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Minimum wages in Australia: an analysis of the impact on small and medium sized businesses

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Minimum wages in Australia: an analysis of the impact on small and medium sized businesses

A report to the Department of Employment
and Workplace Relations

By

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March 2004

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Abbreviations and Glossary

Abbreviations

AACS :	Award and Agreement Coverage Survey
ACCI :	Australian Chamber of Commerce and Industry
ACTU :	Australian Council of Trade Unions
AiG :	Australian Industry Group
AIRC :	Australian Industrial Relations Commission
AAPOR :	The American Association for Public Opinion Research
AWIRS :	Australian Workplace Industrial Relations Survey
CADE :	Computer aided data entry
Casual :	Casual employee
CATI :	Computer aided telephone interview
DEWR :	Department of Employment and Workplace Relations
DtMS :	Desktop Marketing Systems
FDC :	Final disposition code
FT :	Full-time employee
PT :	Part-time employee
SNA :	Safety Net Adjustment
TPR :	Turning Point Research

Glossary

Closed ended question :	Question that allows for a predefined and limited range of responses.
Efficiency wage :	Wage that maximizes the effort supplied by an employee.
Final disposition of cases :	Listing of the final result for each telephone number dialed in a survey.
Open ended question :	Question that allows respondent to make response in their own words.

Reservation wage : Wage at which a person is indifferent between being employed and unemployed.

Unit record data : Data on a single unit in the population. For example a single business enterprise.

I. Overview and introduction

Overview

Background to the report

1. Wage setting between businesses and employees is regulated via the Federal *Workplace Relations Act 1996* and the various State Acts. The principal objective of the Federal *Workplace Relations Act 1996* that is relevant to this report is to provide the means:
 - (i) for wages and conditions of employment to be determined as far as possible by the agreement of employers and employees at the workplace or enterprise level, upon a foundation of minimum standards; and
 - (ii) to ensure the maintenance of an effective award safety net of fair and enforceable minimum wages and employment.
2. Each year since 1997 the Australian Council of Trade Unions (ACTU) has submitted a claim to the Australian Industrial Relations Commission (AIRC) for adjustment to the minimum pay and conditions mentioned in the 1996 Act.
3. In its 1997 decision the AIRC observed that the term ‘safety net’ was undefined and offered some discussion of how it proposed to interpret the term. In its decisions the AIRC has interpreted the phrase "effective award safety net of fair and enforceable minimum wages" to include the federal minimum wage (FMW) and the various Federal minimum award wage rates.¹ This system of minimum award wage rates has become known collectively as the ‘Safety Net’.
4. After the AIRC has passed down its decision there is a flow on to employees not directly covered by the FMW or by federal awards. This flow on can occur in several different ways. First, state industrial commissions can choose to incorporate the ‘Safety Net’ adjustment in their state’s minimum wage and

¹ Previous AIRC decisions are available on the world wide web at URL: <http://www.e-airc.gov.au/wage2004/decisions>. This web page contains links to ‘Safety Net’ cases held under earlier legislation as well as to the various national wage cases held between 1985 and 1991.

can also choose to incorporate it into the various state industrial awards. Second, many industrial agreements provide for automatic pass-on of the ‘Safety Net’ adjustment to employees paid more than minimum award wage rates. Third, some businesses exercise their discretion to pass on the ‘Safety Net’ adjustment to employees who are paid more than minimum award wage rates and who have not received a wage adjustment via one of the two other mechanisms described above.

5. Because ‘Safety Net’ adjustments can influence wages via the various paths described above it is not straightforward to obtain information from administrative databases on how many employees have their wage increment set by the annual ‘Safety Net’ adjustment. This information must be obtained through surveys of business.
6. Against that background, the following research questions were posed by the Department of Employment and Workplace Relations,
 - How many businesses and employees have their wages adjusted through the annual Safety Net case and its flow on effects?
 - What is the effect of annual Safety Net decision on wage setting and labour costs?
 - What was the effect of the 2003 Safety Net adjustment on employment?
 - What is the effect of Safety Net adjustments on employment levels?
7. We were commissioned by the Department of Employment and Workplace Relations to undertake two tasks. The first of these was to design a questionnaire, to be included in the October/November 2003 Yellow Pages survey of 1800 small and medium sized businesses, that could provide information to help answer these research questions.² The second task was to analyse the data collected from that survey.
8. Our principal instruction from the Department was to produce a survey and analysis that was methodologically sound. Since we are economists and econometricians this requires that we pay attention to both economic theory and statistical theory

² Small sized businesses are defined as businesses, with one or more but less than twenty full-time employees. Medium sized businesses are defined as businesses with between twenty and 200 full time employees.

and that we are explicit about the methods used and assumptions made.

9. The research and analysis behind this report was somewhat more complex than we initially envisaged. This was primarily because the response rate to the survey was lower than we expected.
10. Low response rates raise two questions. First, are the estimates biased. Second can valid inference be made about the population on the base of the survey of the survey.
11. Our analysis suggests that the answer to the first of these questions is that the survey provides unbiased estimates of the population quantities of interest. See the final section of this overview at page 20 and Chapter 7 for further information.
12. Inference requires standard errors and this is more problematic.³ The low response rate means that the usual formula for constructing standard errors may not be applicable. While standard errors are desirable the issue of economic significance is of greater importance and we have allocated much of our time to embedding that quality in our report.⁴ Further discussion of response rates and other statistical issues is provided on page 20 and Chapter 7.

Economic framework

13. Facts rarely, if ever, speak for themselves, they are gathered and interpreted within a framework of theory. Often that framework is left implicit. Being explicit focuses attention on the areas where further research and analysis can help resolve the debate and reduces the scope for confusion and misrepresentation.

³ Statistical inference is the process whereby statements are generated about the probability that some outcome could have been generated purely by randomness.

⁴ Economic significance is the notion that estimates should satisfy two criteria. First they should be consistent with maintained economic theory or the reasons that the theory does not apply should be explained. Second, the estimates should be of a magnitude to be of practical importance either for policy or for understanding how the economy works. The article ‘Signifying Nothing’, *The Economist*, 29 January 2004 provides a discussion of this concept with links to relevant academic articles — those articles have one flaw, they convey the impression that economic significance is a new concept. It is not. It is a concept that can be traced back to the beginnings of econometrics and is fundamental to good practice.

14. We have used an economic framework that is eclectic. It encompasses the body of neoclassical theory as well as that part of the modern economic theory of labour markets that departs from neoclassical assumptions.⁵ In short the framework used is a neutral one.
15. A useful stylized representation of this framework is obtained by viewing each business as being faced by four possible wage floors. These comprise,
1. The relevant minimum award wage rate;
 2. The efficiency wage. This is the wage that maximizes the ratio of the effort supplied by the worker to the wage. Efficiency wage theory differs from neoclassical theory because it involves the assumption that the level of effort supplied by an employee depends on the wage paid. The efficiency wage can be thought of as a wage floor because a profit maximizing business will not choose to pay a wage below the efficiency wage.⁶
 3. The competitive wage. This is the wage that the business needs to pay in order to retain existing employees and attract new employees. It is determined by the wage that would be paid to the worker by other businesses. To simplify the discussion we use the term ‘competitive wage’ to include both,⁷
 - (a) the wage that would be determined through the interaction of supply and demand in a neoclassical model of a perfectly competitive labour market; and
 - (b) the wage offer that a business would optimally choose to make in a, more realistic, search model of the labour market.
 4. The reservation wages of the workers in the labour market in which the business sources its labour. This is relevant only in those circumstances where there are no other businesses that could employ the workers. In this

⁵ The economic framework that we use is set out in more detail in Chapter 6.

⁶ Akerlof & Yellen (1986) and Katz (1986) provide surveys of the literature on efficiency wages.

⁷ We put these categories of wage floor together for two main reasons. First, the survey instrument that we design does not provide any information that could be used to distinguish between these two models. Second, the difference does not matter for this report.

case the supply curve of labour to the business is obtained by aggregating the supply curves of the individual businesses operating in that market. Unlike the three other cases, discussed above, the wage floor varies with the quantum of labour demanded and thus by varying employment the business can determine the wage paid so as to maximize profits. In this case the business is said to be a monopsonist. The monopsony case is often extended to encompass the situation where employees face costs of changing their employer. This would arise for example through the costs of selling and buying a house to move locations and the cost of losing any firm specific human capital through changing employer.

16. The wage paid by the business to each worker is the maximum of these wage floors **for that particular worker in that particular business**.
17. The theories of the labour market that lay behind these various wage floors are well understood and are taught in undergraduate economics courses.⁸ As such this framework is not controversial. What is controversial is the empirical relevance of each of the theories. Here a theory is empirically relevant, for a business, if,
 - it is currently binding for that business. That is the particular wage floor is higher than any of the three other wage floors; or
 - under a plausible policy change the wage floor would become binding.
18. This way of thinking about the empirical relevance of the various theories has two advantages. First, it explicitly recognises that all of the theories are approximations to a more complex reality. Second, no single theory is likely to apply to every business in an economy. As such, the research questions posed earlier are best addressed by seeking information on the frequency with which each of these theories are relevant to businesses.

⁸ Despite the general features of these theories being well understood, little empirical work has been undertaken in applying them to Australian data.

Combining theory and evidence to obtain a preliminary assessment of which theories are relevant

19. Working with four wage floors is complicated and we ask whether there is evidence that allows us to rule out, as unsupported by the available evidence, any of these wage floors. A significant piece of evidence in this regard is that value added and employment has grown faster in certain industries — in the main these are industries with a larger proportion of employees paid an award wage.⁹ These facts, when viewed in the light of the economic framework, outlined above constitute strong evidence that:
1. Either the minimum wage or efficiency wage is the binding wage floor. The unusually rapid growth of these indicators provides:
 - (a) strong evidence against the assumption that employment and wages are determined via the intersection of labour demand and supply as in a neo-classical model;¹⁰ and
 - (b) even stronger evidence against the assumption that wages and employment are determined via monopsony in these sectors;¹¹ and
 2. The elasticity of labour demand with respect to the real wage is greater in these award dependent industries than it is for other industries.¹²

⁹ By award dependent industries we mean, industries that in ABS Catalogue 6306.0 have more than one quarter of their employees paid a minimum award wage rate. Inspection of ABS catalogue 5204.0 shows that value added has grown more strongly in these industries than for the economy as a whole. Inspection of ABS Catalogue 6291.0.55.001 shows that employment has grown faster in the award dependent industries than for all industries.

¹⁰ The justification for this statement is that when one of these two wage floors is binding all of the shift in the demand curve is translated into employment changes. In contrast when the competitive model holds with the wage determined by the intersection of supply and demand, changes in demand are partially reflected in employment changes and partially in changes in wages.

¹¹ The justification for this statement is that under monopsony, the bulk of any increase in demand is taken by the monopsonist into profits and less flows through into wages or employment than in the competitive case.

¹² The justification for this statement is that, for a given shift in demand, a larger proportion of that shift is translated in employment the larger is the responsiveness of demand to the real wage.

20. The conclusion at point 1 above is consistent with both the ACTU's and the Commonwealth's position at recent Safety Net cases. These parties can be viewed as disagreeing about which of two wage floors are biting. The conclusion at point 1 says that one of these wage floors is biting for the award dependent industries but is silent about which floor it is.
21. In part of recent theoretical academic literature monopsony is suggested as a serious possibility whereas it had long been regarded as a theoretical curiosity.¹³ Thus, we must take account of this possibility and include tests to assess its empirical relevance. The evidence discussed above shows that we can dismiss the monopsony hypothesis as unsupported by the data for the award dependent industries. We can also dismiss, for the award dependent industries, the hypothesis that wages and employment are determined in a neoclassical model via intersection of labour demand and labour supply. Thus, in addition to the question regarding how widespread is the influence of the safety net adjustment on wage setting, we focus attention on the following issues that remain to be resolved by research:
 1. Is it the efficiency wage, or the minimum award wage, that determines the level of employment in industries where there are a large number of employees paid the minimum award wage rate?
 2. Have past Safety Net wage increases priced minimum award rate labour out of some businesses and activities? That is, is the minimum award wage a binding constraint on employment for those in businesses that currently hire little or no labour at minimum award wage rates?¹⁴
 3. And if the minimum award wage rate is binding, what would be the effect on employment of increasing that wage via a 'Safety Net' adjustment.

Effect on wage setting and labour costs

22. About 1.8 million employees of small and medium sized businesses are paid minimum award wage rates. See section 2.2, Table 2.4, page 33.

¹³ See Manning (2002).

¹⁴ It could be the case, for example, that the minimum award rate is binding so tightly for those businesses that they choose to hire no employees at the minimum award wage rate.

23. A further 1.1 million employees who are paid over award wages received automatic pass-on of the May 2003 Safety Net adjustment to their wages.¹⁵ See section 2.3, Table 2.13, page 39.
24. An additional 1.4 million employees who are paid over award wages, had received or were expected to receive, discretionary pass on of the May 2003 Safety Net adjustment. See section 2.4, Table 2.18, page 42.
25. Thus, the annual Safety Net adjustments to minimum award wage rates influence the wages of about 4.3 million employees of small and medium sized business enterprises. This represents just over two thirds of the 6.7 million persons employed by these businesses. See section 7.7, Table 7.8, page 117 for estimated population characteristics.
26. As a reference point there were 9.7 million persons employed in Australia at December 2003. Thus, we estimate that about 69 per cent of Australian employees are within scope of the survey.

Effect on labour demand

Short run effects

27. We estimate that the May 2003 Safety Net adjustment, via its effect on labour demand, cost about 14,000 jobs in the three months prior to the survey going into the field in October / November. See section 3.3, Table 3.3 page 49.
28. The estimate above relates to the effect on labour demand in businesses that had employees in October / November 2003. There will also have been some job loss caused by the SNA in businesses that had more than one employee in May 2003 but had only one employee when the survey was in the field in October / November 2003. Businesses that currently have one employee were asked different questions to businesses with more than one employee, thus we do not have comparable estimates of job losses attributable to the 2003 SNA for these businesses. However, from the responses to other questions put to businesses with one employee we do know that the 2003 SNA and previous SNAs have caused some job losses. Estimates of the broad magnitude of the effect of past SNAs

¹⁵ Unless otherwise indicated all statements in this report relate to small and medium sized businesses. That is businesses with between one and 200 full-time employees. In some instances we omit the qualifier 'small and medium sized businesses' so as to shorten sentences and improve readability.

on employment by businesses that currently have no employees are reported at page 12. Those estimates relate to experience over several years and it is not straightforward to make an estimate of the effect for any given year.

Implied short run elasticity of demand

29. We estimate that the implied short run elasticity of demand for *minimum award wage rate workers with respect to the minimum award wage rate* to be about -0.2. Here short run is taken to be a period of three months. Over such a short period of time businesses cannot change their production technology, their capital stock or their location. Interest, therefore, mainly centres on the medium to long run effects when businesses can alter these aspects of their operation.
30. These estimated elasticities are provided to assist the reader in comparing the results of our study with those from other studies. The practice of comparing elasticities between reports is fraught with danger as each elasticity has its own specific meaning embedded within the context of the model and dataset from which it is constructed. The main valid use of these elasticities is to provide a quick check that the estimated employment effect of the 2003 Safety Net adjustments is not remarkably different from the range of responses that would be predicted from examination of the Australian or international literature.

Medium to long run effects

31. We estimate that guaranteeing not to adjust the Safety Net for a period of five years would result in employment demand being 245,000 job places higher than otherwise would be the case. See section 4.2 Table 4.2 page 60.
32. A significant part of this additional demand would be for full-time (about 116,000 persons) and part-time employees (about 53,000 persons). The additional demand for casuals is estimated to be about 76,000 persons. See section 4.2 Table 4.2 page 60 and section 5.4 Table 5.7 page 68.
33. The extent to which this higher labour demand would translate into increased employment depends on a number of factors. The most important of these being the number of people currently without a job that are willing to work at the minimum award wage rate. We note in this regard that there are currently about 575,000 persons unemployed in Australia.¹⁶ Labour supply is thought to be inelastic with respect to the

¹⁶ Seasonally adjusted December 2003.

real wage, thus we expect that under a guarantee not to change the Safety Net for a period of five years, most of those currently unemployed would remain available for work rather than withdrawing from the workforce.

34. Of course, how many of the currently unemployed ultimately fill the job opportunities created, will be determined by the incentives that they are provided by the tax and welfare system to take up the job opportunities.

Role of past Safety Net adjustments in job losses by businesses that currently have no employees other than respondent

35. We estimate that about 189,000 businesses have no employees other than the respondent. About 40 per cent of these businesses reported that they previously had employees. See section 5.2, Table 5.1, page 65.
36. Some of these employees lost their jobs because of previous Safety Net adjustments. We estimate that about 75,000 job losses occurred for this reason. However, this is the cumulation over a number of years and does not represent the number of job losses in any given year. Previous Safety Net adjustments played a major role in about 23,500 of these job losses and a moderate role in a further 25,700 job losses. See section 5.3 Table 5.4 page 67 for further details.

Effect on pay levels of a guarantee not to increase the Safety Net for five years

Workers currently paid an award wage rate

37. A guarantee not to adjust the Safety Net for a period of five years would not necessarily hold fixed for five years the pay of workers currently paid a minimum award wage rate. Under such a guarantee some workers that are currently paid the minimum award wage rate would receive pay increases that moved them to being paid over award wages.
38. The evidence for this is that the bulk of businesses, that reported that they would hire additional employees under such a guarantee, also reported that they would fully or partially adjust wages of some of these employees to compensate for inflation. That is, under a guarantee of no change in the Safety Net, employees hired at minimum award wage rates would move to being paid over award wage rates. See section, 4.3, Table 4.5, page 63.

39. This finding has a sound foundation in economic principles and, as discussed in chapter 7, the questionnaire was designed so as to be able to test for its existence and quantify its magnitude. It arises because, in the absence of annual Safety Net adjustments to minimum award wage rates, businesses would have the option to respond to temporary adverse economic circumstances by not raising the nominal wages of their workers. The imposition of a system of minimum award wage rates removes this option for the businesses with regard to workers paid at or near minimum award wage rates. In an uncertain environment with fixed costs of hiring and retrenching this option has a value to businesses. Therefore removal of the option via a minimum award wage rate imposes a cost on business. This cost can be avoided only by using technologies that minimize the use of low skill workers.
40. Aside from hiring and firing costs, the value of the option depends principally on two things. The first of these is the gap between minimum award wage rates and overaward wages. The second is the extent and nature of the variability of the shocks that the business experiences. A guarantee not to adjust the minimum award wage rate for five years would allow the gap between with the actual wage paid to grow over time and thus reduces the cost imposed on the firm via a reduced value of the option not to adjust nominal wages in hard times.
41. The empirical relevance of this effect is illustrated by our finding that about one fifth of businesses said they would hire additional workers under a guarantee of no change to the Safety Net, and also said they would provide employees that are currently paid an award wage rate with the same percentage increase in wages as provided to over award employees.
42. One might ask does the effect just described mean that a policy of adjusting minimum award wage rates in line with inflation would have roughly the same effect as guaranteeing not to adjust their level by not providing Safety Net adjustments? The answer is no. This is because there are important interactions between hiring and firing costs, uncertainty and minimum award wage rates.
43. These interactions mean that the existence of minimum award wage rates imposes a cost on businesses since it removes the option, that might be exercised in adverse circumstances, of not adjusting for inflation, the wages of workers paid an award wage rate. The magnitude of this cost depends on the level of the wage. A guarantee of no change in the Safety Net would have different effects, when compared to inflation indexation,

on the level of the minimum award wage rate. This explains why the two policies will have different effects even though many businesses would, on average, choose to compensate for inflation those employees paid an award wage rate.

Effect on wages that are above minimum award wage rates

44. A guarantee of not adjusting minimum award wage rates for a period of five years would also influence over award wages. We have seen that 40 per cent of employees in small and medium sized businesses are paid more than the minimum award wage rate but receive the annual Safety Net adjustments. This means that for these employees wage setting is on a ‘Safety Net plus’ basis. A guarantee of not adjusting minimum award wage rates for a period of five years would give businesses an increased option not to adjust the pay of overaward workers in bad economic circumstances.¹⁷ We expect that this would, for a period of time, slow the rate of growth of over award wages. Thus, not all of the increased labour demand that we have identified would flow through to minimum award wage rate workers; some would flow through to increased demand for workers paid over award wages.

Implied elasticities of demand

45. Assuming that the guarantee of no change in the Safety Net results in a 13 per cent change in minimum award wage rates, we find that the long run elasticity of demand for *full-time minimum award wage rate workers* with respect to real minimum award wage rates to be about -1.14. The comparable demand elasticity for *part-time minimum award wage rate workers* is about -0.89, while the comparable demand elasticity for *casual minimum award wage rate workers* is about -0.67. We estimate the overall elasticity of demand for *all minimum award wage rate workers* with respect to real minimum award wage rates to be about -0.90. See section 4.2 Table 4.2 page 60.¹⁸

¹⁷ Those businesses that exercise their discretion to pass on the SNAs might be viewed as already having some capacity to choose whether or not to pass on the SNA. But, it is a very constrained choice they exercise since not passing on the SNA when the majority of other workers are receiving the SNA would most likely have an adverse effect on motivation and worker effort.

¹⁸ These estimated elasticities are incidental, rather than essential, to the analysis in this report. They are provided to assist the reader in comparing the results of our study with the results of other studies. See the qualification given earlier regarding the use of elasticities. The elasticities reported here differ from the usual demand elasticity for two main

46. The findings given above involve medium to long run estimated labour demand elasticities for *minimum award wage rate workers* with respect to minimum award wage rates. It is also useful to express this information in terms of the elasticity of demand for all workers with respect to minimum award wage rates. This elasticity uses all employees as the denominator. Thus, it is calculated by multiplying the elasticities discussed above by the ratio of the number of minimum wage rate employees in small and medium sized businesses to total employees in those businesses. The relevant factors are 0.176, 0.468, 0.406 and 0.273 for full-time, part-time, casual and all workers respectively. Applying these factors yields estimated elasticities of demand for *full-time, part-time, casual* and *all workers* with respect to minimum award wage rates of -0.20, -0.42, -0.27 and -0.25 respectively.
47. It is important to recognize that the two sets of elasticities (when reported with the factors) contain exactly the same information about labour demand. But, they express it in a different way.

Implications for causes of casualization of the workforce

48. The elasticities presented above yield an important prediction regarding the casualization of the workforce; at least part of the casualization of the workforce may be explained by the combination of minimum award wage rates being relatively high in Australia and demand for *full-time minimum award wage rate employees* being far more responsive to changes in minimum award wage rates than is the demand for *casual minimum award wage rate employees*.
49. The capacity of our approach to explain other features of the labour market such as the trend towards casualization should be viewed as evidence that the approach adopted in this report has value — one of the most important signs of a successful theory or framework is the capacity to explain a lot with a parsimonious framework.

reasons. First, the elasticity is calculated with respect to minimum award wages rather than the wage paid. Second, the estimated elasticity incorporates the option value effect discussed above. The reader should take these considerations into account when interpreting these elasticities.

Concentration of minimum award wage rate employees in firms, industries and regions

50. Minimum award wage rate employees are highly concentrated. Of those businesses that have at least one employee, 59.3 per cent have no workers paid a minimum award wage rate. That is, only 40.7 per cent of businesses have at least one employee paid a minimum award wage rate. See section 2.2, Table 2.1, page 30.

Regional dimension

51. We find large regional differences in the proportion of businesses that pay at least one employee minimum award wage rates. For example, in the Sydney metropolitan area only 21.6 per cent of small and medium businesses have one or more employees paid exactly a minimum award wage rate. In contrast 56.8 per cent of businesses in non-metropolitan New South Wales have at least one employee paid a minimum award wage rate. See section 2.2, Table 2.2, page 31.

Industry dimension

52. There are similarly large differences across industries in the proportion of businesses that have at least one employee paid a minimum award wage rate. In Accommodation, Cafes and Restaurants 59 per cent of businesses have at least one employee paid a minimum award wage rate. In retail trade 56 per cent of businesses have at least one employee paid a minimum award wage rate. In Finance and Insurance, by way of contrast, 27 per cent of businesses have at least one employee paid a minimum award wage rate. See section 2.2, Table 2.3, page 32.

Implications of the concentration of minimum award wage rate employees

53. The concentration in particular firms, industries and regions of workers paid minimum award wage rates has important and wide ranging implications. Most importantly, it matters for how the effects of changes in minimum award wage rates should be measured. Specifically, time series and cross section statistical analyses that do not take account, in their models, of this concentration of minimum award wage rate employees will be biased towards finding that annual Safety Net adjustments to minimum award wage rates have a smaller effect on employment than is the case.

54. The main reason for this is that, for businesses that have no employees paid a minimum award wage rate, or that have only one employee, all of the effects of changes to minimum award wage rates occur via a decision as to whether or not to employ at a minimum award wage rate. This decision is not captured in those empirical approaches which assume, either explicitly or implicitly, that production uses both over award wage and minimum award wage rate labour. Such approaches only measure the substitution effect (ie adjustment at the intensive margin) they do not measure adjustment at the extensive margin.
55. The term intensive margin is used here to refer to changes in the mix of minimum wage rate workers and over award wage rate workers. While the term extensive margin is used here to refer to the decision as to whether or not to employ any workers at a minimum award wage rate. The distinction is made for two reasons. First, from a businesses perspective the two decisions will involve different considerations. Second, for economists and econometricians, adjustments made at the extensive margin, as defined here, involve additional modelling considerations. Usually, economists and econometricians assume, either implicitly or explicitly, that all adjustment occurs at the intensive margin. This is much simpler than is the case if adjustments at the extensive margin are also modelled. The cost is that if there is some adjustment occurring at the extensive margin, then models that assume the absence of such adjustments will underestimate the effect on aggregate employment of Safety Net adjustments to minimum award wage rates.¹⁹
56. One of the strengths of this report is that we can quantify the empirical significance of this effect and can quantify the magnitude of the bias incurred by those approaches and estimation methods that ignore adjustment at the extensive margin.
57. To do this we decompose our estimated increase in labour demand according to whether the job increase was at the intensive or extensive margin. The estimate of additional demand for 245,000 jobs is comprised of:
- 32,000 job places in businesses that exist but currently have no employees. This avenue of job creation is missed in modes of cross section and time series analysis that

¹⁹ This qualification also applies to the international evidence on the employment effect of changes to minimum wages. It has not, to our knowledge, been previously mentioned in the literature on the effect of minimum wages.

either explicitly or implicitly assume every business has at least one employee other than the respondent.

- 213,000 job places in businesses that currently have at least one employee. This is comprised of:
 - 138,000 job places in businesses that employ at least one person paid a minimum award wage rate. This effect is captured in standard modes of analysis; and
 - 75,000 job places in businesses that currently do not employ anyone at a minimum award wage rate. These are not captured in standard modes of cross section and time series analysis that either explicitly or implicitly assume every business has at least one employee paid a minimum award wage rate.

58. Thus, some 44 per cent of new jobs come from adjustments to employment made at the extensive margin and 56 per cent arise via adjustment made at the intensive margin. We estimate that standard modes of analysis would neglect these effects and underestimate by about 107,000 jobs or 44 per cent the effect on labour demand of guaranteeing not to adjust the Safety Net for a period of five years.

