four alternative wage increase scenarios into the Econtech's MMR model. MMR is a medium-term Computable General Equilibrium (CGE) model of the Australian economy. MMR has many features that are important for analysing the economic impacts of increasing minimum wage rates, including the following.

- MMR distinguishes the 18 Australian and New Zealand Standard Industry Classification (ANZSIC) 1-digit industries, so its industry detail matches that found in ABS data on pay setting methods by industry. Wages rates can be independently adjusted for each of the 18 industries. This makes MMR suitable for distinguishing between the effects of changing the wage rates on different industries.
- Importantly, our modelling approach takes into account that the APCS system has different effects on different industries for at least three reasons. First, our analysis in steps 1 and 2 shows that wage changes in each industry differ due to industry differences in average APCS wages. Second, MMR takes into account that labour accounts for differing shares of costs in each industry. Third, MMR also takes into account that changes in labour costs have different effects in trade-exposed industries than in non-trade-exposed industries.
- MMR allows for substitution between labour and capital in production in each of the 18 industries. The elasticity of substitution between labour and capital is set to 0.5 in each industry, which is at the bottom of the range of 0.5 to 1.25 in Australian empirical work. For example, the ORANI model traditionally uses an elasticity of 0.5 in its medium-run mode and 1.25 in its long-run mode. Two other of Econtech's CGE models, MM2 and MM600+, use an elasticity of 0.75. Treasury's TRYM model uses an elasticity of 0.8 while Treasury's earlier model known as NIF88 used an elasticity of 1.0.
- MMR produces results for key broad economic aggregates such as employment, GDP, labour productivity and consumption, which is the fourth step in the wage rate increase analysis, as shown in Figure 3.1.
- MMR produces industry-by-industry results for variables such as employment, value added (i.e. contribution to GDP) and labour productivity, which is the fifth step in the wage rate increase analysis.
- Finally, MMR produces region-by-region results for variables such as wages, value added, employment and productivity, which is the sixth step in the minimum wage rate increase analysis.

The four hypothetical wage rate increase scenarios simulated in this report are based on the standard medium-run closure of MMR. Therefore, for each alternative scenario, MMR estimates what the Australian economy would be like after several years with the higher minimum wages, not the trajectory that the economy would follow to that point. This is important because we are modelling what the economy would be like with higher minimum wages, not the path the economy would follow were minimum wages increased.

MMR models a medium-run equilibrium and some of the key assumptions involved are as follows.

- *External balance*: in MMR, the balance of trade is at a sustainable level. Specifically, the trade balance is set to zero. The real exchange rate needed to achieve this trade surplus is determined by MMR. Thus shocks to international trade affect the real exchange rate, not the trade surplus.
- *Private investment*: the level of business investment and associated capital stocks are held fixed. This is because the model refers to a medium-run equilibrium, whereas capital stocks only fully adjust in the long run.
- *Private saving*: the level of private sector saving and associated asset accumulation are sustainable. Specifically, private saving is held constant in MMR by fixing the quantity of capital that is owned locally.

The first two steps – collecting data on earnings of APCS reliant, collective agreement and individual agreement employees and estimating the impact of the wage changes on the average wage rate of each industry – are discussed in more detail in the next section.

4 Estimates of Labour Cost Increases

This section estimates the effects of increasing wages on average earnings in each industry. These estimates of the change in average earnings are then used as an input into MMR to simulate the economy and industry wide effects of higher wages in the next three sections of this report. In terms of Figure 3.1 (shown in the previous section), this section describes steps 1 and 2.

4.1 APCS Reliant and Agreement Reliant Workers

Step 1 in Figure 3.1 (the four wage increase scenarios) uses data about the number of employees in each industry by method of setting pay and the average earnings for each method. This data was obtained from the ABS publication titled Employee Earnings and Hours (ABS Cat. No. 6306.0). This survey covers variables such as earnings according to industry, method of pay setting (e.g. award reliant, individual agreement, collective agreement) and full-time and part-time employment. The ABS EEH data contains information for all ANZSIC industries except the Agriculture Industry.⁴

For each method of setting pay, a distinction was also made between full-time and part-time employees in each industry. It is important to identify the proportion of full-time and part-time employees in each industry affected by the hypothetical increases in either APCS or federal minimum wage. For example, Table 4.1 shows that about 13 per cent of full-time non-managerial employees have their pay and conditions set by APCS while the corresponding figure for part-time employees is about 34 per cent.

Table 4.1
APCS and Agreement Coverage by Industry (Non-managerial employees)

	% full-time employees on APCS	% full-time employees on agreements	% part-time employees on APCS	% part-time employees on agreements
Mining	2%	98%	12%	88%
Manufacturing	12%	88%	37%	63%
Electricity, Gas & Water Supply	1%	99%	4%	96%
Construction	14%	86%	29%	71%
Wholesale Trade	13%	87%	39%	61%
Retail Trade	24%	76%	38%	62%
Accom., Cafes & Restaurants	47%	53%	75%	25%
Transport & Storage	12%	88%	31%	69%
Communication Services	0%	100%	10%	90%
Finance & Insurance	3%	97%	7%	93%
Property & Business Services	17%	83%	32%	68%
Government Admin & Defence	0%	100%	3%	97%
Education	6%	94%	11%	89%
Health & Community Services	17%	83%	34%	66%
Cultural & Recreational Services	11%	89%	25%	75%
Personal & Other Services	16%	84%	35%	65%
Total	13%	87%	34%	66%

Source: ABS Cat. No. 6306.0, Employee Earnings and Hours, Australia, May 2004

⁴ In this report, the 2004 EEH data for award reliant workers is used as a proxy for APCS reliant workers. In using this data, it is assumed that since 2004, all award reliant workers have become APCS reliant workers.

The table also shows that these figures vary across industries. Specifically, Table 4.1 shows that APCS reliant employees are concentrated in the Accommodation, Cafes and Restaurant and Retail Trade industries. In contrast, the table also shows that there are relatively few APCS reliant workers in the Electricity, Gas and Water Supply, Mining and Communication Services industries. Given that the four scenarios involve changing either the lowest third or all APCS wages, these differences in coverage mean that the impact of each scenario will vary across industries. For example, there will be larger average wage rate increases in the Accommodation, Cafes and Restaurant and Retail Trade industries relative to the Electricity, Gas and Water Supply, Mining and Communication Services industries under each scenario.

An important determinant of the percentage change in the average wage rate of each industry under the wage increase scenarios is the average wage rate of each industry under the Baseline Scenario. For both full-time and part-time employees, Table 4.2 shows the average weekly wage by method of setting pay for each industry in 2005.⁵ The table shows that average weekly earnings of agreement reliant employees are generally higher than average weekly earnings of APCS reliant employees.

Table 4.2
2005 Average Weekly Earnings of APCS and Agreement Reliant Workers
(Non-managerial employees)

	Full-time employees on APCS	Full-time employees on agreements	Part-time employees on APCS	Part-time employees on agreements
Mining	\$1364	\$1589	\$419	\$632
Manufacturing	\$689	\$998	\$409	\$467
Electricity, Gas & Water Supply	\$949	\$1199	\$424	\$569
Construction	\$659	\$1103	\$427	\$537
Wholesale Trade	\$712	\$907	\$351	\$415
Retail Trade	\$656	\$747	\$315	\$339
Accom., Cafes & Restaurants	\$687	\$750	\$319	\$301
Transport & Storage	\$837	\$991	\$347	\$538
Communication Services	\$713	\$1042	\$230	\$455
Finance & Insurance	\$691	\$1064	\$335	\$479
Property & Business Services	\$728	\$1004	\$372	\$469
Government Admin & Defence	\$806	\$963	\$511	\$452
Education	\$891	\$1038	\$335	\$455
Health & Community Services	\$719	\$953	\$420	\$539
Cultural & Recreational Services	\$695	\$949	\$317	\$377
Personal & Other Services	\$575	\$1013	\$262	\$324

Source: ABS Cat. No. 6306.0, Employee Earnings and Hours, Australia, May 2004, data request

In the next section of this report, the estimates in Tables 4.1 and 4.2 are used to estimate the increases in average earnings in each industry for the four alternative wage increase scenarios.

4.2 Labour Cost Increases by Industry

The second step in Figure 3.1 involves using the data from Tables 4.1 and 4.2 to map the changes in the APCS wages (and likely flow-on to agreement wages) from the first step to changes in average wages by industry. The aim of the second step is to estimate the increases in labour costs on an industry-by-industry basis under each of the four hypothetical

⁵ The estimates in the table are based on the 2004 EEH publication.

wage increase scenarios. A detailed description of the methodology used to estimate the labour cost increases by industry is outlined in Attachment A.

As discussed in Section 3, there are four different hypothetical wage increase scenarios, based on different assumptions about increases in the APCS wages. The estimated labour cost increases by industry under each of the four scenarios are shown in Table 4.3. These estimates take into account the proportion of full-time and part-time workers that are APCS reliant and agreement reliant in each industry (Table 4.1). These estimates also take into account the differences in the APCS and agreement wages in each industry (Table 4.2).⁶

Table 4.3
Estimates of Labour Cost Increases by Industry (deviations from Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	0.05%	0.07%	0.13%	0.20%
Mining	0.03%	0.04%	0.10%	0.16%
Manufacturing	0.06%	0.08%	0.15%	0.23%
Electricity, Gas & Water Supply	0.03%	0.05%	0.11%	0.17%
Construction	0.05%	0.07%	0.13%	0.20%
Wholesale Trade	0.07%	0.10%	0.18%	0.30%
Retail Trade	0.14%	0.19%	0.39%	0.59%
Accom., Cafes & Restaurants	0.15%	0.21%	0.54%	0.76%
Transport & Storage	0.05%	0.07%	0.18%	0.29%
Communication Services	0.02%	0.03%	0.06%	0.09%
Finance & Insurance	0.03%	0.04%	0.09%	0.15%
Property & Business Services	0.06%	0.08%	0.19%	0.30%
Government Admin & Defence	0.04%	0.06%	0.13%	0.21%
Education	0.06%	0.08%	0.18%	0.29%
Health & Community Services	0.08%	0.11%	0.24%	0.38%
Cultural & Recreational Services	0.06%	0.09%	0.20%	0.30%
Personal & Other Services	0.06%	0.09%	0.17%	0.23%
Total	0.07%	0.09%	0.20%	0.31%

The labour cost increases by industry consist of both direct and indirect contributions. The direct contributions, which are generally the larger of the two contributions, represent the increase in either the lowest third or all APCS wages under the four scenarios. The indirect contributions represent the flow-on effects of higher APCS wages to the wages of employees on agreements. As discussed above, in this report, it is assumed that, in aggregate, each 5 per cent increase in the wages of non-agreement employees translates to a 1 per cent increase in the wages of employees on agreements.

