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Research framework and data strategy

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The contents of this paper are the responsibility of the authors and the research has been conducted without the involvement of members of the Minimum Wage Panel of Fair Work Australia.

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- Australian Chamber of Commerce and Industry (ACCI);
- Australian Industry Group (Ai Group);
- Australian Council of Social Services (ACOSS);
- Australian Council of Trade Unions (ACTU);
- Australian Government; and
- State and Territory governments.

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Contents

Executive summary	i
The national economy theme	i
The workplace theme	iii
The safety net theme	iii
1 Introduction	1
1.1 Background and context.....	1
1.2 The underlying economic model of minimum wages.....	3
1.3 The dissenting views of Card and Krueger and Mr Blair.....	4
1.4 The Australian minimum wage system	5
2 The national economy	6
2.1 Overview	6
2.2 Relevant provisions of the <i>Fair Work Act 2009</i>	6
2.3 Research framework.....	6
2.4 Supporting research evidence under the national economy theme	7
2.4.1 Employment effects—aggregate evidence	7
2.4.2 Employment effects—complementary evidence.....	9
2.4.3 Price effects	10
2.4.4 Productivity and related effects	11
2.4.5 Other effects and miscellaneous studies	13
3 The workplace	15
3.1 Overview	15
3.2 Relevant provisions of the <i>Fair Work Act 2009</i>	15
3.3 Research framework.....	16
3.4 Supporting research evidence under the workplace theme.....	17
3.4.1 Quantitative studies.....	17
3.4.2 Qualitative studies	19
4 The safety net	24
4.1 Overview	24
4.2 Relevant provisions of the <i>Fair Work Act 2009</i>	24
4.3 Research framework	25
4.4 Supporting research evidence under the safety net theme	26
4.4.1 Reliance.....	26
4.4.2 Wage inequality	29
4.4.3 Household income, living standards and needs	32

4.4.4	Work incentives and labour supply.....	35
4.4.5	Employment dynamics and mobility.....	36
4.4.6	Other evidence.....	37
5	Data strategy	39
5.1	Introduction	39
5.2	Overview of types of evidence and methodologies	39
5.2.1	Quantitative evidence.....	39
5.2.2	Qualitative evidence	42
5.2.3	Evidence from experimental data.....	43
5.2.4	Evidence from mixed data sources	44
5.3	Major Australian data sources for setting minimum wages.....	44
5.3.1	Household Income and Labour Dynamics in Australia (HILDA) Survey	45
5.3.2	Survey of Employee Earnings and Hours	46
5.3.3	Labour Force Survey and Labour Force Supplementary Surveys.....	49
5.3.4	Survey of Income and Housing and Household Expenditure Survey	51
5.3.5	Survey of Education and Training.....	52
5.3.6	Business Longitudinal Database	53
5.3.7	Other Australian data sources.....	54
5.4	Gaps in understanding and avenues for new data collection	55
5.4.1	Linked Employer-Employee Datasets (LEED)	55
5.4.2	Federal and state government administrative records.....	57
5.4.3	Minimum wage evaluation in the United Kingdom	57
	References.....	59
	Appendix tables.....	67

List of abbreviations

ABS	Australian Bureau of Statistics
AFPC	Australian Fair Pay Commission
BHPS	British Household Panel Survey
BLD	Australian Bureau of Statistics Business Longitudinal Database
CPI	Australian Bureau of Statistics Consumer Price Index
CPS	United States Current Population Survey
CURF	Confidentialised Unit Record File
EEBTUM	Survey of Employee Earnings, Benefits and Trade Union Membership
FW Act	<i>Fair Work Act 2009</i>
FMW	Federal Minimum Wage
HILDA	Household Income and Labour Dynamics in Australia Survey
HES	Australian Bureau of Statistics Household Expenditure Survey
INR	income-to-needs ratio
LFS	Australian Bureau of Statistics Labour Force Survey
LPC	United Kingdom Low Pay Commission
LPI	Australian Bureau of Statistics Labour Price Index
MPHS	Multi-Purpose Household Survey
NMW	National Minimum Wage
OECD	Organisation for Economic Cooperation and Development
RFDS	Research framework and data strategy
SEEH	Australian Bureau of Statistics Survey of Employee Earnings and Hours
SET	Australian Bureau of Statistics Survey of Education and Training
SIH	Australian Bureau of Statistics Survey of Income and Housing
UK NMW	United Kingdom National Minimum Wage
WRA	<i>Workplace Relations Act 1996</i>

Executive Summary

The national economy theme

Standard economic theory, based on the neo-classical model of competitive labour markets, predicts that there will be negative employment effects from setting minimum wages. Time-series empirical evidence based principally on aggregate data, some originating from the Organisation for Economic Cooperation and Development (OECD) and focusing particularly on teenagers, generally supports the theory with estimates of statistically significant negative employment elasticities. More recent micro-economic empirical studies of the economy-wide effects of minimum wages have been more qualified, however, and their evidence is neither strong nor unambiguous, the different results being primarily driven by the additional pertinent information contained in the individual-based micro data. Where researchers have managed to find data that allow natural experiments to be undertaken with respect to minimum wages, the dominant view is that negative employment effects are concentrated on specific product markets (intensely competitive ones, such as restaurants) and on more vulnerable groups of workers that are likely to be targeted by social inclusion policies, including youths, women, workers with a disability, immigrants, mature-aged workers, and workers with low education/skills. Studies for the United States feature heavily in this body of evidence, because of the ability to design natural experiments around the variation in state minimum wage levels and the timing of increases.

There are likely to be numerous reasons why the existing empirical literature does not find uniformly strong negative employment effects consistent with the standard economic theory of minimum wages. First, minimum wages may be set through a process that is mindful of their potential negative employment effects, rather than being determined exogenously. In Australia, the minimum wages and modern awards provisions of the *Fair Work Act 2009* (FW Act) require that these effects be taken into account by the Minimum Wage Panel (the Panel) of Fair Work Australia. Second, any negative employment effects may be concentrated in a few segments of the economy, and consequently masked by other offsetting changes occurring in the wider workforce. Third, the predicted employment effects may simply be too weak to trace in conventional models, or non-existent. Finally, data limitations apply. The latter is a key consideration in Australia, where very little work has been done to assess the employment effects of minimum wages at the micro-economic level; for instance, by tracking lay-offs, new hires, changes in working hours and types of employment contracts, and substitution of high-skilled for low-skilled labour in the production process. The mixed international evidence on minimum wages suggests that these types of effects should be examined and monitored over time in the Australian context, as soon as appropriate data become available.