59. The implication of this finding is that, estimates, made for Australia, of elasticities of demand for *minimum award wage rate* workers with respect to the *minimum award wage rate* will, if they are based on models that exclude adjustment at the extensive margin, be biased downwards (ie towards zero). The estimates given above suggest that to remove most of this bias in estimates made for Australia one should multiply the estimated elasticities by a factor of 1.79.²⁰

60. In order to fully remove this bias econometric models would need to be respecified to allow for adjustment at the extensive margin as well as the intensive margin.

Macroeconomic management

61. The findings of regional and industry differences in the incidence of minimum award wage rates also has important implications for macroeconomic management and for the regional and industry effects of macroeconomic shocks. Occasionally the Australian economy is hit by adverse macroeconomic shocks that require real wages to fall if employment levels are to be

²⁰ The scaling factor 1.79 is calculated as $1/0.56$.

maintained. The fact that certain regions have a larger proportion of employees paid minimum award wage rates means that, in the event of such an adverse macroeconomic shock, more of the adverse shock will be transformed into reductions in employment (and hence increases in unemployment) and less into reductions in real wages for employees in those regions. That is differences in the regional incidence of minimum award wage rates will translate into differences in the cyclical volatility of employment and unemployment.

Evidence on wage setting for over award employees

62. In addition to gathering evidence on the effects of the Safety Net on wage setting, the survey also sought information on wage setting for over award employees.
63. Inflation is low on the list of factors influencing wage setting. This is true independently of whether the business is asked about past consumer price inflation, expected consumer price inflation, the price at which the businesses own goods or services are increasing or productivity. What does matter, however, is profitability.
64. Aside from profitability the other factors that are important in wage setting are
 - paying a wage necessary to retain good employees, reduce turnover and attract high quality employees;
 - rewarding good performance; and
 - paying a wage that motivates employees.
65. These findings have some important implications. First, it is clear that for many businesses and industries the neoclassical model and the search model provides a good approximation. For these businesses competition, to attract and retain good employees, is intense.
66. Second, whatever the merits are of the monopsony argument overseas, there is no support in the results of this survey for the hypothesis that Australian small and medium sized businesses are characterized by monopsony. A finding that is consistent with our earlier discussion of other evidence.
67. Third, the findings suggest that the efficiency wage model is a good approximation for some businesses.
68. Further details are in section 2.6 page 43. The monopsony and efficiency wage models are briefly discussed in sections 6.4 and

6.6 respectively, pages 75 and 77 respectively.

Statistical issues

69. The analysis in this report was conducted using information from questions placed in the October/November 2003 survey of small and medium sized businesses. That survey is a panel of 1800 small and medium businesses. It provides the most comprehensive coverage of small and medium sized businesses in Australia that is available from a regular survey.
70. The population of interest for this survey comprises private businesses with between one and two hundred full-time employees in all industries other than the primary sector. Because this is a panel the sample frame has two parts. The first part comprises businesses that are members of the panel. The second part of the sample frame comprises the Desktop Marketing Systems database of telephone numbers of Australian businesses. Potential recruits to the panel are selected via telephone numbers chosen randomly from this database. Potential recruits are admitted into the panel if they a) agree to participate; and b) come from the same state and industry, and are the same size, as the firm that they are to replace in the panel. This feature of the selection of respondents ensures that, over time, the panel remains representative of small and medium sized Australian businesses.

Response rates

71. The response rate for this survey was between 20 and 22 per cent. It is important to be precise about what this response rate does and does not mean. Most importantly a low response rate **does not** necessarily mean that the estimates of population quantities obtained using design based estimators (DBEs) of population means or sums are biased.²¹ What it **does** mean is that one needs to mount additional arguments in order to convince ones most trenchant critic that the design based estimators are unbiased for this survey.
72. The discussion below provides the additional arguments that we feel make a compelling case that the design based estimators used in this report are not ‘significantly biased’ when applied to the data obtained from this survey.²² We then pro-

²¹ Design based estimators depend for their validity on the survey being designed and administered so that the probability of selection into the sample is known.

²² By ‘not significantly biased’ we mean that any bias is too small to modify the main findings of the report.

vide a discussion of the model based estimators that are also used in this report and which are unaffected by low response rates.²³

73. Before turning to those issues it is also important to emphasise that the response rate of between 20 and 22 per cent **does not** mean that the data collected by the survey is of low quality. Indeed, the opposite is the case as in part the low response rate arises because major efforts were made to select businesses that match those which leave the panel. This requires that more businesses be contacted, and thus more refusals encountered, than would be the case with a one-off survey.

Reasons why the design based estimators are unlikely to be significantly biased

74. There are three main reasons to support the contention that the low response rates do not create a significant bias in design based estimators for this survey.
75. First, the decision not to respond was made before the business was told (at the preamble to question 11) that the survey contained some questions about Safety Net issues.²⁴
76. Second, the non response was attributable to factors that are best described as random and would not, therefore, be expected to over (or under) select respondents that,
- have minimum award wage rate employees;
 - have passed on the 2003 Safety Net adjustment to over award employees;
 - have reduced employment because of the 2003 Safety Net adjustment;
 - would increase employment in response to a guarantee of no change to the Safety Net for a period of five years.
77. Third, the weights used in this survey are constructed via poststratification. They therefore are, by virtue of their construction, robust to missing at random non response; see Lohr (1999, p. 268).
78. Thus, we do not consider it likely that the non response causes any significant bias in the estimates we make in this report.

²³ Chapter 7 provides a more detailed discussion of the statistical issues and defines terms such as ‘design based estimator’ and ‘model based estimator’.

²⁴ All businesses that reached the preamble to question 11 completed the survey.

79. The only additional evidence that could be provided here is from the analysis of a survey of non respondents. Such analysis would involve testing hypotheses that the non responses are, using the terminology in Lohr (1999, p. 265), either ‘missing completely at random’ or ‘missing at random’.²⁵ If the first of these hypotheses cannot be rejected then no adjustments are required to produce unbiased design based estimators. If the first hypothesis can be rejected but the second cannot be rejected, then all that is required to reduce the bias is the reweighting, via poststratification, that we have already done. Thus, the only way that such a survey of non respondents could modify the results obtained using design based estimators would be if it was found that, after controlling for the characteristics of businesses such as size, location, industry etc, the probability of non response was related to the businesses answers to the Safety Net questions. Such a finding would not affect the results obtained using model based estimators which are discussed below.

Model based estimators

80. Model based estimators provide an alternative to design based estimators and have five main advantages. First, they are unaffected by non response. Second, they allow the investigator to provide some indication of the likely extent of any bias associated with design based estimators. Third, they provide estimators that are more efficient than DBEs in the sense that they produce smaller standard deviations and tighter confidence intervals. Fourth, they bring to light important relationships in the data. Fifth, they can provide a better basis for testing hypotheses than do design based estimators.
81. We have discussed the model based estimators that we believe can be applied to this data set but have not yet applied those estimators to the dataset.

Summary

82. We have sought to be explicit about the statistical issues that arise in this work and we have sought to adhere to the highest standards for the execution and presentation of empirical work. Our assessment is that we have dealt with the non

²⁵ A non response is said to be missing completely at random if the probability of non response is unrelated to both respondent characteristics and the responses to the questions of interest (ie the Safety Net questions). A non response is said to be missing at random if, after controlling for respondent characteristics, the probability of non response is unrelated to the responses to questions of interest. There are standard econometric procedures for testing these hypotheses.

response issue using the best statistical and econometric practices available.

83. Of course, given the richness of the dataset obtained from this survey, and the importance of the issues under investigation, there is always more that could be done. But, our judgement is that the features that might be discovered in a more extensive model based estimation approach would be in the fine detail rather than requiring major modification of the conclusions drawn in this report.
84. We have observed that further assurances about the validity of design based estimators could be obtained for this dataset by taking a random sample of non-respondents and analysing it to establish beyond doubt the hypotheses advanced above that the non response was random rather than systematic. We note that these assurances will not be required for those conclusions of the report that are subsequently confirmed using model based estimators as the latter are robust to non response.

1 Structure of the report

- 1.1. Chapter 2 presents evidence from the survey on how wages are determined in small and medium sized Australian businesses. Particular attention is paid to the question of the extent to which SNA adjustments are passed on to workers receiving over award wages.
- 1.2. The estimated effect on employment of the May 2003 SNA is presented in chapter 3.
- 1.3. The estimated effect on employment of guaranteeing not to adjust the 'Safety Net' for a period of five years is presented in chapter 4.
- 1.4. The effects of SNAs on firms that currently have no employees are presented and discussed in chapter 5.
- 1.5. Good analysis and research is guided by economic theory. Chapter 6 sets out the relevant bodies of economic theory that have guided our analysis.
- 1.6. The empirical contribution of this report is based on the analysis of questions related to SNAs placed in wave 43 of the 'Yellow Pages' survey that was administered in October and November 2003. This survey and the statistical foundations for our methods of analysis are discussed in chapter 7.
- 1.7. These chapters are in two parts. The first part comprises analysis of the completed survey responses. The second part comprises more technical material on the economic framework used and the technical details of the survey.
- 1.8. These two parts are followed by three appendices of a technical nature.

II. The impact of minimum wages on small and medium sized businesses: results from the analysis of a survey

2 Evidence on how wages are determined in small and medium sized Australian businesses

2.1 Introduction

- 2.1. In this chapter we study how wages are determined in small and medium sized Australian businesses.¹ The questions of interest here are firstly, what is the extent to which SNAs impact on wage setting, and secondly what is the nature of that impact? Is it uniform across industries, regions? Does the extent of the impact vary by size of business?
- 2.2. In addressing these questions we first report, in section 2.2, on businesses directly affected by the May 2003 SNA because they have at least one employee paid a minimum award wage rate. We then report in section 2.3 on firms that were directly affected by the May 2003 SNA because they are party to agreements that provide for automatic pass on of SNAs.
- 2.3. Businesses may be indirectly affected by SNAs because they choose to pass-on SNAs to employees who are paid over award wages, but are not entitled to receive automatic pass-on of the SNA under their agreement. Section 2.4 reports on firms that are influenced by SNAs in this way. Reasons why businesses choose to exercise their discretion to pass on SNAs are canvassed in section 2.5.
- 2.4. Many factors other than the annual SNAs influence wage setting. The evidence gathered in the survey on these other factors is reported in section 2.6 and related back to the Safety Net which is the main focus of this report.

¹ All data in this section relates to businesses that have one or more employees other than themselves. That is, businesses that reported yes to q11.

2.2 Businesses with employees paid exactly a minimum award wage rate

2.2.1 Number of businesses with employees paid exactly a minimum award wage rate

- 2.5. As shown in Table 2.1 we estimate that some 238,109 businesses have at least one employee paid a minimum award wage rate. This represents 40.7 per cent of the 585,476 businesses that have more than one employee and provides one measure of the extent of the influence of SNAs.

Table 2.1: Businesses with at least one employee paid a minimum award wage rate, cross tabulated by size of business

Size (Number of FT)	Number of business with at least one employee paid a minimum award wage rate	All firms	Per cent
1 to 5	161738	432497	37.4
6 to 10	36765	79734	46.1
11 to 20	21752	38155	57.0
21 to 50	12003	23835	50.4
51 to 100	3873	7795	49.7
100+	1977	3461	57.1
All sizes	238109	585476	40.7

- 2.6. Businesses with one to five FT employees are least likely to have at least one employee paid a minimum award wage rate, and businesses with more than 100 FT employees are most likely to have at least one employee paid a minimum award wage rate.
- 2.7. There are marked regional differences in the extent to which firms are influenced by the SNA by virtue of having one or more employees paid a minimum award wage rate. These differences are shown in Table 2.2. Looking across the states, South Australia and Queensland have the largest proportions of businesses directly influenced by the SNA, 56.0 and 52.2 per cent respectively. New South Wales has the smallest proportion of businesses (34.4 per cent) with at least one employee paid a minimum award wage rate.²
- 2.8. In some instances the differences within states, between the capital city and the remainder of the state, are larger than the

² The Northern Territory has 33.4 per cent of businesses with at least one employee paid the minimum wage.

differences between states. Sydney, for example, has only 21.6 per cent of businesses reporting that they have an employee paid exactly a minimum award wage rate. In contrast for the remainder of New South Wales the comparable figure is 56.8 per cent of businesses.

Table 2.2: Businesses with at least one employee paid a minimum award wage rate, cross tabulated by region

Region	Number of business with at least one employee paid a minimum award wage rate	All	Per cent
Sydney	26271	121854	21.6
Other NSW	39798	70068	56.8
NSW	66069	191922	34.4
Melbourne	45471	128300	35.4
Other VIC	14655	33338	44.0
Victoria	60126	161638	37.2
Brisbane	25647	51119	50.2
Other QLD	32753	60862	53.8
Queensland	58400	111981	52.2
Adelaide	17616	31000	56.8
Other SA	4086	7732	52.8
South Australia	21702	38732	56.0
Perth	16189	42022	38.5
Other WA	5037	12477	40.4
Western Australia	21226	54499	38.9
Hobart	2772	5386	51.5
Other TAS	2759	7024	39.3
Tasmania	5531	12410	44.6
Northern Territory	1667	4998	33.4
ACT	3387	9295	36.4
Australia	238109	585476	40.7

2.9. Victoria and Western Australia are evenly balanced in terms of the proportion of businesses directly influenced by SNAs in the capital city relative to the remainder of the state. Queensland shows an intra state regional incidence of workers on the Safety Net that is similar to that for NSW but not as pronounced. Tasmania has a pronounced intra state regional incidence of workers on the Safety Net that is the mirror image of NSW with 51.5 per cent of businesses in Hobart reporting

that they have at least one employee paid minimum award wage rates compared with 39.3 per cent of businesses in the rest of Tasmania.

- 2.10. As is shown in Table 2.3 there are also substantial differences across industries in terms of the incidence of minimum award wage rates.

Table 2.3: Businesses with at least one employee paid a minimum award wage rate, cross tabulated by industry

ANZIC Code	Industry	Number of businesses with at least one employee paid a minimum award wage rate	All	Per cent
C	Manufacturing	22777	49263	46.2
E	Construction/Building	24550	75579	32.5
F	Wholesale	22570	54916	41.1
G	Retail trade	68381	122360	55.9
H	Accommodation, cafes and restaurants	15605	26547	58.8
I	Transport / storage	12638	36462	34.7
J/L	Communication, Property and Business Services	39357	137290	28.7
K	Finance and Insurance	6836	25134	27.2
O	Health and Community Services	9307	27746	33.5
P/Q	Cultural and recreation and other services	16087	30180	43.3
All Industries		238109	585476	40.7

- 2.11. Finance and Insurance is the industry group where the smallest proportion of businesses (27.2 per cent) have at least one employee paid a minimum award wage rate, and Accommodation, Cafes and Restaurants (58.8 per cent) is the industry group with the highest incidence of businesses affected by the Safety Net.

- 2.12. Because a large proportion of businesses are influenced by the annual SNA it is clear that these adjustments have the potential to have significant macroeconomic effects. The nature of these effects will depend in part on how the incidence of

minimum award wage rates is distributed spatially, by industry and by size of business. Moreover, because the Safety Net provides a system of wage floors, the pattern of distribution of minimum award wage rate employees across the economy will be a factor that causes differential responses to macroeconomic shocks. Evaluating the extent to which the Safety Net has this effect is beyond the scope of this report.

2.2.2 Employment

By size of business

- 2.13. We estimate that just over 1.8 million employees are paid a minimum award wage rate. Small businesses employ the bulk of workers in this category — the largest number of these employees (603,013) are in businesses with 1 to 5 full-time employees a further (337,336) person are employed at a minimum award wage rate in businesses with 6 to 10 full-time employees. See Table 2.4.

Table 2.4: Number of employees paid a minimum award wage rate, cross tabulated by size of business

Size FT	FT	PT	Casual	All
1 to 5	157531	187151	258334	603013
6 to 10	93867	56160	187309	337336
11 to 20	123915	42235	71637	237787
21 to 50	145054	49874	159883	354811
51 to 100	79039	19250	28471	126760
100+	122726	13959	29811	166497
Sub Total	722131	368630	735442	1826203

- 2.14. Businesses with at least one employee paid a minimum award wage rate account for 3,376,581 employees in total which is about one half of the workforce of all businesses with less than 200 full-time employees. See Tables 2.5 and 7.8.
- 2.15. Table 2.6 presents evidence on the extent to which minimum award wage rate employees are concentrated in particular businesses. It shows the number of employees paid a minimum award wage rate as a proportion of all employees in businesses that paid at least one employee a minimum award wage rate. As can be seen from Table 2.6, for the small and medium sized business sector, the employment of minimum award wage rate workers is highly concentrated with these employees comprising 54.1 per cent of all employees in those businesses that have at least one employee paid a minimum award wage rate. This

concentration is highest for part-time workers with part-time workers paid a minimum award wage rate making up 80.5 per cent of all part-time workers in businesses that pay at least one worker a minimum award wage rate. The comparable figure for casuals is 77.7 per cent and for full-time workers is 36.6 per cent.

Table 2.5: Number of employees in businesses that have at least one employee paid a minimum award wage rate

Size FT	FT	PT	Casual	All
1 to 5	431445	238241	310226	979911
6 to 10	267974	63030	260597	591601
11 to 20	324959	56369	144454	525782
21 to 50	400977	58187	163919	623082
51 to 100	258996	22993	34181	316170
100+	287930	19264	32841	340035
Sub Total	1972281	458084	946218	3376581

Table 2.6: Employees paid a minimum award wage rate as a percentage of all employees in firms that have at least one employee paid a minimum award wage rate cross tabulated by size of firm, per cent

Size FT	FT	PT	Casual	All
1 to 5	36.5	78.6	83.3	61.5
6 to 10	35.0	89.1	71.9	57.0
11 to 20	38.1	74.9	49.6	45.2
21 to 50	36.2	85.7	97.5	56.9
51 to 100	30.5	83.7	83.3	40.1
100+	42.6	72.5	90.8	49.0
Sub Total	36.6	80.5	77.7	54.1

Source: Calculation. Element in Table 2.4 as a percentage of corresponding element in Table 2.5

- 2.16. One policy implication of this feature is that the annual SNA will have differential effects across categories of business. Most businesses will not be directly affected because they do not have any minimum award wage rate employees.³ Those that are affected will, on average, experience a substantial effect because, on average, minimum award wage rate employees make up more than one half of all their employees.

³ Businesses without minimum wage employees could still be directly affected because they have agreements that provide for automatic pass on of the SNA to employees paid more than minimum wages. The extent of this effect is discussed in section 2.3.

Distribution by industry

- 2.17. Retail trade (526,135 persons) and accommodation cafes and restaurants (335,150 persons) are the two industry groups that account for the largest number of minimum award wage rate employees. Finance and insurance is the industry group that accounts for the smallest number of minimum award wage rate employees. Estimates of the number of minimum award wage rate employees by industry are provided in Table 2.7

Table 2.7: Number of employees paid a minimum award wage rate, by industry

	Industry	FT	PT	Casual	All
C	Manufacturing	81567	17817	34349	133732
E	Construction/Building	47925	4548	16042	68516
F	Wholesale	60740	21355	27425	109521
G	Retail trade	166094	65043	294997	526135
H	Accommodation, cafes and restaurants	99171	55628	180351	335150
I	Transport / storage	47234	16612	21917	85763
J/L	Communication, Property and Business Services	91539	47367	47913	186818
K	Finance and Insurance	17629	10066	10508	38203
O	Health and Community Services	59521	99448	25025	183992
P/Q	Cultural and recreation and other services	50711	30747	76916	158374
All industries		722131	368630	735442	1826203

- 2.18. Table 2.8 shows the number of employees in businesses that have at least one employee paid a minimum award wage rate. This Table provides the denominator for the calculations reported in Table 2.9.

- 2.19. As can be seen from Table 2.9 minimum award wage rate employees are heavily concentrated in the Accommodation, Cafes and Restaurants industry group, where they comprise 75.3 per cent of all employees in businesses that pay at least one employee a minimum award wage rate.

Table 2.8: Total employment in firms that pay at least one employee a minimum award wage rate, cross tabulated by industry

	Industry	FT	PT	Casual	All
C	Manufacturing	297716	24206	38077	359998
E	Construction/Building	150709	5825	22098	178632
F	Wholesale	178732	23668	35109	237509
G	Retail trade	428656	77771	300318	806745
H	Accommodation, cafes and resturants	181456	58964	204551	444971
I	Transport / storage	99442	18957	27387	145786
J/L	Communication, Property and Business Services	365430	93283	104015	562729
K	Finance and Insurance	43950	10778	10881	65609
O	Health and Community Services	108186	106619	37262	252067
P/Q	Cultural and recreation and other services	118004	38012	166521	322537
All industries		1972281	458083	946219	3376583

Table 2.9: Employees paid a minimum award wage rate as a percentage of all employees in businesses that have at least one employee paid a minimum award wage rate, cross tabulated by industry

	Industry	FT	PT	Casual	All
C	Manufacturing	27.4	73.6	90.2	37.1
E	Construction/Building	31.8	78.1	72.6	38.4
F	Wholesale	34.0	90.2	78.1	46.1
G	Retail trade	38.7	83.6	98.2	65.2
H	Accommodation, cafes and resturants	54.7	94.3	88.2	75.3
I	Transport / storage	47.5	87.6	80.0	58.8
J/L	Communication, Property and Business Services	25.0	50.8	46.1	33.2
K	Finance and Insurance	40.1	93.4	96.6	58.2
O	Health and Community Services	55.0	93.3	67.2	73.0
P/Q	Cultural and recreation and other services	43.0	80.9	46.2	49.1
All industries		36.6	80.5	77.7	54.1

2.20. Inspection of Table 2.9 also reveals that there is great diversity in the concentration of minimum award wage rate employees. In Manufacturing, for example, minimum award wage rate employees comprise only 37.1 per cent of employees in businesses that pay at least one employee a minimum award wage rate. But even within manufacturing firms that have at least one employee paid a minimum award wage rate there is diversity, for example, casuals paid a minimum award wage rate comprise 90.2 per cent of all casual workers paid a minimum award wage rate. By way of contrast, in manufacturing, full-time workers paid a minimum award wage rate comprise only 27.4 per cent of all full-time workers in businesses that pay at least one employee a minimum award wage rate.

2.3 Automatic pass on of SNAs

2.3.1 Number of businesses covered by agreements providing for automatic pass on of SNAs

By size of business

2.21. Almost 140,000 businesses, 23.8 per cent of small and medium enterprises, were covered by agreements that provided for automatic pass on of the SNA to over award employees. As is shown in Table 2.10, small businesses with less than 5 FT employees were least likely to be covered by agreements that provide for automatic pass on of the SNA. Businesses with 51 to 100 FT employees were the most likely to have such an agreement. The table also shows there is considerable variation across sizes of business in the propensity to pass on SNAs.

Table 2.10: Number of businesses that automatically passed on the 2003 SNA to over award employees, cross tabulated by size of business

Size (FT)	Number covered by agreements providing automatic pass on of SNAs	All firms	Per cent
1 to 5	85795	432497	19.9
6 to 10	29641	79734	37.2
11 to 20	11041	38155	28.9
21 to 50	8406	23835	35.3
51 to 100	3271	7795	42.0
100+	1137	3461	32.9
Sub Total	139291	585476	23.8

By region

- 2.22. There are marked regional and industry differences in the proportion of businesses that are covered by agreements which provide for automatic pass on of SNAs. Businesses in metropolitan NSW are least likely to be covered by such agreements while those in non-metropolitan Tasmania are the most likely to be covered; see Table 2.11.

Table 2.11: Number of businesses that automatically passed on the 2003 SNA to over award employees, cross tabulated by region

Region	Number covered by agreements providing automatic pass on of SNAs	All	Per cent
Sydney	23241	121854	19.1
Other NSW	22478	70068	32.1
All NSW	45719	191922	23.8
Melbourne	34458	128300	26.9
Other VIC	8490	33338	25.5
All Victoria	42948	161638	26.6
Brisbane	11684	51119	22.9
Other QLD	11745	60862	19.3
All Queensland	23429	111981	20.9
Adelaide	6490	31000	20.9
Other SA	1496	7732	19.3
All South Australia	7986	38732	20.6
Perth	8928	42022	21.2
Other WA	3155	12477	25.3
All Western Australia	12083	54499	22.2
Hobart	1180	5386	21.9
Other TAS	2521	7024	35.9
All Tasmania	3701	12410	29.8
Northern Territory	1375	4998	27.5
ACT	2050	9295	22.1
All regions	139291	585476	23.8

By industry

- 2.23. Wholesale trade is the industry group where businesses are least likely to be covered by agreements providing automatic pass on of SNAs with only 14.1 per cent of businesses reporting such agreements. In manufacturing, by way of contrast, some 32.5 per cent of businesses are covered by agreements providing for automatic pass on of SNAs. See Table 2.12.

Table 2.12: Number of businesses that automatically passed on the 2003 SNA to over award employees, cross tabulated by industry

	Industry	Number	All	Per cent
C	Manufacturing	16033	49263	32.5
E	Construction/Building	19160	75579	25.4
F	Wholesale	7756	54916	14.1
G	Retail trade	35384	122360	28.9
H	Accommodation, cafes and resturants	5371	26547	20.2
I	Transport / storage	7974	36462	21.9
J/L	Communication, Property and Business Services	30210	137290	22.0
K	Finance and Insurance	3709	25134	14.8
O	Health and Community Services	6454	27746	23.3
P/Q	Cultural and recreation and other services	7421	30180	24.6
All Industries		139291	585476	23.8

2.3.2 Employment

By size of business

2.24. Just under 1.1 million employees of small and medium sized businesses received automatic pass on of the May 2003 SNA; see Table 2.13. This represented 15.9 per cent of all employees of small and medium business enterprises; see Table 2.14.

Table 2.13: Number of over award employees that automatically received a pass on of May 2003 SNA, cross tabulated by size of firm

Size FT	FT	PT	Casual	All
1 to 5	148443	40869	100706	290018
6 to 10	117787	43589	92816	254192
11 to 20	69100	13238	9869	92207
21 to 50	216780	6965	11593	235337
51 to 100	102508	3010	9520	115037
100+	77304	1796	1471	80571
Sub Total	731921	109467	225975	1067363

Table 2.14: Proportion of over award employees that received automatic pass-on of the May 2003 SNA, crosstabulated by size of business

Size FT	FT	PT	Casual	All
1 to 5	13.2	9.4	10.0	11.3
6 to 10	20.1	29.5	25.7	23.2
11 to 20	12.1	18.5	6.1	11.4
21 to 50	27.0	9.2	6.0	21.9
51 to 100	19.7	8.9	18.0	19.0
100+	15.9	7.1	3.7	14.7
Sub Total	17.9	13.9	12.5	15.9

By industry

- 2.25. As shown in Tables 2.15 and 2.16, there are also differences between industry groupings in the proportion of over award employees who received automatic pass on of the 2003 SNA.