Table 4.3 shows that there are relatively high percentage increases in labour costs in certain industries. In general, labour cost increases are larger for industries where a high proportion of workers are APCS reliant and average APCS wages are relatively high. For example, the Accommodation, Cafés and Restaurant Industry and the Retail Trade Industry have relatively high labour cost increases because a high proportion of workers are APCS reliant employees in these industries. The Manufacturing, Construction, Wholesale Trade and Health and Community Services industries have relatively high labour cost increases

⁶ When estimating the labour cost increases for each industry, under each hypothetical scenario, it is assumed that wage increases granted by the AFPC to workers in corporations is passed on by the Australian Industrial Relations Commission to other workers in the federal jurisdiction (i.e. those employees not working in corporations) and passed on by state tribunals to their workers. Because the AFPC covers about two-thirds of all Australian workers, minor differences in the wage increases granted by different tribunals and statutory bodies are unlikely to have a significant impact on the rule-of-thumb estimates presented in this report.

because average APCS wages are relatively high in these industries, which means there is more potential for increases in industry labour costs from higher APCS wages.

Further, Table 4.3 shows that the average estimated labour cost increase for all industries get progressively larger starting with Scenario 1 (about 0.07 per cent) and moving to Scenario 4 (about 0.31 per cent). This is because the size of the wages shock gets progressively larger. For example, the first set of scenarios (1 and 2) only involves increasing the lowest third of APCS wages, which directly affects about 7 per cent of employees. In comparison, the second set of scenarios (3 and 4) involves increasing all APCS wages, which directly affects the highest proportion of employees (about 20 per cent) of the two sets of scenarios and therefore has the largest impacts on industry labour costs.

As discussed in the previous section, the estimates presented in this report are intended to be used as a rule-of-thumb as an input into policy discussion when analysing the potential economic impacts of minimum wage rate increases. The results in Table 4.3 show the rule-of-thumb estimates of the change in industry labour costs from four different increases in wages. The rule-of-thumb estimates for each of the four different wage increase scenarios are discussed in turn below.

- Scenario 1 – increasing the lowest one-third of APCS wages in Australia by 10 cents per hour, combined with the flow-on effects of higher APCS wages to higher agreement wages, raises industry labour costs in Australia by an average of about 0.07 per cent. Table 4.3 shows relatively high labour cost increases in the Accommodation, Cafés and Restaurant (0.15 per cent) and Retail Trade (0.14 per cent) industries because these industries account for a high proportion of lower paid APCS reliant workers. In contrast, the table shows relatively small labour cost increases in the Mining, Electricity, Gas and Water and Communication Services industries because these industries account for a very small proportion of lower paid APCS reliant workers.
- Scenario 2 – increasing the lowest one-third of APCS wages in Australia by 1 per cent, combined with the flow-on effects of higher APCS wages to higher agreement wages, raises industry labour costs in Australia by an average of about 0.09 per cent. Not surprisingly, increasing the lowest one-third of APCS wages by 1 per cent represents a larger increase in hourly average wage rates than increasing the same one-third of APCS wages by 10 cents per hour.
- Scenario 3 – increasing all APCS wages by 10 cents per hour, combined with the flow-on effects of higher APCS wages to higher agreement wages, raises industry labour costs in Australia by an average of about 0.20 per cent. Table 4.3 shows relatively high labour cost increases for Accommodation, Cafés and Restaurant (0.54 per cent), Retail Trade (0.39 per cent) and Health and Community Services (0.24 per cent) industries because these industries have a high proportion of APCS reliant workers.
- Scenario 4 – increasing all APCS wages by 1 per cent, combined with the flow-on effects of higher APCS wages to higher agreement wages, raises average industry labour costs in Australia by about 0.31 per cent. Table 4.3 shows higher labour cost increases under this scenario than under Scenario 3 because increasing all APCS wages by 1 per cent represents a larger increase in hourly average wage rates than increasing all APCS wages by 10 cents per hour.

The estimated employment and other economic impacts under the hypothetical are conservative for three reasons:

- the elasticity of substitution between capital and labour has been set at 0.5, which is at the bottom end of the range of 0.5 to 1.25 in Australian empirical work – the employment changes are proportional to the assumed level of this elasticity;
- because MMR is a medium-term model that holds industry capital stocks fixed, no allowance has been made for higher labour costs stimulating capital formation with associated further falls in employment; and

In the next section of this report, the estimates of the industry labour cost increases shown in Table 4.3 are used as an input into MMR to simulate the national, industry and regional impacts under each alternative wage increase scenarios.

5 Increasing Lowest Third of APCS Wages

The next two sections of this report use the estimates of the effects on average earnings in each industry from Table 4.3 in the economy-wide model (MMR) to estimate the national, industry and regional effects under each of the four alternative wage increase scenarios. In terms of Figure 3.1, these sections cover steps three, four, five and six for all of the scenarios.

MMR is a CGE model of the Australian economy that models a medium-run equilibrium. Its results show the effects of the increases in wage rates on variables such as GDP, prices, investment and employment, as well as employment and production in individual industries and regions.

DEWR commissioned Econtech to estimate the impacts of four hypothetical alternative wage increase scenarios on economic aggregates such as GDP, employment, unemployment, labour productivity, consumption and wages. These estimates are intended to be used as a rule-of-thumb as an input into policy discussion when analysing the potential economic impacts of various different wage rate increases.

The first set of scenarios involves increasing the lowest third of full-time and part-time APCS hourly wage rates. The parameters for these two alternative wage increase scenarios are as follows:

- Scenario 1 – a scenario in which the lowest one-third of APCS hourly wages in Australia is increased by 10 cents per hour. Table 4.3 shows that this increase in APCS wages raises Australian labour costs by about 0.07 per cent.
- Scenario 2 – a scenario in which the lowest one-third of APCS hourly wages in Australia are increased by 1 per cent. Table 4.3 shows that this increase in APCS wages raises Australian labour costs by about 0.09 per cent.

For full-time workers, the cut-off point for lowest third of APCS hourly wage rates is \$16 per hour. Under this pair of scenarios, this means that all full-time APCS reliant workers earning \$16 per hour or less receive a pay rise. For part-time workers, the cut-off point for lowest third of APCS hourly wage rates is higher at about \$17.50 per hour. Once again, under this pair of scenarios, this means that all part-time APCS reliant workers earning \$17.50 per hour or less receive a pay rise.

Increasing the lowest third of APCS wages directly affects about 7 per cent of employees in Australia. The rule-of-thumb national, industry and regional impacts for Scenarios 1 and 2 are discussed in more detail below.

5.1 National Effects

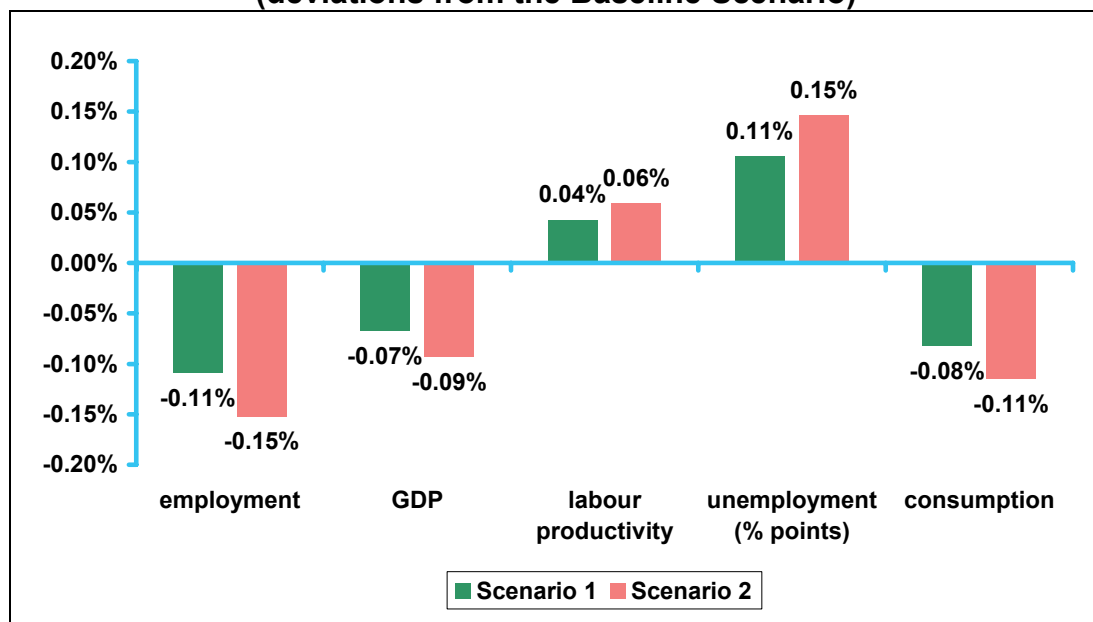
Chart 5.1 shows the main national effects for both Scenario 1 and Scenario 2 (shown as step 4 in Figure 3.1). In general, the modelling results show that increasing the wage rates of the lowest third of APCS either by 10 cents per hour (i.e. Scenario 1) or by 1 per cent (i.e. Scenario 2) stimulates falls in employment, GDP and consumption and stimulates a rise in labour productivity and unemployment.

As discussed above, higher national labour costs stimulate a fall in national employment. For example, Chart 5.1 shows that each rise in the wage rates of the lowest third of APCS of

10 cents per hour reduces national employment by about 0.11 per cent (or 10,700 jobs). The chart also shows that each rise in the wage rates of the lowest third of APCS of 1 per cent reduces national employment by 0.15 per cent (or 15,000 jobs).⁷

The falls in employment also lead to falls in real GDP under both wage increase scenarios. Specifically, each 10 cent per hour rise in the wage rates of the lowest third of APCS is simulated to reduce real GDP by about 0.07 per cent. Similarly, each rise in the wage rates of the lowest third of APCS of 1 per cent is simulated to reduce real GDP by 0.09 per cent.

Chart 5.1
National Effects from Increasing Lowest Third of APCS Wage Rates
(deviations from the Baseline Scenario)



Source: MMR Model simulations

Under both scenarios, Chart 5.1 shows that employment falls by a larger percentage than real GDP. This is because labour productivity increases as each employee produces more real GDP than before the increases in the APCS wage rates. Specifically, the chart shows that each 10 cent per hour increase in the wage rates of the lowest third of APCS increases labour productivity by about 0.04 per cent while each 1 per cent increase in the wage rates of the lowest third of APCS increases labour productivity by about 0.06 per cent.