Minimum wage adjustments can also prompt employers to change their price settings. Price rises that occur in response to minimum wages have implications both for the performance and competitiveness of the national economy and for business competitiveness and viability. Economic theory predicts that, in a competitive product market, the cost to employers of increasing minimum wages will be fully passed on to consumers in the form of higher product prices, as there are no profit margins to be cut. This theoretical prediction is supported by several empirical studies that find evidence of price rises in competitive settings, particularly in the restaurant industry, following minimum wage increases in the United States, United Kingdom and France. In such settings, price increases often occur only after some time lag, rather than following immediately from a minimum wage increase.

A theoretical alternative to price increases is reduced profit margins, but this will be possible only for firms that exercise a degree of monopolistic power. Hence, profit effects are difficult to observe and there is very little empirical evidence. Both the price and profit effects assume continuity of business. It is also possible that very marginal businesses cease trading as a result of minimum wage increases, leading to reduced total production and lower employment, but direct evidence on this issue is rare.

There is the possibility that the price, profitability and business-closure effects of minimum wages are stronger in Australia than in other countries, because it is likely that more of the workforce is minimum wage-reliant. As with the literature on employment effects, however, the quality of empirical evidence is hampered by a lack of suitable workplace-level data. The variation between firms in the proportion of the wages bill represented by minimum wage-reliant employees could perhaps be used to test for differences in price and profit effects. The main lessons from the international literature are the need to differentiate between different types of market structure, isolate the minimum wage adjustment effect and allow for time lags when testing for these effects.

Minimum wage adjustments also have the potential to bring about productivity changes that ultimately affect national economic performance, business viability and social inclusion. As with the evidence on price effects, however, the lagged nature of these responses may be difficult to measure and tie to the adjustment of minimum wages.

On the employer side, higher minimum wages may prompt the removal of inefficient work practices through a hypothesised (but little tested) 'shock' effect. The contention is that the higher minimum wage can motivate productivity-enhancing change, although why profit-maximising employers should require external stimulus to remove existing inefficiencies in their workplaces is not well explained. Minimum wage increases may also cause substitution effects, whereby employers replace unskilled workers either with skilled workers (whose labour has become relatively less expensive as a result of wage compression due to the higher minimums), or with labour-saving technology. With respect to the capital-for-labour substitution effect, a significant branch of recent inequality research in the United States has suggested that falling real wages at the bottom of the distribution are the result of unskilled jobs being replaced by microcomputers. Employers may also alter their use of training programs in response to minimum wage increases, as a means of raising the productivity of their current workers.

On the employee side, minimum wages may improve productivity if they increase input of effort and reduce the incentives for shirking. (This will also benefit the employer indirectly if it reduces the need for close monitoring of employee performance.) Minimum wages may affect the appeal of education and training in complex ways. A higher minimum wage can encourage the unemployed and other members of groups targeted by social inclusion policies to increase their investment in education in the hope of securing a minimum wage job and escaping welfare dependence. Conversely, a higher minimum wage may induce some current minimum wage recipients to abandon or postpone training, since the opportunity cost of training has become higher relative to the rewards for working (provided that the working hours offered by their employers do not also fall when the minimum rate of pay rises).

The international evidence on many of these productivity-related effects is underdeveloped, with mixed findings about the effects of minimum wages on education and training participation. There are frequently problems with the definition or measurement of key variables, and establishing a link to minimum wage increases. The Australian evidence is in its infancy and studies that investigate responses to minimum wage increases in the form of efficiency wage or shock effects are yet to be carried out in Australia.

There is scope for more work on comparisons of minimum wage regimes in different countries. These can provide evidence on the extent to which variations in the bite of minimum wages as expressed by the Kaitz index and other measures have different effects on employment or on particular groups and sectors. The effectiveness of particular administrative arrangements and the impact of tighter sanctions on non-compliance can also be considered.

The workplace theme

It is important to recognise that only some firms will have minimum wage-reliant employees (or a proportion of their workforce minimum wage-reliant) and the remaining firms will not be directly affected by minimum wage adjustments. The awards system in Australia means that the proportion of firms with some minimum wage-reliant employees is likely to be higher than in most other countries, but there is little evidence at present on the exact number of Australian firms in the two categories.

Studies in a number of countries suggest that minimum wages can harm the employment prospects of young workers, though there is no evidence that minimum wages are detrimental to training provision. A lack of data similar to that available in some other countries means that comparable research is lacking in Australia.

In the United States, business location decisions can be examined by comparing data from bordering states where different minimum wage regimes are in operation. Living wage ordinances in some locations also allow researchers to compare establishments that are obliged to pay a living wage with those which are free of such an obligation. Given the breadth of federal award coverage, these circumstances in practical terms do not apply in Australia.

The response of firms to minimum wages adjustment appear to be diverse or heterogeneous, with some employers, for example, adopting a core-periphery approach in which some key workers are drawn closer into the firm by appropriate personnel strategies, while others are let go.

Qualitative studies suggest that, in many cases, minimum wage adjustments do not create a major shock for employers and are regarded as only one of a number of pressures facing firms. Such studies point to a diversity of approaches to dealing with minimum wage adjustments depending on the size of firms and the characteristics of the industries in which they operate. However, when action is taken, reducing labour costs appears to be a primary response to all cost increases/revenue decreases, including minimum wage increases.

In general, the qualitative research results seem to be in line with the predictions of economic theory, although firms may respond by making changes that affect all their employees rather than just those directly affected by the minimum wages increase. Studies which examine particular groups occur infrequently, but those examining the disabled suggest that there is a need for additional information.