Table 2.15: Number of over award employees that automatically received a pass on of May 2003 SNA, cross tabulated by industry

	Industry	FT	PT	Casual	All
C	Manufacturing	154918	5666	12838	173423
E	Construction/Building	60735	2460	37995	101191
F	Wholesale	55574	5010	8701	69285
G	Retail trade	139761	8465	21511	169738
H	Accommodation, cafes and resturants	42384	488	15756	58628
I	Transport / storage	23400	2195	43345	68940
J/L	Communication, Property and Business Services	143521	63366	15636	222523
K	Finance and Insurance	23237	1878	111	25226
O	Health and Community Services	39333	15862	49669	104863
P/Q	Cultural and recreation and other services	49057	4077	20413	73547
All industries		731921	109467	225975	1067363

Table 2.16: Proportion of over award employees that received automatic pass on of the 2003 SNA, by industry

	Industry	FT	PT	Casual	All
C	Manufacturing	23.9	14.1	19.1	22.9
E	Construction/Building	16.0	7.7	50.8	20.8
F	Wholesale	14.3	9.2	16.4	14.0
G	Retail trade	17.6	6.7	6.3	13.5
H	Accommodation, cafes and restaurants	18.0	0.8	6.6	10.9
I	Transport / storage	10.8	6.1	50.3	20.3
J/L	Communication, Property and Business Services	16.9	29.9	2.5	13.3
K	Finance and Insurance	15.3	7.4	0.8	13.3
O	Health and Community Services	16.3	10.9	43.0	20.8
P/Q	Cultural and recreation and other services	25.7	8.0	9.9	16.4
	All industries	17.9	13.9	12.5	15.9

2.4 Discretionary pass on of the May 2003 SNA

- 2.26. Businesses may also choose to pass on the SNA to over award employees who are not covered by an agreement that provides for automatic pass on of the SNA. We refer to this as discretionary pass on of the SNA. Discretionary pass on is a little more difficult to summarize than is automatic pass on. The reason for this is that businesses that have adjusted the pay of their employees between mid May 2003 and mid October when the survey went into the field, will have passed on the SNA, made a decision to pass it on in the future or decided not to pass on the SNA. However, those businesses that have not adjusted the pay of their employees can only say whether or not they intend to pass on the May 2003 SNA when they next adjust the pay of their workers. This is made even more complex by the fact that businesses can elect to exercise discretionary pass on for all or some of their workers. Describing these outcomes by size of business, region and industry proved to yield too complex a set of tables so we have chosen just to present the aggregate figures here.

2.4.1 Number of businesses that provided discretionary pass on of the May 2003 SNA to their employees

- 2.27. Almost 20 per cent of small and medium sized businesses exercised their discretion to pass the 2003 SNA on to some or all of their over award employees. A further 6.1 per cent of businesses intend to exercise their discretion to pass on the SNA when they next adjust the pay of their employees.

Table 2.17: Number of firms providing discretionary pass on of the May 2003 SNA to some or all over award employees

Passed on to	Passed on SNA		Intend to pass on SNA	
	Number	Per cent	Number	Per cent
All employees	92979	15.9	29614	5.1
Some employees	23075	3.9	6194	1.0
Sub Total	116054	19.8	35808	6.1

Note the percentage is obtained by using as the denominator the number of businesses with at least one employee (ie 585,476).

2.4.2 Employment

- 2.28. Just over 1.4 million employees of small and medium businesses receive pay increases via discretionary pass on of safety net adjustments. This represents 23.8 per cent of all employees of small and medium businesses. The bulk of workers who receive pay adjustments in this way are employed full-time. About one third of casual workers receive their pay increases via this discretionary pass on mechanism.

Table 2.18: Employment in businesses that have exercised, or intend to exercise their discretion, to pass on the May 2003 SNA to over award employees, cross tabulated by size of business

	FT	PT	Casual	All
Have passed on to				
All employees	544141	47072	517237	1108450
Some employees	66305	1158	1667	69130
Intend to pass on to				
All employees	192244	34653	23887	250784
Some employees	20150	92	342	20584
Total	822840	82975	543133	1448948
Per cent of all employees	20.1	10.5	30.0	23.8

2.5 Reasons for exercising discretion to pass on the May 2003 SNA to employees paid over award wages

- 2.29. Maintaining the motivation and workplace effectiveness of employees was the rationale that businesses most strongly advanced for providing discretionary pass on of the May 2003 SNA. The next most important rationale given was to maintain wage relativities. These results are consistent with a version of the efficiency wage model in which the effort supplied by workers depends on the premium that they are paid over minimum award wage rates. Such a model suggests that once an increase in the Safety Net is granted, businesses face a choice between passing that increase on to over award employees or face a reduction in motivation and ultimately a reduction in worker effort.

Table 2.19: Reasons for passing SNAs on to over award employees, per cent

	Describes businesses motivation			
	Very Well	Somewhat well	Not at all	Don't Know
Maintain wage relativities between employees	35.4	21.8	42.0	0.8
Maintain motivation and workplace effectiveness of employees	64.1	19.1	16.3	0.5
Because it was close to wage increase that these employees would have obtained	21.2	20.7	54.1	4.0

2.6 Factors that influence wage setting

- 2.30. Table 2.20 provides information on the factors other than SNAs that influence wage setting. Interestingly, inflation is low on the list of factors and this is true independently of whether the business is asked about past consumer price inflation, expected consumer price inflation, productivity, or the price at which the businesses own goods or services are increasing.

2.31. The factors that are important in wage setting are

- paying a wage necessary to retain good employees, reduce turnover and attract high quality employees;
- rewarding good performance;
- profitability of the business; and
- paying a wage that motivates employees.

Table 2.20: Factors that influence businesses in wage setting, per cent

	Importance of factor			
	Very	Some what	Not important	Don't Know
Rate of CPI inflation since last wage review	19.1	34.4	44.9	1.6
The expected rate of CPI inflation until the next wage review	9.3	25.9	62.9	1.8
Wage competitors are paying comparable employees	31.9	31.7	34.4	1.9
The wage necessary to motivate employees	50.2	31.5	16.8	1.5
The wage necessary to attract high quality employees	48.1	24.8	25.6	1.5
The wage necessary to retain good employees and reduce turnover of employees	63.2	23.4	12.0	1.4
The rate at which productivity has increased since the last wage review	31.5	37.5	28.5	2.6
The rate at which the price of the firms products and services is expected to increase	21.4	31.9	43.5	3.3
The profitability of the business	57.3	29.6	12.2	1.0
Merit and good performance	68.3	21.8	8.8	1.2

2.32. The information in Table 2.20 has some important implications. First, it tells us that competition is intense among Australian businesses to attract and retain employees. There is no support for the hypothesis that Australian business is characterized by monopsony.

2.33. Second, the Table suggests that the efficiency wage model is likely to be relevant to the study of wage setting in Australia. However, interpreting Table 2.20 in the context of the findings of the rest of this report suggests that it would be inappropriate to simply apply the standard efficiency wage model

to Australia. The reason is that the baseline efficiency wage model needs to be extended to incorporate Australia's particular wage setting institutions. Most importantly that model needs to be extended so that minimum award wage rates play the role of a reference wage and thus Safety Net adjustments have an effect on over award wages and thus aggregate employment. Undertaking that research is beyond the scope of this report but it is very important that it be done so that misleading conclusions are not drawn from the efficiency wage model when it is applied to analyse Australian issues.

3 Estimated effect on employment of the May 2003 SNA

3.1 Introduction

- 3.1. The question examined in this chapter is what was the short run impact, on minimum award wage rate employment, of the May 2003 Safety Net Adjustment.¹ Here short run was given the precise meaning of the three month period prior to the survey. We focused on businesses that have at least one employee paid a minimum award wage rate and therefore the employment effects reported here do not include the effect on employment prospects of the 2.5 million workers that received automatic or discretionary pass on of the 2003 SNA. Thus, the estimates reported here provide a lower bound on the short run employment effects of the May 2003 SNA.
- 3.2. Section 3.2 reports the dates at which the SNA was passed on into Federal and State awards.
- 3.3. Our estimates of the aggregate effect on employment of the May 2003 Safety Net Adjustment together with our estimates of the short run elasticity of demand for minimum award wage rate employees with respect to minimum award wage rates are reported in section 3.3.
- 3.4. The remainder of the chapter provides a more detailed discussion of how these estimates were obtained.
- 3.5. Businesses that reported at questions 12a, 13a and 14a that they have at least one full-time, part-time or casual employee paid a minimum award wage rate, were then asked whether their employment levels had increased, stayed the same or decreased. Responses are reported in Section 3.4. Depending on their response, these businesses were then asked about the effect of the 2003 SNA on their decision to increase, maintain or decrease the size of their workforce. Firms that reported an effect were then asked to quantify the size of that effect. The responses are reported in sections 3.5 to 3.7.

¹ All data in this section relates to businesses that have one or more employees other than the respondent. That is, businesses that reported yes to q11.

3.2 Dates at which the May 2003 SNA passed on into Federal and State Awards

As can be seen from Table 3.2 the ‘Safety Net’ decision was passed on to awards in all five States with industrial commissions by 1 August 2003.

Table 3.1: Date of State wage case decisions, 2003

State	Date
New South Wales	27 May
Victoria ^a	1 August
Western Australia	5 June
South Australia	2 July
Tasmania	10 July
Queensland	1 August

Source: DEWR

Note: (a) The Victorian adjustment is due to an AIRC decision that was made on 25 July and came into effect on 1 August.

The pass an of the SNA to Federal awards was a little slower than for state awards but even here the bulk of the pass on was completed by August 2003 and 91 per cent was complete by the time the survey went into the field in October.

Table 3.2: Dates of flow on of 2003 SNA to Federal Awards

Month	Number of Awards	Per cent ^a	Cumulative per cent
May	34	6	6
June	147	28	34
July	146	28	62
August	61	12	74
September	80	15	89
October	13	2	91
November	20	4	95
December	26	5	100
Total to receive 2003 SNA	527	100	na

Source: Safety Net Adjustments Database, DEWR

Notes: (a) proportion of all awards adjusted for the 2003 SNA as at 31 December 2003

3.3 Aggregate effect and estimated short run elasticity of employment demand with respect to the minimum award wage rate

- 3.6. In the three months prior to the survey, just over 14,000 jobs were lost (or not created) because of the 2003 Safety Net adjustment. This represents just under a 0.8 of one per cent reduction in employment of workers paid a minimum award wage rate and just over 0.4 of one per cent reduction in employment of all workers in businesses that employ at least one person at a minimum wage rate.
- 3.7. As is shown in Table 3.3 just under half of these (49 per cent) were full-time jobs and a further 35 per cent were part-time jobs.

Table 3.3: Estimated effect of the 2003 SNA on the number of employees

	FT	PT	Casual	All
Estimated reduction in employment over past three months attributable to the 2003 SNA	6847	4893	2320	14061
Memo Item: Estimated number of employees paid a minimum award wage rate	722131	368630	735442	1826203
Estimated reduction in employment as a percentage of the number of employees paid a minimum award wage rate	0.95	1.33	0.32	0.77
Memo Item: Estimated number of employees in businesses that pay at least one employee at a minimum award wage rate	1972281	458084	946218	3376581
Estimated reduction in employment as a percentage of all employees in businesses that pay at least one employee at a minimum award wage rate	0.35	1.07	0.25	0.42
Memo Item: Estimated number of employees in all small and medium sized businesses	4093667	788100	1812740	6694507
Estimated reduction in employment as a percentage of all employees	0.17	0.62	0.13	0.21

- 3.8. The estimated reduction in employment as a percentage of the number of employees paid a minimum award wage rate of 0.77 when combined with the fact that award wages increased by about 4 per cent as a result of the 2003 SNA yields a short run elasticity of demand for *minimum award wage workers* with respect to *minimum award wages* of about -0.2.²

² One could quibble about what to use as the wage change in the elas-

- 3.9. Analysis of those businesses that reported an adverse effect of the SNA on employment shows that the bulk of the effect occurred through loss (or non creation) of minimum award wage jobs. Specifically, 94 per cent of casual jobs, 98 per cent of part-time jobs and 55 per cent of full-time jobs in these businesses are paid an award wage rate. From this information we calculate that at least 10,842 of these 14,061 job losses were minimum wage jobs. Our expectation is that almost all of the reported job loss relates to minimum wage jobs.

3.4 The direction of employment change

- 3.10. Firms that we established at questions 12a, 13a and 14a have at least one employee paid a minimum award wage rate were asked at question 20 whether their employment levels had increased, stayed the same, or decreased over the past three months. Their responses are in Table 3.4.
- 3.11. As expected, the bulk of firms did not change their employment levels over the past three months. Of those firms that changed employment, a larger proportion (19.4 per cent) increased employment than decreased employment (12.4 per cent).

Table 3.4: Number of firms by nature of change to workforce over the past three months

Workforce	Number of Firms	Proportion of firms with at least one employee paid a minimum award wage rate (per cent)
Increased	46133	19.4
Stayed the Same	162464	68.2
Decreased	29512	12.4
Total	238109	100.0

3.5 Businesses that reported an overall increase in employment levels

- 3.12. Those businesses that reported an increase in employment levels in the past three months were asked to choose one of four statements regarding the effect of the May 2003 SNA on their employment levels. Those statements were:

ticity calculation. We note that for wage changes in the range of 3.08 per cent to 5.13 per cent the elasticity calculated will round to -0.2.

1. The 2003 Safety Net wage increase had no effect on our decision to expand our workforce.
2. My business would have expanded its workforce by more if there had been no Safety Net wage increase in 2003.
3. My business would have expanded its workforce by less if there had been no Safety Net wage increase in 2003.
4. Don't know.

3.13. The responses to these questions are in Table 3.5.

Table 3.5: Direction of effect on employment of May 2003 SNA, firms that reported that employment expanded over the past three months

Workforce	Number of Firms	Proportion of firms with at least one employee paid a minimum award wage rate (per cent)
1. The 2003 Safety Net wage increase had no effect on our decision to expand our workforce.	43377	94.0
2. My business would have expanded its workforce by more if there had been no Safety Net wage increase in 2003.	1422	3.1
3. My business would have expanded its workforce by less if there had been no Safety Net wage increase in 2003.	513	1.1
4. Don't know.	821	1.8
Total	46133	100.0

3.14. Businesses that reported an effect of the May 2003 SNA were asked to quantify by how much. The results are in Table 3.6.

Table 3.6: Estimated effect on employment of the 2003 SNA, businesses that increased overall employment

Estimated effect on employment	FT	PT	Casual	All
Would have increased by more	1774	828	752	3354
Would have increased by less ^a	452	452	452	1355
Net effect	1322	376	300	1999

Note: (a) Numbers in row add to 1355 rather than 1356 because of rounding.

- 3.15. We estimate that businesses that expanded employment in the three months prior to the survey would have created just under 2,000 more jobs if the Safety Net had not been increased. Two thirds of these jobs would have been full-time.

3.6 Businesses that reported no change in employment

- 3.16. Businesses that reported no change in employment were also asked to choose one of the following four statements regarding the effect of the May 2003 SNA on their employment levels.

1. The 2003 Safety Net wage increase had no effect on our decision to keep our workforce constant.
2. My business would have expanded its workforce in the past three months if there had been no Safety Net wage increase in 2003.
3. My business would have reduced its workforce if there had been no Safety Net wage increase in 2003.
4. Don't know.

- 3.17. The responses to these questions are in Table 3.7

Table 3.7: Direction of effect on employment of May 2003 SNA, firms that reported no change in employment over past three months

Workforce	Number of Firms	Proportion of firms with at least one employee paid a minimum award wage rate (per cent)
1. The 2003 Safety Net wage increase had no effect on my business's decision to keep our workforce constant.	144231	88.8
2. My business would have expanded its workforce in the past three months if there had been no Safety Net wage increase in 2003.	8277	5.1
3. My business would have reduced its workforce in the past three months if there had been no Safety Net wage increase in 2003.	428	0.3
4. Don't know.	9528	5.9
Total	162464	100.0

3.18. Businesses that reported an effect of the May 2003 SNA were asked to quantify by how much. The responses are in Table 3.8.

Table 3.8: Estimated effect on employment of the 2003 SNA, businesses that increased overall employment

Estimated effect on employment	FT	PT	Casual	All
Would have increased employment	4207	3301	2020	9528
Would have reduced employment	178	0	0	178
Net effect	4029	3301	2020	9350

3.19. We estimate that firms that did not change employment in the past three months would have employed an additional 9350 people if the Safety Net had not been increased in 2003. Some 43 per cent of these extra jobs would have been full-time and 35 per cent part-time.

3.7 Businesses that reported a decline in employment

3.20. Businesses that reported a decline in employment were also asked to choose one of the following four statements regarding the effect of the May 2003 SNA on their employment levels.

1. The 2003 Safety Net wage increase did not influence my business's decision to reduce our workforce.
2. If there had been no Safety Net wage increase in 2003 my business would have reduced our workforce by more.
3. The 2003 Safety Net wage increase did influence my business's decision to reduce our workforce.
4. Don't know.

3.21. The responses to these questions are in Table 3.9

Table 3.9: Direction of effect on employment of May 2003 SNA, firms that reported that employment declined over past three months

Workforce	Number of Firms	Proportion of firms with at least one employee paid a minimum award wage rate (per cent)
1. The 2003 Safety Net wage increase did not influence my business's decision to reduce our workforce.	26669	90.4
2. If there had been no Safety Net wage increase in 2003 my business would have reduced our workforce by more.	0	
3. The 2003 Safety Net wage increase did influence my business's decision to reduce our workforce.	2264	7.7
4. Don't know.	579	2.0
Total	29512	100.0

3.22. Businesses that reported an effect of the May 2003 SNA were asked to quantify by how much. The results are in Table 3.10.

Table 3.10: Estimated effect on employment of the 2003 SNA, businesses that decreased overall employment

Estimated effect on employment	FT	PT	Casual	All
Business would have reduced workforce by less if there was no SNA in 2003	1496	1216	0	2712
Business would have reduced workforce by more if there was no SNA in 2003	0	0	0	0
Net effect	1496	1216	0	2712

3.23. We estimate that if there had been no SNA in 2003, 2,712 jobs would have been saved in businesses that reduced employment in the past three months. Just over one half of these jobs would have been full-time and the remainder part-time.

4 Estimated effect on employment of not changing the Safety Net for a period of five years

4.1 Introduction

4.1. The issue studied in this chapter is what is the long run impact on labour demand of the system comprised of minimum award wage rates and Safety Net adjustments to those wages.¹ In framing the questionnaire to obtain this information we felt that it was important that:

- The period of time specified should be sufficiently long as to allow businesses to adjust their capital stock and possibly their location. We settled on a period of five years.
- The hypothetical situation put to business involved a significant expected change in real minimum award wage rates, and a significant expected change in relative wages. This was necessary in order to ensure that there would be sufficient incentive for firms that currently employ no minimum award wage rate workers to consider employing such workers. We felt that a hypothetical guarantee of no change to the Safety Net for a period of five years was the best option to satisfy this requirement.
- That the hypothetical situation put to respondents produced information on the extent to which the Safety Net has an adverse employment effect by removing the option for businesses not to adjust, in poor economic circumstances, the pay of those workers who are paid an award wage rate. To fully examine this issue we needed information on how businesses would adjust the wages of employees paid an award wage rate in situations where there was no legal obligation to raise the wages of such workers. A guarantee of no change to the Safety Net for a period of five years was the main situation that would generate this information.

¹ All data in this section relates to businesses that have one or more employees other than themselves. That is, businesses that reported yes to q11.

- That the hypothetical situation put to respondents should be as free from ambiguity as possible and minimize the extent to which they had to undertake complex mental calculations in forming their response. We felt that a hypothetical guarantee of no change in the Safety Net the best option to satisfy this requirement, since the expected change in real minimum award wage rates would be minus the expected change in inflation, and the expected change in the relative wage of those paid minimum award wage rates would be minus the expected change in the nominal wage of over award employees.

- 4.2. Estimates of the effect on aggregate employment, of a guarantee that the Safety Net would not be changed for a period of five years, together with estimates of the medium to long run elasticity of demand for minimum award wage rate workers with respect to minimum award wage rates are reported in section 4.2.
- 4.3. Section 4.3 discusses the effect on wage setting of a guarantee of no change in the Safety Net for five years.

4.2 Estimated effect on aggregate employment of a guarantee of no change in the Safety Net for a period of five years

- 4.4. Businesses that at question 11 were identified as having at least one employee were asked at question 24a which of a list of five statements best described the effect on their business of a guarantee of no increase in the Safety Net for five years. The statements and the responses are reported in Table 4.1. Some 81.7 per cent of businesses reported that they would not change employment decisions in response to a guarantee of no change to the Safety Net for a period of five years. While 11.8 per cent of businesses reported that they would increase employment, 2.5 per cent said they would not decrease employment by as much as they otherwise would have done. Just 0.3 of one per cent of businesses reported that they would reduce employment in response to such a guarantee.

Table 4.1: Estimated effect on employment of a guarantee not to change the Safety Net for five years

Employment response	Number of Firms	Proportion of firms with at least one employee paid a minimum award wage rate (per cent)
1. My business would put on additional employees	68964	11.8
2. My business would not reduce its workforce by as much as it would have otherwise done	14551	2.5
3. My business would not change the number of people it employs	478625	81.7
4. My business would reduce the number of people it employs	1627	0.3
5. Don't know	21710	3.7
Total	585476	100.0

- 4.5. Those businesses that indicated that they would change employment in response to a guarantee not to change the Safety Net were asked to say by how much for each of the categories of full-time part-time and casual employees. The results are reported in Table 4.2.

Table 4.2: Estimated effect on employment of a guarantee not to change the Safety Net for five years

Employment response	FT	PT	Casual	All
Put on additional employees	95792	39460	60217	195469
Reduce workforce by less	11128	3058	3959	18145
Reduce workforce by more	172	58	116	346
Net effect	106748	42460	64060	213268
Memo Item: Number of workers paid a minimum award wage rate	722131	368630	735442	1826203
Employment effect as a percent of all minimum award wage rate employees	14.78	11.52	8.71	11.68
Implied elasticity	-1.14	-0.89	-0.67	-0.90
Memo item: Total employment	4093667	788100	1812740	6694507
Employment effect as a percent of all employees	2.61	5.39	3.53	3.19
Implied elasticity	-0.20	-0.41	-0.27	-0.25

- 4.6. In chapter 2 we found that the bulk of businesses currently do not have employees paid at a minimum award wage rate. The magnitude of the employment response to a reduction in real minimum award wage rates therefore depends on whether such businesses will respond by employing minimum award wage rate employees. Table 4.3 sheds light on this issue and shows that about 8.7 per cent of businesses that currently do not have any employees paid at a minimum award wage rate would respond to a guarantee of no change in the Safety Net for a period of five years by employing workers at the minimum award wage rate. By way of comparison 16.3 per cent of businesses that currently have at least one worker paid a minimum award wage rate would hire additional employees (or not dismiss existing employees) in response to such a guarantee.
- 4.7. Businesses that currently have at least one minimum award wage rate employee account for 64.8 per cent of the jobs that would be created or saved though a guarantee not to change the Safety Net for a period of five years. See Table 4.4. The bulk of these (59.2 per cent) involve job creation, and 5.8 per cent the saving of jobs. Businesses that currently do not have minimum award wage rate employees would account for the other 35.2 per cent of jobs that are created or saved though such a policy. Again the bulk of these are jobs that are created rather than saved.

Table 4.3: Response to a guarantee not to change the Safety Net for a period of five years, cross tabulated by whether the business currently has any minimum wage rate employees, number of businesses

	Do not have minimum award wage rate employees		Have minimum award wage rate employees	
	Number	Per cent	Number	Per cent
1. My business would put on additional employees	30147	8.7	38817	16.3
2. My business would not reduce its workforce by as much as it would have otherwise done	6910	2.0	7640	3.2
3. My business would not change the number of people it employs	297004	85.5	181621	76.3
4. My business would reduce the number of people it employs	95	0.0	1531	0.6
5. Don't know	13211	3.8	8499	3.6
Total	347367	100.0	238108	100.0

- 4.8. A guarantee of no change in the Safety Net for a period of five years would also save some jobs in firms that currently do not have minimum award wage rate employees. This situation arises where, without such a guarantee, an over award employee would experience sufficiently slow wage growth for the minimum award wage rate to become binding and result in job loss. We estimate that 2.7 per cent of the total employment effect from a guarantee of no change in the Safety Net would be attributable to this effect.

Table 4.4: Response to a guarantee of no change in the Safety Net for a period of five years, cross tabulated by whether the business currently has minimum award wage rate employees, additional labour demand, number of jobs

	Do not have minimum award wage rate employees		Have minimum award wage rate employees	
	Number	Per cent	Number	Per cent
1. My business would put on additional employees	69350	32.5	126119	59.2
2. My business would not reduce its workforce by as much as it would have otherwise done	5750	2.7	12394	5.8
4. My business would reduce the number of people it employs	78	0.0	346	0.2
Total	75022	35.2	138167	64.8

4.3 Effect on wage setting for those currently on minimum award wage rates of a guarantee of no change to the Safety Net for a period of five years

4.9. A guarantee of no change in the Safety Net for a period of five years, would have a significant effect on how wages are set for workers that are employed at a minimum award wage rate. An important question for evaluating the equity effects of such a policy is whether businesses would begin to pay overaward wages for some workers who are currently paid a minimum award wage rate. In order to gather information on this we asked the following question of those businesses that said they would change employment levels if there was a guarantee of no change in the Safety Net for five years.

Q24f. : Which of the following statements best describes the direct effect that such a guarantee would have on how your business adjusts the pay of employees who are currently paid a wage exactly equal to the award rate of pay?

4.10. The responses are in Table 4.5, and show that if a guarantee of no change in the Safety Net for a period of five years were to be made, only 8.7 per cent of these businesses would make no

adjustment to the wages of employees currently paid minimum award wage rates. The remaining 91.3 per cent of businesses would provide its employees with some wage adjustment. It is reasonable to interpret the detailed responses of this 91.3 per cent of businesses as indicating the dominant practice that they would follow in setting the pay of these employees.

- 4.11. Some 9.7 per cent of businesses would adjust the wages of minimum award wage rate employees by less than the percentage increase in the CPI.

Table 4.5: Response to a guarantee of no change in the Safety Net for a period of five years, cross tabulated by whether the business currently has minimum award wage rate employees, number of businesses

	Number	Per cent
1. My business would not adjust the wages of any of these employees in line with inflation	4182	8.7
2. My business would provide some of these employees with wage increases but at a rate less than the rate of inflation	4673	9.7
3. My business would provide some of these employees with wage increase equal to the rate of inflation	18386	38.3
4. My business would provide some of these employees with wage increase greater than the rate of inflation but less than the percentage increase over award employees receive	4092	8.5
5. My business would provide employees currently on award rates of pay with the same percentage increase in wages as over-award employees	9049	18.9
Don't know	7609	15.9
Total	47991	100.0

- 4.12. That is, under such a guarantee of no change in the Safety Net, the bulk of business would, on average, adjust, to at least compensate for inflation, the pay of some workers hired at a minimum award wage rate. More than one-third (38.3 per cent) of these businesses said they would provide wage increases that fully adjusted wages for inflation.