Chart 5.1 shows falls in employment, which means that the unemployment rate is expected to increase under both scenarios. Specifically, Chart 5.1 shows that each rise in the wage rates of the lowest third of APCS of 10 cents per hour is simulated to increase the unemployment rate by 0.11 percentage points. The chart also shows that each rise in the wage rates of the lowest third of APCS of 1 per cent is simulated to increase the unemployment rate by 0.15 percentage points.

Finally, Chart 5.1 shows that the falls in national income from the use of less labour in production stimulate falls in real consumption under both scenarios.

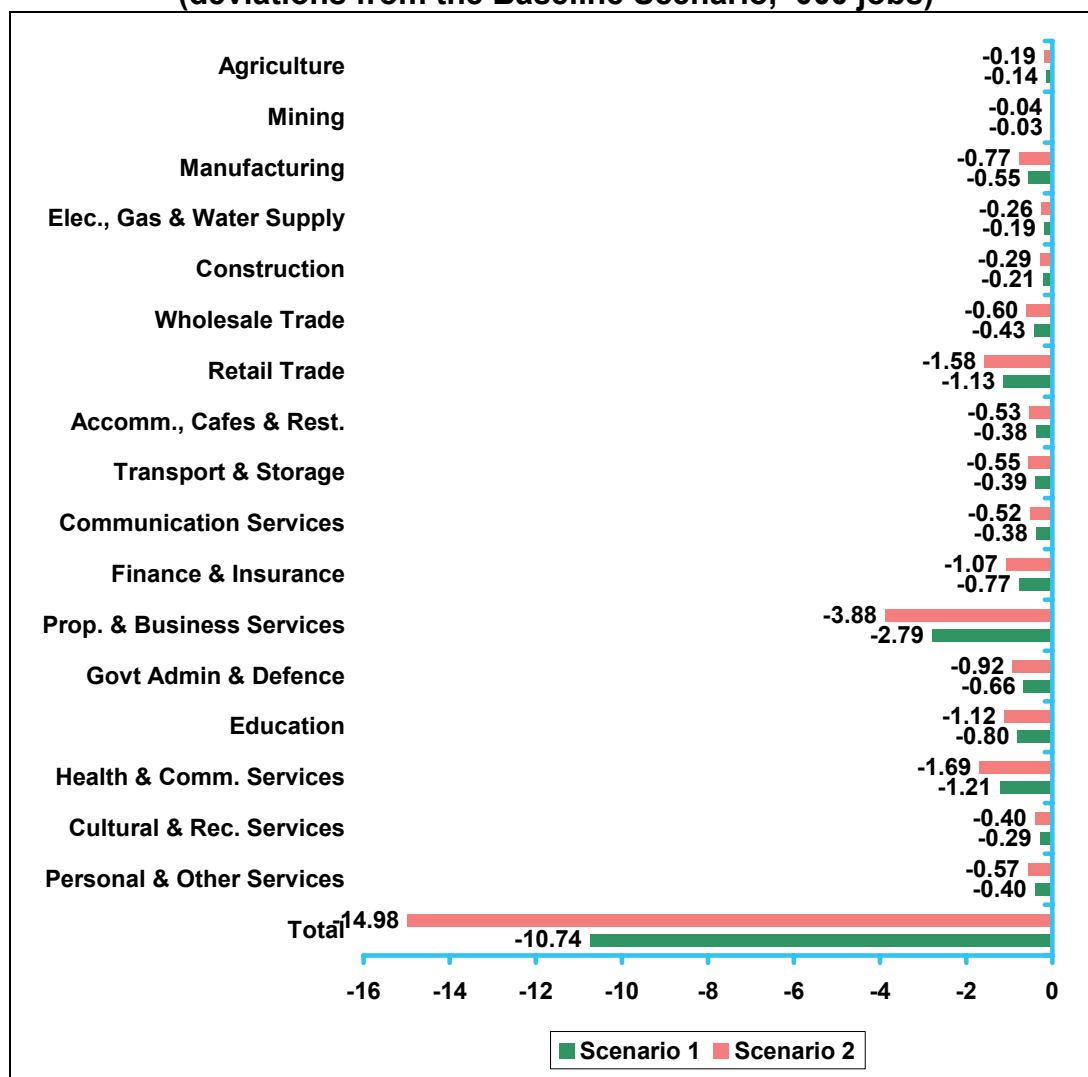
⁷ Because MMR produces estimates that are broadly linear, this means raising the lowest third of APCS wages by 20 cents per hour would reduce national employment by 0.22 per cent.

5.2 Industry Effects

This section describes the industry-wide economic impacts of increasing the lowest third of APCS wages as shown in Step 5 in Figure 3.1. This section focuses on rule-of-thumb industry employment effects (Chart 5.2) and GDP effects (Chart 5.3). Detailed tables outlining the changes in industry GDP and employment, as well as changes in labour productivity, are contained in Attachment B.

The change in employment depends on the proportion of APCS reliant employees in each industry. Specifically, for industries that are trade-exposed, prices are determined on world markets and the extent of employment falls from increasing the lowest third of APCS wages depends on the extent of labour cost increases by industry. For example, the workforce of the Property and Business Services Industry is more APCS reliant than the Mining Industry workforce and so experiences greater percentage increases in direct labour costs under both Scenarios 1 and 2.

Chart 5.2
Industry Employment Effects from Lowest Third of APCS Wages Increase
(deviations from the Baseline Scenario, '000 jobs)



Source: MMR Model simulations

Further, the Property and Business Services Industry also experiences greater percentage increases in indirect labour costs because of the flow-on from higher non-agreement wages to agreement wages. In the Property and Business Services Industry, each 5.8 per cent increase in non-agreement wages translates to a 1 per cent increase in the wages of employees on agreements. This exacerbates the impact because the labour costs of the Property and Business Services Industry are the second highest of all industries (behind the Manufacturing Industry) and employees on agreements account for about 85 per cent of these costs.

Combining the direct and indirect increases in labour costs, each 10 cents per hour increase in the lowest third of APCS wages reduces employment in the Property and Business Services Industry by around 2,800 jobs (or 0.17 per cent). Further, each 1 per cent increase in the lowest third of APCS wages reduces employment in the Property and Business Services Industry by around 3,900 jobs (or 0.24 per cent).

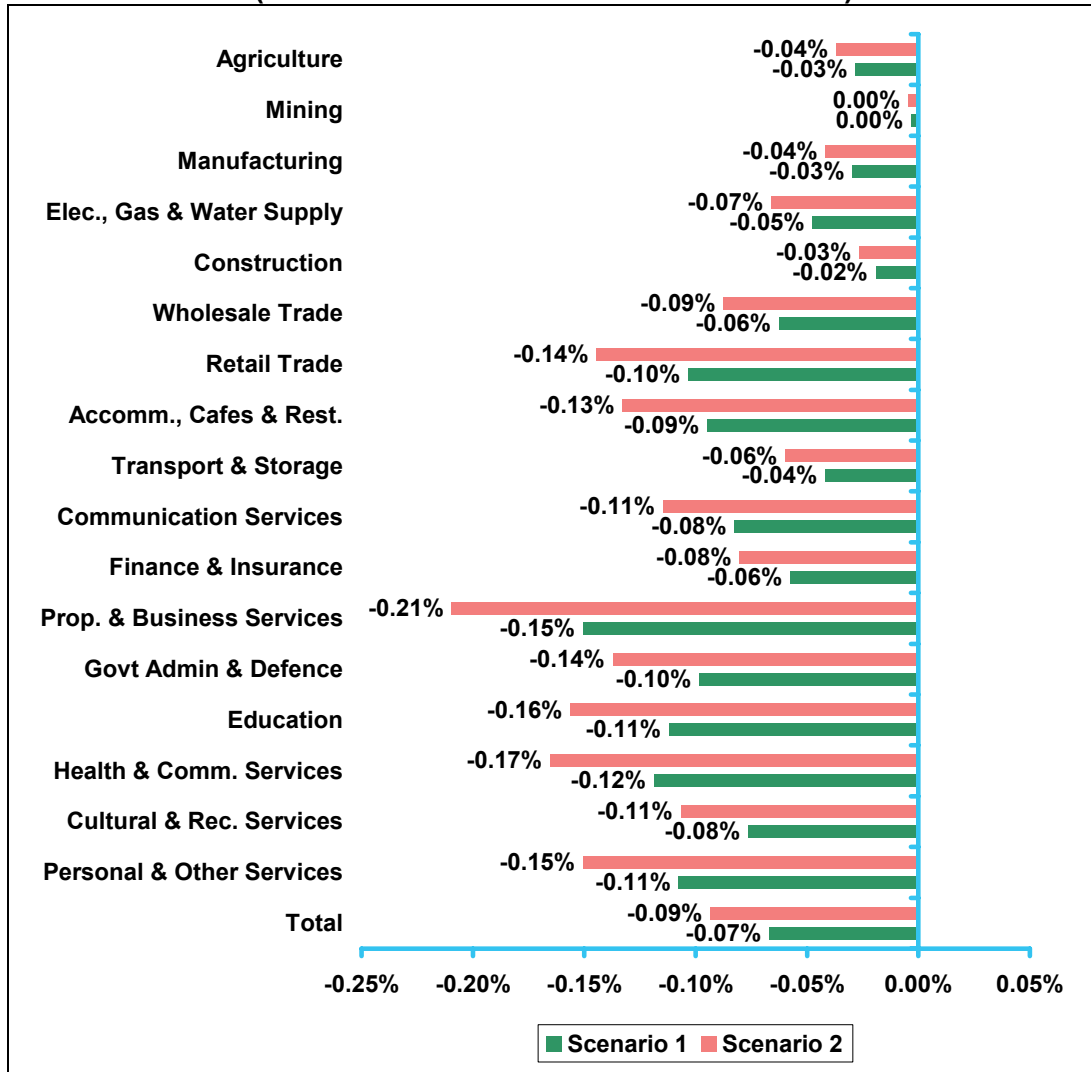
For industries that are not trade-exposed, prices are determined domestically by the interplay of demand and supply. The extent of employment falls therefore depends both on the fall in supply from labour cost increases as well as the fall in demand from lower national income. For both scenarios, Chart 5.2 shows that higher labour costs and lower demand both work to reduce employment in the Retail Trade Industry and the Accommodation, Cafes and Restaurants Industry.

The change in employment in each industry also depends on the capital intensity of each industry. For example, Chart 5.2 (and Table B2 in Attachment B) shows relatively large proportional falls in employment in the Electricity, Gas and Water Industry under both scenarios. This is because the Electricity, Gas and Water Industry is capital intensive and any increase in the cost of labour will stimulate substitution of capital for labour.