The safety net theme

The body of research investigating Australian minimum wages coverage is dominated by studies of the lowest-paid workers, i.e. those near the previous Federal Minimum Wage (FMW) or those meeting a generic definition of 'low pay', such as two-thirds of median earnings. Studies of the low paid in Australia will include employees who are paid above minimum wages levels and exclude other employees who are minimum wage-reliant. This body of work includes numerous descriptive and regression-based studies of low-paid workers' characteristics, and a small number of studies of their employment dynamics and advancement prospects over time. These studies are clearly relevant to the criterion of *relative living standards and the needs of the low paid*, but are not relevant to consideration of the breadth of the safety net's coverage, because minimum wages in Australia are not set only for the lowest-paid workers.

A few recent studies have begun to investigate the wages and other attributes of the entire population of 'minimum wage-reliant' employees, but this work is relatively underdeveloped and constrained by data limitations. Consequently, there is little evidence about the costs and benefits of maintaining minimum wages for employees in the Australian context. The Panel acknowledged this feature of the Australian system in its 2010 Annual Wage Review decision, by noting that 'employees on award wages that are above [conventional low pay thresholds, such as the bottom quintile of the wage distribution] can be considered to be low paid in a different sense' (Fair Work Australia, 2010a, pp.58–59).

Examples of the important issues about which current understanding is poor are: (1) how does the maintenance of the higher award minimum rates of pay affect career progression, and thus relative living standards and the needs of the low paid?; (2) what are the experiences of wage increases and relative living standards for employees who rely on award wages persistently, compared to those who move between pay-setting methods?; (3) how close are the wages of employees who rely on higher award rates to those of other (overaward) workers doing similar jobs?; and (4) what would the effects of narrowing pay differentials be for bargaining incentives, and perceptions of fairness?

Largely due to data limitations and inconsistencies, the evidence about minimum wage reliance and its consequences has not been developed as much as would be desired for the three groups of employees mentioned in relation to the Panel's responsibility for *providing a comprehensive range of fair minimum wages* (i.e. juniors, employees with a disability, and employees to whom training arrangements apply). The Australian Bureau of Statistics (ABS) Survey of Employee Earnings and Hours (SEEH) provides cross-sectional evidence about minimum wage reliance for junior employees. There is also substantial evidence about progression from low-paid employment. But there is little understanding at present about the transitions that individual employees in these three particular groups make through jobs (and pay-setting methods) over time, and how these changes affect their *relative living standards and needs*.

Such detailed, longitudinal research is important, given the evidence from international studies that extended periods of low-wage employment: (a) are more likely to be concentrated among disadvantaged groups, including people with low educational attainment and people with previous unemployment spells; and (b) may produce significant 'scarring' effects, including reduced labour supply (because of lower wages), reduced training and skills acquisition, and reduced labour market experience and tenure. If these outcomes occur to the same extent in Australia as in the other countries previously examined, they would be likely to impede the goal of *promoting social inclusion through increased workforce participation* for the demographic groups at greatest risk of prolonged labour market disadvantage. At present, there is little empirical research on the link between social inclusion and minimum wages in Australia, although work has been done to survey the literature and to understand the determinants (not including wage rates) of poor labour force attachment for youths. It is not yet known whether there are any negative effects associated with long-term minimum wage reliance for Australian employees who are higher paid but still minimum wage-reliant.

A large body of empirical studies illuminates the *relative living standards and the needs of the low paid* by examining the effect on overall and between-group wage inequality of changes in minimum wage coverage, levels and rates or frequency of adjustment. There is substantial evidence from cross-country comparisons, before-and-after studies, and studies of different wage-setting arrangements within countries, that overall wage inequality is lower in more centralised systems. There is also significant evidence to suggest that relative wages are higher for groups of workers whose wages are typically low compared with the male average wage—including women, youths, immigrants, part-time workers and employees without post-school qualifications—in places where wage-setting is more centralised. However, studies for the United Kingdom suggest that the National Minimum Wage (UK NMW) had only a modest effect on closing the gender pay gap. These empirical conclusions provide a background to

interpreting the *relative living standards and needs* criterion in the Australian context. To the extent that women's wages are improved relative to men's wages as a result of the safety net's operation, these wage inequality studies also provide evidence relevant to the criterion of *equal remuneration for work of equal or comparable value*. The conclusions on this subject require similar caveats to those on wage inequality in Australia more generally, however, because of the difficulty of establishing that jobs or types of work are 'of equal or comparable value'. The challenge here is partly related to data limitations, which leave many differences between men and women unobserved, but more important still are the subjective judgments that comparisons of work 'value' necessarily entail.

Since the early 1990s, Australia has moved from a centralised wage-setting system based largely on arbitrated awards (but with widespread informal overaward bargaining), to a much more formally decentralised system in which an award 'safety net' coexists with collective and individual forms of agreement-making. Since the formal award safety net was established, two important and opposing trends have occurred: the structure of award rates of pay has become more compressed—as a result of flat dollar increases as opposed to percentage increases—while wage inequality has increased in the Australian workforce generally. These contrasting trends have led to a variant of the 'swimming upstream' phenomenon, whereby wages have become more equal within the award-reliant sector of the workforce only as the award-reliant sector as a whole has fallen behind the rest of the market. What is not fully understood at this stage, because of data deficiencies, is whether these contrasting trends reflect growing differences between the minimum wage-reliant group of employees and other employees, or whether inequality has also increased between otherwise similar employees who differ only in terms of how their pay is set.

A variety of studies relating to household income, expenditure, financial stress and budget standards also contribute to an understanding of *relative living standards and the needs of the low paid*. Several studies conclude that when low-paid workers are placed within their household and compared with an equivalent (size-adjusted) income distribution that includes all Australian households, they are often found not to belong to the lowest-income households. The conclusion reached by most authors of these studies in Australia, and other countries, is that minimum wages are a poor instrument for helping the poor, because of the imprecise targeting of their benefits and because of their (often presumed) negative employment effects. Another inference that can be taken from these studies is that Australia's high (by international standards) level and coverage of minimum wages, combined with generous social welfare entitlements and a high prevalence of multiple-income households, have kept most low-paid workers from living in poverty. While only one study has provided equivalent household income data for the whole group of 'minimum wage-reliant' employees, its evidence confirms the expectation that these workers will be better off (on average) than the lowest-paid workers, because minimum wages in Australia are set for (and relied upon by) workers whose earnings place them well above standard definitions of 'low pay'.