- 4.13. A further 8.5 per cent of businesses said that, under a guarantee of no change in the Safety Net they would provide employ-

ees hired at an award wage rate with wage increases between the rate of inflation and the rate of wage increase given over award employees.

- 4.14. Some 18.9 per cent of businesses said that they would provide the same percentage wage increase as they give to over award employees.
- 4.15. These results, although anticipated by us, may well seem counter intuitive to some, and thus need some explanation and discussion to establish that it is consistent with economic theory. The Safety Net places a floor on the wages that a firm can pay certain workers. When deciding whether to hire such workers, the firm weighs up if the expected benefits exceed the wage by an amount that is sufficient to cover the fixed cost of hiring and the expected cost of retrenchment.² The Safety Net removes the option for the firm not to make wage increases in bad times and thus increases the probability that the worker will be retrenched in the future. This has two effects on the firm's cost benefit calculation regarding hiring. First, it shortens the expected period of time that the worker will be employed by the firm and thus reduces the expected stream of benefits to the firm from hiring the worker. Second, it increases the expected cost to the firm of retrenchment because it increases the probability of retrenchment. Thus, it is rational for businesses to say that they will hire additional employees in response to a guarantee of no change in the Safety Net for a period of five years even though, on average, they would give those newly hired workers the same percentage wage increase as afforded to over award employees. As can be seen from Table 4.5 this effect is quantitatively important.
- 4.16. In summary the imposition of a Safety Net increases the expected costs of businesses without necessarily increasing the wage received by employees. For employees at firms affected in this way, the Safety Net then provides a lottery. Those that remain employed have a wage security, but it comes at the cost of an increased probability of being retrenched which operates as a force to reduce income security for low paid workers as a group.

² Retrenchment cost should be understood to include the disruption to work teams, adverse effects on morale and loss of goodwill. Expected costs of retrenchment will vary with the size of the business because smaller firms may be exempt from legislative provisions regarding pay-outs in the event of retrenchment.

5 Estimated effect of SNAs on employment by firms that currently have one employee

5.1 Introduction

- 5.1. We estimate that some 189,599 businesses have no employee other than the respondent. This represents 24.5 per cent of all small and medium sized businesses. These businesses are of interest in this study for three main reasons.
- 5.2. First they may contain some businesses that previously were employers, section 5.2 sets out the evidence on this.
- 5.3. Second, some of these businesses may have ceased being employers because previous Safety Net adjustments had increased their labour costs to an unsustainable level. Evidence on the extent to which this is the case is provided in section 5.3.
- 5.4. Third, under a guarantee of no change in the Safety Net for a period of five years some of these businesses may choose to become employers. Section 5.4 provides evidence on these employment effects.

5.2 Past employment by firms that currently have one employee

- 5.5. Just under 40 per cent of businesses that currently have one employee had more than one employee at some stage in the past. See Table 5.1.

Table 5.1: Whether or not business has previously had more than one employee, number of businesses

Business has:	Number	Per cent
Previously had more than one employee	75534	39.8
Only had one employee	114065	60.2
Total	189599	100.0

- 5.6. Business that had previously had employees were asked what was the maximum number of people they had employed. The modal response was two but the maximum number of employees ranged up to 18. See Table 5.2.

Table 5.2: Frequency histogram of maximum number of previous employees

Maximum number of employees	1	2	3	4	5	6	7
Number	13236	18122	16531	8761	910	4269	4721
Per cent	17.5	24.0	21.9	11.6	1.2	5.7	6.3
Maximum number of employees	8	9	10	11	12	15	18
Number	5926	767	347	1506	364	37	37
Per cent	7.8	1.0	0.5	2.0	0.5	0.0	0.0

Note: The total number of businesses is 75,534.

- 5.7. Businesses that previously had employees were asked what was the year in which the maximum number of staff were employed. The responses are in Table 5.3 where it can be seen that the largest mode was at 2002.

Table 5.3: Frequency histogram of year in which business had maximum number of employees, number of businesses

Year in which business had maximum number of employees	Number	Per cent
Prior to 1990	12407	16.4
1990	2899	3.8
1991	345	0.5
1992	6674	8.8
1993	3260	4.3
1994	651	0.9
1995	2541	3.4
1996	3116	4.1
1997	2946	3.9
1998	7024	9.3
1999	2402	3.2
2000	6763	9.0
2001	5198	6.9
2002	14243	18.9
2003	4024	5.3
Don't know	1043	1.4
Total	75534	100.0

5.3 Extent to which previous SNAs were a factor in the firm reducing employment

5.8. To find out whether previous SNA adjustments had been a factor in these business's decision to reduce employment we asked the following question.

Q28. : Which one of the following best describes the extent to which previous Safety Net wage increases were a factor in your business's decision to reduce the number of employees.

5.9. The responses which are summarised in Table 5.4 lead us to estimate that previous Safety Net adjustments had played some role in 75,103 job losses in firms that currently have one employee and played a major role in 23,589 of those job losses.

Table 5.4: Effect of previous Safety Net adjustments on the business's decision to reduce employment

	Businesses		Employment loss	
	Number	Per cent	Persons	Per cent
A major influence	5934	7.9	23589	8.5
A moderate influence	8684	11.5	25741	9.3
A minor influence	5952	7.9	25773	9.3
Not an influence	54964	72.8	202161	72.9
Total	75534	100.0	277264	100.0

5.4 Effect on future employment intentions of a guarantee not to change the Safety Net for a period of five years

5.10. Businesses that currently have one employee were asked how likely they are to hire in the future. As shown in Table 5.5, 19.7 per cent responded that they are either very likely or somewhat likely to hire in the future.

Table 5.5: How likely businesses that currently have one employee are to hire in the future

	Number	Per cent
Very likely	16616	8.8
Somewhat likely	20670	10.9
Unlikely	142264	75.0
Don't know	10050	5.3
Total	189599	100.0

- 5.11. We then asked businesses that currently have one employee whether a guarantee of no change in the Safety Net for a period of five years would make them more or less likely to hire in the future. As shown in Table 5.6, 10.7 per cent of businesses said that such a guarantee would increase the prospect that they would hire in the future. Just 0.3 of one per cent of businesses said that such a guarantee would make them less likely to hire.

Table 5.6: Effect of a guarantee not to change the Safety Net for a period of five years on the prospect that businesses currently with one employee would hire in the future

	Number	Per cent
Much more likely to employ in the future	4852	2.6
Somewhat more likely to employ in the future	15318	8.1
Would not change my decision about future hiring	167727	88.5
Would be less likely to employ in the future	506	0.3
Don't know	1196	0.6
Total	189599	100.0

- 5.12. Businesses that said a guarantee of no change in the Safety Net for a period of five years would influence their hiring decisions were asked to say by how much. The results which are in Table 5.7 indicate that they would hire about 32,026 employees. In contrast to businesses with employees, businesses currently with one employee would be more likely to hire casual workers than full-time or part-time employees.

Table 5.7: Estimated effect on employment of a guarantee not to change the Safety Net for a period of five years, businesses that currently have no employees

Estimated effect on employment	FT	PT	Casual	All
Net effect	9609	10413	12004	32026

III. Technical material

6 An economic framework for understanding the effects of the Safety Net on employment

6.1 Introduction

- 6.1. This chapter is concerned with the task of setting out the relevant economic theory that guided our analysis.
- 6.2. A natural starting point is the perfectly competitive model without frictions and uncertainty which is discussed briefly in section 6.2. Although this model is reasonably well known there are some aspects of it that are less well known but which turn out to be empirically important and thus warrant some discussion.
- 6.3. The perfect competitive model is a useful starting point, but we also need to consider what the effects would be in situations where the operation of the economy departs from perfect competition. We consider four such models.
- 6.4. The first of these is an extension to the perfectly competitive model. It is described in section 6.3 and relates to the case where businesses face fixed costs of hiring and firing workers, and are subject to random shocks that affect either the demand for their product or their production technologies. This model has not to our knowledge been discussed previously in the minimum wage literature but we feel it warrants discussion for two main reasons. First, it is a natural, and arguably more realistic, extension to the perfectly competitive model. Second, it provides an additional prediction that turns out to be empirically relevant in the data analysed for this report.
- 6.5. The second model considered has long been regarded as a theoretical curiosity. It is mentioned here because it was advanced by Card & Kruger (1995) as an explanation of the results that they find in their studies. This model which involves the hypothesis that firms are monopsonistic is set out in section 6.4.
- 6.6. Section 6.5 sets out the standard labour search model. This model provides an explanation as to why it is that, in some countries, the interaction between the tax and welfare system on the one hand and the minimum wage on the other results

in a minimum wage that has only a small effect on employment, while in other countries the interaction is such that the employment effect is large.

- 6.7. The fourth model we consider relaxes the implicit assumption in the competitive model that the effort supplied by workers is not influenced by the wage paid. This model which in the literature is given the rather unattractive and slightly misleading name of the efficiency wage model is set out in section 6.6.
- 6.8. The various models are put together in a stylized framework in section 6.7.

6.2 The effects of wages floors on employment in a perfectly competitive world with no frictions or uncertainty

- 6.9. The predictions of economic theory regarding the effects of minimum wages in a perfectly competitive world without frictions and uncertainty are well known and are found in standard intermediate microeconomics textbooks.
- 6.10. In the competitive model an increase in the minimum wage causes the wages of those low paid workers whose wage was below the previous minimum to rise. This causes firms to substitute away from low skilled workers towards higher skilled workers and capital.
- 6.11. An auxiliary assumption that is frequently made in economic analysis is that some of both high skilled and low skilled labour must be used in production.¹ This assumption is implicit in most of the standard production functions used in the empirical literature such as the constant ratio elasticity of substitution homothetic (CRESH) production function and all of its special cases such as the constant elasticity of substitution (CES) and Cobb-Douglas production function.
- 6.12. It should be obvious that this auxiliary assumption is highly problematic since there is some level of the minimum wage at

¹ Technically, this assumption is imposed whenever the analysis uses a production function that involves the assumption that the marginal product of the first increment in unskilled labour is infinite. This assumption occurs when ever the production function $F(L^{us}, L^s, K)$ is such that $\lim_{L^{us} \searrow 0} F(L^{us}, L^s, K) = \infty$, where (L^{us}, L^s) are hours of unskilled and skilled labour respectively and K is the capital stock. The assumption is implicitly made in production functions that aggregate skilled and unskilled labour and it is also made implicitly in models that work with either the logarithm of unskilled labour input or that raise the unskilled labour input to a negative power. In short, the assumption is widely used.

which businesses will stop using low skilled labour and thus stop paying the minimum wage. Thus, variations in the minimum wage will have two effects. The first of these is to cause some firms to vary their decision as to whether or not to use low skilled labour. The second is to cause firms that use low skilled labour to vary the intensity with which they combine that labour with other inputs. Empirical analysis that, by their choice of production function, makes the implicit assumption that both low skill and high skill labour are essential in production, measure the second of these effects, albeit imperfectly and with a bias towards underestimation of the effect. But they completely neglect to measure the first effect.

- 6.13. One indication of the empirical relevance of this consideration is provided by the proportion of businesses that have no employees on the minimum wage; see section 2.2 page 30 for estimates of that proportion. Another indication of the empirical relevance of this effect is the proportion of businesses that currently do not have employees paid the minimum wage but who report that in response to a guarantee of no change to the Safety Net they would take on additional employees; see section 4.2 page 58 for estimates of this proportion.

6.3 The effect of minimum wages in the presence of uncertainty and fixed hiring and firing costs

- 6.14. The minimum wage places a floor on the wage that a firm can pay certain workers. In the standard neoclassical model without uncertainty or any fixed costs of hiring and firing workers the result of imposing a minimum wage is a lower level of employment of low skilled workers. But those low skilled workers who remain employed gain a higher wage and the welfare effects of raising the minimum wage depend, in part, on whether the increase in income for those who remain in jobs is greater than the loss of income of those who become unemployed.
- 6.15. In reality things are not as smooth as assumed in the perfectly competitive model. Most importantly, firms typically incur fixed costs when seeking to vary the number of people employed. Hiring costs are one source of these fixed costs and firing or retrenchment costs are another source. Thus when deciding whether to hire such workers the firm must weigh up whether the expected benefits exceed the wage by an amount that is sufficient to cover the fixed cost of hiring and the expected cost of retrenchment if economic circumstances prove to be adverse. Imposition of a minimum wage removes the op-

tion for the firm not to make wage increases in bad times and thus increases the probability that a low skilled worker will be retrenched in the future. This has two effects on the firm's cost benefit calculation regarding hiring. First, it shortens the expected period of time that the worker will be employed by the firm and thus reduces the expected stream of benefits to the firm from hiring the worker. Second, it increases the expected cost to the firm of retrenchment because it increases the probability of retrenchment.

- 6.16. For employees at firms affected in this way the minimum wage then provides a lottery. Those that remain employed have an increased wage and reduced fluctuations in their wage but it comes at the cost of an increased probability of being retrenched which operates as a force to reduce income security for low skilled workers as a group.
- 6.17. The extension of the perfectly competitive model just described yields the prediction that if the minimum wage is lowered and it is guaranteed that the lower minimum will stand for a period of time then, there will be a number of businesses that are willing to hire workers at the old minimum wage. Thus, unlike the perfectly competitive model, this model does not require the wage paid to low skilled workers to fall in order for there to be an employment gain. The reason for this is that the lowering of the minimum wage increases the scope for the business to allow the real wage to fall by holding the nominal wage fixed should adverse circumstances eventuate in the future. Thus lowering the minimum wage confers an increased option value on the firm and this benefit explains why some firms will be willing to employ more workers at a wage that is equal to the old minimum wage.
- 6.18. Thus, for example, this model predicts that a guaranteed of no change in the level of the minimum wage may cause a significant increase in employment without there necessarily being a large fall in the wage paid to low skilled workers. Evidence on the empirical relevance of this theory is provided in section 4.3 page 62.
- 6.19. This effect operates in addition to the standard substitution effect that is captured in most econometric studies. Neglect of this effect would bias time series and cross section studies of the minimum wage.

6.4 Monopsony

- 6.20. In the perfectly competitive model the quantity of labour demanded by the firm does not affect the wage at which that labour is available. Monopsony is the situation where this assumption does not hold and the wage paid by the firm depends on the quantity of labour it uses. In this situation the profit maximizing firm takes into account the effect on the wage of using more labour and optimally chooses to use less labour than in the competitive case.²
- 6.21. In this situation the imposition of a legislated minimum wage means that the firm is faced with a situation whereby, while the minimum wage is binding, increased use of low skill labour does not affect the wage paid. Thus in this case imposition of a minimum wage can increase the quantity of low skill labour that is used by the firm.
- 6.22. How plausible is the monopsony story? Well, the monopsonist earns above normal profits so unless it can prevent the entry of another business into its market it will ultimately be forced to compete for labour with new entrants. In the long run such entry would result in a situation approximating perfect competition. For the small and medium sized business sector such entry is likely to be a powerful force acting to eliminate monopsony.
- 6.23. Because the monopsony story has been advanced by Card & Kruger (1995) we designed the questionnaire so that it would elicit evidence of monopsony if it existed. For example, we allowed businesses the opportunity to say that the May 2003 SNA saved jobs as would be the case if they were monopsonists. We also allowed businesses to respond that not adjusting the safety net would cost jobs as would be the case if the business were a monopsonist. Since monopsony is not prohibited they had no reason not to report this effect if it existed. When we asked about factors that affect wage setting we also allowed businesses the opportunity to report that monopsony existed. They could do this by rating the following items as unimportant in wage setting
- The wage competitors are paying comparable employees;
 - The wage necessary to attract high quality employees;

² It is sometimes asserted that the fact that firms set wages is an indication of monopsony power on the part of firms. Such logic, if applied to business, would brand the local lolly store a monopolist because it sets the price at which it's lollies are offered to the customers.

- The wage necessary to retain good employees and reduce turnover.
- 6.24. However, businesses rated all of these as very or somewhat important suggesting that monopsony is not a major feature of the Australian labour market. See section 2.6 page 43.

6.5 Labour search models

- 6.25. In the perfectly competitive model and its extension considered in section 6.3, wages are assumed to adjust instantaneously to clear the market. This is an unsatisfactory assumption. A more realistic description of the labour market recognizes that firms search for workers and that the unemployed search for jobs.
- 6.26. Search models capture these features of the labour market. The search model introduces the notion of the reservation wage. That is, the wage below which it is not optimal for an unemployed person to accept a job offer. The reservation wage is determined by the interaction between the workers preferences for labour and leisure with the tax and welfare system. This interaction is important because the tax and welfare system may result in the reservation wage being above the minimum wage. This has three main implications.
- 6.27. First, most econometric studies do not attempt to sort out the effects of the minimum wage from the effects of the reservation wage on employment outcomes. Again this means that in situations where the reservation wage is near the minimum wage econometric studies are likely to underestimate the effects on employment of variations in the minimum wage. One of the advantages of the survey based approach taken in this report is that it is not compromised by the interaction of the minimum wage with the reservation wage and therefore identifies the effect on labour demand of a guarantee not to increase the minimum wage for a period of five years.
- 6.28. The second implication is that for this increased quantity of labour demand to be translated into employment it is necessary for the wage paid to be above the reservation wage. Thus depending on the level of the reservation wage it may be necessary to adjust labour tax and welfare benefits in order to ensure that the increase in the quantity of labour demanded actually turns into an increase in employment.
- 6.29. The third implication is that studies of the employment effects of minimum wages are not immediately transferable between

countries because the estimated effects will depend in part on the interaction of the tax and welfare system with the minimum wage. Thus the studies conclusions would need to be adjusted to take into account these differences.

- 6.30. We note that little research has been undertaken on how to adapt search models to fit the institutional features of the Australian labour market.³

6.6 Efficiency wage model

- 6.31. In the perfectly competitive model and in the search model the effort supplied by workers is assumed not to depend on the wage paid. The assumption made in the competitive model is that firms can costlessly monitor the effort supplied by workers and can costlessly write and enforce contracts that ensure the required level of effort is supplied. There are many instances where this assumption is implausible.
- 6.32. Efficiency wage models explicitly allow for instances where monitoring and contracting over the level of effort is costly. In these cases the effort supplied by workers depends on the wage rate that is paid. In this setup firms choose a wage that results in the employee providing the optimal, for the firm, level of effort. This ‘efficiency wage’ may be above or below the minimum wage. If it is above the minimum wage then small changes in the minimum wage would have no effect on employment outcomes. Here it should be remarked that this is not because the firm’s demand for labour is inelastic, although one would reach this conclusion from econometric studies that did not make allowance for efficiency wage effects. As with the situation in the search model, if the efficiency wage is above the minimum wage, this may indicate that adjustment of the tax and welfare system, which also influences the level of the efficiency wage, may be required in order to realize the employment effects from adjusting the minimum wage.
- 6.33. Efficiency wage theories can suggest, depending on their exact formulation, that businesses will voluntarily pass-on increases in minimum wages to some employees paid more than the minimum wage. Within the efficiency wage model the firm’s motivation for doing this would be to encourage effort from those employees paid more than the minimum wage. To the extent

³ Don Harding’s Intermediate Macroeconomics lecture notes on search unemployment set out a basic model that includes the interaction between minimum wages and the tax and transfer system. The lecture notes are available from the authors on request.

that this effect is present it will mean that increases in minimum wages will have more widespread implications for employment than is the case in the perfectly competitive model of the labour market.⁴

- 6.34. In the survey we asked businesses whether it was important in setting wages to take into account the effect that the wage had in motivating employees. Some 50.2 per cent of businesses responded that this consideration was very important; a response that they would not make if the labour market was characterised by perfect competition.

6.7 Combining the models to provide a stylized representation of wage floors

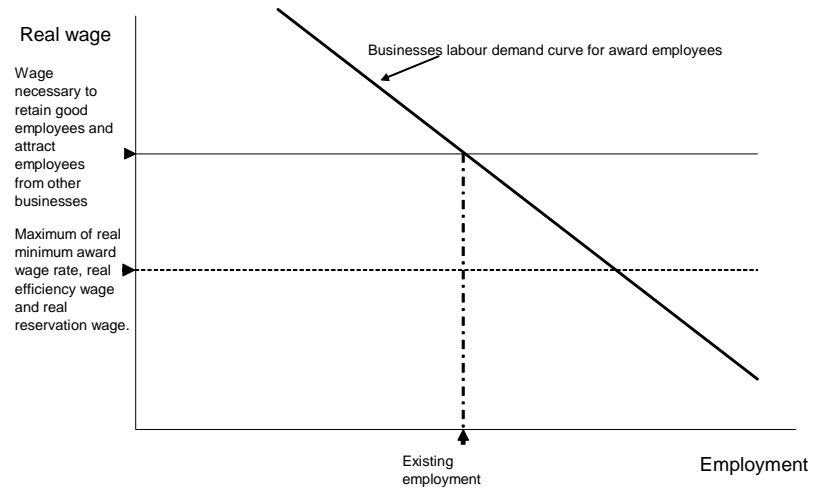
- 6.35. The modern theory of the labour market can be interpreted as viewing employment in a business as determined by the interaction of the businesses' labour demand with the maximum of four wage floors. These wage floors are discussed below.

Sources and implications of wage floors

- 6.36. The first case is the neoclassical model where the wage floor is the wage necessary to retain good employees and to attract employees from other businesses. This wage floor, which is set through competition with other businesses for labour, determines both the wage paid and the businesses' employment. Figure 6.1 shows a stylized representation of this case for an individual business. Here, small changes in the level of the other wage floors do not influence either the wage paid or the level of employment. If the other three wage floors are not binding in any of the other businesses with which this business competes for labour then that particular labour market is well approximated by the neoclassical model. Notice that in this case a business answering Q24a would respond that a guarantee of no change in the safety net for a period of five years would have no effect on their employment of labour.
- 6.37. For future reference we note that the aggregate labour demand for an industry is obtained by taking the labour demand curves for each business and summing horizontally over all the businesses. By summing horizontally we mean that a given wage is chosen and the labour demand for each business is obtained

⁴ Don Harding's Intermediate Macroeconomics lecture notes on the efficiency wage model set out a basic efficiency wage model that includes the interaction between efficiency wages and the tax and transfer system. The lecture notes are available from the authors on request.

Figure 6.1: Neoclassical model where the wage is determined through competition for employees with other businesses



at that wage. The sum, over all businesses in the particular labour market, of all these individual labour demands, at that wage, yields a point on the aggregate labour demand curve. The process is repeated for different wage rates until the complete aggregate labour demand curve is obtained.

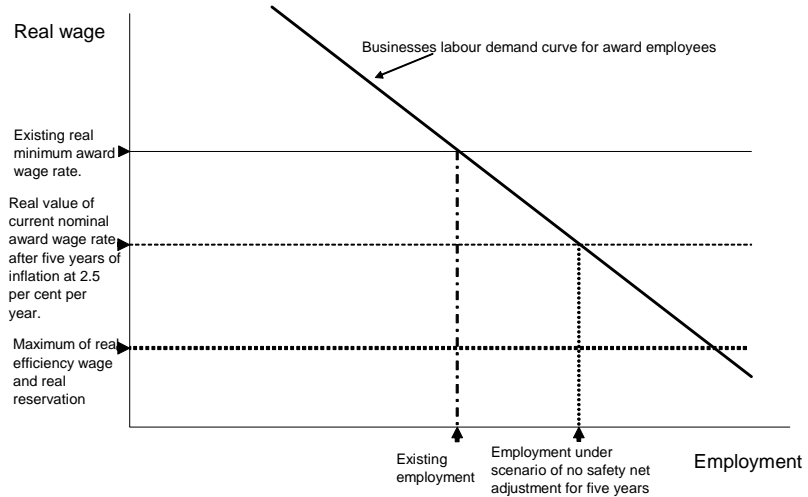
6.38. In Figure 6.1 there are three other wage floors that are referred to. These comprise,

- The wage floor set by the Safety Net for the particular industry or occupation. We refer to this as the **minimum award wage rate**.
- The **efficiency wage**.
- The **reservation wage**.

6.39. The second case is where the wage set by the Safety Net is currently above the maximum of the other wage floors and would remain in that position even if the Safety Net was not increased for five years. This case is shown in Figure 6.2. Businesses in this situation are those that would respond at Q24a that they would hire additional employees if a guarantee were given that the Safety Net would not be adjusted for a period of five years and would respond at Q24f that they would not give these new employees a wage increase over the next five years.

6.40. The third case is where the wage set by the Safety Net is currently above the efficiency wage but after the Safety Net was

Figure 6.2: Case where minimum wage would remain the binding constraint even if the Safety Net was not increased for five years



held constant for five years the efficiency wage would become binding. This case is illustrated in Figure 6.3. Businesses in this situation would respond at Q24a that they would hire additional employees if a guarantee were given that the Safety Net would not be adjusted for a period of five years but would respond at Q24f that they would give these new employees wage increases over the next five years. These wage increases would come into play when the efficiency wage became binding.

6.41. The fourth case to consider is where the efficiency wage is the binding floor that determines the businesses employment. This case is shown in Figure 6.4. In this situation the business will respond at Q24a that under a guarantee of no change in the Safety Net they would not hire any additional employees because the wage set by the Safety Net is not the binding constraint that prevents their business from employing more people.