Falls in industry GDP depend both on the employment falls and the labour intensity of each industry. For example, under both scenarios, the falls in employment in the labour-intensive Retail Trade and Accommodation, Cafes and Restaurants industries flow through to similar proportional falls in GDP of these industries (see tables B2 and B3 in Attachment B). In contrast, the fall in employment in the capital-intensive Electricity, Gas and Water Industry has only a minor impact on output of this industry. The situation is similar in the Communications Industry where the capital intensity of the industry helps to offset the impact on production of a fall in employment.

For a more technical explanation of the magnitude of the employment and production effects in each industry, see Box 6.1 in Section 6. It explains how the industry production and employment effects relate back to assumed changes in industry real wages and elasticities of substitution between labour and capital.

Chart 5.3
Industry GDP Effects from Increasing the Lowest Third of APCS Wages
(deviations from the Baseline Scenario)



Source: MMR Model simulations

5.3 Regional Effects

This section describes the regional economic impacts of increasing the lowest third of APCS wages as shown in Step 6 in Figure 3.1. Like the previous section, this section focuses on rule-of-thumb GDP and employment regional effects under both scenarios. Detailed tables for both labour productivity and consumption effects by region are contained in Attachment B.

Table 5.1 shows that the falls in employment and GDP vary across regions for both scenarios. This is because of differences in the distribution of the types of industries in each region. As discussed in the previous section, the largest rule-of-thumb employment and GDP impacts are expected in the Property and Business Services Industry, which means that regions with a large Property and Business Services Industry will experience larger falls in employment and GDP. For example, Table 5.1 shows that the falls in employment and GDP are generally larger in capital cities than in regional areas because of the high concentration of the Property and Business Services Industry in capital cities.

Under both scenarios, employment falls by a larger percentage than real GDP in all regions (see Tables B6 and B7 in Attachment B). This is because labour productivity increases as each employee produces more real GDP than before the hypothetical APCS wage increase, which means that labour productivity increases in all regions.

Table 5.1
Regional GDP & Employment Effects from Lowest Third APCS Wage Increase
(deviations from the Baseline Scenario)

	Employment ('000 jobs)		GDP	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Sydney	-2.75	-3.84	-0.08%	-0.11%
Hunter	-0.24	-0.33	-0.05%	-0.07%
Illawarra	-0.16	-0.23	-0.06%	-0.08%
South Eastern	-0.10	-0.13	-0.07%	-0.10%
Richmond-Tweed, Mid-North	-0.17	-0.24	-0.06%	-0.08%
Northern, Far West-North West, Central West	-0.18	-0.25	-0.05%	-0.07%
Murray-Murrumbidgee	-0.10	-0.14	-0.05%	-0.07%
Melbourne	-2.19	-3.05	-0.07%	-0.10%
Barwon-Western District	-0.14	-0.20	-0.06%	-0.08%
Central Highlands-Wimmera	-0.08	-0.11	-0.06%	-0.08%
Loddon-Mallee	-0.09	-0.13	-0.05%	-0.07%
Goulburn-Ovens-Murray	-0.12	-0.16	-0.06%	-0.08%
All Gippsland	-0.11	-0.15	-0.06%	-0.08%
Brisbane	-1.02	-1.42	-0.07%	-0.10%
South & East Moreton	-0.23	-0.32	-0.07%	-0.10%
North & West Moreton	-0.14	-0.20	-0.06%	-0.08%
Wide Bay-Burnett	-0.08	-0.11	-0.05%	-0.07%
Darling Downs-South West	-0.10	-0.14	-0.05%	-0.07%
Mackay-Fitzroy-Central West	-0.15	-0.20	-0.04%	-0.06%
Northern-North West	-0.11	-0.16	-0.05%	-0.07%
Far North	-0.12	-0.17	-0.06%	-0.09%
Adelaide	-0.62	-0.86	-0.07%	-0.10%
Northern & Western SA	-0.05	-0.07	-0.04%	-0.05%
Southern & Eastern SA	-0.09	-0.12	-0.05%	-0.07%
Perth	-0.81	-1.13	-0.06%	-0.08%
Lower Western WA	-0.10	-0.14	-0.04%	-0.06%
Remainder WA	-0.10	-0.13	-0.03%	-0.05%
Greater Hobart-Southern	-0.13	-0.18	-0.08%	-0.11%
Northern	-0.06	-0.08	-0.06%	-0.09%
Mersey-Lyell	-0.04	-0.05	-0.05%	-0.06%
Northern Territory	-0.10	-0.15	-0.06%	-0.09%
ACT	-0.27	-0.38	-0.10%	-0.14%
Australia	-10.74	-14.98	-0.07%	-0.09%

Source: MMR Model simulations

6 Increasing all APCS Wages

The second pair of scenarios involves increasing all APCS hourly wage rates. The parameters for these two alternative wage increase scenarios are as follows:

- Scenario 3 – a scenario in which all APCS hourly wages in Australia are increased by 10 cents per hour. Table 4.3 shows that this increase in APCS wages raises Australian labour costs by about 0.20 per cent.
- Scenario 4 – a scenario in which all APCS hourly wages in Australia are increased by 1 per cent. Table 4.3 shows that this increase in APCS wages raises Australian labour costs by about 0.31 per cent.

Increasing all APCS wages directly affects about 20 per cent of employees in Australia. In contrast, increasing the lowest-third of APCS wages rates (Scenarios 1 and 2) directly affects about 7 per cent of all employees. Therefore, the rule-of-thumb national, industry and regional impacts for Scenarios 3 and 4 will be larger than the corresponding impacts under the other two alternative wage increase scenarios.

6.1 National Effects

Chart 6.1 shows the main national effects for both Scenario 3 and Scenario 4. As discussed above, increasing all APCS wages directly affects about 20 per cent of employees in Australia. Therefore, Chart 6.1 shows that the rule-of-thumb national, industry and regional impacts for Scenarios 3 and 4 are larger than the corresponding impacts under the other two alternative wage increase scenarios.

Specifically, Chart 6.1 shows that each 10 cent per hour increase in APCS wages is estimated to reduce national employment by 0.33 per cent (or 31,500 jobs). This fall is significantly larger than the fall in employment under Scenario 1 (only about 0.11 per cent). This is because there is a significantly larger increase in industry labour costs under Scenario 3 than under Scenario 1. The chart also shows that each 10 cent per hour increase in APCS wages has the following impacts:

- it reduces national GDP by 0.20 per cent;
- it increases labour productivity by 0.13 per cent;
- it increases the unemployment rate by 0.32 percentage points; and
- it reduces national consumption by 0.25 per cent.

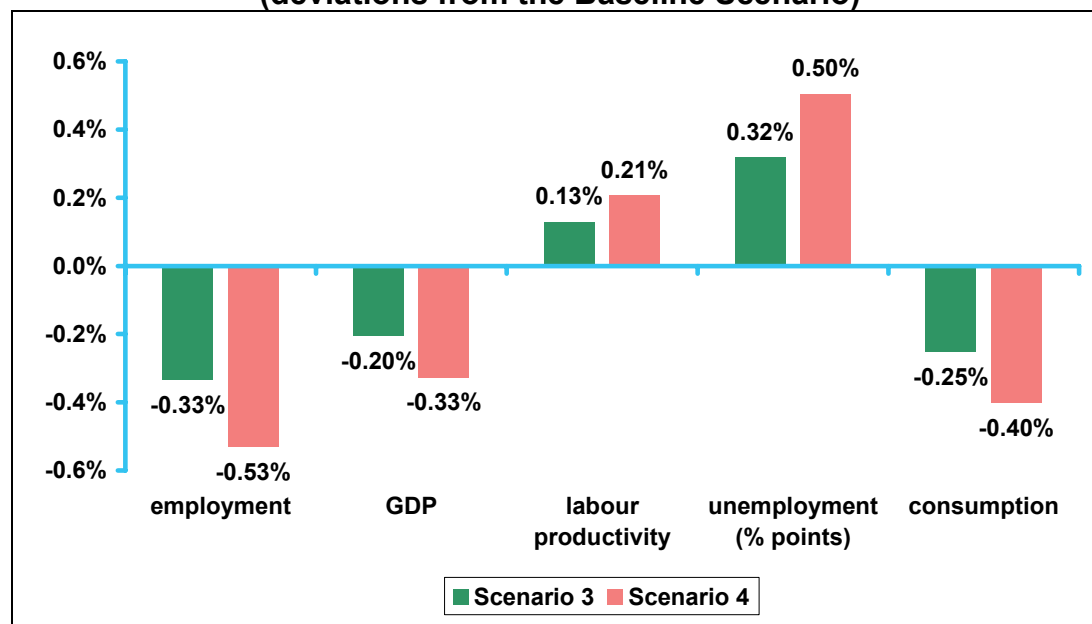
Further, Chart 6.1 shows that each 1 per cent increase in APCS wages has the following impacts:

- it reduces national employment by 0.53 per cent (or 50,300 jobs);
- it reduces national GDP by 0.33 per cent;
- it increases labour productivity by 0.21 per cent;
- it increases the unemployment rate by 0.50 percentage points; and
- it reduces national consumption by 0.40 per cent.

Of all the different wage increase scenarios simulated in this report, the national effects are the largest under Scenario 4. This is because increasing all APCS wages by 1 per cent is

estimated to increase average labour costs in Australia by about 0.31 per cent, which is a significantly larger increase in average labour costs than the other three alternative scenarios.

Chart 6.1
National Effects from Increasing All APCS Wage Rates
(deviations from the Baseline Scenario)



Source: MMR Model simulations

In CGE models such as MMR, the wage sensitivity of labour demand is driven by the degree of substitutability between capital and labour. In particular, the wage elasticity of labour demand is equal to (the negative of) the elasticity of substitution between capital and labour (0.5 in MMR) divided by the profit share of national income (0.3 in MMR). This implies a wage sensitivity of employment demand in MMR of -1.67.

This is borne out in the MMR results. For example, scenario 3 shows a 0.33 per cent fall in employment resulting from a 0.20 per cent rise in real wages (Table 4.3), implying a wage elasticity of labour demand of -1.65 in MMR, virtually identical to the theoretical value of -1.67.

These results can be compared with those found in empirical studies. Studies of production functions generally find that the elasticity of substitution between capital and labour is between 0.5 and 1.0. This makes the value in MMR of 0.5, and the employment responses that flow from it, appear low. On the other hand, as surveyed in section 2, studies of labour demand in Australia find a wage elasticity of labour demand of -0.6 to -1.0. By this standard, the value in MMR of -1.65 may appear high.

However, as pointed out by Webster (2000), some of these studies treat output as a separate influence on employment yet “one of the main ways relative factor prices (including wages) can affect employment is through its effect on the profit maximising level of production”. Hence these studies may capture the direct effect of higher wages on employment but not the indirect effect that operates via lower output. MMR captures both.