Although these studies have generated much useful information about *relative living standards and the needs of the low paid*, the international research literature suggests a number of further ways in which the Australian evidence could be developed. First, it would be useful for studies to examine differences in needs within the minimum wage-reliant group. In the United States, for instance, poverty is much more prevalent among sub-groups of minimum wage workers, such as youths and high school dropouts, than is suggested by the average evidence for all minimum wage recipients. Second, there may be scope for experimenting with alternative definitions of 'needs'. In the United States, again, there have been numerous studies that relate household incomes directly to poverty lines (varied by household composition) to estimate so-called 'income-to-needs' ratios. Australian researchers have begun to employ a broader array of measures, such as combinations of low income, low expenditure, and low household wealth, to deepen understanding about 'needs'. This line of research can also be seen as adding to existing knowledge about the connection between minimum wages, disadvantage, and social

inclusion. A final, and perhaps the most challenging, requirement is for studies that include estimates both of the potential benefits (in higher incomes) and costs (in lower employment) resulting from minimum wage adjustments. Such studies may be inhibited, in the short run, by data limitations, but this research direction appears to hold the greatest potential for improving understanding, both of *relative living standards and the needs of the low paid* and the impact that minimum wages ultimately have in *promoting social inclusion through increased workforce participation*.

1 Introduction

1.1 Background and context

Minimum wages are an important economic and social policy instrument in most Western countries. Their purpose is primarily one of equity and fairness. The idea behind minimum wages is that society provides a guarantee that nobody who enters the paid workforce earns less than the minimum wage. The level of the minimum wage varies across countries, over time and, in some cases, across categories of employees. Its level (or levels) reflects the prevailing social norms and economic constraints and circumstances. The primary effect of minimum wages is to reduce the inequality of wages at the low end of the distribution. Like many labour market policies, however, the setting and implementation of minimum wages involve trade-offs and produces a host of other effects. The following three examples illustrate some of the complexity involved in thinking about minimum wages and how they interact with other policies.

Minimum wages introduce a principal labour market dilemma. While they reduce the inequality of wages, they may, through negative employment effects, fail to reduce or potentially increase the inequality of incomes, and could affect national productivity and the employment rate. The trade-off between equity and productivity concerns is contested in this context. Further complexity is introduced by the fact that, across countries, there are marked differences in relation to the objectives that guide minimum wages determination, their levels for specific groups such as junior workers and the disabled, their processes for implementation and adjustment, the agencies involved, and sanctions for non-compliance.

Minimum wages may be confused with and confuse social policies designed to combat low household income and poverty, including child poverty. We know that there are many minimum wage recipients with family incomes well above the poverty line, just as there are likely to be some employees paid above minimum wages whose family incomes are below the poverty line. Operating alongside strong social welfare arrangements and an interventionist tax and transfer system, minimum wages can produce complex interactions. It is necessary to consider the impact of minimum wages in combination with other policies that affect the relative living standards and needs of the low paid, such as in-work benefits, including wage subsidies, and social security taxes.

Minimum wages are also likely to influence wage bargaining processes. Amidst the diversity of contemporary workplaces and working arrangements, the traditional model of employers versus unions will not apply as strongly as it once did. In many cases, alternative methods of bargaining are emerging and these demand special considerations. Furthermore, the number and diversity of minimum wages that are set in Australia through modern awards implies that there will be consequences for bargaining processes and the wider national labour market beyond that for countries with a single minimum wage.

Although these examples only touch on the complexity and diversity of the issues surrounding minimum wages, they illustrate that core concepts of economic and social equity and fairness have to be combined with other concepts of economic efficiency and national productivity in order to strike a balance between the diverse views of stakeholders.

Almost three-quarters of European Union member states have some form of statutory minimum wage, and the remainder tend to impose wage floors through collective bargaining. In the United States, different states impose their own minima in addition to the FMW. This diversity enables researchers to analyse the effects of different policies on labour market outcomes in a way which is not possible with single-country studies. For example, to what extent does setting the level of the minimum wage high or low—either in absolute terms, or as a proportion of average earnings, or affecting different proportions of the workforce—impact on the wage distribution in different countries? Comparisons can be made using

the Kaitz index, which measures the minimum wage as a proportion of average earnings. For example, in Europe in 2004 this index ranged from 29 per cent in Romania to 51 per cent in Ireland. The beneficiaries of minimum wages may also vary according to whether workers are in the public or private sector, according to the age of the workers, and according to their disability status or even region of employment.

The objectives of Australian minimum wage policy have been defined by legislation, in the FW Act. The National Institute of Labour Studies has been commissioned by Fair Work Australia to provide external research to inform the development of a Research framework and data strategy (RFDS) that will assist in informing how individual pieces of research sit within the broader research framework. In preparing the RFDS, we have had to weigh the available national and international evidence and evaluate its relevance whilst identifying the most prominent and pertinent research gaps.

The development of the RFDS consists of the following sections:

We begin with a brief outline of the standard neoclassical economic model of minimum wages. We consider this to be essential background understanding, as it illustrates the core underlying incentives and conflicts involved in setting minimum wages. We provide some contextual information relevant to the Australian history of minimum wage determination.

We continue with the identification of research issues or questions that are most relevant to the minimum wage-setting functions of Fair Work Australia. These functions are given in two key objectives of the FW Act, the 'minimum wages objective' (s.284) and the 'modern awards objective' (s.134). We translate the legislative requirements of the FW Act into a framework of issues relevant to minimum wage research. The ultimate objective is to inform the development of a forward program of specific research projects based on an understanding of the work that has gone before and how different pieces of research are related.