Monopsony

6.42. Monopsony arises where the wage paid by the business varies with the quantity of labour it uses. This is shown in Figure 6.5 by an upward sloping labour supply curve. Thus, the monopsony case is very different to the other cases illustrated in Figures 6.1 to 6.4 where the wage paid by the business does not depend on the quantity of labour used by the business. In

Figure 6.3: Case where the wage set by the Safety Net is binding now but after five years of no change in the Safety Net the efficiency wage would be binding

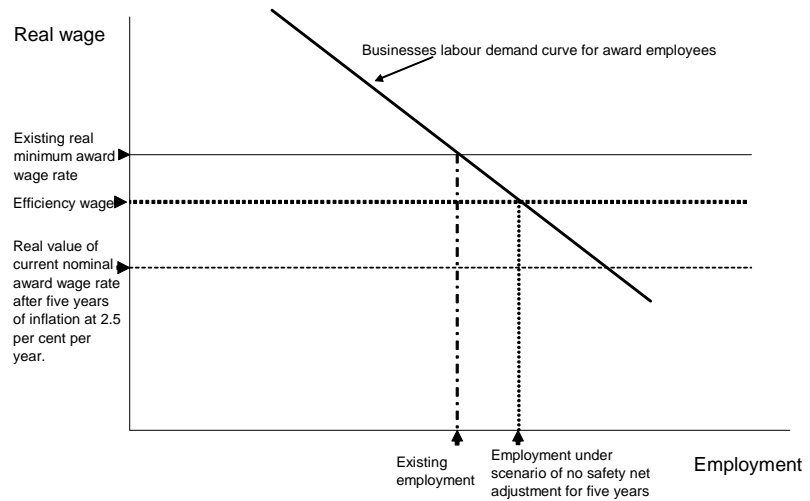
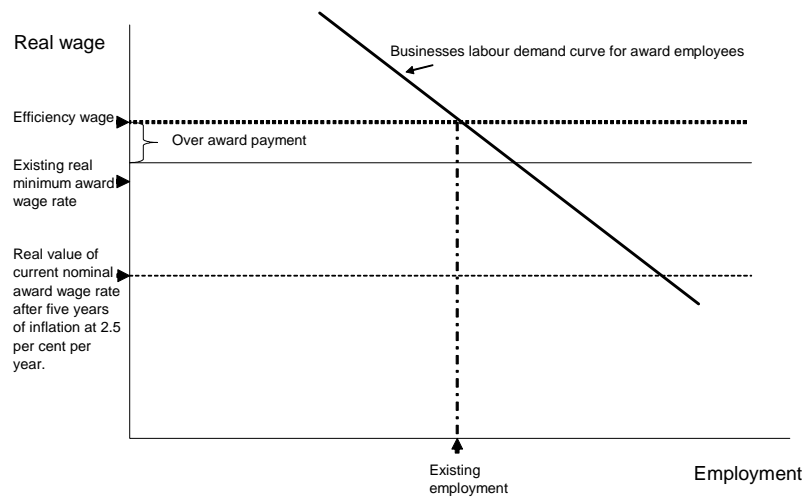
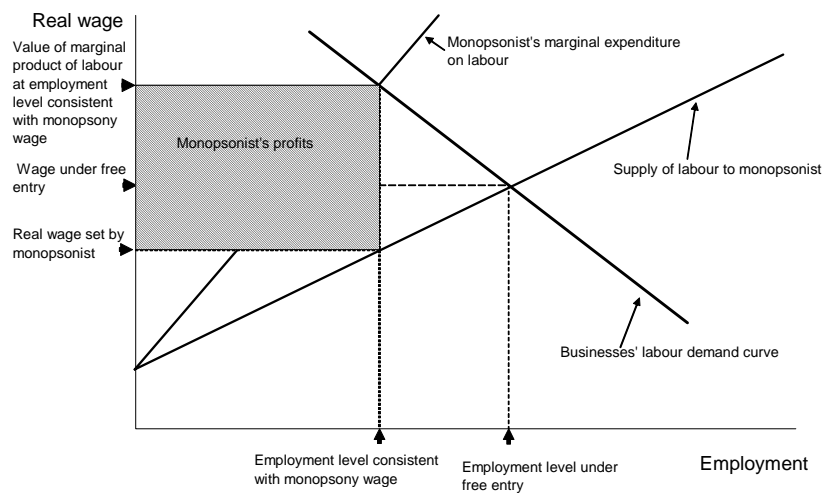


Figure 6.4: Case where efficiency wage is currently binding and wage set by Safety Net is never binding



the monopsony case the labour supply curve is upward sloping for two reasons only. The first reason is that the labour force in that market has different reservation wages. The second reason is that for each member of the labour force the wage required to obtain an additional unit of labour is increasing in the quantity of labour supplied. This reflects the standard assumption made in all analysis of the labour market that the marginal disutility of labour is non decreasing. The labour supply curve is the horizontal sum of the labour supply curves of the individual workers.

Figure 6.5: Monopsony



- 6.43. Under monopsony the fact that the labour supply curve is upward sloping means that each time the monopsonist hires an additional worker the higher wage must be paid to all of the existing employees. Thus the monopsonists' marginal expenditure on labour is always above its average expenditure on labour as measured by the labour supply curve. The monopsonist's labour demand curve is equal to the value of the marginal product of labour. The monopsonist optimally chooses the level of employment that maximizes its profits. This occurs where the monopsonist's marginal expenditure on labour is equal to the value of the marginal product of labour. The wage paid by the monopsonist is then obtained from the labour supply curve faced by the monopsonist. The monopsonist obtains a profit that is equal to the product of the difference between the value of the marginal product of labour and the wage paid with the monopsonist's employment. Such profits would in the normal course of events attract other businesses to enter, to compete for labour with the monopsonist. If entry

is completely unrestricted then it will drive the wage up to the competitive wage where the labour demand curve intersects with the labour demand curve thereby eliminating the monopsonist's profits.

7 The Survey and its analysis

7.1 Introduction

- 7.1. The questions that provide the data for this report were included in a quarterly survey of small and medium sized business. This survey is briefly described in section.7.2.
- 7.2. Because this is a survey funded by the Commonwealth, approval must be obtained from the Commonwealth Government Statistical Clearing House. The approval number for this survey is 01438-02.
- 7.3. Details of the design of the survey instrument are in section 7.3.
- 7.4. Information on the administration of the survey instrument are provided in section 7.4. Evidence from the survey that sheds light on the quality of the survey instrument is presented in this section which also contains a discussion of the response rate and the estimation strategies adopted to deal with the issue of non response.
- 7.5. Information on the cleaning, coding and analysis of the data is provided in section 7.5. The statistical methods used to analyse the survey are introduced and discussed in section 7.6.
- 7.6. Estimates of some important population characteristics are presented in section 7.7.
- 7.7. The model based approach to estimation which is used in parts of the report is explained in section 7.8.

7.2 The survey of small and medium sized business

- 7.8. This survey started in 1993 as a survey of small business which are defined as businesses with 19 or fewer full-time employees.
- 7.9. In November 2000 the coverage of the survey was expanded to include medium sized businesses which are defined as businesses with fewer than 200 full-time employees. At the same time the regional and industry coverage of the survey was enhanced. These changes made the survey one of the most comprehensive of the quarterly surveys of Australian business. Because the survey is on-going it means that the results obtained

are replicable in the sense that the survey instrument can be re-administered at some point in the future within the same broad survey structure.

- 7.10. The primary respondent is a person chosen by the business who can speak authoritatively about all aspects of the businesses' operations. Where feasible a secondary respondent is nominated by the business as someone who can speak authoritatively for the business should the primary respondent be unavailable.
- 7.11. The panel is structured as follows:
- **Size** There are 1200 small businesses (i.e. businesses with 19 or fewer full-time employees) and 600 medium sized businesses (i.e. businesses with 20 to 200 full-time employees).
 - **Region** The regional structure is summarized in Table 7.1
 - **Industry** The industry structure is summarized in Table 7.2.
- 7.12. When one business leaves the panel a business of similar size from the same industry and region is recruited into the panel.

Table 7.1: Regional structure of sample

	Metropolitan	Non-Metropolitan	Total
New South Wales	240	60	300
Victoria	240	60	300
Queensland	165	135	300
South Australia	195	30	225
Western Australia	195	30	225
Tasmania	90	60	150
Northern Territory	90	60	150
ACT	150	0	150
Total	1365	435	1800

Table 7.2: Industry structure of sample

	ANZIC Division	Number of businesses
Manufacturing	C	200
Building and Construction	E	250
Wholesale Trade	F	150
Retail Trade	G	250
Accommodation, Cafes and Restaurants	H	100
Transport and Storage	I	150
Finance and Insurance	J/L	100
Communications, Property and Business Services	K	300
Health and Community Services	O	150
Culture, Recreational and Personal Services	P/Q	150
Total		1800

7.3 Design of the survey instrument

- 7.13. The survey instrument was designed in consultation with DEWR, Sensis and Sweeney Research. The consultation with DEWR was designed firstly to ensure that the questionnaire would produce information that could be used to address the questions regarding the effects on employment and wage setting of annual Safety Net adjustments to minimum award wage rates. Specifically, we used screening questions so as to remove the possibility of a question being seen as leading. In no case was a respondent asked to quantify or describe an effect until it had been established, by the respondent, that the effect existed.
- 7.14. Screening questions regarding the effect on employment of the annual SNAs were designed to start from a neutral perspective in which SNAs could have a positive effect, no effect or a negative effect on employment. Only after the direction of the effect was established was the business asked to quantify the magnitude of the effect.
- 7.15. The survey was piloted on seven firms in metropolitan New South Wales. The pilot provided less help than usual in fine tuning the design of the survey because the bulk of firms contacted proved to either have no minimum award wage rate employees or so few such employees that they did not move beyond the screening questions in the survey. When the survey results came back we discovered why this occurred — there are far fewer businesses with minimum award wage rate employees

in metropolitan NSW than in any of the other States, or than in non-metropolitan NSW.

7.16. This was a potential problem since, when designing closed ended questions, it is important that:

- The wording of the question makes sense to the respondent and seeks information that the respondent can reasonably be expected to possess;
- The range of responses allowed encompass the responses that the typical respondent is likely to provide. That is one does not wish to omit valid responses; and
- The range of questions asked cover the relevant issues that the respondent would canvass in a longer more conversational interview.

7.17. We addressed these issues in the following way.

7.18. First, we consulted extensively with both Sweeny Research and Sensis to ensure that the wording of the question made sense to small business and was relevant to the information they possess. We also sought Sweeny's input on the range of responses to allow for in the open ended questions. Given that they have administered the panel for eleven years Sweeny's knowledge and input was very useful.

7.19. Second, in several places after asking closed ended questions we added open ended questions of the type 'are there any other reasons ..?'.

7.20. Third the last question of the section sought information on any other effects of the 'Safety Net' that were not adequately canvassed earlier in the report.

7.21. The result of these design features is that the choice of metropolitan NSW to pilot the survey did not compromise the quality of the final survey instrument. Moreover, several of the design features of the survey just mentioned allow us to provide, in section 7.3.2, quantitative information on the quality of the survey instrument.

7.3.1 Structure of the survey instrument

- 7.22. This section provides an overview of the survey instrument which is available at Appendix C.

The term ‘Safety Net’

- 7.23. ‘Safety Net’ is an emotive term. This raised the issue of what language to use in the survey. The use of an emotive term such as ‘Safety Net’ is known to cause some bias as some respondents will be unwilling to report adverse effects. Against this, surveys are made more accurate by using language that is in popular usage. Ultimately, we chose to use the term ‘Safety Net’ as this term is specified in the *Workplace Relations Act 1996*, is the term that the AIRC uses on its website and is the term in popular usage.
- 7.24. In writing this report we found that using the term ‘Safety Net’ pushed us, unconsciously, towards thinking of the system that we were analysing as one that was confined in its effects to low paid workers. It would be natural if some respondents reacted this way and therefore were unwilling to report adverse effects arising from Safety Net adjustments and were unwilling to report beneficial effects from a guarantee of not increasing the Safety Net for a period of five years.
- 7.25. One of the main findings of this report is that the ‘Safety Net’ extends, in its influence, well beyond low paid workers and thus we feel that a more descriptively accurate and less emotive term should be used in the future to describe the system of wage floors and the process of adjusting those wage floors. Such neutral language would reduce the scope for bias in future survey based evaluations of the ‘Safety Net’.

Preamble

- 7.26. Once a business reached section 4 of the survey, which deals with the ‘Safety Net’, they were read the following preamble:

Federal minimum award wages, often referred to as safety net wages, are set each year by the Australian Industrial Relations Commission and also passed on to State award wages. I would like to ask you some questions about how wages are determined in your business, about whether the increases in minimum award wages influence your business in any way.

- 7.27. The objective of the preamble was to alert businesses to the broad topic being investigated. The preamble also provides

a space in the interview where the respondent can raise any concerns about the next set of questions and if necessary seek assurances regarding confidentiality of responses and the ultimate use of the survey.¹

Q11. Screening for businesses with more than one employee

- 7.28. Businesses were then screened at Q11 according to whether they employ one or more people other than the respondent. Businesses with one employee only were directed to question 26 while those with more than one employee were directed to Q12a.

Q12a to Q17e. Obtaining information on the number of employees whose wages are adjusted via the Safety Net

- 7.29. Questions 12a to 12d sought information on:
- how many **full-time** employees are paid exactly a minimum award wage rate;
 - how many **full-time** employees are paid more than the minimum award wage rate;
 - how many of the over award **full-time** employees are covered by agreements that provide for automatic pass on of Safety Net adjustments; and
 - how many of the over award **full-time** employees, that did not receive the SNA via one of the mechanisms above, were given discretionary pass on of the SNA.
- 7.30. Questions 13 and 14 sought comparable information for any part-time and casual employees of the business.
- 7.31. Question 15 sought information on when the pay of over award employees was last adjusted. Those businesses where the pay adjustment was made in May 2003 or later were asked at Q16a whether some or all of their employees receive a discretionary pass on of the May 2003 Safety Net adjustment. Those that responded 'some' were asked at questions 16b to 16d how many full-time, part-time and casual employees received 'Safety Net' adjustments in this way. Those that said that they had not yet given a discretionary pass on of the May 2003 'Safety Net' adjustment were asked, at Q16e, whether they were likely to

¹ This part of the conversation between the respondent and the interviewer is not, usually, recorded and does not form part of the data given to those analysing the data.

provide a discretionary pass on of the May 2003 ‘Safety Net’ adjustment at some time in the future.

- 7.32. Question 17a to 17e sought comparable information, from businesses that had last adjusted the pay of their over award employees before May 2003, about those businesses’ intentions to provide discretionary pass on of the May 2003 ‘Safety Net’.

Q18a to Q18b. Obtaining information on businesses reasons for discretionary pass on of Safety Net adjustments to overaward employees

- 7.33. Question 18 sought information on the reasons for providing, or intending to provide, discretionary pass on of the May 2003 Safety Net adjustment. Question 18b provided businesses with the option to provide additional information on their reasons should the list of possibilities given at Q18 not be exhaustive of their reasons.

Q19 and Q24f. Questions related to the impact of the Safety Net on wage setting

- 7.34. In order to fully understand the impact of the Safety Net on wage setting it is necessary to obtain information on how businesses would set wages in the absence of the Safety Net. We approached this issue in two ways.

- 7.35. First, at Q19 we sought information from businesses that pay over award wages on the factors that are important for them in wage setting. As discussed earlier, there are several theories of wage setting which differ in terms of the factors that businesses will take into account.

- 7.36. Second, at Q24f information is sought about how businesses would set wages under a scenario where businesses were guaranteed that there would be no Safety Net adjustment for a period of five years.

Q20 to Q23d. Questions on the impact of the May 2003 Safety Net adjustment on employment

- 7.37. At question 20 businesses were asked whether over the past three months the size of their total workforce had increased, stayed the same or decreased.² The objective of this screening question was to allow businesses to be asked about the effect of the May 2003 Safety Net adjustment in a way that related to their own employment experience.

² Since they were asked the question between late October and early November the time period relates to the three months between July/August and the survey date.

- 7.38. Businesses that reported an increase in their workforce were asked, at Q21a, to choose between four statements regarding the effect of the May 2003 Safety Net adjustment on their businesses decision to increase employment. The question was asked in a neutral way that did not prejudge the issues of the existence of an effect or the direction of any affect. The respondent was also given the option to respond that they did not know whether there was an effect. Those that reported an effect were then asked at either Q21b or Q21c to quantify the magnitude of the employment effect for each of the categories or full-time, part-time and casual employees.³ They were also provided with the option to respond ‘don’t know’ if they knew the direction but could not quantify the magnitude of the effect.
- 7.39. Those that provided an answer that is consistent with there being monopsony in the labour market were then asked at Q21d an open ended question that required them to explain the reasons for their response.⁴ This question was designed so that we could identify any responses that might be evidence of monopsony behaviour.
- 7.40. These questions were then repeated at Q22a to Q22d for those respondents that reported no change in employment and at Q23a to Q23d for those businesses that reported a decline in employment. This structure of questioning meant that each respondent was asked about the employment effects of the 2003 SNAs in a way that related directly to their businesses’ own employment experience.
- 7.41. Respondents were not given information about the magnitude of the 2003 SNA as this could have been construed as leading the respondent. This raises the issue of what warrants can we provide that the respondents were aware of the exact magnitude of the 2003 SNA. There are three such warrants. First, these questions were asked only of those businesses that have at least one employee paid a minimum award wage rate. Second we know, from analysis of the survey results, that for the businesses that reported an adverse employment effect, 86

³ Which of questions 21b or 21c was asked depended on whether the effect of the May 2003 SNA was said to be positive or negative on employment. This structure was again used to eliminate the possibility of asking a leading question.

⁴ Monopsony is the situation where a business can influence the wage rate that it pays by varying the number of people that it employees. If a labour market is monopsonistic then it is possible, but not automatically assured, that raising the minimum wage could create additional labour demand.

per cent of their employees were directly affected by the May 2003 SNA either because their employees were paid minimum award wage rates or because they received automatic pass on of the SNA. Moreover, 100 per cent of the part-time and casual employees were directly affected by the May 2003 SNA and 75 per cent of the full-time employees were directly affected by the May 2003 SNA. Third as discussed in the next paragraph businesses were twice given the option to respond don't know. As a result of these considerations it is evident that those respondents who provided an estimate of the adverse effect on employment of the May 2003 SNA would have been acutely aware of the magnitude of that adjustment to minimum award wages.

- 7.42. In addition to being neutral, relevant to their experience, and not leading the respondent, this structure of questions provides assurance that where the respondent has ultimately given a numerical estimate it is the result of a considered thought process in which the respondent has explicitly rejected the answer of 'no effect' in favor of there being an effect, and when asked to quantify 'by how much employment would change', has rejected the option of 'don't know' in favour of providing an estimate of the employment response. For these reasons the estimates provided in this report represent the aggregation of careful and considered responses in which the respondent was not led and was given every opportunity to avoid making speculative responses.

Q24a to Q24e. Obtaining information on the medium to long run impact of the 'Safety Net' on employment

- 7.43. To investigate the medium to long run effects of the annual Safety Net adjustments to minimum award wage rates, we explored the implications of a guarantee to business that Safety Net adjustments would not be made to award wages for a period of five years. If inflation averaged 2.5 per cent per year, this would result in the real value of minimum award wage rates being 13 per cent lower at the end of the five year period.⁵
- 7.44. We chose to structure the question in this way for four main reasons. First, we sought information about adjustments made

⁵ Of course, some respondents might expect inflation to be a little faster than 2.5 per cent per year while others might expect it to be a little slower. Respondent's expectations regarding inflation only matters for the magnitude of the calculated elasticity of demand. A quantity that is inessential to the analysis as the latter focuses exclusively on the magnitude of the employment effect.

over a sufficiently long period of time as to allow businesses to adjust capital and location of production. This allows the effects to be interpreted as long run. We judged that two years would be too short and ten years would be too long. Second, we sought an implied change in real (ie deflated by the price level) minimum award wage rates of between ten and twenty per cent. This would yield a decline that was large enough to generate a reported effect on employment demand even if the elasticity of labour demand was small. Third, we sought to explore the magnitude of the effect that economic theory suggests might arise because annual Safety Net adjustments to minimum award wage rates removes the option for businesses, in bad economic circumstances, not to adjust the nominal wage of employees on minimum award wage rates. Fourth, it is scenario that is readily understood by the respondent. Most notably the respondent can assess for themselves what they think would happen to real minimum award wages under this scenario. Structured in this way the question avoids the possibility of being seen as leading the respondent in regard to what might happen to wages and prices under this scenario. In addition, by not specifying what might happen to prices and wages under this scenario we are able to ask the business, at Q24f, how they would adjust wages under this scenario.

7.45. In asking, at Q24a to Q24e, about the effect of a guarantee of no change in the ‘Safety Net’ for five years we sought to ensure that leading questions were not asked. Q24a is a screening question that is asked in a neutral way so that it,

- does not prejudge the existence of an effect;
- does not prejudge the direction of any effect;
- does not prejudge that there would be a movement in the businesses workforce in the absence of a guarantee of no increase in the Safety Net for five years;
- does not prejudge the direction of any movement in the businesses workforce in the absence of such a guarantee; and
- allows the respondent to say they don’t know what the effect of such a guarantee would be.

7.46. Those businesses that reported an effect on their employment were then asked at Q24b, Q24c and Q24d to quantify the magnitude of the effect on full-time, part-time and casual employment. Again this structure was used to ensure that the

questions were relevant to the businesses expected employment outcome, that businesses were not led in their answers and that the direction, magnitude and composition of the employment response was not prejudged.

- 7.47. Businesses that provided an answer that is consistent with there being monopsony in the labour market were asked to explain their responses so that the extent of monopsony could be assessed.
- 7.48. Those businesses that ultimately provided estimates of the employment effect of a guarantee of no change in the Safety Net for a period of five years have explicitly rejected the option of reporting no effect at Q24a, have also explicitly rejected the option of saying ‘don’t know’ and have explicitly chosen to report a particular direction of effect. Moreover, at one of Q24b to Q24d they have explicitly rejected the option to say ‘don’t know’ in favour of quantifying the magnitude of the effect on employment. As such, their responses should be regarded as the outcome of a careful and considered thought process in which leading questions were eschewed and businesses given every opportunity to avoid speculative responses.
- 7.49. Under a guarantee of no change in the ‘Safety Net’ for a period of five years, businesses would have the option of paying over award wages to employees that are currently paid exactly an award wage. Businesses that said they would employ additional workers under such a guarantee were asked, at Q24f, how they would adjust the wages of those workers. Their responses, which are discussed in more detail on page 12, bring out two main points that are relevant here. First, the responses to this question indicate that, in framing their responses regarding the employment effect, the majority of businesses had given consideration to how they would set wages under a guarantee of no change in the ‘Safety Net’. Second most businesses would at least maintain real wages under a guarantee of no change to the ‘Safety Net’ and many businesses would provide real wage increases to those currently on awards under such a guarantee. Relatively few businesses said that they would leave the pay of those on awards unchanged for the five year period over which the Safety Net was unchanged.
- 7.50. The discussion above shows that the questions were designed so that the hypothetical change in the real value of the Safety Net was not so large as to be outside of the comprehension of businesses, but was sufficiently large that at the end of the five year period minimum award wage rates would be binding for a much smaller proportion of businesses than is currently the

case. In short, if an employment effect existed we would find it.

Q26 to Q30. Obtaining information on the effects of Safety Net adjustments on businesses that currently have one employee only⁶

- 7.51. Businesses that currently have one employee were asked, at Q26, whether they had previously had employees. Those that responded no were directed to Q31 and the end of the ‘Safety Net’ questions. Those businesses that previously had employees were asked at Q27a what was the maximum number of people they had employed and at Q27b and Q27c were asked about the date at which that maximum occurred.
- 7.52. They were asked at Q28 to choose from four statements regarding the impact of previous ‘Safety Net’ adjustments on their decision to reduce employment. These statements allowed for three gradations of effect and the possibility of no effect.
- 7.53. All businesses that currently have only one employee were asked, at Q29, how likely they were to employ in the future. They were given three gradations of response ie ‘very likely’, ‘somewhat likely’ and ‘unlikely’ as well as the possibility of saying ‘don’t know’.
- 7.54. Respondents were then asked at Q30 about whether they would be likely to hire additional employees under a guarantee that there would be no ‘Safety Net’ adjustment for a period of five years. The question was asked in a neutral way that did not prejudice the existence of an effect or the direction of an effect. Respondents that indicated an effect were asked at Q30b to quantify the magnitude of that effect for full-time, part-time and casual employees.
- 7.55. Respondents who said that they would be less likely to employ under this scenario were asked at Q30c to explain why. The objective here was to obtain information on whether it was the existence of monopsony power which underpinned this response.

Q31a to Q31e. Is the questionnaire complete? Are there any other effects?

- 7.56. We also sought to gather information, from all respondents, of any other economic effects of annual Safety Net adjustments, whether favourable, neutral or unfavourable. Question

⁶ Note there was no Q25 in the survey as all businesses were directed to Q31.

31a sought information on the existence of any such effects. Question 31b sought information on whether the effects were ‘favourable’, ‘neutral’ or ‘unfavourable’ — multiple responses were permitted here to allow respondents to report a mix of effects. These effects were followed up at Q31c to 31e where the respondents were asked to describe the nature of these effects.

- 7.57. The broad objective of this question was to provide information on the issue of whether there was any aspect of the effects of the Safety Net that were not covered adequately in the earlier questions. Evidence on the quality of coverage of the survey instrument is presented below.

7.3.2 Evidence on the quality of the survey instrument in terms of its coverage of the issues

- 7.58. At q31 we sought feedback from the respondents on whether there were effects arising from Safety Net adjustments that were important to them but which had not been covered in the previous questions. The bulk of respondents (93.3 per cent) said that there were no other effects.
- 7.59. The 6.7 per cent of respondents who reported that there were additional effects, were asked whether those additional effects were ‘favourable’, ‘neutral’ or ‘unfavourable’. Multiple responses were allowed here as some effects could be favourable while others might be neutral or unfavourable.
- 7.60. Of the 6.7 per cent of respondents that reported additional effects only 0.3 per cent said that the additional effects were favourable. Thus, the remaining 6.4 per cent of respondents thought that there were additional effects that were not captured in the questionnaire and these additional effects were either neutral or unfavourable. The bulk of these (4.9 per cent of all respondents) said that the additional effects were unfavourable and did not identify any favourable effects. The remaining 1.5 per cent of respondents said that the additional effects were neutral and did not specify any unfavourable effects.
- 7.61. Respondents in each of the categories above were then asked to describe the nature of the additional effects. Our reading of those comments about the additional effects is that the respondents were seeking to emphasise the effects of the SNAs that had been captured elsewhere in the questionnaire rather than raising any new issues or effects that had not been incorporated into the questionnaire design.

- 7.62. We conclude on the basis of the findings reported above that the questionnaire was well designed in that it fully covered the issues related to the effects of SNAs on small and medium sized businesses.

7.3.3 Evidence regarding the truthfulness of responses to the survey

- 7.63. Surveys rely on the assumption that respondents respond truthfully to the questions asked. Most religions and the humanist tradition place an emphasis on truth telling. Moreover, lying is costly since it requires the respondent to invent a false answer when the truth is, costlessly, available. For these reasons it can be assumed that the dominant strategy for the respondent is to respond truthfully. We appeal to this assumption in regard to Q11 to Q20 and Q26 to Q29.⁷
- 7.64. However, for certain questions the respondent may have an economic incentive that could work against the usual presumption of truth telling. In these circumstances the best approach is to explore in greater detail the nature of those incentives so as to reach a conclusion as to whether it is reasonable to assume that truth telling was the dominant strategy pursued by respondents.
- 7.65. The first point to make in this regard is that, the questions where this issue arises were located after Q11 to Q20 for businesses with more than one employee, and after Q26 to Q29 for businesses with exactly one employee. Since in CATI interviews the respondent does not know what the next question will be, this structure eliminated the possibility that truth telling issues could have contaminated the responses to earlier questions.

⁷ Q28 asks businesses without only one employee, the respondent, whether previous safety net adjustments were a factor in that businesses' decision to reduce employment. Since these businesses have no employees other than the respondent the respondent has no incentive to lie about the extent to which previous 'Safety Net' influenced that decision.