Overall, using an elasticity of substitution between labour and capital of 0.5 seems a reasonable trade-off between the apparently conflicting empirical studies on the elasticity of substitution between labour and capital, and the wage elasticity of labour demand. This is

especially the case given that some studies of the wage elasticity of labour demand ignore indirect effects operating through output. For further discussion of the wage-employment relationship and how it is reflected in the MMR results, see Box 6.1.

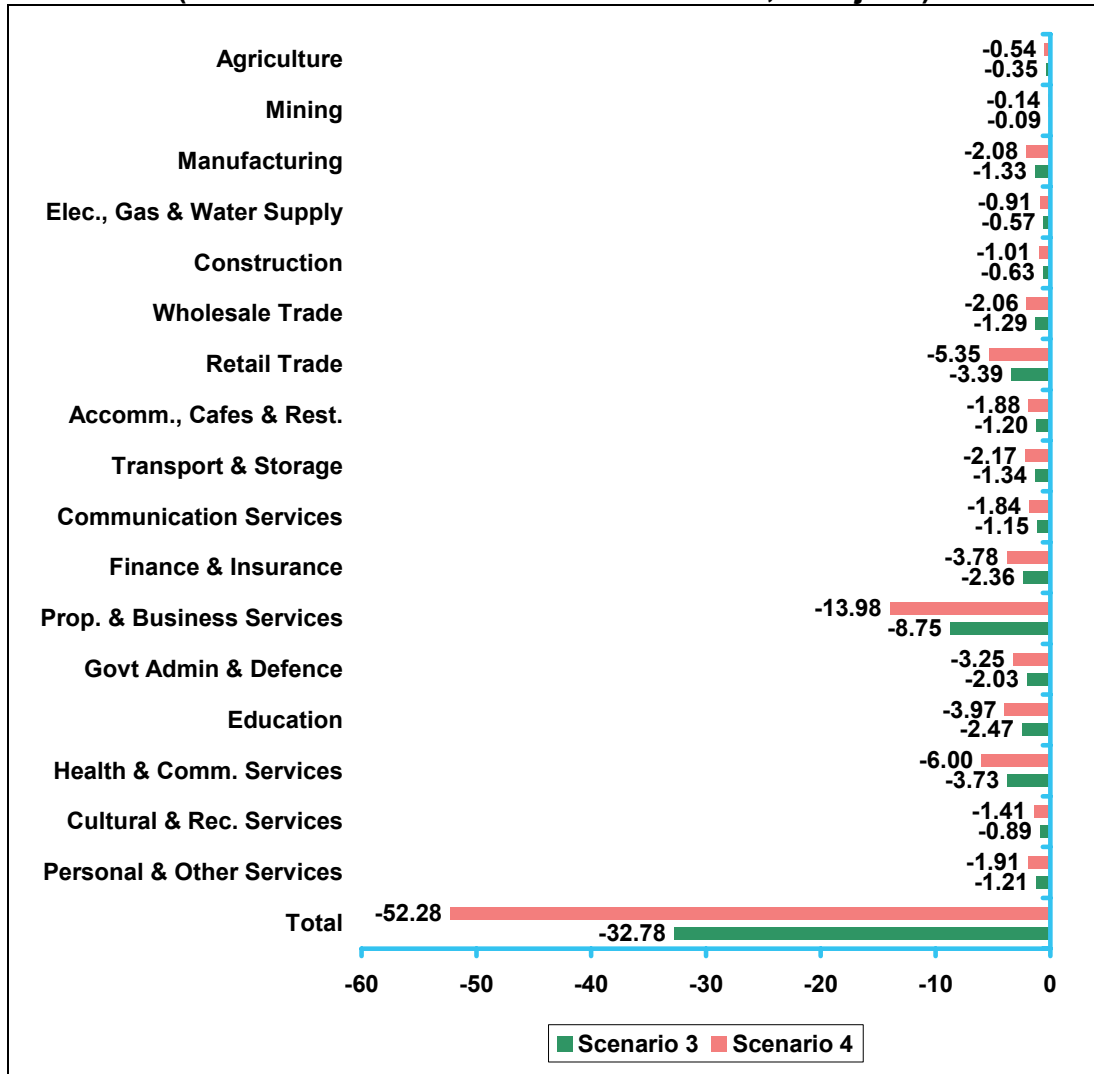
6.2 Industry Effects

This section describes the industry-wide economic impacts of increasing all APCS wages. Once again, this section focuses on rule-of-thumb industry employment effects (Chart 6.2) and GDP effects (Chart 6.3). For all four alternative wage increase scenarios, detailed tables for both industry GDP and employment effects, as well as industry labour productivity effects, are contained in Attachment B.

The main employment and GDP impacts for Scenarios 3 and 4 are as follows:

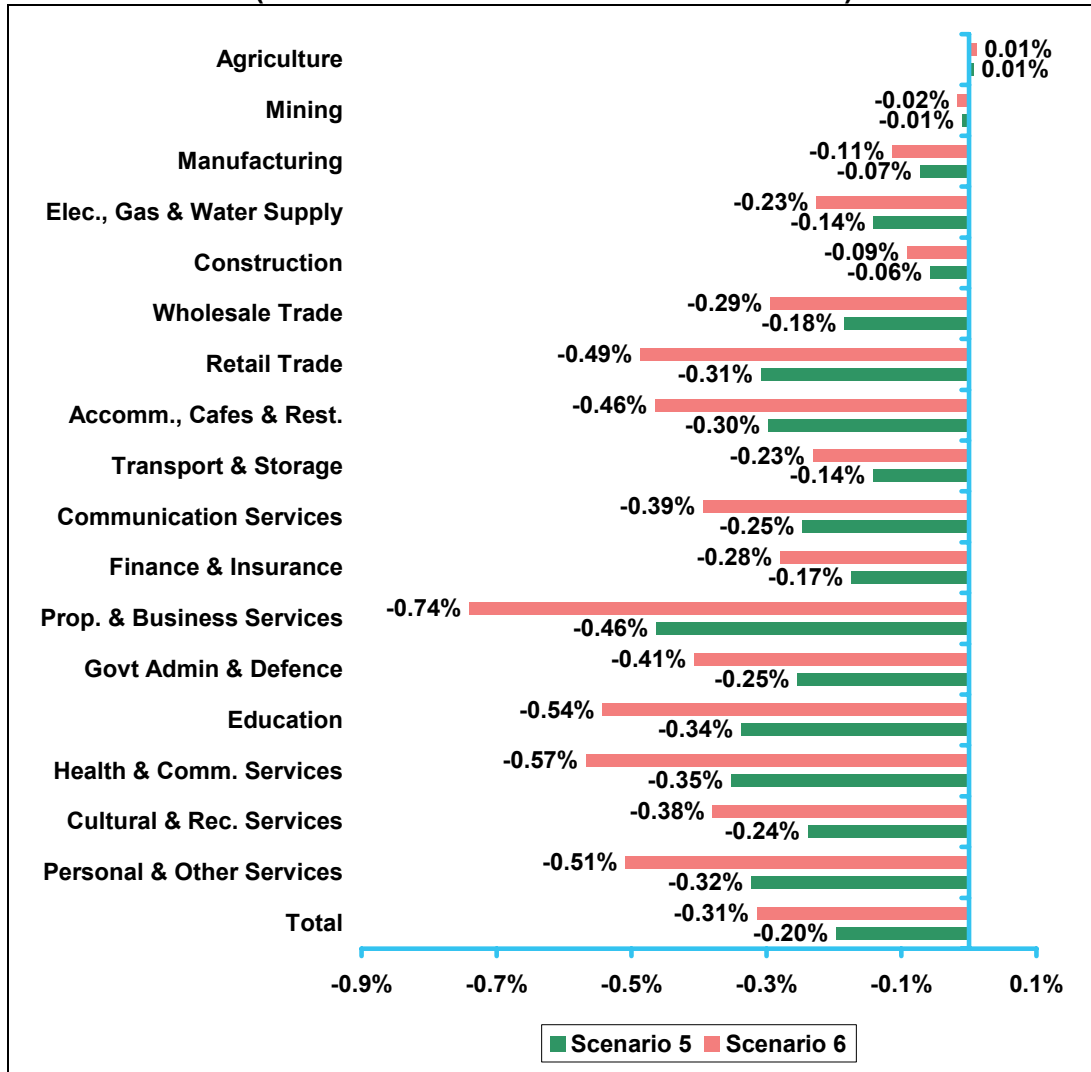
- the workforce of the Property and Business Services Industry is more APCS reliant than the Mining Industry and therefore experiences greater percentage falls in employment and GDP;
- higher labour costs combined with lower demand (from lower consumption) feed through to reduce employment and GDP in the Retail Trade and Accommodation, Cafes and Restaurants industries;
- there are relatively large falls in employment in the Electricity, Gas and Water Industry under both scenarios because this industry is capital intensive and any increase in the cost of labour will stimulate substitution of capital for labour;
- the fall in employment in the Electricity, Gas and Water Industry has a smaller impact on output of this industry because this industry is capital-intensive;
- the falls in employment in the labour-intensive Retail Trade and Accommodation, Cafes and Restaurants industries flow through to similar falls in GDP of these industries; and
- the rule-of-thumb industry impacts for Scenarios 3 and 4 are larger than the corresponding impacts under scenarios 1 and 2 because increasing all APCS wages directly affects about 20 per cent of employees in Australia (compared to about 7 per cent for Scenarios 1 and 2).

Chart 6.2
Industry Employment Effects from Increasing All APCS Wages
(deviations from the Baseline Scenario, '000 jobs)



Source: MMR Model simulations

Chart 6.3
Industry GDP Effects from Increasing All APCS Wages
(deviations from the Baseline Scenario)



Source: MMR Model simulations

For a more technical explanation of the magnitude of the employment and production effects in each industry, see Box 6.1 below. It explains how these effects relate back to assumed changes in industry real wages and elasticities of substitution between labour and capital.