We identified the relevant research output from a range of sources and disciplinary perspectives, using the broadest range of data sources and analytical methodologies. We included in the scope of our search many published papers, some recent unpublished papers, all reports commissioned or undertaken by the Australian Fair Pay Commission (AFPC) from 2006 to 2009, and all reports subsequently commissioned or undertaken by Fair Work Australia (except in some cases where versions of these reports later appeared in refereed journals). We also included the papers presented at the Minimum Wage Research Forum hosted by the AFPC in October 2008. Our search for other published research was carried out in the major bibliographic databases, Scopus and EconLit. We searched mainly for studies that had 'minimum wage' or its variants, including 'arbitration' for Australian studies, in the title, abstract, or keywords. The international minimum wage literature is vast, comprising thousands of published studies. We therefore focused on more recent studies, generally meaning those published since 2000, although some earlier papers were included if we considered these especially valuable. From the (still-large) post-2000 literature, we sought to identify the seminal contributions, using a combination of citation counts, place of publication (with preference to higher-ranked journals), and our judgment about the study's merit, based on data, methodology, and novelty of the findings. Our focus is on empirical studies. Papers that are exclusively theoretical in content—i.e. those that develop models of behaviour without testing these against data—were generally excluded from our review of the evidence.

In sections 2, 3 and 4, we use the chosen literature to assess the current knowledge in the areas relevant to the applicable provisions of the FW Act. We discuss the national and international findings and evaluate the extent to which these provide useful, pertinent and complete answers to questions relevant to the Australian minimum wages context. The project brief did not call for a comprehensive review of the literature, but for the development of a research framework that would assist in understanding how

discrete pieces of research could complement each other in informing discussion of minimum wage issues. The challenge was to be inclusive of the diversity of research material, but selective in terms of which specific studies were discussed.

Our organisation of the research evidence is divided into three 'themes'. These were chosen as representing the scope of the existing evidence and also the criteria for minimum wage setting under the FW Act. The national economy theme considers the role and significance of minimum wages in the performance of the national economy and developments in key labour markets. The focus here is aggregate-level and time-series evidence for the economy as a whole and for particular industries. The workplace theme covers the role and significance of minimum wages in workplace-level structures and performance. The safety net theme refers to the impact of minimum wages coverage, levels and increases on the safety net for employees. The focus here is micro-economic data for individuals and households.

At each of these levels of analysis, we are interested not only in the impact of minimum wages, but also their significance within the wider array of factors influencing outcomes for the economy, workplaces and employees outside the control of Fair Work Australia. There is necessarily some overlap between these three research themes, because of the multifaceted nature of minimum wages and their effects. Notwithstanding this overlap, we believe the division into themes is useful and necessary for organising the material presented here and facilitating an understanding of it. For reference, Appendix Tables 1, 2 and 3 list the studies that we refer to and discuss in this report as supporting evidence under each of the three research themes.

In section 5, we present a data strategy that appraises the data available for addressing the issues identified in the research framework. The data strategy reviews existing data availability, identifies where significant gaps exist in current data collection, and explores strategies for remedying these data gaps in the medium term.

1.2 The underlying economic model of minimum wages

Minimum wages continue to be an area of disagreement in many parts of public life. This is not surprising, as their workings and outcomes can be complex in economic, political and social terms. Minimum wages have economic consequences. It has been argued that getting it wrong, by paying too little, can result in adverse economic and social outcomes. It has also been argued that paying too much can have detrimental economic and social outcomes. Both views are correct, up to a point. It has been argued that minimum wages can be used as a policy instrument against poverty, inequality and to promote fairness in the workplace. But the validity of these arguments is not universally accepted. Notwithstanding disagreements about the workings of minimum wages, 17 of the 29 OECD countries had some form of minimum wage in 1998, and the United Kingdom and Ireland have introduced their own since (in 1999 and 2000 respectively). We begin with an outline of the theoretical foundations that will guide our thinking.

The neoclassical and the Keynesian models offer different views on minimum wage policies. Keynes argued that a change in money wages can change real income and employment as well as money income and the price level, although in practice he accepted that a rise in minimum wages was likely to have a modest negative employment effect. The implication is that an increase in minimum wages is not likely to have a major equilibrium employment effect. By contrast, the neoclassical view simply presumes that a rise in minimum wages will have a clear negative employment effect, and suggests that the monopsonistic case is an exception. This report takes the pragmatic view that the neoclassical and Keynesian theories posit the same negative employment effect, and that the outcomes are difficult to establish at the empirical level. This has become apparent in the development of the minimum wage literature.

The neoclassical view on minimum wages is represented by Stigler's (1946) seminal paper. Stigler examined the effect of a minimum wage rise, stressing that it matters mostly to those with the lowest productivity, in particular the workers whose productivity is lower than the new level of the minimum wage. In the eyes of their employer (and a competitive market) these workers are not employable any more unless something is done. Stigler saw two main solutions. First, these workers could be made unemployed, and this would be the most rigid interpretation of the neoclassical model. Second, the productivity of these workers could increase to a level that lies above the new minimum wage, in order to make them employable again. This could be achieved either by the workers increasing their effort level or by the workers receiving training which would increase their productivity whilst retaining the same effort levels. Stigler's analysis implies that increased effort levels and/or training are costly activities that were not optimal for these workers at the previous (lower) minimum wage level, but may become optimal at the new level, because the alternative of not undertaking them may be unemployment. Stigler's analysis suggests that whether a lay-off, or an increase in the effort without further training, or an increase in training without a change in effort (or a mix of the two) follows a minimum wage rise will ultimately depend on the prevailing production technologies and the market structure facing the employer. Stigler recognised at that early time the important distinction between monopsonistic and competitive markets in the context of minimum wage effects, but did not take this to its logical conclusion (Card and Krueger would do that almost five decades later). Stigler (1946, p.361) concluded that, regarding the implementation of a national minimum wage in the United States, 'a uniform NMW, infrequently changed, is wholly unsuited to these diversities of conditions', a recommendation that still resonates as very topical regarding the setting of Australian minimum wages.