- 7.66. The issue of the incentives for truth telling in regard to questions Q21 to 24 and Q30 is more complex and requires further discussion. If no minimum award wage is binding then the business has no incentive to say that it is binding and if at least one such wage is binding then the business has no incentive to say that it is not binding. Thus, an estimate of the proportion of businesses for which at least one minimum award wage is binding can be obtained from the proportion of businesses that respond at Q24a that given a guarantee of no change in the Safety Net for a period of five years they would either,
1. put on additional employees; or
 2. not reduce its workforce by as much as it otherwise would have done.
- 7.67. The issue remaining is whether some respondents have sufficient incentive to overstate the adverse effects of the Safety Net on employment at Q21 to Q23 and overstate, at Q24 and Q30, the beneficial effect of guaranteeing not to change the Safety Net for five years.⁸ The extent of the financial incentive to lie depends primarily on whether the respondent owns any assets for which the price depends on the level of minimum award wages. Respondents that are employees and are not owners of the business will have no financial incentive to lie since they would obtain no pecuniary interest from changes in minimum award wages.
- 7.68. There are two categories of respondent that we can identify in the dataset that may have a significant financial incentive to over state the adverse employment effect of the Safety Net. These are family owned businesses and franchises.⁹ Some 14.6 per cent of all family owned businesses compared with 13.5 per cent of all other businesses responded to Q24a that a guarantee

⁸ Here we can only discuss the magnitude of the financial incentive. The choice a respondent makes will depend not only on the magnitude of this financial incentive but also on how much the respondent values truth telling. On average, larger financial incentives will reduce the extent of truth telling.

⁹ In both cases the respondent is more likely to be an owner of the business. In the case of family owned businesses the existence of a financial incentive to lie depends on whether the business owns or rents fixed factors of production with a price that depends on the level of minimum award wage rates. For franchisees the situation is much clearer, if minimum award wages are biting then the value of the franchise will rise if the real minimum wage falls. So there is a strong financial incentive for such businesses to overstate the adverse effect on employment of increases in the safety net.

of no change to the ‘Safety Net’ would either save or create jobs. Thus, there is not much evidence that family businesses overstated the adverse effect of the Safety Net on employment.

- 7.69. In contrast 27.6 per cent of franchises, compared with 13.5 per cent of other businesses responded to Q24a that a guarantee of no change to the ‘Safety Net’ would either save or create jobs. Thus, we need to investigate further whether some franchises over estimated the effect of the Safety Net on employment. We have not yet completed this investigation which involves the estimation of a model and testing to establish whether the higher propensity of franchises to report adverse employment effects is attributable to features of their business or to the financial incentives that they face. If we find that franchisees have overstated the employment effects then we will need to make an adjustment to the estimates that account for this feature. Franchises account for 4.9 per cent of businesses and we therefore do not expect that, if it is necessary, such an adjustment will have a major impact on our estimate of the employment consequences of not adjusting the Safety Net for a period of five years.

7.4 Administration of the survey instrument

- 7.70. The survey was administered by Sweeny Research in October and November 2003 using computer aided telephone interview (CATI) and computer aided data entry (CADE) technology which is described in section 7.4.1 below. Because this is a panel survey, respondents fall into two categories. The first category comprises respondents who were in the panel at previous wave 42 and who remain in the panel at wave 43. The second comprises those respondents who were recruited into the panel in wave 43. Procedures for recruitment into the panel are discussed in section 7.4.2. The quality of surveys is enhanced by monitoring of the administration of the survey; section 7.4.3 describes the initiatives undertaken in this regard. Information supplied to TPR for analysis is described in section 7.4.4. Information on the average duration of the interview in this, and the five previous waves of the survey, is presented in section 7.4.5 and the implications of this information are explained. Response rates are reported and discussed in section 7.4.6.

7.4.1 The CATI-CADE technology

- 7.71. The CATI-CADE technology involves interviewers using telephones that are connected to a computer, video screen and data storage device. The computer program selects the telephone number that is to be dialed. Because this is panel survey the telephone number would be selected in one of two ways:
- From the database of members of the panel;
 - Randomly from the Desktop Marketing System (DtMS) database.
- 7.72. Once the number is dialed there are a range of possible outcomes for the call. These outcomes are referred to as ‘final dispositions of cases’ and are helpful in understanding what occurred during the survey process and to calculate the response rates that are reported in section 7.4.6.
- 7.73. In order to use the records of the final dispositions of cases to understand the survey we need to organise them in a systematic way. A list of final dispositions of cases (FDC) codes that we constructed is provided in Table 7.3. In constructing these codes we have taken as a starting point the AAPOR (2000) *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys* which is primarily designed for household surveys. We have modified this framework for the special features of the case at hand which are that it is a panel survey of business. The Table is constructed so that each FDC maps into one of the final disposition categories supplied to us by Sweeny Research.
- 7.74. Starting from the bottom of the table we see that some numbers when dialed either resulted in no contact because the number was disconnected, or not working, or a contact that is not in the scope of the sample because, for example, it turns out to be a residence rather than a business. We have followed the practice of Bates & Dixon (2003) and have included businesses that are ‘ineligible’ because they are contacted after the quota of businesses in a particular strata is full. The statistical justification for this classification is provided in section 7.4.7 page 110.

Table 7.3: Final disposition of cases

FDC Code	Details / Explanation
1.	Interviewed
1.1	Completed interview
1.2	Partial interview
2.	Eligible, non interview
2.1	Panel members
2.1.1	Refused - no longer wishes to participate
2.1.2	Refused - unable to participate this wave
2.1.3	Business sold to new owner
2.1.4	Taken over by another business
2.2	Potential recruits to the panel that refused to participate
3	Unknown eligibility, non interview
3.1	No contact made
3.1.1	Answering machine
3.1.2	Unobtainable
3.1.3	Engaged
3.1.4	No answer
3.1.5	Called too often
3.2	Contact made but not interviewed
3.2.1	Firm appointment made but not met
3.2.2	Tentative appointment made but not met
4.0	Not eligible
4.1	Residential
4.2	Over 200 full-time employees
4.3	Under 20 full-time employees
4.4	Business closed down
4.5	Mobile phone
4.6	Number not working
4.7	Phone disconnected
4.8	Quota filled

7.75. Moving up the table the next category comprises numbers dialled where it has proved not to be possible to determine the eligibility of the respondent for inclusion in the survey. There are two sub categories here. The first comprises numbers where it has proved impossible to make contact with a human who responds. The second category comprises cases where a person is contacted, they cannot respond immediately and an appointment is made to contact the person but that appointment and subsequent appointments are missed.

- 7.76. The second category from the top comprises businesses that were contacted, found to be eligible but were not interviewed. The category is split into two parts.
- 7.77. The first relates to businesses that were previously part of the panel but were not interviewed. Here there are two main sub categories. One relates to businesses that no longer wish to participate in the panel, and the other comprises businesses that remain in the panel but are not available for interview this quarter.
- 7.78. The second part comprises businesses that were contacted as potential recruits into the panel but were subsequently not interviewed because they refused to join the panel.
- 7.79. This takes us to the first category in the table which comprises businesses interviewed. Here the interview can run its course leading to a completed unit record — the set of these is the data to be analysed. Or it can be terminated during the interview yielding a partial interview. There were no partial interviews in wave 43 of the survey.
- 7.80. During the interview the CATI technology puts the question on the interviewers screen along with prompts. The response is entered by the interviewer and where necessary is automatically checked for validity — this is the computer aided data entry part of the technology. If the response is invalid the interviewer seeks a valid one. The computer then follows a program and undertakes any necessary intermediate calculations. Based on the results of those calculations and the responses to previous questions the program selects the next question according to the decision rules specified in the survey instrument. The survey instrument at Appendix C shows how the questions asked are influenced by previous responses. The process just described continues until all of the relevant questions have been asked.

7.4.2 Procedures for recruitment into the panel

- 7.81. The survey is comprised of a panel of firms. In the October/November 2003 wave, membership of the panel was determined as follows:
- 1150 businesses remained in the panel from the survey conducted the previous quarter (wave 42);
 - 55 businesses that had entered the panel before wave 42, but were not interviewed in wave 42, rejoined the active panel members and were interviewed in wave 43; and

- 595 businesses were recruited to the panel to replace those businesses that left the panel after the previous wave.

7.82. Where replacement businesses are obtained the objective is to replace like business (in terms of region, industry and size) with like business. The telephone numbers of potential replacement respondents are drawn randomly and then dialed. Once the potential replacement business is contacted they are asked some screening questions about industry, business size and the like. The business is admitted into the panel if it has the characteristics of the business that is to be replaced. This preserves the structure of the sample and means that it provides a good coverage of business by size, industry and region.

7.4.3 Monitoring administration of the survey instrument

7.83. Each days administration of the survey is monitored by the survey supervisor at Sweeny Research. This is undertaken in a room where summary details of each interview in progress is projected on a screen. The survey supervisor can listen in on selected interviews to ensure quality of administration.

7.84. On the first half day that the survey was administered Don Harding, together with a representative of Sensis, monitored the interviews to establish whether there existed any problems that needed to be resolved. Interviews were selected and listened to so as to establish whether:

- the instructions to the interviewers in their pre-survey were being followed;
- the interviewers were experiencing any difficulty with the questions;
- the questions made sense to the respondents and sought information that they possessed;
- the range of responses allowed was sufficient given the diversity of responses; and
- the questions covered the range of issues that the respondent would raise regarding the Safety Net and minimum award wage rates.

7.85. On all of these points there were no substantive issues that came to light from this process. Some very minor changes were made to the instructions given to interviewers. But there was nothing abnormal in this. It was apparent that the complexity

and precision of the questions was a slight problem for some interviewers. We did not see evidence that this caused any bias in the responses nor did we see evidence that it increased the non-response rate by causing businesses to terminate the interview.

7.4.4 Information from the survey supplied to TPR for analysis

- 7.86. On completion of the survey we were supplied with an SPSS data file containing 1800 completed unit records from wave 43 of the survey.
- 7.87. We also obtained three additional pieces of information:
- The average duration of wave interviews for wave 43 and the five earlier waves of the survey;
 - Summary information to be used for calculation of response rates; and
 - A file that identified respondents that remained in the panel and respondents who were recruited into the panel at wave 43.
- 7.88. For the reasons discussed in section 7.4.6 this information influenced the judgements that we made as to the nature of the assumptions that could be used to analyse the survey data and to make statements about the population.

7.4.5 Average completion times

- 7.89. As shown in Table 7.4 the average interview for wave 43 (this survey) was completed in 17 minutes 41 seconds. Wave 39 was conducted in October / November 2002 and did not contain any supplementary questions. The difference between the average response time for waves 43 and 39 therefore provides an indication of the extent to which the Safety Net questions increased the average interview duration. We calculate this to be 6 minutes 30 seconds.

Table 7.4: Average interview duration, waves 39 to 43 of the survey

Wave	Average Interview Duration
43	17 minutes 41 seconds
42	21 minutes 35 seconds
41	24 minutes 05 seconds
40	17 minutes 05 seconds
39	11 minutes 11 seconds

- 7.90. Our assessment is that the interview duration at wave 43 did not produce an undue burden on small business respondents. It is well within the range of experience when supplementary questions have been added to this survey.

7.4.6 Response rates

- 7.91. In Table 7.5 we report the final disposition of calls for waves 39 and 43 which were administered in October/November 2002 and 2003 respectively.

- 7.92. Inspection of Table 7.5 highlights some important features. The most noticeable of these is that the number of businesses telephone numbers dialed to obtain 1800 interviews was 9887 in wave 39 but had increased by 54 percent by wave 43. The second notable feature is that 9887 is a large number relative to the 1800 completed interviews. Thus, the issues that need to be explored are:

1. What was the likely cause of the rise in the number of businesses contacted in order to obtain the 1800 completed interviews?
2. What are the best practice measures that we can use to summarize the response rate from this survey?
3. Is the response rate for the survey too low to justify analysing the sample using the assumptions that the sample is drawn randomly with known probability of selection into the sample?
4. What alternative methods are available to analyse the data from the sample?

Table 7.5: Final dispositions of numbers dialed

Final disposition categories	Wave	
	39	43
1 Interviewed	1804	1800
1.1 Completed interview	1804	1800
1.2 Partial interview	0	0
2 Eligible, non interview	3592	6474
2.1 Panel members	638	2334
2.1.1 Refused - declined	235	1161
2.1.2 Refused - unable to participate	365	1125
2.1.3 Business sold to new owner	19	31
2.1.4 Taken over by another business	19	17
2.2 Potential recruits to the panel refused to participate	2954	4140
3 Unknown eligibility, non interview	1083	918
3.1 No contact made	519	361
3.1.1 Answering machine	69	85
3.1.2 Unobtainable	66	34
3.1.3 Engaged	27	13
3.1.4 No answer	214	117
3.1.5 Called too often	143	112
3.2 Contact made but not interviewed	564	557
3.2.1 Firm appointment	76	103
3.2.2 Tentative appointment	488	454
4 Not eligible	3408	5247
4.1 Residential	0	541
4.2 Over 200 full-time employees	0	528
4.3 Under 20 full-time employees	0	651
4.4 Business closed down	198	172
4.6 Mobile Phone	27	111
4.7 Number not working	658	945
4.8 Phone disconnected	231	181
4.9 Quota filled	2294	2118
Total calls made	9887	14439

What are the best practice summary measures of survey response?

- 7.93. What constitutes best practice is, of course, a matter of judgement. We have taken the guidance of Bates & Dixon (2003) who summarise the efforts of the United States Interagency Household Survey Nonresponse Group. They mention six measures of response rate but three of them differ only in how partial interviews are treated and since there were no partial

interviews in this survey we can simplify things to three response rates by ignoring partial interviews. Using the final disposition of cases codes above we define the following variables:

I : Number of complete interviews (FDC code 1.1);

R : Number of refusals (panel members FDC code 2.1.1 plus 2.1.2 plus refusals by potential recruits FDC code 2.2); This is comprised of:

RP : Refusals by panel members who no longer wish to be in the panel (FDC code 2.1.1 plus refusals by panel members who wish to remain in the panel but who cannot participate in the current wave of the survey (FDC code 2.1.2).

RPR : Refusals by potential recruits (FDC code 2.1.2)

NCO : Number of eligibles not contacted (FDC code 2.1.3 plus 2.1.4). This aggregates the categories 'non contact' (NC) and 'other' in Bates & Dixon (2003).

UE : Number with unknown eligibility not contacted. This is a somewhat broader group than the categories 'unknown if household occupied' and 'Unknown other' in Bates & Dixon (2003). Of course because this is a business survey we replace the description of these as 'unknown whether the business is working'.

IE : Number of respondents that are ineligible.

Then Bates & Dixon (2003) suggest the following measures of response rates,

$$\text{RR2} : 100 \times \frac{I}{I+R+NCO+UE}$$

RR4 : $100 \times \frac{I}{I+R+NCO+eUE}$. Where e is the proportion of respondents of unknown eligibility that are estimated to be eligible. Bates & Dixon (2003) comment that RR4 "estimates what proportion of cases of unknown eligibility are actually eligible. In estimating e , one must be guided by the best available scientific information on what share eligible cases make up among the unknown cases and one must not select a proportion in order to boost the response rate". In the absence of any scientific research for Australia on the magnitude of this parameter we estimated it as the ratio of the number of eligibles divided by the total number of businesses called. That

is

$$\hat{e} = \frac{I + R + NCO}{I + R + NCO + UE + IE}$$

Since we expect businesses of unknown eligibility to be less likely, than the typical business, to prove to be eligible on further investigation, this procedure is likely to over estimate the true proportion of those with unknown ineligibility that are actually eligible and therefore underestimate the true response rate.

RR6 : $100 \times \frac{I}{I+R+NCO}$ as Bates & Dixon (2003) note this is just a special case of RR4 with e set to zero. Thus, RR4 and RR6 might be thought of as providing upper and lower bounds for the true response rate.

7.94. Response rates calculated using the approach just described are reported in Table 7.6. The response rates in wave 43 were 8 to 11 percentage points lower than in wave 39. The response rates in wave 43 were between 20 and 22 per cent.

Table 7.6: Response rates

	Wave	
	39	43
RR2	28	20
RR4	30	20
RR6	33	22

7.95. It is also useful to define some other measures,

RFRP : $100 \times \frac{RP}{I+R+NCO}$ is the number of refusals by members of the panel expressed as a percentage of known eligible responses;

RFRPR : $100 \times \frac{RPR}{I+R+NCO}$ is the number of refusals by potential members of the panel expressed as a percentage of known eligible responses;

RFRO : $100 \times \frac{NCO}{I+R+NCO}$ is the number of non contacted panel members expressed as a percentage of known eligible responses.

7.96. These refusal rates calculated for waves 39 and 43 of the survey are reported in Table 7.7. As can be seen from the Table, refusal rates by potential recruits into the panel are about twice as high as refusal rates by members of the panel. It is also apparent from the Table that about one half of potential recruits refused to participate in the panel. The refusal rate

by members of the panel increased from 11 per cent in wave 39 to 28 per cent in wave 43.

Table 7.7: Refusal rates

	Wave	
	39	43
RFRP	11	28
RFPPR	55	50
RFRO	1	1

What was the likely cause of the fall in response rates?

- 7.97. The first and most important point to make here is that the refusals in wave 43 were not anything to do with the additional questions placed in the wave 43 questionnaire. We know this firstly because potential respondents were not informed about these questions until they were at the preamble to question 11 and secondly because there were no partial responses to wave 43 of the survey.
- 7.98. It is also useful to report some statistics that summarise aspects of the panel process. Here it is useful to recall that 1205 members of the panel continue, 1150 of them were in the panel last quarter, 55 were in the panel in previous quarters but not the last quarter and 595 members left and had to be replaced. Thus, one might calculate a continuation rate for the panel as 64 per cent.¹⁰

7.4.7 What are the implications of the response rate for analysis of the survey using design based estimators?

- 7.99. The design based estimation methodology is explained in more detail in appendix A which also establishes the properties of design based estimators when applied to the particular survey design used in this survey. Specifically, we show that the features of the survey make it particularly robust to non response.
- 7.100. The central idea behind design based estimators is that there is a population of interest and some fixed quantity of interest (y_j) specific to each member of that population. The objective is estimate the sum of the y_j for the population as a whole and perhaps construct confidence intervals for that estimate.¹¹

¹⁰ Calculated as $100 \times 1150/1800$.

¹¹ That is, the population quantity of interest is $Y = \sum_{j=1}^N y_j$, where N is the number in the population and y_j is the quantity of interest for the j^{th} member of the population.

This could be done by undertaking a census but that is too expensive so a random sample is taken. Thus, in the design based approach the only source of the randomness comes from the random sampling that is necessary to reduce cost of estimating the population quantity.¹²

- 7.101. Design based estimators are so named because the investigator puts all of the prior information that they have about the population into the design of the survey. For example, if the population responses are known to vary according to some known characteristics of the respondent then that information is included into the design of the survey by stratifying it according to these characteristics. The survey is stratified by region, industry and size of business. The main reason for doing this is to reduce the size of the standard errors for the estimates but it also has the benefit of reducing the scope for low response rates to cause bias in the estimates. The statistical reasons for this are set out in appendix A. Here we provide a general discussion of the issues drawing on that appendix.
- 7.102. Assume that the investigator chooses I strata which are indexed by $i = 1, \dots, I$. If the sample frame can be divided up into these strata before the survey goes into the field then the survey is said to be pre-stratified. If this is not the case then questions can be put into the questionnaire so as to stratify the sample after the questionnaire is completed, a procedure that is called poststratification. In some cases surveys are a mixture of pre and post stratification. This arises in this survey where the region in which the business is located is known but the industry and size of the business may not be known in the sample frame.
- 7.103. Once the strata are chosen the investigator can determine how many members of the population fall into each strata. In the case of this survey the information comes from the Australian Bureau of Statistics *Business Registrar*. We will denote by N_i the number in the population that fall into the i^{th} stratum.¹³ The investigator then determines the number of respondents they seek in each strata, denote this number as n_i for the i^{th} stratum. Thus, there will be $n = \sum_{i=1}^I n_i$ respondents in total. In the case where the sample is pre stratified the investigator then randomly selects respondents using simple

¹² This is in contrast to the model based estimation approach which is concerned with an entirely different source of randomness. See section 7.8 and Appendix B for further discussion.

¹³ The number in the population in each stratum sums to the total number in the population ie $N = \sum_{i=1}^I N_i$.

random sampling within each strata.

7.104. In the case of a poststratified sample, potential respondents are selected randomly and their telephone number dialed. As discussed earlier, there are four main classes of outcomes from this process:

1. They are successfully contacted and interviewed;
2. They are successfully contacted, willing to participate in the survey, asked some screening questions to determine what strata they fall into, and from their responses it is established that the quota of respondents for that strata is full so they are not interviewed;
3. They are successfully contacted but refuse to be interviewed; or
4. They cannot be contacted.

7.105. Recall that in the response rate calculations made earlier we treated respondents in categories 2 and 3 above very differently. Specifically, we excluded category 2 non respondents from the response rate calculation but included category 3 non respondents. To understand why this is done it is useful to observe that category 2 respondents might be described as ‘missing completely at random’. This description is warranted because we know that the only reason that they are a non respondent is that their telephone number was drawn after the quota for their strata was full. The refusals (category 3) in contrast are a group for which the reason for refusal is unknown. This difference together with some results from sampling theory discussed below is the reason why they are treated differently in the response rate calculations.

7.106. Returning to the discussion of the design based estimator, let π_j be the probability that the j^{th} member of population completes the survey instrument. As is discussed in appendix A this can be decomposed into the product of two probabilities. The first of these is the probability that the j^{th} member of the population is contacted (π_j^C) and the second is the probability that the j^{th} member of the population would complete the survey if contacted (π_j^R). That is

$$\pi_j = \pi_j^C \pi_j^R \tag{7.1}$$

7.107. In appendix A we show that, for the particular statistical design used in this survey, the probability that the j^{th} member of

the population is contacted (π_j^C) is determined by three things. The first of these is the number of completed responses that are to be obtained n . The second is the number of members in the population N . The third is the probability that the j^{th} member of the population would complete the survey if contacted (π_j^R). The first two of these are fixed either as a feature of the survey design (n) or as a known feature of the population (N). Thus we can focus on the third of these (π_j^R) when analysing non response bias.

- 7.108. We will discuss two cases where the properties of π_j^R are such that design based estimators remain unbiased in the presence of low response rates. The first of these is where looking across the whole population the probability of response π_j^R is
1. Unrelated to any observable characteristics of the business; and
 2. Unrelated to the answers that the business would give to the questions of interest.
- 7.109. In this case, which is referred to as ‘non respondents missing completely at random’ the design based estimator of population quantities is unbiased although some adjustment would need to be made to the design based estimator of the standard deviation.
- 7.110. The second case is where the probability of response π_j^R is
1. Related to observable characteristics of the respondent when looking across the population; but
 2. Unrelated to observable characteristics of the respondent within each stratum of the population; and
 3. Unrelated to the answers that the non respondent would give to the questions of interest.
- 7.111. In this case, which is referred to as ‘non respondents missing at random’ in the population but ‘missing completely at random’ within strata the design based estimators with stratification are unbiased.
- 7.112. In all other cases non response **might** cause a bias although it will not necessarily do so and the bias may not be very large. In appendix A we show that the bias in each stratum b_i is given by,

$$b_i = \sqrt{\frac{N_i - 1}{n_i}} \sigma_{\kappa i} \sigma_i \rho_i \quad (7.2)$$

where

1. $\sigma_{\kappa i}$ is the population standard deviation of the probability of response from $\frac{n_i}{N_i}$;
2. σ_i is the population standard deviation of y for the i^{th} stratum; and
3. ρ_i which is the population correlation between the probability of π_{ji} response and $(y_{ji} - \mu_i)$.

7.113. In summary, if non respondents are missing completely at random in the i th stratum then $\sigma_{\kappa i} = \rho_i = 0$ and the bias is zero. If this is not the case one needs to estimate the bias and then use that estimate to produce a bias adjusted estimator for the stratum. To make such an estimate of the bias one needs additional information which can be obtained from a survey of non respondents.¹⁴ This is combined with the original sample of non respondents and a model of probability of response estimated. This model can be used to compute estimates of $\sigma_{\kappa i}$ and ρ_i which when combined with the sample standard deviation yield estimates of the bias via equation (7.2). This approach also provides the basis for statistical tests of the hypotheses that the non response is ‘missing completely at random’ or ‘missing at random’.

7.114. The other point to make about non response bias is that it is unlikely that the bias in all of the stratum will be of the same sign. This means that when the stratum sample means are aggregated to obtain the estimate of the population quantity of interest any biases in the strata are likely to cancel out and any bias in the population estimate is likely to be small.

7.115. The variables that are used in poststratification are industry, size and region. Investigation of the sample suggests that these are the main variables that explain variation in the sample and thus, by extension, these variables are likely to capture the bulk of any variation in the probability of non response, although we cannot know this for certain without conducting and analysing a survey of non respondents. Thus our assessment is that poststratification will reduce the non response bias to such an extent that we consider it would be too small to modify the conclusions of this report. We have suggested a mechanism through which that judgement can be tested empirically.

7.116. In order to provide further assurances that any remaining bias

¹⁴ See Lohr (1999, p. 256).

is small we have also shown that the design based estimator has an alternative interpretation as a model based estimator for a one way analysis of variance model. This has the advantage that it requires no assumptions be made about the probability of selection into the sample being known and, is therefore, robust to non response. Model based estimators are discussed in more detail in section 7.8 and appendix B.

7.5 Cleaning coding and analysis of the data

- 7.117. The data was cleaned and checked for consistency first by Sweeny Research and then by us.
- 7.118. To be suitable for analysis the raw data needed to be coded so that the missing values accurately reflected the structure of the questionnaire with its many screening questions.
- 7.119. We made two substantive adjustments to the data as a result of our consistency checks.
- 7.120. One business that currently has no employees reported at Q30b that, in response to guarantee of no change in the Safety Net for a period of five years, they would hire 20 casual workers. This response seemed implausibly large and thus we treated it as an outlier adjusting it down to 2 additional casual employees. The effect of this adjustment when weighted up to be representative of the population as a whole was to reduce by 13,000 the estimated number of casual jobs created by a guarantee of no change in the Safety Net for a period of five years.
- 7.121. Another business reported at Q22a that if the May 2003 SNA had not occurred then they would have shed employees. Q22b indicated that they would have shed 15 of its 30 casual employees in the absence of the SNA. Leaving aside the sign of the response, its magnitude seemed implausibly large. On further investigation we found that this business reported at question 24a that it would increase employment of casual workers in response to a guarantee of no change in the Safety Net. Thus the direction of the long run effect on the businesses employment was opposite to the short effect. Moreover, at Q24c the business said that it would employ six more casuals in response to a guarantee of no change in the Safety Net for a period of five years. Thus, the magnitude of the long run effect of was just over one third of that for the short run effect; something that is also implausible. The reason given at Q22d indicated that the business was concerned about the effect of SNAs on

labour costs. A justification that is more consistent with the view that business was reporting that the SNA increase would cost jobs. We concluded that a coding error was the most likely explanation for these inconsistencies and thus adjusted the businesses response to Q22b to zero. The effect of this adjustment when weighted up to be representative of the population as a whole was to reduce by 4370 the estimated number of casual jobs saved by the May 2003 SNA.

- 7.122. Given the complexity of the survey and the difficulty of the issues under investigation we were reassured that only the two outliers mentioned above were found and required adjustment. We take this as evidence of the high quality of the survey instrument and the high quality of the administration of that instrument.

7.6 Analysis of the survey

- 7.123. For the purposes of the analysis the data were classified into strata on the basis of region, size of business and industry. A design based estimator was employed. The strata means were estimated and were multiplied by the number of businesses in the strata to obtain the population estimate of the quantity of interest.