Box 6.1**Technical Explanation of Industry Employment and Production Effects**

MMR is a model of medium-term equilibrium. As such, in each industry, profits are maximised subject to a production function and a given capital stock. In these circumstances, the percentage effects on employment and production in each industry are determined approximately by the following formulas (the exact formulas are used in MMR).

$$\% \text{ change employment} = - [(\text{capital-labour elasticity of substitution}) / (\text{profit share})] \times (\% \text{ change in real wage})$$

$$\% \text{ change production} = (\text{labour share}) \times (\% \text{ change employment})$$

The outcomes for the Retail Trade Industry under Scenario 3 can be used as an example. As reported in Tables B2 and B3, the rise in labour costs of the Retail Trade Industry of 0.39 per cent leads to the falls in industry employment and production of 0.38 per cent and 0.31 per cent respectively. These results can be reproduced using the above approximation formulas as follows.

$$\begin{aligned} &\% \text{ change in employment:} \\ &-0.38\% = - [0.5 / 17.8\%] \times (0.135\%) \end{aligned}$$

$$\begin{aligned} &\% \text{ change in production:} \\ &-0.31\% = 82.2\% \times -0.38\% \end{aligned}$$

In the above illustration, the increase in the producer real wage is 0.135 per cent. This reflects the assumed rise in the nominal wage of 0.39 per cent for the Retail Trade Industry (as shown in Table 4.3) partly offset by a rise in the “price” of Retail Trade (i.e. Retail Trade nominal gross margins) of 0.26 per cent. This price rise reflects higher labour costs for the Retail Trade Industry partly offset by the effects of lower demand from a fall in consumer spending.

The percentage effects on production and employment for other industries shown in Tables B2 and B3 can be reproduced in the same way. For example, the outcomes for the Property and Business Services Industry under Scenario 3 can also be reproduced to explain the differences between the impacts for this industry and the Retail Trade Industry. As reported in Tables B2 and B3, the rise in labour costs of this industry is 0.19 per cent in nominal terms, which translates to 0.135 per cent in real terms. This leads to falls in industry employment and production of 0.54 per cent and 0.47 per cent respectively. These results can be reproduced using the above approximation formulas as follows.

$$\begin{aligned} &\% \text{ change in employment:} \\ &-0.54\% = - [0.5 / 12.6\%] \times (0.135\%) \end{aligned}$$

$$\begin{aligned} &\% \text{ change in production:} \\ &-0.47\% = 87.4\% \times -0.54\% \end{aligned}$$

6.3 Regional Effects

This section describes the regional economic impacts of increasing all APCS wages. Like the previous section, this section focuses on rule-of-thumb GDP and employment effects scenarios. Detailed tables for both labour productivity and consumption effects by region are contained in Attachment B.

Table 6.1 shows that the falls in employment and GDP are generally larger in capital cities than in regional areas because of the high concentration of the Property and Business Services Industry in capital cities. More generally, increasing all APCS wages has the largest rule-of-thumb regional impacts of both sets of scenarios.

Table 6.1
Regional GDP and Employment Effects from Increasing All APCS Wages
(deviations from the Baseline Scenario)

	Employment ('000 jobs)		GDP	
	Scenario 3	Scenario 4	Scenario 3	Scenario 4
Sydney	-8.47	-13.53	-0.24%	-0.39%
Hunter	-0.71	-1.14	-0.15%	-0.25%
Illawarra	-0.50	-0.79	-0.18%	-0.28%
South Eastern	-0.30	-0.48	-0.21%	-0.34%
Richmond-Tweed, Mid-North	-0.52	-0.83	-0.18%	-0.29%
Northern, Far West-North West, Central West	-0.55	-0.87	-0.15%	-0.24%
Murray-Murrumbidgee	-0.31	-0.49	-0.16%	-0.25%
Melbourne	-6.67	-10.64	-0.23%	-0.36%
Barwon-Western District	-0.43	-0.68	-0.17%	-0.27%
Central Highlands-Wimmera	-0.23	-0.36	-0.17%	-0.28%
Loddon-Mallee	-0.27	-0.43	-0.15%	-0.24%
Goulburn-Ovens-Murray	-0.35	-0.56	-0.17%	-0.26%
All Gippsland	-0.32	-0.51	-0.17%	-0.27%
Brisbane	-3.13	-5.00	-0.22%	-0.34%
South & East Moreton	-0.71	-1.13	-0.21%	-0.34%
North & West Moreton	-0.44	-0.71	-0.18%	-0.29%
Wide Bay-Burnett	-0.23	-0.36	-0.15%	-0.24%
Darling Downs-South West	-0.29	-0.46	-0.16%	-0.25%
Mackay-Fitzroy-Central West	-0.44	-0.71	-0.13%	-0.20%
Northern-North West	-0.34	-0.54	-0.16%	-0.26%
Far North	-0.36	-0.58	-0.19%	-0.31%
Adelaide	-1.88	-3.00	-0.22%	-0.35%
Northern & Western SA	-0.15	-0.23	-0.11%	-0.17%
Southern & Eastern SA	-0.26	-0.42	-0.15%	-0.23%
Perth	-2.48	-3.95	-0.19%	-0.30%
Lower Western WA	-0.31	-0.49	-0.13%	-0.21%
Remainder WA	-0.29	-0.47	-0.10%	-0.16%
Greater Hobart-Southern	-0.39	-0.62	-0.24%	-0.38%
Northern	-0.18	-0.28	-0.18%	-0.29%
Mersey-Lyell	-0.11	-0.18	-0.14%	-0.22%
Northern Territory	-0.33	-0.52	-0.20%	-0.32%
ACT	-0.84	-1.35	-0.31%	-0.50%
Australia	-32.78	-52.28	-0.20%	-0.33%

Source: MMR Model simulations

Attachment A – Calculation of Labour Cost Increases by Industry

This attachment outlines the methodology for estimating the labour cost increases by industry as shown in Table 4.3 of this report.

As discussed in Section 4, the labour cost increases by industry consist of both direct and indirect contributions. The direct contributions, which are the larger of the two contributions, represent the increase in either the lowest third or all APCS wages under each of the four scenarios. The indirect contributions represent the flow-on effects of higher APCS wages to the wages of employees on agreements. The direct and indirect contributions to total labour cost increases by industry are discussed in turn below.

Direct Labour Cost Increases

The estimated direct labour cost increases comprise two parts: the direct change in wages under the hypothetical wage increase scenarios and the total wage bill.

The 2004 EEH survey provided the necessary data to estimate the labour cost increases by industry. The data included both published (ABS Cat. No. 6306.0) and unpublished (specific data request) estimates. Specifically, the 2004 EEH survey was used to obtain the following data:

- the number of federal minimum wage reliant employees by industry;
- the number of APCS reliant employees by industry;
- the average APCS wage rate by industry;
- the number of agreement reliant employees by industry;
- the average agreement wage rate by industry;
- the total number of employees by industry;
- the average wage rate for all employees by industry.

Under each hypothetical alternative scenario, either the lowest third or all APCS wages are simulated to increase. Equation 1 is used to estimate the direct increase in wages by industry (DWI_i). This equation states that the estimated increase in wage rates is the difference between the average APCS wage in each industry (AW_i) and the hypothetical average APCS wage in each industry under Scenarios 1 through to 4 (AW_s). This is weighted by the number of APCS reliant workers in each industry (K_i) to get an estimate of the total increase in labour costs by industry for each scenario. All of this data was obtained from the 2004 EEH survey.

The wage bill of each industry is a measure of the total labour costs of each industry and is estimated via Equation 2. Equation 2 shows that the total wage bill by industry (WB_i) is measured by the number of employees in each industry (T_i) times the average wage of that industry (AW_i). As discussed above, this data was also obtained from the 2004 EEH survey.

Finally, the estimated increase in direct labour costs by industry ($DLCI_i$) is the increase in direct labour costs by industry over the total labour costs in that industry (see Equation 3).

$$DWI_i = K_i * (AW_i - AW_s) \quad [1]$$

$$WB_i = T_i * AW_i \quad [2]$$

$$DLCI_i = \frac{DWI_i}{WB_i} \quad [3]$$

Definitions:

- DWI_i = direct wage increase in industry i
- K_i = number of employees on APCS wage in industry i
- AW_i = average APCS wage in industry i under the Baseline
- AW_s = average APCS wage in industry i under scenarios 1 through to 4
- WB_i = wage bill in industry i
- T_i = number of employees in industry i
- AW_i = average wage of all employees in industry i
- DLCI_i = direct labour cost increase in industry i

The direct labour cost increases are estimated separately for full-time and part-time workers. In turn, the direct labour cost increases for both part-time and full-time employees in each industry are aggregated to get the total labour cost increases in each industry. The next section outlines the methodology for estimating the indirect (or flow-on) increases in labour costs by industry.

Indirect Labour Cost Increases

As discussed above, the indirect contribution to the labour cost increases represent the flow-on effects of higher APCS wages to the wages of employees on agreements. In this report, it is assumed that, in aggregate, each 5 per cent increase in APCS wages translates to a 1 per cent increase in the wages of employees on agreements.

The wage gap between average weekly APCS wages and average weekly agreement wages (both collective and individual combined) varies considerably between industries from about \$120 in Retail Trade to over \$600 in Communication Services. Therefore, it is reasonable to assume that the ratio of the flow-on of increases in APCS wages to agreement wages is larger when the gap between the average wages of the two different pay setting methods is smaller. For example, when applying this assumption, there would be larger flow-on effects from the increases in APCS wages to agreement wages in the Retail Trade Industry than in the Communication Services Industry. Specifically, instead of the aggregate ratio of 5:1 for all industries, the ratio for the Retail Trade Industry would be larger at about 2½:1, as shown in Table A1. This means that the wage increases will have larger indirect impacts on the average wage rate of the Retail Trade Industry than the average wage rate of the Communication Services Industry.

The estimated flow-on impacts for each industry used in this report are outlined in Table A1. The bottom row of the table shows the difference between average APCS wages and average agreement wages (collective and individual combined) for all industries is about \$306. The

table also shows the difference between the average APCS wage and the average agreement wage in each industry varies considerably around this average. The variance of the difference in average wages of each industry from this average of \$306 (shown in the fifth column of the table) determines the size of the flow-on for each industry (shown in the last column of the table). Importantly, although the ratio of the flow-on effects varies between industries, in aggregate, each 5 per cent increase in APCS wages translates to a 1 per cent increase in the wages of employees on agreements, as shown in the bottom row of the table.

Table A1
Estimates of the Different Ratio of Flow-on Effects by Industry

	Average wage: APCS	Average wage: agreement	Difference	Variation from the mean	Ratio applied
Mining	\$1235	\$1569	\$334	0.23	6.8
Manufacturing	\$600	\$946	\$346	0.32	7.1
Electricity, Gas and Water Supply	\$844	\$1154	\$310	0.03	6.2
Construction	\$600	\$1033	\$433	1.02	9.0
Wholesale Trade	\$587	\$852	\$266	-0.32	5.1
Retail Trade	\$451	\$571	\$120	-1.48	2.3
Accom., Cafes and Restaurants	\$413	\$541	\$128	-1.42	2.4
Transport and Storage	\$657	\$923	\$266	-0.32	5.1
Communication Services	\$299	\$941	\$641	2.68	11.4
Finance and Insurance	\$546	\$932	\$385	0.64	8.0
Property and Business Services	\$550	\$843	\$294	-0.10	5.8
Gov't Administration and Defence	\$611	\$864	\$253	-0.42	4.9
Education	\$584	\$806	\$222	-0.67	4.1
Health and Community Services	\$499	\$731	\$232	-0.59	4.4
Cultural and Recreational Services	\$437	\$692	\$255	-0.41	4.9
Personal and Other Services	\$411	\$820	\$409	0.82	8.5
Average	\$583	\$889	\$306		5.0

Like the direct industry labour cost increases, the estimated indirect labour cost increase comprise of two parts: the indirect change in wages under the hypothetical wage increase scenarios and the total wage bill. The size of the flow-on effects for each industry is shown in the last column of Table A1.