Stigler (1946) provided further valuable insights regarding the workings of minimum wages, including the importance of distinguishing between hourly and annual earnings, the importance of examining family incomes and not only individual wages, and the importance of income from sources other than paid employment. Further, he noted that the minimum wage may not be an appropriate instrument for combating poverty, expressing his preference for negative income taxes as more equitable and more efficient interventions. A practical limitation of Stigler's model is that he assumed that markets would work unhindered to provide their predicted (competitive) market outcomes. Hindsight allows us to understand that this is not always the real-life outcome. Despite the clear implications arising from Stigler's work regarding the possibility that the employment effect of minimum wages could be limited, most work for the next four decades focused on the neoclassical model's prediction that (other things being equal) increases in minimum wages will cause employment rates to decline.

1.3 The dissenting views of Card and Krueger and Mr Blair

There were two main catalysts for change in the research on minimum wages in the Western economies after Stigler's work. The first was the path-breaking work of Card and Krueger (1995), who challenged the received wisdom of a definite *negative* causal relationship between minimum wages and employment levels. Their work was received with enormous interest, caused a lot of controversy and motivated a new strand in the literature. Although there are still many economists who do not fully accept the findings of Card and Krueger, the breadth of the work that was stimulated by their book has started doing justice to the diversity of the empirical problem of understanding how minimum wages work.

The second major catalyst was the 1999 introduction of a NMW in the United Kingdom by Mr Blair's government. This has provided a new and fertile testing ground for minimum wage effects, because of the high quality of the United Kingdom's economic and social research and the availability of extensive relevant labour market data. The introduction of the Low Pay Commission (LPC) was a major event in the proliferation of research in this area. It is by now clear that the emerging United Kingdom applied economic and social research program is proposing and supporting a policy alternative to the market-

oriented, neoclassical view of minimum wage effects. This alternative was forcefully debated in the 2008 Minimum Wage Research Forum organised by the AFPC, in which eminent international economists discussed the two contrasting models and agreed to disagree.

1.4 The Australian minimum wage system

Although the origins of the Australian minimum wage system can be traced back to pre-Federation industrial disputes, and nationally to the very start of the federal arbitration system in the early 20th century, a single national minimum wage (supplementing award minimum wages) was first introduced with the shift to the use of the corporations constitutional head of power in the 2006 amendments to the *Workplace Relations Act 1996* (WR Act).¹ A distinctive and defining feature of the Australian system is that minimum rates of pay are predominantly determined by the awards system, which sets a range of occupation-specific and industry-specific minimum rates of pay in addition to the national minimum wage. As well as introducing additional complexity, this feature of the Australian system complicates the interpretation of the operation of the system. It also makes the Australian minimum wages system much more significant for the national economy than is the case for minimum wages in other Western economies.

Given the diversity of actual conditions in which minimum wages are set, and the possibility that these conditions differ in important ways from the competitive labour market represented in the standard economic model, it has been widely accepted that the effects of minimum wages for individual employees, households, employers and the national economy are ultimately matters requiring careful empirical investigation. Complete and robust empirical answers need extensive and reliable data, and considerable statistical and econometric resources, for their analysis, which are not always available. Our report has been built on this understanding, seeking guidance from the underlying economic models where appropriate.

¹ Note that previous references to a federal or national minimum wage in Australia referred to the C14 classification rate of pay in the then Metals Award. This rate of pay had no application beyond the specific award coverage and many awards contained minimum classification rates of pay below the C14 rate. The WR Act amendments in 2006 raised previous minimum rates of pay in Australian Pay and Classification Scales (derived from award rates of pay) that were below the new FMW to that level.

2 The national economy

The role and significance of minimum wages in the performance of the national economy and developments in key labour markets.

2.1 Overview

The research conducted under the national economy theme focuses on the relationship between minimum wages and macroeconomic performance. The outcomes of interest are monitored on most occasions at highly aggregated levels of activity, either for the whole economy or for particular sectors or groups that are known to be strongly affected by minimum wage decisions.

The main questions are whether changes in minimum wages have any detectable influence on:

- employment (measured by labour force participation, employment and unemployment rates, especially among groups who are the targets of social inclusion policies);
- inflation (measured by changes in prices and influencing performance and competitiveness at the national and individual business level); and
- productivity (measured through education and training as well as workplace productivity).

2.2 Relevant provisions of the *Fair Work Act 2009*

The minimum wages objective at section 284(1) of the FW Act states that Fair Work Australia must establish and maintain a safety net of fair minimum wages, taking into account:

- Section 284(1)(a) the performance and competitiveness of the national economy, including productivity, business competitiveness and viability, inflation and employment growth; and
- Section 284(1)(b) promoting social inclusion through increased workforce participation.

The modern awards objective at section 134(1) of the FW Act states that Fair Work Australia must ensure that modern awards, together with the National Employment Standards, provide a fair and relevant minimum safety net of terms and conditions, taking into account:

- Section 134(1)(c) the need to promote social inclusion through increased workforce participation; and
- Section 134(1)(h) the likely impact of any exercise of modern award powers on employment growth, inflation and the sustainability, performance and competitiveness of the national economy—only insofar as it relates to the adjustment of minimum wages.

2.3 Research framework

Minimum wages interact in complex ways with *the performance and competitiveness of the national economy* and the goal of *promoting social inclusion through increased workforce participation*. When minimum wages are set or increased, there may be responses from employers and employees that lead to important changes in workforce participation patterns, employment and unemployment rates, prices, education and training participation, and business viability. There are likely to be differences in the size and importance of these responses across different sectors of the economy, and for different groups of workers affected by minimum wages. A large number of empirical studies, many of them discussed in the subsequent sections, have attempted to exploit these differential effects to estimate the consequences of minimum wage adjustments, but very little of this evidence is focused on Australia. A general limitation of macroeconomic analyses of minimum wage effects is the difficulty of disentangling them from

the multitude of other variables that influence macroeconomic performance over time. An important complication for data collection and analysis in the Australian context is that minimum rates of pay are set throughout the distribution and there is little evidence of bunching at the level of the NMW. Another issue is that Australian minimum wage increases are made on a reasonably predictable annual basis. This makes the evaluation of their effects more complex than in the United States, where for much of the past two decades increases have been sporadic, because some expectation of future minimum wage rises may be already 'factored into' Australian employers' decision-making, wage-setting, and labour management practices.