Source of weights used in this study

- 7.124. The number of firms in each strata used in this study were supplied by Sweeny Research who obtained them from the ABS *Business Registrar*.

7.6.1 Standard errors and confidence intervals

- 7.125. The discussion above relates to the estimation of means and population. One also needs to provide information on the precision of the estimates. This is done using standard errors, confidence intervals and simulated probability distributions for the quantities of interest. Good practice involves the reporting of these measures of precision.

- 7.126. However, we are unable to calculate standard errors until,
- We have derived the correct formula for calculating design based standard errors for this survey. That formula will need to take into account the fact that with non response the number of businesses contacted is a random variable; or

- The model based approach, set out in section 7.8, is implemented and appropriate assurances given regarding the fit of the model.

7.127. Until this further work is undertaken the calculation of standard errors could be interpreted as misleading readers regarding the precision of the estimates presented in this report.

7.7 Estimates of some important population characteristics

7.128. We estimate on the basis of the responses to question 11 in the survey instrument that 585,476 small and medium sized businesses have one employee other than the respondent and 189,599 businesses have no employees other than the respondent. The former group are the main focus of attention for this report. The data presented in this section is used as the denominator in many of the calculations of proportions made throughout the report.

7.129. Small and medium sized businesses employ about 6.7 million people. The bulk of these (4.1 million employees) are full-time, 0.8 million workers are employed on a part-time basis and 1.8 million workers are employed on a casual basis. Further information on the distribution of employment by size of business is presented in Table 7.8. Table 7.9 presents information on the distribution of employment in small and medium sized businesses by industry. The regional distribution of employment is reported in Table 7.10.

Table 7.8: Employment by size of business, business has employees other than self

Number FT	FT	PT	Casual	All
1 to 5	1127048	433974	1002288	2563311
6 to 10	585786	147795	361470	1095051
11 to 20	571879	71629	162057	805565
21 to 50	804036	75673	194448	1074158
51 to 100	520161	33658	52748	606567
100+	484756	25370	39729	549855
All Businesses	4093666	788099	1812740	6694507

Table 7.9: Employment by industry, businesses that have employees other than self, number

Industry (ANZIC Division)	FT	PT	Casual	All
C Manufacturing	649116	40295	67201	756612
E Construction/Building	378612	32097	74822	485531
F Wholesale	388085	54224	53042	495351
G Retail trade	793615	126870	340483	1260968
H Accommodation, cafes and restaurants	235152	64685	240499	540337
I Transport / storage	217444	36260	86208	339912
J/L Communication, Property and Business Services	847328	211584	616187	1675099
K Finance and Insurance	151510	25344	13201	190056
O Health and Community Services	241558	145898	115625	503080
P/Q Cultural and recreation and other services	191248	50841	205473	447562
All industries	4093667	788100	1812740	6694507

- 7.130. The ABS *Forms of Employment Survey* estimated that there were just over 2 million casual employees at November 2001. Given that this survey covers about 69 per cent of the workforce and assuming that the number of casuals increased by about six percent between November 2001 and November 2003 we would expect to see about 1.5 million casuals in the population of small and medium sized businesses. Thus the estimate of 1.8 million casuals employed in the small and medium sized business sector in October/November 2003 seems somewhat too high. Of course, this may reflect the fact that small and medium sized businesses are more intensive employers of casuals than are large businesses, but we don't have any evidence on that.

Table 7.10: Employment by region, businesses with employees other than self, number of employees

Region	FT	PT	Casual	All
Sydney	925517	129752	667295	1722565
Other NSW	512348	97457	237688	847494
NSW	1437865	227209	904983	2570059
Melbourne	832582	206408	334714	1373704
Other VIC	240701	50104	72812	363616
Victoria	1073282	256511	407526	1737319
Brisbane	362074	72445	87765	522283
Other QLD	367197	50753	182873	600823
Queensland	729271	123197	270638	1123106
Adelaide	213342	40467	40265	294074
Other SA	69348	5610	8596	83555
South Australia	282691	46077	48861	377629
Perth	279468	70498	91347	441313
Other WA	119205	20433	17582	157220
Western Australia	398674	90931	108929	598533
Hobart	49898	10819	16474	77191
Other TAS	42332	8173	15993	66498
Tasmania	92231	18992	32466	143689
Northern Territory	23352	4101	9628	37080
ACT	56301	21080	29710	107091
Australia	4093667	788100	1812740	6694507

7.131. Using the ABS *Forms of Employment Survey* we estimated that in November 2001 there were 1.1 million permanent part-time employees in the economy as a whole. Using the same factors as in the calculation for casuals we estimate that there should be 0.8 million permanent part-time employees in the small and medium sized business sector. This is close to the number reported in Table 7.8. Thus, the estimates from the survey seem able to match some important population features. This is reassuring since minimum award wage rate workers are heavily concentrated in casual and part-time jobs.

7.7.1 Employment in businesses that reported at q11 they have no employees other than self

7.132. Businesses were asked in question 2 to report their full-time, part-time and casual employment. The notion of what constitutes an employee is somewhat loosely understood by business. For example, a family member working in the business may not necessarily be an employee from the perspective of the law. Similarly a partner working in a partnership may

not be an employee. Thus, the preamble placed before question eleven outlined what information the survey was seeking and then at question 11 the respondent was asked to confirm whether they had employees.

- 7.133. For the reasons outlined above some businesses that had stated at question 2 that they had employees realized that although these persons might work in the business on occasion they were not employees for the purposes of this survey. Table 7.11 sets out the number of ‘employees’ identified at question 2 that are removed from the survey via question 11.

Table 7.11: Employment by size of busines, business has no employees other than self

Number FT	FT	PT	Casual	All
1 to 5	230127	39211	22635	291373
6 to 10	1997	0	0	1997
10+	0	0	0	0

- 7.134. As can be seen from Table 7.11 this feature of responses only occurs in businesses with 10 or less employees and it is primarily a feature of businesses with 5 or fewer employees. By removing these ‘employees’ we remove a potential bias from the survey that could arise because of an imperfect understanding among respondents of what constitutes an employee.

7.8 Model based approach to estimation

- 7.135. The model based approach is the main alternative to the design based approach that was discussed in section 7.4.7 and appendix A. The model based approach which is discussed in appendix B is based on the idea that data obtained from the survey is the realization of a some unknown data generating process. The latter is understood to be a set of rules that describe how the data is generated. The modeler’s task is to postulate candidate models that are viewed as approximations to the data generating process. These models are then estimated and evaluated in terms of their fit to the data.
- 7.136. The difference between the model based method and the sampling based method relates to the information that is being used in the estimation process. In the sample based approach only information about the sample design and the probability of selection is used to construct the estimates. Thus any prior information possessed by the investigator is incorporated into

the structure of the questionnaire and the stratification of the sample. For example, if responses are thought to vary by size of business, industry and region then that information is incorporated into the survey design by stratifying the sample on these features.

- 7.137. In the model based approach the prior information used relates to the knowledge of the data generating process. In the case of the models set out in Appendix B that knowledge is firstly, that means and variances of responses may differ by industry, region and business size and secondly, that deviations from the expected employment response are independently and identically distributed. This information is used to obtain estimates of the relevant means and variances that satisfy one or more estimation principles. The estimated mean for each cell is then factored up to make statements about the population by multiplying it by the number in the population that occur in the cell.
- 7.138. Because the model based approach breaks the link between the weights and the probability of selection it can be used to make statements about the population even when the probability that a particular unit record is selected into the data set is not known. This means that the model based approach remains valid in the presence of non response. See Lohr (1999) for a further discussion of the model based approach to the analysis of surveys.
- 7.139. Among economists the model based approach is a widely used method of making statements about the population using data on unit records collected from the population.
- 7.140. The model based approach produces estimates of the population quantities in the following way. Let y_j be the variable of interest and x_j be characteristics of the respondent. The modeler specifies, estimates and tests models $y_j = f(x_j, \alpha)$ that relates the variable of interest to the observed characteristics and the parameters α . Let $f^*(x_j, \alpha)$ the model that is thought to provide the best fit to the data and $\hat{\alpha}$ represent the estimated parameters of the model. Then, for each unit record in the data the model yield a predicted value \hat{y}_j which is obtained as follows,

$$\hat{y}_j = f^*(x_j, \hat{\alpha})$$

- 7.141. Weights w_j that represent how many businesses in the population have the same characteristics as the j^{th} business in the

sample are obtained from a source such as the Australian Bureau of Statistics *Business Registrar*. The weights here do not rely on their being interpreted as probabilities of selection and this means that non response does not cause a bias in the estimates of the population quantities. With these methods there is also no requirement that the data be drawn from a random sample although the latter feature can help in satisfying the assumptions of certain models.

- 7.142. The estimate of the population quantity of interest is then obtained as the weighted sum of the predicted values \hat{y}_j . That is

$$Y = \sum_{j=1}^N w_j \hat{y}_j \quad (7.3)$$

- 7.143. The variance of the predicted value can be obtained from the covariance matrix of the estimated parameters using the approach described in appendix B. Let $\hat{\tau}_j^2$ represent the estimated variance of \hat{y}_j then the variance of Y is obtained as follows,

$$Var(Y) = \sum_{j=1}^N w_j^2 \hat{\tau}_j^2 \quad (7.4)$$

- 7.144. Here we have implicitly used the assumption that y_j and y_k are independent in order to estimate the variance. This assumption is guaranteed by design if the data is collected by a random sample.
- 7.145. Two models that could be used in further work with this data are described in appendix B.

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IV. Appendices

Appendix A Statistical properties of design based estimators in the presence of non response

- A.1. Our objective in this appendix is make precise statements about the properties of design based estimators in the presence of various types of non response. Some of this material can be found in texts books on sampling design and analysis by Sharon Lohr (1999).
- A.2. However, most of the cases studied in textbooks relate to a statistical design where the number of members selected from the population is fixed at the design stage and the response rate then determines how many completed questionnaires are obtained. The latter being a binomial random variable with probability of success determined by the response rate.
- A.3. In this survey, in contrast, the number of completed surveys is set at the design stage and the number of businesses contacted to obtain those completed responses is a random variable whose distribution is determined by the response rate. We felt that it was important to establish the properties of design based estimators in the actual statistical design used and much of this appendix is directed at that task.
- A.4. Section A.1 provides a brief discussion of what it is that design based estimation seeks to achieve and contrasts that methodology and its goals with model based estimation which is also used in parts of this report. This discussion leads naturally to the discussion of non response. Section A.2 discusses a particular case where the probability of non response is unrelated to either the characteristics of the respondent or the answers that they provide to questions of interest. Section A.3 discusses the case where the probability of response depends on the characteristics of the respondent but not on their answers to the questions of interest.
- A.5. The two cases just mentioned are those where appropriately stratified design based estimators are unbiased in the presence of non response. Section A.4 shows what factors determine the size and direction of any bias that is present and section

A.5 discusses procedures that allow the extent of non response bias to be quantified.

A.1 Design based estimation

- A.6. Design based estimators are so named because the investigator puts all of the prior information that they have about the population into the design of the survey. For example, if the population responses are known to vary according to some known characteristics of the respondent then that information is included into the design of the survey by stratifying it according to these characteristics. One reason for doing this is to reduce the size of the standard errors for the estimates. But as we show below stratification can be a useful tool for reducing the extent of non response bias.
- A.7. Design based estimation starts with the assumption that there is a population of interest comprising N members. Each member of that population has a vector of fixed characteristics, x_j , and some fixed quantity of interest to the investigator, y_j .¹ Interest centers on estimating the sum of the y_j for the population as a whole.² This could be done by undertaking a census but that is too expensive so a random sample is taken. Thus, in this approach the only source of the randomness comes from the sampling that is necessary to reduce the cost of estimating the population quantity.
- A.8. The random selection of members from the population is described by two independent³ binary⁴ random variables S_j and R_j . Where

¹ It could be a vector of quantities of interest but we focus on the scalar case here to simplify the presentation.

² That is, the population quantity of interest is $Y = \sum_{j=1}^N y_j$, where N is the number in the population and y_j is the quantity of interest for the j^{th} member of the population.

³ Here independence means that the joint probability density of S_j and R_j , $f(S_j, R_j)$, can be written as the product of the two marginal densities, $h(S_j)$ and $g(R_j)$. That is, $f(S_j, R_j) = h(S_j)g(R_j)$. In the case of the Yellow Pages survey the assumption of independence is justified because the telephone numbers of respondents were selected randomly. The fact that this random drawing of telephone numbers occurred at different times, depending on when the businesses entered the panel, does not affect the independence of S_j and R_j .

⁴ Binary means that S_j can take on one of two values 1 (Selected) or 0 (not selected) and, similarly, R_j can take on one of two values 1 (response if selected) or 0 (non response if selected). The non response could be split into further categories according to the FDC codes but we will not do that here.

1. S_j describes the selection process
 - (a) $S_j = 1$ if individual j is selected; and
 - (b) $S_j = 0$ if individual j is not selected.
2. R_j describes how members of the population respond if selected:
 - (a) $R_j = 1$ if individual j completes the survey when selected; and
 - (b) $R_j = 0$ if individual j does not complete the survey when selected.

A.9. The sample mean \bar{y} can be written as follows,

$$\bar{y} = \frac{1}{\sum_{j=1}^N S_j R_j} \sum_{j=1}^N S_j R_j y_j$$

A.10. In many surveys the number of completed responses $n^c = \sum_{j=1}^N S_j R_j$ is a random variable but in this survey the sampling continues until the actual number of completed interviews n^c is equal the planned number of interviews n . That is $n^c = n$. Thus, for the survey, we can write the sample mean as

$$\bar{y} = \frac{1}{n} \sum_{j=1}^N S_j R_j y_j$$

A.11. The expected value of the sample mean is,

$$\bar{y} = \frac{1}{n} \sum_{j=1}^N E(S_j) E(R_j) y_j$$

where $E(X)$ denotes the expected value of X . Because S_j and R_j are binary variables $E(S_j)$ and $E(R_j)$ can be interpreted, respectively, as the probability that the j^{th} member of the population is selected for interview and the probability that the j^{th} member of the population responds by completing the interview.

A.12. There are three cases to consider here,

1. $E(R_j)$ is equal to a constant π that is independent of both the characteristics of the respondent x_j and the respondents answer to the question of interest y_j . In

this case the non respondents are said, in the literature, to be ‘**missing completely at random**’. In this survey ‘missing completely at random non response’ might arise, for example, where the business person is has unusually high demands on their time during the interview period and thus

- (a) if in the panel cannot respond this interview period;
or
- (b) if a potential recruit to the panel is too busy to agree to join the panel.

These would be ‘missing completely at random’ if the factors causing demand on their time did not depend on the businesses characteristics and were not correlated with any of the variables of interest in the survey such as the number of award employees the business has or the number of additional employees the business would hire in the event of a guarantee of no change in the Safety Net;

2. $E(R_j)$ varies with the characteristics of the respondent x_j , but does not vary with the respondents answer to the question of interest y_j . In this case the non respondents are said, in the literature, to be ‘**missing at random**’. In this case we write $E(R_j) = \gamma(x_j)$, where $\gamma(x_j)$ is a function that describes how the probability of response varies with the characteristics of the respondent. In this survey, missing at random, non response might arise, for example, where larger businesses, as measured by turnover, are more (or less) likely than small businesses to respond to the survey;
3. $E(R_j)$ varies with the characteristics of the respondent x_j **and** with the respondents answer to the question of interest y_j . In this case the non respondents are said, in the literature, to be ‘**non ignorable nonresponse**’.⁵ In this case we write $E(R_j) = \theta(x_j, y_j)$, where $\theta(x_j, y_j)$ is a function that describes how the probability of response varies with the characteristics of the respondent and with the answer to the question of interest. In this survey non ignorable nonresponse might, for example, arise if:

⁵ We do not like the term non ignorable non response as it implies, incorrectly, that the other categories of non response are ignorable. Nonetheless, we use the term because it is used in the literature; see Lohr (1999).

- (a) Businesses where the respondent had unusually higher demand on their time during the survey period were more likely to pass-on the SNA to over award employees;
- (b) Businesses where the respondent had unusually higher demand on their time during the survey period were more likely than other businesses to have high demand for their product and thus, arguably,
 - i. less likely, than businesses that responded, to report that the 2003 SNA cost jobs in their business; but
 - ii. more likely, than businesses that responded, to report that they would hire additional employees if there were a guarantee of no change in the Safety Net for a period of five years.

A.13. The examples given above were deliberately chosen to illustrate the point that there are ‘swings and roundabouts’ with bias. The biases mentioned, in the examples, would cause underestimation of the extent to which SNAs are passed on, over estimation of the job loss from the 2003 SNA but under estimation of the number of jobs created by a guarantee of no change in the Safety Net for a period of five years. Non statisticians often claim that the bias works against their case and cite example to support that contention. But this is a poor statistical practice. The best statistical practice is to re-administer the survey to non respondents and then estimate the probability of non response and test whether it is ‘missing completely at random’, ‘missing at random’ or ‘non ignorable non response’.

A.2 What are the implications of ‘missing completely at random’ non response?

A.14. From the preceding discussion we know that under this form of non response that $E(R_j) = \pi$ a constant. Now we need to obtain $E(S_j)$. To do this we observe that the S_j belong to a Bernoulli process that continues until n interviews are completed. To work this out notice that we can write the unconditional expectation as the weighted sum of conditional expectations. That is,

$$E(S_j) = \sum_{k=0}^N E(S_j|k) \Pr(K = k|n)$$

- A.15. Where $E(S_j|k)$ is the probability that the j^{th} member of the population is selected for interview given that k members of the population were contacted. And, $\Pr(K = k|n)$ is the probability that $n + k$ members of the population were to be contacted so as to obtain the n completed responses. It is well known that under random sampling $E(S_j|k) = \frac{k}{N}$. The $\Pr(K = k|n)$ is, for large N , well approximated by the negative binomial distribution with probability of success π .⁶ Thus

$$\begin{aligned} E(S_j) &= E \frac{n + K}{N} \\ &= \frac{n}{N} \left(1 + \frac{1 - \pi}{\pi} \right) \\ &= \frac{n}{N\pi} \end{aligned}$$

- A.16. Making use of the results above, the expected value of the sample mean is,

$$\begin{aligned} \bar{y} &= \frac{1}{n} \sum_{j=1}^N E(S_j) E(R_j) y_j \\ &= \frac{1}{n} \sum_{j=1}^N \frac{n}{N\pi} \pi y_j \\ &= \frac{1}{N} \sum_{j=1}^N y_j \end{aligned}$$

- A.17. That is, for the particular design of the survey, the sample mean is an unbiased estimator of the population mean, in the presence of ‘missing completely at random’ non response.

A.3 What are the implications of ‘missing at random’ non response?

- A.18. From the preceding discussion we know that under this form of non response that $E(R_j) = \gamma(x_j)$, a function that varies

⁶ The exact distribution is a negative binomial that is truncated at $N-n$. We see little value in using this exact distribution as it only introduces additional complexity for negligible gain in accuracy.

with the characteristics of the respondent but not with the response to the question of interest.

A.19. For the purposes of exposition assume that:

1. The characteristics x_j are discrete;
2. There is sufficient information to stratify the population, according to these characteristics. We assume that there are I strata, indexed by $i = 1, \dots, I$.
3. The number in the population is known for each stratum from some source such as the Australian Bureau of Statistics *Business Registrar*.
4. Within each strata the probability of response is a constant that is $\gamma(x_j) = \gamma_i$ for j a member of the i^{th} strata.

A.20. With the assumptions given above, the non respondents while ‘missing at random’ for the population as a whole are ‘missing completely at random’ for each strata. This means that we can appeal to the results for the missing completely at random case to argue that within each strata the sample mean is an unbiased estimator for the population mean of that strata.

A.21. Thus, for the particular design of the survey, stratification provides a remedy for ‘missing at random’ non response.

A.22. The use of poststratification to adjust for non response involves the implicit assumption that the characteristics used to construct the strata exhaust the list of characteristics on which the probability of non response depends. As Lohr (1999, p. 268) observes this means that we are assuming that the probability of non response is the same for every member of a cell in the strata. This assumption may fail in some circumstances. The next section examines the factors that determine the extent of non response bias in those situations where stratification does not completely eliminate non response bias.

A.4 Factors that determine the magnitude of non response bias

A.23. To identify the factors that determine the size of non response bias we separate, for each stratum, the probability that a completed interview is obtained into two parts, viz,

$$E(S_{j_i}) E(R_{j_i}) = \frac{n_i}{N_i} + \kappa_{j_i}$$

A.24. Where, j_i indexes the j^{th} member of the population in the i^{th} stratum, N_i is the number of members of the population in the i^{th} stratum and n_i is the number of members of the population in the i^{th} strata that are selected into the sample. Now the fact that interviewing proceeds until n_i interviews are completed means that

$$\sum_{j=1}^N E(S_j) E(R_j) = n_i$$

A.25. Thus,

$$\begin{aligned} \sum_{j=1}^N \left(\frac{n_i}{N_i} + \kappa_{j_i} \right) &= n_i \\ n_i + \sum_{j=1}^N \kappa_{j_i} &= n_i \\ \sum_{j=1}^N \kappa_{j_i} &= 0 \end{aligned}$$

also since the probability of selection is positive $\kappa_{j_i} > \frac{-n_i}{N_i}$ and since the probability of selection is less than one, $\kappa_{j_i} > \frac{N_i - n_i}{N_i}$.

A.26. Now using this fact the sample mean can be written as

$$\begin{aligned}
\bar{y}_i &= \frac{1}{n_i} \sum_{j=1}^N E(S_j) E(R_j) y_j \\
&= \frac{1}{n_i} \sum_{j=1}^N \left(\frac{n_i}{N_i} + \kappa_{j_i} \right) y_j \\
&= \frac{1}{N_i} \sum_{j=1}^N y_j + \frac{1}{n_i} \sum_{j=1}^N \kappa_{j_i} y_j \\
&= \frac{1}{N_i} \sum_{j=1}^N y_j + \frac{1}{n_i} \sum_{j=1}^N \kappa_{j_i} \mu_i + \frac{1}{n_i} \sum_{j=1}^N \kappa_{j_i} (y_j - \mu_i) \\
&= \frac{1}{N_i} \sum_{j=1}^N y_j + \frac{1}{n_i} \sum_{j=1}^N \kappa_{j_i} (y_j - \mu_i) \\
&= \frac{1}{N_i} \sum_{j=1}^N y_j + \frac{1}{n_i} \sum_{j=1}^N \kappa_{j_i} (y_j - \mu_i) \\
&= \frac{1}{N_i} \sum_{j=1}^N y_j + \frac{N_i - 1}{n_i} \sigma_\kappa \sigma_i \rho_i
\end{aligned}$$

A.27. The first part on the right hand side is the population mean for the i th stratum and the second part is the remaining part of the non response bias after stratification. The bias is comprised of four parts

1. $\frac{N_i-1}{n_i}$ which, for large N_i , is approximately the number in the population for each member of the sample.
2. $\sigma_\kappa = \sqrt{\frac{1}{N_i-1} \sum_{j_i=1}^{J_i} \kappa_{j_i}^2}$, which is the population standard deviation of the probability of response from $\frac{n_i}{N_i}$. Given the constraints that κ_{j_i} sum to zero, that $\kappa_{j_i} > \frac{-n_i}{N_i}$ and that $\kappa_{j_i} < \frac{N_i-n_i}{N_i}$, it is the case that $\sigma_\kappa < \frac{n_i}{N_i-1} \sqrt{\frac{N_i-1}{N_i}}$;
3. $\sigma_i = \sqrt{\frac{1}{N_i-1} \sum_{j_i=1}^{J_i} (y_j - \mu_i)^2}$, which is the population standard deviation of y for the i th stratum; and
4. ρ_i which is the population correlation between κ_{j_i} and $(y_j - \mu_i)$ a number that must lie between -1 and 1.

A.28. Making use of the various inequalities obtained yields the result that

$$|bias_i| < |\sigma_i \rho_i| < \sigma_i$$

- A.29. Thus the non response bias in the i^{th} stratum will be less than than one population standard deviation of y for the i th strata. It is instructive to understand what would generate the maximum bias. This would require the following:
1. setting the one half of the κ_{ji} equal to $\frac{-n_i}{N}$ and the other half of the κ_{ji} equal to $\frac{n_i}{N}$; and
 2. choosing the one half of the population where κ_{ji} equal to $\frac{-n_i}{N}$ to be where $(y_{ji} - \mu_i) < 0$ and the other half to be where $(y_{ji} - \mu_i) > 0$; and
 3. $(y_{ji} - \mu_i)$ to be proportional to $\frac{-n_i}{N}$ in one half of the population and proportional to $\frac{n_i}{N}$ in the other half of the population. This is necessary to make $|\rho_i| = 1$.
- A.30. Achieving the above three things would be a difficult thing to do and this suggests that the actual bias in any given stratum is likely to be small relative to the maximum bias.
- A.31. So far we have worked out the bias in a particular stratum. The bias for the sample as a whole requires summing across all the strata. Unless the bias in each stratum is of the same sign the sum of the biases will be smaller than the sum of the maximum bias in each stratum.
- A.32. We do not want to trivialise the issue, non response bias is a serious problem, and should be dealt with seriously. But we do want to stress that the mere existence of non response bias does not mean that such bias is large or significant in the sense that it would affect the policy conclusions from a survey.
- A.33. Our assessment is that the stratification of the survey will reduce the non response bias to such an extent that correction for any remaining non response bias would not significantly modify the policy conclusions from this report. The next section discusses how evidence could be gathered and analysed so as to evaluate whether any significant bias remains.

A.5 What can be done to quantify the magnitude of non response bias?

- A.34. In the previous section we derived some bounds for non response bias. These provide some guidance but ultimately the careful investigator will seek to test whether any non response bias exists, and if it does exist, quantify the magnitude of that

bias. To do this the investigator must take a sample of the non respondents. Usually, this is done by re-administering the questionnaire to a randomly drawn sample of the non respondents. Some of these will again refuse to respond but some will respond. Combining the responses from the first and second surveys allows one to estimate the probability of non response and to test whether the non response is ‘missing completely at random’ or ‘missing at random’. If it is the former then the survey is unbiased, if it is the latter but further tests show that non respondents were ‘missing completely at random’ within every strata then the stratified survey is unbiased.

- A.35. In all other cases there is bias that needs to be quantified. To do this one estimates a model explaining the probability of non response for each member of each strata and subtracts from that probability $\frac{n_i}{N}$, this yields $\widehat{\kappa_{j_i}}$ which is an estimate of κ_{j_i} . One then uses the $\widehat{\kappa_{j_i}}$ to obtain estimates of ρ_i and σ_κ . Combining all of these together yields an estimate of the bias for the i th stratum. Estimates of the bias for all the other strata are obtained in the same way and ultimately one can create a bias adjusted estimate. Any remaining bias, after these adjustments are made, would be very small.