Equation 4 is used to estimate the indirect (i.e. the flow-on) increase in labour costs by industry ($INWI_i$). As discussed above, the indirect increase applies to the wages of employees on collective and individual agreements. Equation 4 states that the estimated indirect increase in wage rates for agreement reliant employees is the direct wage increase in each industry (DWI_i) multiplied by one divided by the ratio of the wage increase flow-on effects in industry (R_i). This is weighted by the number of agreement reliant workers in each industry (N_i) to get an estimate of the total indirect increase in labour costs by industry for each scenario.

The estimated indirect increase in labour costs by industry ($INLCI_i$) is the total indirect increase in labour costs by industry over the total labour costs in that industry (see Equation 5). Once again, the increase in labour costs is estimated separately for full-time and part-time employees and aggregated to get the total indirect increase in labour costs in each industry.

$$INWI_i = (DWI_i * 1 / R_i) * N_i \quad [4]$$

$$INLCI_i = \frac{INWI_i}{WB_i} \quad [5]$$

Definitions:

$INWI_i$ = indirect wage increase in industry i

DWI_i = direct wage increase in industry i

R_i = ratio of the wage increase flow-on effects in industry i

N_i = number of agreement reliant employees in industry i

WB_i = wage bill in industry i

$INLCI_i$ = indirect labour cost increase in industry i

Total Labour Cost Increases

Finally, the estimated increase in total labour costs by industry ($TLCI_i$) is the direct increase in labour costs by industry ($DLCI_i$) plus the indirect increase in labour costs by industry ($INLCI_i$), as shown in Equation 6.

$$TLCI_i = DLCI_i + INLCI_i \quad [6]$$

Definitions:

$TLCI_i$ = total labour cost increase in industry i

$DLCI_i$ = direct labour cost increase in industry i

$INLCI_i$ = indirect labour cost increase in industry i

Attachment B – Detailed Model Results for All Scenarios

This attachment outlines (and compares) the detailed rule-of-thumb industry and regional effects for the four wage increase scenarios. The industry and regional impacts cover employment, GDP, labour productivity and consumption.

Table B1
Industry Employment Effects for All Scenarios
(deviations from the Baseline Scenario, '000 jobs)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	-0.14	-0.19	-0.35	-0.54
Mining	-0.03	-0.04	-0.09	-0.14
Manufacturing	-0.55	-0.77	-1.33	-2.08
Elec., Gas & Water Supply	-0.19	-0.26	-0.57	-0.91
Construction	-0.21	-0.29	-0.63	-1.01
Wholesale Trade	-0.43	-0.60	-1.29	-2.06
Retail Trade	-1.13	-1.58	-3.39	-5.35
Accomm., Cafes & Rest.	-0.38	-0.53	-1.20	-1.88
Transport & Storage	-0.39	-0.55	-1.34	-2.17
Communication Services	-0.38	-0.52	-1.15	-1.84
Finance & Insurance	-0.77	-1.07	-2.36	-3.78
Prop. & Business Services	-2.79	-3.88	-8.75	-13.98
Govt Admin & Defence	-0.66	-0.92	-2.03	-3.25
Education	-0.80	-1.12	-2.47	-3.97
Health & Comm. Services	-1.21	-1.69	-3.73	-6.00
Cultural & Rec. Services	-0.29	-0.40	-0.89	-1.41
Personal & Other Services	-0.40	-0.57	-1.21	-1.91
Total	-10.74	-14.98	-32.78	-52.28

Source: MMR Model simulations

Table B2
Industry Employment Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	-0.05%	-0.07%	-0.13%	-0.20%
Mining	-0.02%	-0.02%	-0.05%	-0.08%
Manufacturing	-0.05%	-0.07%	-0.13%	-0.20%
Elec., Gas & Water Supply	-0.19%	-0.26%	-0.57%	-0.91%
Construction	-0.02%	-0.03%	-0.07%	-0.11%
Wholesale Trade	-0.08%	-0.11%	-0.23%	-0.37%
Retail Trade	-0.13%	-0.18%	-0.38%	-0.60%
Accomm., Cafes & Rest.	-0.15%	-0.21%	-0.47%	-0.73%
Transport & Storage	-0.06%	-0.09%	-0.22%	-0.36%
Communication Services	-0.16%	-0.23%	-0.50%	-0.80%
Finance & Insurance	-0.15%	-0.21%	-0.46%	-0.73%
Prop. & Business Services	-0.17%	-0.24%	-0.54%	-0.86%
Govt Admin & Defence	-0.12%	-0.16%	-0.35%	-0.57%
Education	-0.12%	-0.17%	-0.37%	-0.60%
Health & Comm. Services	-0.13%	-0.18%	-0.40%	-0.65%
Cultural & Rec. Services	-0.17%	-0.23%	-0.52%	-0.83%
Personal & Other Services	-0.12%	-0.17%	-0.36%	-0.57%
Total	-0.11%	-0.15%	-0.33%	-0.53%

Source: MMR Model simulations

Table B3
Industry GDP Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	-0.03%	-0.04%	-0.07%	-0.11%
Mining	0.00%	0.00%	-0.01%	-0.02%
Manufacturing	-0.03%	-0.04%	-0.07%	-0.11%
Elec., Gas & Water Supply	-0.05%	-0.07%	-0.14%	-0.23%
Construction	-0.02%	-0.03%	-0.06%	-0.09%
Wholesale Trade	-0.06%	-0.09%	-0.19%	-0.30%
Retail Trade	-0.10%	-0.14%	-0.31%	-0.49%
Accomm., Cafes & Rest.	-0.09%	-0.13%	-0.30%	-0.47%
Transport & Storage	-0.04%	-0.06%	-0.15%	-0.24%
Communication Services	-0.08%	-0.11%	-0.25%	-0.40%
Finance & Insurance	-0.06%	-0.08%	-0.18%	-0.28%
Prop. & Business Services	-0.15%	-0.21%	-0.47%	-0.75%
Govt Admin & Defence	-0.10%	-0.14%	-0.30%	-0.48%
Education	-0.11%	-0.16%	-0.35%	-0.56%
Health & Comm. Services	-0.12%	-0.17%	-0.36%	-0.59%
Cultural & Rec. Services	-0.08%	-0.11%	-0.24%	-0.38%
Personal & Other Services	-0.11%	-0.15%	-0.32%	-0.51%
Total	-0.07%	-0.09%	-0.20%	-0.33%

Source: MMR Model simulations

Table B4
Industry Labour Productivity Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Agriculture	0.02%	0.03%	0.06%	0.09%
Mining	0.01%	0.02%	0.04%	0.07%
Manufacturing	0.02%	0.03%	0.05%	0.08%
Elec., Gas & Water Supply	0.14%	0.20%	0.43%	0.69%
Construction	0.00%	0.01%	0.01%	0.02%
Wholesale Trade	0.01%	0.02%	0.04%	0.07%
Retail Trade	0.02%	0.03%	0.07%	0.11%
Accomm., Cafes & Rest.	0.05%	0.08%	0.17%	0.27%
Transport & Storage	0.02%	0.03%	0.08%	0.13%
Communication Services	0.08%	0.11%	0.25%	0.40%
Finance & Insurance	0.09%	0.13%	0.28%	0.45%
Prop. & Business Services	0.02%	0.03%	0.07%	0.11%
Govt Admin & Defence	0.02%	0.02%	0.05%	0.08%
Education	0.01%	0.01%	0.03%	0.04%
Health & Comm. Services	0.01%	0.02%	0.04%	0.06%
Cultural & Rec. Services	0.09%	0.13%	0.29%	0.45%
Personal & Other Services	0.01%	0.02%	0.04%	0.06%
Total	0.04%	0.06%	0.13%	0.21%

Source: MMR Model simulations

Table B5
Regional Employment Effects for All Scenarios
(deviations from the Baseline Scenario, '000 jobs)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sydney	-2.75	-3.84	-8.47	-13.53
Hunter	-0.24	-0.33	-0.71	-1.14
Illawarra	-0.16	-0.23	-0.50	-0.79
South Eastern	-0.10	-0.13	-0.30	-0.48
Richmond-Tweed, Mid-North	-0.17	-0.24	-0.52	-0.83
Northern, Far West-North West, Central West	-0.18	-0.25	-0.55	-0.87
Murray-Murrumbidgee	-0.10	-0.14	-0.31	-0.49
Melbourne	-2.19	-3.05	-6.67	-10.64
Barwon-Western District	-0.14	-0.20	-0.43	-0.68
Central Highlands-Wimmera	-0.08	-0.11	-0.23	-0.36
Loddon-Mallee	-0.09	-0.13	-0.27	-0.43
Goulburn-Ovens-Murray	-0.12	-0.16	-0.35	-0.56
All Gippsland	-0.11	-0.15	-0.32	-0.51
Brisbane	-1.02	-1.42	-3.13	-5.00
South & East Moreton	-0.23	-0.32	-0.71	-1.13
North & West Moreton	-0.14	-0.20	-0.44	-0.71
Wide Bay-Burnett	-0.08	-0.11	-0.23	-0.36
Darling Downs-South West	-0.10	-0.14	-0.29	-0.46
Mackay-Fitzroy-Central West	-0.15	-0.20	-0.44	-0.71
Northern-North West	-0.11	-0.16	-0.34	-0.54
Far North	-0.12	-0.17	-0.36	-0.58
Adelaide	-0.62	-0.86	-1.88	-3.00
Northern & Western SA	-0.05	-0.07	-0.15	-0.23
Southern & Eastern SA	-0.09	-0.12	-0.26	-0.42
Perth	-0.81	-1.13	-2.48	-3.95
Lower Western WA	-0.10	-0.14	-0.31	-0.49
Remainder WA	-0.10	-0.13	-0.29	-0.47
Greater Hobart-Southern	-0.13	-0.18	-0.39	-0.62
Northern	-0.06	-0.08	-0.18	-0.28
Mersey-Lyell	-0.04	-0.05	-0.11	-0.18
Northern Territory	-0.10	-0.15	-0.33	-0.52
ACT	-0.27	-0.38	-0.84	-1.35
Australia	-10.74	-14.98	-32.78	-52.28