2.4 Supporting research evidence under the national economy theme

2.4.1 Employment effects—aggregate evidence

The employment effect of minimum wages has been a contentious area for decades. Economic theory does not predict unambiguous results and there is no unanimity about the most appropriate theoretical framework for testing. It is now widely (and sometimes reluctantly) accepted that finding the effect of minimum wages on employment is largely an empirical question, and one that we know can produce different answers depending on the specific setting where it is asked and the method and data used to estimate any effects.

The earlier theoretical understanding about minimum wages comes from Stigler's (1946) paper, which we presented in the Introduction. We will not repeat the workings of the model here, but the principles are used as the foundation for evaluating the evidence we look at.

Earlier evidence generated the received wisdom that higher minimum wages cause a negative employment effect. For example, OECD research based on time-series analysis between 1975 and 1996 suggested that increasing minimum wages by 10 per cent would reduce employment of teenagers by 2–4 per cent (OECD, 1998). Similarly, Wolfson and Belman (2004) used time-series analysis in which the minimum wage has been shown to (1) raise wages consistently between 1947 and 1997 in the low-wage industries, and (2) to have no discernible effect on employment. It was realised that aggregate data analysis masks the diversity that is present in the labour market, especially at the lower end of the wage distribution, which gave a partial explanation of the fact that negative employment effects were often either not empirically discernible or on the margins of statistical significance.

This earlier understanding of the workings of the minimum wage has been superseded by studies that still aim to examine aggregate employment effects, but are now based on disaggregated (micro-economic) data and analysis, especially after the appearance of Card and Krueger's (1995) book, which stimulated extensive debate in academic and policy circles and gave rise to considerable new research in the area of minimum wages. We have split the evidence on employment effects of minimum wages into two parts, principally for expository convenience. First come studies that look at the whole economy. Second come studies that look at specific sectors, especially sectors with a pertinent characteristic. There is considerable evidence from the United Kingdom suggesting that the introduction of the UK NMW in 1999, at the chosen level, did not have any noticeable negative aggregate employment effects. A number of papers collected in the *Economic Journal* in 2004 argue this point. While Stewart (2004) found no significant employment effect, Machin and Wilson (2004) found a small negative employment effect in the care sector (noting that this is low paid and low skilled), but no effect on overall business closures in the sector.

Aaronson and French (2007) found a 2 to 4 per cent drop in low skilled employment in the United States due to minimum wages and a 1 to 3 per cent drop in overall employment. The similarity of their results to those of Machin and Wilson is clear. By contrast, Addison, Blackburn and Cotti (in press) found that the

negative employment effect in the United States is mainly at the state level and not at the sector level. They showed that once state differences are accounted for, sector differences have no empirical effect, which leads to a different and much broader explanation than that suggested by Aaronson and French. In other major studies for the United States, Neumark (2001) and Singell and Terborg (2007) found evidence of a negative relationship between minimum wages and employment. Their estimated elasticities of employment with respect to the minimum wage, for the results that were statistically significant, were generally in the order of -0.2 (implying a 2 per cent reduction in employment for a 10 per cent increase in the minimum wage).

Leigh (2003, 2004a) provided evidence of a large and statistically significant negative relationship between employment and minimum wages in Australia for the years 1994 and 2001 (estimated elasticities in the range of -0.25 to -0.40), using the differences between Western Australia and the rest of Australia as the basis of his calculations. Watson (2004) challenged Leigh's methodology and findings as fundamentally flawed, which resulted in a rebuttal from Leigh (2004b) and the slightly revised elasticity estimates reported above.

A number of papers have gone further, to argue that the simple level of the minimum wage and employment-headcount relationship is not sufficient for describing the complexities of the labour market within the broader economy. Metcalf (2008) finds no evidence of headcount reduction in the United Kingdom. He explains this by alternative adjustments, such as decreased average hours of work, increased training, incomplete compliance, a reduction in profits, and improvements in productivity. Stewart and Swaffield (2008) also found that working hours were used to adjust for the newly introduced UK NMW in 1999, but with no effect on paid overtime. Belman and Wolfson (2010) also found some (statistically weak) evidence of hours reduced and wages increased in response to minimum wages in a counterfactual analysis for the United States. They focused on 24 low-wage industries and found that it takes about five years for the full effect of minimum wages to work its way through the labour market. Oesch (2010) examined the effect of minimum wages in tandem with the effect of other factors that could influence employment, such as active labour market policies, monetary policy and employment regulation in 21 OECD countries. He focused on the low skilled and found that minimum wages do not have an employment effect, while active labour market policies and low interest rates clearly promote employment.

The overall message is that minimum wages may have an effect on employment, but this is empirically not very strong. The effect seems to be more prominent where minimums are set close to actual wages, which will typically be in competitive industries and in low skill jobs. In these settings, the minimum wage is more likely to 'bite' as an exogenously imposed constraint. The effect within the industries in which the minimum wages bite may be masked when we look at the whole economy. Economic theory can provide some guidance here with respect to the type of industry and the prevailing market structure in which this is more likely to happen.

Research suggests that when minimum wages apply to many employees there is an array of possible alternative adjustments in addition to changes in headcount employment. These include training, hours, overtime, work organisation, and all these may be influenced by the speed at which they work. Research suggests that there are also other policies that may compete and/or co-exist with minimum wages, such as active labour market policies, monetary policies and employment regulation. These policies do not receive as much attention in the minimum wages debate, although some research argues that they can be equally influential in terms of policy outcomes.

Finally, there is a recent paper by Doucouliagos and Stanley (2009) which argues strongly that 'publication bias' is present in the minimum wage literature, resulting in a negative employment effect being promoted

over the result of no effect in published academic research. This bias is a common problem in empirical research, because studies that do not find statistically significant effects are considered inferior and therefore are not published.