Appendix B Model based estimators

- B.1. Two models could be used in further analysis of the survey data used in this report. The first model is the one way analysis of variance (ANOVA-1) discussed in Lohr (1999, p. 46-48.). It is a linear model and postulates that the mean and variance of the strata. Specifically,

$$y_j = \sum_{i=1}^I \alpha_i \mathbf{1}(x_j \in \text{strata } j) + \sum_{i=1}^I \sigma_i \mathbf{1}(x_j \in \text{strata } j) \varepsilon_{ij} \quad (\text{ANOVA-1})$$

- B.2. Where $\mathbf{1}(x_j \in \text{strata } j)$ is an indicator function that takes the value 1 if x_j is an element of strata j , α_i is the mean of the i th strata, σ_i is the standard deviation of the i th strata and ε_{ij} is an independently and identically distributed random disturbance with mean zero and variance one. The main reason for mentioning this model is that the generalized method of moments (GMM) estimators of α_i and σ_i^2 are the sample mean and sample standard deviation for the i th strata. That is, the GMM estimators have exactly the same formula as the stratified design based estimator, although they now have a different interpretation as a model based estimator. Thus, the ANOVA-1 model can provide an alternative foundation for the estimates made in this report. A foundation that is valid in the presence of non response.
- B.3. Of course, the ANOVA model is not necessarily the best model to fit the data. Specifically, it is only unbiased if the expected value of the y_j are constant within each stratum and it is only the model that yields the minimum variance among the class of linear unbiased estimators for α_i if the σ_i are constant within each stratum.
- B.4. The second model that we suggest attempts to capture the fact that a viewing of the histogram of variables such as employment shows that it has a skewed distribution. Moreover, employment as with most of the variables in this dataset, must be non negative and take on integer values. The negative binomial distribution is a reasonable choice to model such data. It is reasonably flexible and its properties are well known.

- B.5. We specify the mean λ_j and variance σ_j^2 of the Negative Binomial distribution to have the forms,

$$\lambda_j = e^{\theta z_j} \quad (\text{B.1})$$

$$\sigma_j^2 = \lambda_j (1 + e^{\beta z_j}) \quad (\text{B.2})$$

- B.6. Where, θ and β are vectors of parameters and z_j is a vector that has one as its first element and then transformations of the x_j as its other elements. The Negative Binomial distribution has the property that the probability density $g(y_j)$ is,

$$g(y_j) = \frac{\Gamma(y_j - e^{(\theta-\beta)z_j} - 1)}{\Gamma(y_j) \Gamma(e^{(\theta-\beta)z_j} - 1)} \left(\frac{1}{1 + e^{\beta z_j}} \right)^{e^{(\theta-\beta)z_j}} \left(\frac{e^{\beta z_j}}{1 + e^{\beta z_j}} \right)^{y_j} \quad (\text{B.3})$$

where $\Gamma(y_j)$ is the gamma function.

- B.7. The likelihood function for the full data, $l(y_1, ..y_N; \theta, \beta)$, is defined as the product of the likelihoods for the individual unit records. That is,

$$l(y_1, ..y_N; \theta, \beta) = \prod_{j=1}^N g(y_j) \quad (\text{B.4})$$

- B.8. The parameters (θ, β) and their variance covariance matrix can be estimated via the method of maximum likelihood. Procedures to estimate this model are standard in the *Constrained Maximum Likelihood* package that is written for the matrix based computer language GAUSS. Specifically, the procedure CMLNegbin in the *Constrained Maximum Likelihood* package could be used to estimate the model.

Appendix C Selected questions from the survey instrument

The following questions formed part of the survey instrument that is relevant to this report. The numbering reflects the numbering in the questionnaire.

Selected questions from the

MAIN QUESTIONNAIRE

Wave 43

SECTION 1: A REVIEW OF THE RECENT PAST

<p>Q2a. Now thinking about your workforce.</p> <p>How many full time people do you now employ? That means people who work 20 hours a week or more – including yourself but excluding casual employees or sub-contractors?</p>	<table> <tr> <td>a. Now</td> <td>b. Three months ago</td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>	a. Now	b. Three months ago	<input type="text"/>	<input type="text"/>
a. Now	b. Three months ago				
<input type="text"/>	<input type="text"/>				

<p>b. How many full time people did you employ three months ago?</p>	<p>RECORD :</p> <p>Increase1</p> <p>Decrease2</p> <p>No change3</p>
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<p>c. How many part time people (less than 20 hours per week) do you employ now?</p>	<table> <tr> <td>c. Now</td> <td>d. Three months ago</td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>	c. Now	d. Three months ago	<input type="text"/>	<input type="text"/>
c. Now	d. Three months ago				
<input type="text"/>	<input type="text"/>				

<p>d. How many part time people did you employ three months ago?</p>	<p>RECORD :</p> <p>Increase1</p> <p>Decrease2</p> <p>No change3</p>
--	--

<p>d(1). How many casual employees, if any, do you employ in an average week.</p> <p>A casual employee is defined as someone who does is usually employed on a short term basis and is not entitled to paid holiday or sick leave.</p>	<input type="text"/>
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<p>d(2). How many casual employees, if any, are you currently employing?</p>	<table> <tr> <td>d(2). Now</td> <td>d(3). Three months ago</td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>	d(2). Now	d(3). Three months ago	<input type="text"/>	<input type="text"/>
d(2). Now	d(3). Three months ago				
<input type="text"/>	<input type="text"/>				

<p>d(3). How many casual employees, if any, were you employing three months ago?</p>	<p>RECORD :</p>
--	------------------------

	Increase	1
	Decrease	2
	No change	3

<p>d(4). IF CHANGE IN EMPLOYEE MIX (i.e. CODE 1 OR 2 IN Q2b, d OR d(3) ASK... Overall, taking into account the changes in the number of employees you have, has the total number of hours you obtain from all your employees increased, decreased or stayed the same?</p>	<p>Increased</p> <p>Decreased</p> <p>No change</p>
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SECTION 4 : EFFECTS OF SAFETY NET ADJUSTMENTS TO MINIMUM AWARD WAGES

Federal minimum award wages, often referred to as safety net wages, are set each year by the Australian Industrial Relations Commission and also passed on to State award wages. I would like to ask you some questions about how wages are determined in your business about whether the increases in minimum award wages influence your business in any way.

Q11. If (ANSWER AT Q2a > 0) or (ANSWER AT Q2c > 0) or (ANSWER AT Q2d1 > 0). OTHERWISE GO TO Q26

First could I confirm that you employ one or more people other than yourself? Include casual employees but exclude sub-contractors in your answer.

Continue
Go to Q26

Has employees other than self1
Has no employees other than self.....2

FULL TIME EMPLOYEES ASK IF Q2a > 0 and Q11a = 1

Q12a. How many of your (SAY NUMBER IN Q2a) **full time** employees have their wages set at exactly the State or Federal minimum award wage?
(IF ALL (I.E. Q12a = Q2a) SKIP TO Q13)

Q12b. How many have their wages set above the minimum award wage?

Q12c. IF ANSWER IN Q12b > 0 CONTINUE – OTHERWISE SKIP TO Q13

How many of these (SAY NUMBER IN Q12b) **full time** employees who receive over award payments are covered by agreements that provide for automatic pass on of the Safety Net Adjustments?
(IF ANSWER IS DON'T KNOW – SKIP TO Q13)
(IF ALL (I.E Q12b = Q12c) SKIP TO Q13)

<p>Q12d. So can I confirm that the remaining (Q12b – Q12c) full time employees who receive over award payments are not covered by an agreement that provides for automatic pass on of the Safety Net adjustment and it is at your business's discretion whether or not to pass on the adjustment?</p>	<p>Number</p>	<div style="border: 1px solid black; padding: 5px; width: 100%;">Q12b – Q12c</div>
<p>Correct1 Not correct2 Don't know3</p>		

PART TIME EMPLOYEES ASK IF Q2c > 0 and Q11a = 1

<p>Q13a. How many of your (SAY NUMBER IN Q2c) part time employees have their wages set at exactly the State or Federal minimum award wage? (IF ALL (i.e. Q13a = Q2c) SKIP TO Q14)</p>	<div style="border: 1px solid black; height: 30px; width: 100%;"></div>
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<p>Q13b. How many have their wages set above the minimum award wage?</p>	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
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<p>Q13c. IF ANSWER IN Q13b > 0 CONTINUE – OTHERWISE SKIP TO Q14 How many of these (SAY NUMBER IN Q13b) part time employees who receive over award payments are covered by agreements that provide for automatic pass on of the Safety Net Adjustments? (IF ANSWER IS DON'T KNOW – SKIP TO Q14) (IF ALL (i.e. Q13b = Q13c) SKIP TO Q14)</p>	<div style="border: 1px solid black; height: 30px; width: 100%;"></div>
--	---

<p>Q13d. So can I confirm that the remaining (Q13b – Q13c) part time employees who receive over award payments are not covered by an agreement that provides for automatic pass on of the Safety Net adjustment and it is at your business's discretion whether or not to pass on the adjustment.?</p>	<p>Number</p>	<div style="border: 1px solid black; padding: 5px; width: 100%;">Q13b – Q13c</div>
<p>Correct1 Not correct2 Don't know3</p>		

CASUAL EMPLOYEES ASK IF Q2d(2) > 0 and Q11a = 1

<p>Q14a. How many of your (SAY NUMBER IN Q2d(2)) currently employed casual employees have their wages set at exactly the State or Federal minimum award wage? (IF ALL (i.e. Q14a = Q2d(2)) SKIP TO Q15)</p>	<div style="border: 1px solid black; height: 30px; width: 100%;"></div>
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<p>Q14b. How many have their wages set above the minimum award wage?</p>	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
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<p>Q14c. IF ANSWER IN Q14b > 0 CONTINUE – OTHERWISE SKIP TO Q15 How many of these (SAY NUMBER IN Q14b) casual employees who receive over award payments are covered by agreements that provide for automatic pass on of the Safety Net Adjustments? (IF ANSWER IS DON'T KNOW – SKIP TO Q15) (IF ALL (i.e. Q14b = Q14c) SKIP TO Q15)</p>	<div style="border: 1px solid black; height: 30px; width: 100%;"></div>
---	---

Q14d. So can I confirm that the remaining (Q14b – Q14c) casual employees who receive over award payments are not covered by an agreement that provides for automatic pass on of the Safety Net adjustment and it is at your business's discretion whether or not to pass on the adjustment.?	Number	Q14b – Q14c
	Correct	1
	Not correct	2
	Don't know	3

CONTINUE IF NUMBER OF EMPLOYEES WHO RECEIVE OVER AWARD PAYMENTS AND ARE NOT COVERED BY AN AGREEMENT HAVE BEEN IDENTIFIED (i.e. CODE 1 IN Q12d, Q13d OR Q14d). OTHERWISE GO TO Q19.

Q15a. When did your business last review the pay of your full time, part time or casual employees who are paid over award payments are not covered by an agreement that provides for automatic pass on of the Safety Net adjustment?	Month	
	Year	

Q15b. And when do you expect that your business will next review the pay of these employees? <i>(Note to interviewers, if response is DON'T KNOW then prompt by asking how frequently does business review wages. Combine this with date of last review to get an estimate of the date of the next review. Only if this fails record DON'T KNOW).</i>	Month	
	Year	
	Don't know	

Q16a. ASK IF ANSWER AT Q15a AT OR LATER THAN MAY 2003 OTHERWISE GO TO Q17 Thinking about employees that are paid over award wages but are not covered by agreements that provide for automatic pass on of the Safety Net Adjustment. In your most recent wage review in (SAY MONTH AND YEAR FROM Q15a) did your business pass the full 2003 Safety Net wage increase on to all or some of these employees?	Go to Q18	All of them.....	1
	Continue	Some of them.....	2
	Go to Q16e	None of them.....	3
	Go to Q19	Don't know	4

Q16b. IF ANSWER AT Q12d > 0 How many of these (SAY NUMBER IN Q12d) full time over award employees received the full Safety Net wage increase in this way?	
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Q16c. IF ANSWER AT Q13d > 0 How many of these (SAY NUMBER IN Q13d) part time over award employees received the full Safety Net wage increase in this way?	
---	--

Q16d. IF ANSWER AT Q14d > 0 How many of these (SAY NUMBER IN Q14d) casual over award employees received the full Safety Net wage increase in this way?	
--	--

IF ANSWERED CODE 2 AT Q16a GO TO Q18

Q16e. Is your business likely to pass on this safety net adjustment at some time in the future?

Go to Q18	Yes	1
Go to Q19	No	2
Go to Q19	Don't know.....	3

Q17a. **ASK IF BEFORE MAY 2003 AT Q15a IF DON'T KNOW IN Q15b GO TO Q17e**

Still thinking about employees that are paid over award wages but are not covered by agreements that provide for automatic pass on of the Safety Net Adjustment.

In your next wage review in (SAY MONTH AND YEAR FROM Q15b) is it likely that your business will pass on the 2003 Safety Net wage increase on to some or all of these employees?

Go to Q18	All of them.....	1
Continue	Some of them.....	2
Go to Q17e	None of them.....	3
Go to Q19	Don't know	4

Q17b. **IF ANSWER AT Q12d > 0**

How many of these (SAY NUMBER IN Q12d) **full time** over award employees do you expect to pass the 2003 Safety Net wage increase on to?

Q17c. **IF ANSWER AT Q13d > 0**

How many of these (SAY NUMBER IN Q13d) **part time** over award employees do you expect to pass the 2003 Safety Net wage increase on to?

Q17d. **IF ANSWER AT Q14d > 0**

How many of these (SAY NUMBER IN Q14d) **casual** over award employees do you expect to pass the 2003 Safety Net wage increase on to?

IF ANSWERED CODE 2 AT Q17a GO TO Q18

Q17e. Is your business likely to pass on this Safety Net adjustment at some time in the future?

Go to Q18	Yes.....	1
Go to Q19	No	2
Go to Q19	Don't know.....	3

Q18a .IF ANSWER IN Q16a = 1 OR 2

How well do the following statements describe the reasons why your business passed on the 2003 Safety Net wage increase to these employees?

OR

IF ANSWER IN Q17a = 1 OR 2

OR ANSWER IN Q16e = 1 OR Q17e = 1

How well do the following statements describe the reasons why your business expects to pass on the 2003 Safety Net wage increase to these employees?

	Describes Very Well	Describes Somewhat	Does not describe at all	(Don't know)
To maintain wage relativities between employees	1	2	3	4
To maintain the motivation and workplace effectiveness of our employees	1	2	3	4
Because it was close to the wage increase that we would have given other employees	1	2	3	4

b. What other reasons, if any, do you have for (passing on) (expecting to pass on) the Safety Net Wage increases to employees not covered by a Safety Net agreement?

Q19. ASK IF Q12b OR Q13b or Q14b > 0, (i.e. HAVE OVER AWARD EMPLOYEES) OTHERWISE SKIP TO Q20.

Thinking now about all employees that receive over award rates of pay, when reviewing or adjusting the wages of those employees, are the following considerations very important, somewhat important, or not important?

	Very Important	Somewhat Important	Unimportant	(Don't know)
1. The rate of consumer price inflation since the last wage review	1	2	3	4
2. The expected rate of consumer price inflation until the next wage review ..	1	2	3	4
3. The wage that competitors are paying comparable employees	1	2	3	4
4. The wage necessary to motivate employees	1	2	3	4
5. The wage necessary to attractive higher quality employees.....	1	2	3	4
6. The wage necessary to retain good employees and reduce turnover of employees.....	1	2	3	4
7. The rate at which productivity has increased since the last wage review ...	1	2	3	4
8. The rate at which you expect the price of your products and/or services to increase	1	2	3	4
9. The profitability of your business	1	2	3	4
10. Merit and good performance	1	2	3	4

Q20. ASK IF Q12a OR Q13a OR Q14a > 0 (i.e. HAVE EMPLOYEES PAID EXACTLY THE AWARD RATE) – OTHERWISE GO TO Q24		
Could I just check. Over the past three months have you increased, decreased or made no change to the size of your total workforce?	Ask Q21	Increased.....1
	Ask Q22	No change.....2
	Ask Q23	Decreased.....3

Q21a. IF INCREASED IN Q20 Which of the following statements best describes the effect of the 2003 Safety Net wage increase on the decision to increase your workforce?	Go to Q24	The 2003 Safety Net wage increase had no effect on our decision to expand our workforce1
	Ask Q21b	My business would have expanded its workforce by more if there had been no Safety Net wage increase in 2003.....2
	Ask Q21c	My business would have expanded its workforce by less if there had been no Safety Net wage increase in 2003.....3
	Go to Q24	Don't know4

Q21b. How many additional full time, part time or casual jobs would you have created if there had been no Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know.....	X
NOW GO TO Q24		

Q21c. How many full time, part time or casual jobs would have been lost if there had been no Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know.....	X

Q21d. Can I follow up and ask why your business would have expanded its workforce by less?	
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
NOW GO TO Q24	

Q22a. IF NO CHANGE IN Q20 Which of the following statements best describes the effect of the 2003 Safety Net wage increase on your business's decision to keep the size of your workforce constant?	Go to Q24	The 2003 Safety Net wage increase had no effect on my business's decision to keep our workforce constant1
	Ask Q22b	My business would have expanded its workforce in the past three months if there had been no Safety Net wage increase in 20032
	Ask Q22c	My business would have reduced its workforce in the past three months if there had been no . Safety Net wage increase in 20033
	Go to Q24	Don't know4

Q22b. How many additional full time, part time or casual jobs would your business have created if there had been no Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know.....	X

NOW GO TO Q24

Q22c. How many full time, part time or casual jobs would have been lost if there had been no Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know.....	X

Q22d. Can I follow up and ask why your business would have reduced its workforce?

NOW GO TO Q24

Q23a. IF DECREASED IN Q20 Which of the following statements best describes the effect of the 2003 Safety Net wage increase on your business's decision to decrease your workforce?	Go to Q24	The 2003 Safety Net wage increase did not influence my business's decision to reduce our workforce1
	Ask Q23b	If there had been no Safety Net wage increase in 2003 my business would have reduced our workforce by more.....2
	Ask Q23c	The 2003 Safety Net wage increase did influence my business's decision to reduce our workforce3
	Go to Q24	Don't know4

Q23b. How many full time, part time or casual jobs were saved because of the Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know..... X	

NOW GO TO Q23d

Q23c. How many full time, part time or casual jobs were lost because of the Safety Net wage increase in 2003?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	Don't know..... X	

NOW GO TO Q24

Q23d. Can I follow up and ask why your business would have reduced its workforce by more?

<p>Q24a. If you were guaranteed that, over the next 5 years, there would be no Safety Net increases to award wages, which of the following statements best describes the effects that guarantee would have on your business?</p>	Ask Q24b	My business would put on additional employees.....1
	Go to Q24c	My business would not reduce its workforce by as much as it otherwise would have done ...2
	Go to Q31	My business would not change the number of people it employs.....3
	Go to Q24d	My business would reduce the number of people it employs4
	Go to Q31	Don't know5

<p>Q24b. Can I follow up and ask how many full time, part time or casual jobs you would expect to create per year if you were guaranteed that there would be no Safety Net Wage increase for 5 years?</p>	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	NOW GO TO Q24f	

<p>Q24c. Can I follow up and ask how many full time, part time or casual jobs you would expect to save per year if you were guaranteed that there would be no Safety Net Wage increase for 5 years?</p>	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>
	NOW GO TO Q24f	

<p>Q24d. Can I follow up and ask how many full time, part time or casual jobs you would expect to lose per year if you were guaranteed that there would be no Safety Net Wage increase for 5 years?</p>	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>

<p>Q24e. Can I follow up and ask why your business would reduce its workforce?</p>

Q24f. IF Q12a >0 OR Q13a > 0 OR Q14a > 0

Which of the following statements best describes the direct effect that such a guarantee would have on how your business adjusts the pay of employees that are currently paid a wage **exactly equal to the award rate** of pay?

My business would not adjust the wages of any of these employees in line with inflation.....	1
My business would provide some of these employees with wage increases but at a rate less than the rate of inflation.....	2
My business would provide some of these employees with wage increases equal to the rate of inflation	3
My business would provide some of these employees with wage increases greater than the rate of inflation but less than the percentage increase over award employees receive.....	4
My business would provide employees currently on award rates of pay with the same percentage increase in wages as over award employees	5
Don't know	6

NOW GO TO Q31

NOTE : NO Q25 – ALL RESPONDENTS ARE ASKED Q31

CONTINUE IF HAVE NO EMPLOYEES, OTHERWISE GO TO Q31

Q26. IF (ANSWER AT Q11a =2)
 You said you currently have no employees. Has your business ever had any employees? Include both casual and permanent employees in your answer?

Continue	Yes	1
Go to Q29	No.....	2

Q27a. What was the maximum number of people your business employed at any one time?

Q27b. In what year was it that you employed (SAY ANSWER AT Q27a) people?

Year

Q27c. IF 2002 OR 2003 IN Q27b
 And in what month was this?

Month

Q28. Which one of the following best describes the extent to which previous Safety Net wage increases were a factor in your businesses' decision to reduce the number of employees?

A major influence	1
A moderate influence.....	2
A minor influence	3
Not an influence at all	4

Q29. Which one of the following statements describes how likely your business is to take on employees in the future?

Very likely	1
Somewhat likely	2
Unlikely.....	3
Don't know.....	4

Q30a. If you were guaranteed that, over the next 5 years, there would be no Safety Net Adjustments to minimum award wages. Which of the following statements best describes the direct effect this would have on your decision to employ people in the future?	Ask Q30b	Much more likely to employ in the future	1
	Ask Q30b	Somewhat more likely to employ in the future.....	2
	Go to Q31	Would not change my decision about future hiring	3
	Go to Q30c	Would be less likely to employ in the future	4
	Go to Q31	Don't know.....	5

Q30b. Can I follow up and ask how many full time, part time or casual jobs you would expect to create per year?	Full Time	<input type="text"/>
	Part Time	<input type="text"/>
	Casual	<input type="text"/>

NOW GO TO Q31

Q30c. **IF (ANSWER AT Q30a = 4) ASK...**
 Can I follow up and ask why you would be less likely to employ people in the future?

ASK ALL

Q31a. Do the annual increases to the safety net award wages have any effects on your business that you have not already had an opportunity to report on in this questionnaire?	Ask Q31b	Yes	1
	Go to Section 7	No.....	2
Q31b. How would you describe that effect on your business? Would it be... (ALLOW MULTIPLE)	Favourable	1
	Neutral	2
	Unfavourable	3

Q31c. **IF (ANSWER AT Q31b = 1) ASK...**
 What are these favourable effects?

Q31d. **IF (ANSWER AT Q31b = 2) ASK...**
 What are these neutral effects?

Q31e. **IF (ANSWER AT Q31b = 3) ASK...**
 What are these unfavourable effects?

SECTION 7 : CLASSIFICATION

Now, a few questions to help classify your answers. We need to ask these questions even though we asked some of them the last time, just so we can gather the information from one source...

C1 In which year did this business start operating?	<input style="width: 80%; height: 20px;" type="text"/>
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C2 Roughly what is your total annual turnover? Based on last years figures was it...	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Under \$10,000</td><td style="text-align: right;">1</td></tr> <tr><td>\$10,000 to \$30,000</td><td style="text-align: right;">2</td></tr> <tr><td>\$31,000 to \$50,000</td><td style="text-align: right;">3</td></tr> <tr><td>\$51,000 to \$100,00</td><td style="text-align: right;">4</td></tr> <tr><td>\$101,000 to \$500,000.....</td><td style="text-align: right;">5</td></tr> <tr><td>\$501,000 to \$1 million.....</td><td style="text-align: right;">6</td></tr> <tr><td>\$1.1 million to \$2 million</td><td style="text-align: right;">7</td></tr> <tr><td>\$2.1 million to \$5 million.....</td><td style="text-align: right;">8</td></tr> <tr><td>\$6 million to \$10 million</td><td style="text-align: right;">9</td></tr> <tr><td>\$11 million to \$20 million</td><td style="text-align: right;">10</td></tr> <tr><td>Over \$20 million</td><td style="text-align: right;">11</td></tr> <tr><td>(Refused/Don't know)</td><td style="text-align: right;">12</td></tr> </table>	Under \$10,000	1	\$10,000 to \$30,000	2	\$31,000 to \$50,000	3	\$51,000 to \$100,00	4	\$101,000 to \$500,000.....	5	\$501,000 to \$1 million.....	6	\$1.1 million to \$2 million	7	\$2.1 million to \$5 million.....	8	\$6 million to \$10 million	9	\$11 million to \$20 million	10	Over \$20 million	11	(Refused/Don't know)	12
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Over \$20 million	11																								
(Refused/Don't know)	12																								

C3 Approximately what proportion of your total income from all sources does this particular business represent?	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Less than 10 per cent</td><td style="text-align: right;">1</td></tr> <tr><td>Between 10 and 25 per cent</td><td style="text-align: right;">2</td></tr> <tr><td>Between 26 and 50 per cent</td><td style="text-align: right;">3</td></tr> <tr><td>Between 51 percent and 75 per cent</td><td style="text-align: right;">4</td></tr> <tr><td>Between 76 percent and 99 per cent</td><td style="text-align: right;">5</td></tr> <tr><td>100 per cent</td><td style="text-align: right;">6</td></tr> </table>	Less than 10 per cent	1	Between 10 and 25 per cent	2	Between 26 and 50 per cent	3	Between 51 percent and 75 per cent	4	Between 76 percent and 99 per cent	5	100 per cent	6
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Between 10 and 25 per cent	2												
Between 26 and 50 per cent	3												
Between 51 percent and 75 per cent	4												
Between 76 percent and 99 per cent	5												
100 per cent	6												

C3 Would you describe this as a family business?	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Yes</td><td style="text-align: right;">1</td></tr> <tr><td>No</td><td style="text-align: right;">2</td></tr> </table>	Yes	1	No	2
Yes	1				
No	2				

C4 Is your business a franchise?	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Yes</td><td style="text-align: right;">1</td></tr> <tr><td>No</td><td style="text-align: right;">2</td></tr> </table>	Yes	1	No	2
Yes	1				
No	2				

C5a Does this business operate primarily out of your home or out of commercial business premises?	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Ask b</td> <td style="width: 30%;">Home</td> <td style="width: 40%; text-align: right;">1</td> </tr> <tr> <td>Go to C6</td> <td>Business Premises</td> <td style="text-align: right;">2</td> </tr> <tr> <td>Go to C6</td> <td>Other (specify)</td> <td></td> </tr> <tr> <td></td> <td>.....</td> <td></td> </tr> </table>	Ask b	Home	1	Go to C6	Business Premises	2	Go to C6	Other (specify)	
Ask b	Home	1											
Go to C6	Business Premises	2											
Go to C6	Other (specify)												
												

<p>b. And would most of the work done by your firm be done in the home or outside the home – at clients' premises for example?</p>	<p>In the home1 Out of home2 Both.....3</p>
<p>C6. And could you tell me into which of the following age groups you fall? (READ OUT)</p>	<p>30 or under1 31 - 402 41 - 453 46 - 504 51 - 605 Over 60.....6</p>
<p>C7. Are you located in....?</p>	<p>A capital city 1 A major regional centre with a Population of over 250,0002 A provincial city or town with a Population of between 10,000 & 250,0003 A small town or rural area4</p>
<p>C8. RECORD SEX</p>	<p>Male 1 Female 2</p>