Source: MMR Model simulations

Table B6
Regional Employment Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sydney	-0.13%	-0.18%	-0.39%	-0.62%
Hunter	-0.09%	-0.12%	-0.27%	-0.43%
Illawarra	-0.10%	-0.13%	-0.29%	-0.47%
South Eastern	-0.11%	-0.15%	-0.33%	-0.53%
Richmond-Tweed, Mid-North	-0.10%	-0.13%	-0.29%	-0.46%
Northern, Far West-North West, Central West	-0.08%	-0.12%	-0.25%	-0.40%
Murray-Murrumbidgee	-0.09%	-0.12%	-0.25%	-0.40%
Melbourne	-0.12%	-0.16%	-0.36%	-0.57%
Barwon-Western District	-0.09%	-0.13%	-0.28%	-0.45%
Central Highlands-Wimmera	-0.09%	-0.13%	-0.28%	-0.44%
Loddon-Mallee	-0.09%	-0.12%	-0.25%	-0.40%
Goulburn-Ovens-Murray	-0.09%	-0.12%	-0.26%	-0.42%
All Gippsland	-0.10%	-0.14%	-0.30%	-0.47%
Brisbane	-0.11%	-0.15%	-0.34%	-0.54%
South & East Moreton	-0.11%	-0.15%	-0.33%	-0.53%
North & West Moreton	-0.09%	-0.13%	-0.28%	-0.45%
Wide Bay-Burnett	-0.08%	-0.12%	-0.25%	-0.39%
Darling Downs-South West	-0.08%	-0.12%	-0.25%	-0.40%
Mackay-Fitzroy-Central West	-0.08%	-0.11%	-0.25%	-0.39%
Northern-North West	-0.09%	-0.13%	-0.28%	-0.44%
Far North	-0.10%	-0.14%	-0.31%	-0.50%
Adelaide	-0.11%	-0.16%	-0.35%	-0.55%
Northern & Western SA	-0.07%	-0.10%	-0.21%	-0.34%
Southern & Eastern SA	-0.08%	-0.11%	-0.24%	-0.38%
Perth	-0.10%	-0.15%	-0.32%	-0.51%
Lower Western WA	-0.08%	-0.11%	-0.24%	-0.39%
Remainder WA	-0.07%	-0.10%	-0.22%	-0.35%
Greater Hobart-Southern	-0.12%	-0.17%	-0.37%	-0.60%
Northern	-0.10%	-0.14%	-0.30%	-0.48%
Mersey-Lyell	-0.08%	-0.11%	-0.25%	-0.39%
Northern Territory	-0.10%	-0.14%	-0.32%	-0.52%
ACT	-0.14%	-0.20%	-0.44%	-0.71%
Australia	-0.11%	-0.15%	-0.33%	-0.53%

Source: MMR Model simulations

Table B7
Regional GDP Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sydney	-0.08%	-0.11%	-0.24%	-0.39%
Hunter	-0.05%	-0.07%	-0.15%	-0.25%
Illawarra	-0.06%	-0.08%	-0.18%	-0.28%
South Eastern	-0.07%	-0.10%	-0.21%	-0.34%
Richmond-Tweed, Mid-North	-0.06%	-0.08%	-0.18%	-0.29%
Northern, Far West-North West, Central West	-0.05%	-0.07%	-0.15%	-0.24%
Murray-Murrumbidgee	-0.05%	-0.07%	-0.16%	-0.25%
Melbourne	-0.07%	-0.10%	-0.23%	-0.36%
Barwon-Western District	-0.06%	-0.08%	-0.17%	-0.27%
Central Highlands-Wimmera	-0.06%	-0.08%	-0.17%	-0.28%
Loddon-Mallee	-0.05%	-0.07%	-0.15%	-0.24%
Goulburn-Ovens-Murray	-0.06%	-0.08%	-0.17%	-0.26%
All Gippsland	-0.06%	-0.08%	-0.17%	-0.27%
Brisbane	-0.07%	-0.10%	-0.22%	-0.34%
South & East Moreton	-0.07%	-0.10%	-0.21%	-0.34%
North & West Moreton	-0.06%	-0.08%	-0.18%	-0.29%
Wide Bay-Burnett	-0.05%	-0.07%	-0.15%	-0.24%
Darling Downs-South West	-0.05%	-0.07%	-0.16%	-0.25%
Mackay-Fitzroy-Central West	-0.04%	-0.06%	-0.13%	-0.20%
Northern-North West	-0.05%	-0.07%	-0.16%	-0.26%
Far North	-0.06%	-0.09%	-0.19%	-0.31%
Adelaide	-0.07%	-0.10%	-0.22%	-0.35%
Northern & Western SA	-0.04%	-0.05%	-0.11%	-0.17%
Southern & Eastern SA	-0.05%	-0.07%	-0.15%	-0.23%
Perth	-0.06%	-0.08%	-0.19%	-0.30%
Lower Western WA	-0.04%	-0.06%	-0.13%	-0.21%
Remainder WA	-0.03%	-0.05%	-0.10%	-0.16%
Greater Hobart-Southern	-0.08%	-0.11%	-0.24%	-0.38%
Northern	-0.06%	-0.09%	-0.18%	-0.29%
Mersey-Lyell	-0.05%	-0.06%	-0.14%	-0.22%
Northern Territory	-0.06%	-0.09%	-0.20%	-0.32%
ACT	-0.10%	-0.14%	-0.31%	-0.50%
Australia	-0.07%	-0.09%	-0.20%	-0.33%

Source: MMR Model simulations

Table B8
Regional Labour Productivity Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sydney	0.05%	0.07%	0.14%	0.23%
Hunter	0.04%	0.05%	0.12%	0.19%
Illawarra	0.04%	0.05%	0.11%	0.18%
South Eastern	0.04%	0.05%	0.12%	0.19%
Richmond-Tweed, Mid-North	0.04%	0.05%	0.11%	0.17%
Northern, Far West-North West, Central				
West	0.04%	0.05%	0.10%	0.17%
Murray-Murrumbidgee	0.03%	0.04%	0.10%	0.15%
Melbourne	0.04%	0.06%	0.13%	0.21%
Barwon-Western District	0.04%	0.05%	0.11%	0.17%
Central Highlands-Wimmera	0.03%	0.05%	0.10%	0.16%
Loddon-Mallee	0.03%	0.05%	0.10%	0.16%
Goulburn-Ovens-Murray	0.03%	0.05%	0.10%	0.15%
All Gippsland	0.04%	0.06%	0.12%	0.20%
Brisbane	0.04%	0.06%	0.12%	0.19%
South & East Moreton	0.04%	0.05%	0.12%	0.19%
North & West Moreton	0.03%	0.04%	0.10%	0.16%
Wide Bay-Burnett	0.03%	0.05%	0.10%	0.16%
Darling Downs-South West	0.03%	0.05%	0.10%	0.15%
Mackay-Fitzroy-Central West	0.04%	0.05%	0.12%	0.19%
Northern-North West	0.04%	0.05%	0.12%	0.18%
Far North	0.04%	0.05%	0.12%	0.19%
Adelaide	0.04%	0.06%	0.13%	0.20%
Northern & Western SA	0.04%	0.05%	0.11%	0.17%
Southern & Eastern SA	0.03%	0.04%	0.09%	0.15%
Perth	0.04%	0.06%	0.13%	0.21%
Lower Western WA	0.04%	0.05%	0.11%	0.18%
Remainder WA	0.04%	0.05%	0.12%	0.18%
Greater Hobart-Southern	0.05%	0.06%	0.14%	0.22%
Northern	0.04%	0.05%	0.11%	0.18%
Mersey-Lyell	0.04%	0.05%	0.11%	0.17%
Northern Territory	0.04%	0.06%	0.12%	0.20%
ACT	0.04%	0.06%	0.13%	0.21%
Australia	0.04%	0.06%	0.13%	0.21%

Source: MMR Model simulations

Table B9
Regional Consumption Effects for All Scenarios
(percentage deviations from the Baseline Scenario)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sydney	-0.11%	-0.15%	-0.34%	-0.54%
Hunter	-0.06%	-0.08%	-0.18%	-0.30%
Illawarra	-0.07%	-0.09%	-0.20%	-0.32%
South Eastern	-0.08%	-0.11%	-0.25%	-0.40%
Richmond-Tweed, Mid-North	-0.07%	-0.10%	-0.21%	-0.33%
Northern, Far West-North West, Central West	-0.06%	-0.08%	-0.17%	-0.27%
Murray-Murrumbidgee	-0.06%	-0.08%	-0.17%	-0.28%
Melbourne	-0.10%	-0.14%	-0.30%	-0.48%
Barwon-Western District	-0.07%	-0.09%	-0.20%	-0.32%
Central Highlands-Wimmera	-0.06%	-0.09%	-0.19%	-0.30%
Loddon-Mallee	-0.06%	-0.08%	-0.17%	-0.27%
Goulburn-Ovens-Murray	-0.06%	-0.08%	-0.18%	-0.28%
All Gippsland	-0.09%	-0.12%	-0.26%	-0.41%
Brisbane	-0.08%	-0.11%	-0.25%	-0.40%
South & East Moreton	-0.08%	-0.11%	-0.24%	-0.39%
North & West Moreton	-0.06%	-0.08%	-0.17%	-0.28%
Wide Bay-Burnett	-0.06%	-0.08%	-0.17%	-0.27%
Darling Downs-South West	-0.06%	-0.08%	-0.17%	-0.27%
Mackay-Fitzroy-Central West	-0.06%	-0.08%	-0.17%	-0.27%
Northern-North West	-0.06%	-0.09%	-0.19%	-0.31%
Far North	-0.07%	-0.10%	-0.22%	-0.36%
Adelaide	-0.09%	-0.12%	-0.27%	-0.43%
Northern & Western SA	-0.05%	-0.06%	-0.14%	-0.22%
Southern & Eastern SA	-0.05%	-0.07%	-0.16%	-0.25%
Perth	-0.08%	-0.11%	-0.23%	-0.37%
Lower Western WA	-0.05%	-0.08%	-0.16%	-0.26%
Remainder WA	-0.05%	-0.07%	-0.14%	-0.23%
Greater Hobart-Southern	-0.10%	-0.14%	-0.31%	-0.50%
Northern	-0.08%	-0.10%	-0.22%	-0.36%
Mersey-Lyell	-0.05%	-0.07%	-0.16%	-0.25%
Northern Territory	-0.08%	-0.11%	-0.24%	-0.38%
ACT	-0.11%	-0.15%	-0.34%	-0.55%
Australia	-0.08%	-0.11%	-0.25%	-0.40%

Source: MMR Model simulations

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