The research on the aggregate employment effect has used powerful natural experimental methodologies, especially in the United States where the federal structure is used to construct counterfactuals, and in the United Kingdom where the recent UK NMW introduction provided uniquely valuable data. These types of studies cannot be easily replicated in Australia. The international evidence may be the sole guide until Australia develops powerful data sources. The message is clearly that diversity matters in the research methodology and the data used and this goes all the way back to Stigler (1946) who argued so. Given the complex Australian award system, there would appear to be little use in trying to estimate overall effects of minimum wages. Although the Australian awards system has undergone change since the introduction of the FW Act, and modern awards have reduced the number and complexity of awards, existing data sources do not fully reflect the whole range of wage changes resulting from the minimum wage and award setting decisions by Fair Work Australia. Research in alternative and additional adjustment mechanisms to the conventionally studied employment headcount adjustment (such as reducing hours, increasing flexibility and others) could be promoted, especially where if there are clear differences in the market structures and surrounding labour market policies. In this context, the Australian award system could provide unique data for testing hypotheses regarding the flow-on effects of multiple minimum wages across occupations and/or across sectors and possible flow-on effects to overaward wages. Countries where there is only one statutory level of minimum wage cannot have the data diversity offered by the Australian system.

2.4.2 Employment effects—complementary evidence

International research and research that focused on specific demographics show some important aspects of the empirical relationship between minimum wages and employment. This sub-section contains studies from many countries and for different demographics—primarily youths, females, migrants and mature age workers. Examples from different countries produce a range of findings, from no effect to strong negative employment effects. Direct comparisons are not easy to make and perhaps should not be made as the analyses rely on very different premises, data and general economic, social, demographic and industrial relations surroundings. The overall message remains one of employment effects ranging from zero to clearly identified negative.

Böckerman and Uusitalo (2009) utilised the introduction of a new agreement in Finland which allowed employers to pay younger workers a lower minimum wage. By comparing the group to which this applied with a group that was only slightly older and therefore not eligible, they established a small reduction in the wages of the affected group and no significant employment effects. This was a rare study in which the opposite question has been asked, namely whether reducing the minimum wage increases employment. No evidence was found that it does.

Campolieti, Fang and Gunderson (2005) presented Canadian evidence by province and argued that minimum wages have reduced employment by 4 to 8 per cent in the period between 1993 and 1999. By contrast, Connolly and Gregory (2002) focused on female employment in the United Kingdom to find that three years after its introduction, the UK NMW did not affect the hours worked by either full-time or part-time females and had no effect on whether they were or continued to work full time or part time. Thompson (2009) found significant negative employment effects and stressed the effect of regional variation, arguing that when weak employment effects may appear they are in part due to the inclusion in the data of local labour markets in which the minimum wage is not binding.

A very thorough study by Hyslop and Stillman (2007) examined the effect of legislative reform in New Zealand that increased the level of the minimum wage entitlement of youth and also broadened the minimum wage eligibility of youth. They focused on three outcomes: employment headcount, hours worked and total earnings, and found no adverse employment effect immediately after the reform, but some weak evidence after two years. They found a 10 to 20 per cent increase in hours worked for the 16-year-olds to 17-year-olds and up to a 10 per cent increase for the 18-year-olds to 19-year-olds. The combined wage, hours and employment effects resulted in significant increases in labour earnings and total income of teenage relative to adult workers. Neumark and Wascher (2004) investigated 17 OECD countries and found that overall negative employment effects differ by country, depending on their provisions for youth sub-minimum rates, union coverage and the strength of general labour market regulation.

Another demographic group of interest is migrants. They may be perceived as (and in some cases be) low skill employees but, like youth, they are often aiming at improving their skill levels. How they go about up-skilling may be influenced by minimum wages. Migrants in receipt of minimum wages were examined by Orrenius and Zavodny (2008), who did not find a lot of evidence of minimum wage employment effects among the more disadvantaged migrants in the United States and explain that as the result of self-selection, presuming that the more disadvantaged migrants would not have moved to the more demanding states. Another important group is teenagers, who may be in danger of not gaining sufficient education if caught in a vicious employment circle facilitated by minimum wage employment effects. Such negative employment effects for teenagers were shown by Sabia (2009) to be a robust finding using alternative data structures. Bazen and Marimoutou (2002) found a clear negative employment effect for teenagers in the United States between the early 1980s and the late 1990s. They stressed the need to differentiate between trend, cyclical and seasonal effects. The broader importance of teenage employment effects is argued by Sen, Rybczynski and Van De Waal (in press), who discussed the relationship between minimum wages and hardship among low-income families in Canada. They argued that an increase in the minimum wage of 10 per cent reduces teenage employment by 3 to 5 per cent, which increases the percentage of families living in low-income conditions by 4 to 6 per cent. They argued that the income that teenagers on the minimum wage contribute is a non-trivial proportion of the total family income, so that negative employment effects can have a large effect on the wider household.

By contrast with the relatively well-established negative employment effects for younger workers, there is little research on older workers who receive a minimum wage. Fang and Gunderson (2009) found a counter-intuitive positive employment effect for older workers in Canada between 1993 and 1999. They argued that this might be due to substitution with teenage workers (they find a strong negative employment effect in the same regions and provinces for teenagers) or possibly to pre-retirement employment paths of mature aged workers. This study, along with the one by Orrenius and Zavodny (2008) on migrants, is an example of how selection and other relevant information about the specific circumstances of sub-groups of workers could help explain results that may in the first instance look counter-intuitive.

2.4.3 Price effects

There is not much empirical evidence on the effects of minimum wage increases on price levels, though Lemos (2008) cited 30 such studies, some including Phillips curve analysis. When firms are perfectly competitive (or monopolistically competitive) and have a constant-returns production function, economic profits must be zero both before and after the minimum wage change. As Lemos (2008) noted, conventional economic theory predicts that minimum wage increases should not reduce economic profits because affected firms are normally too small and too competitive to absorb the extra cost. Thus, it is unsurprising that empirical evidence on profit effects is rare. Consequently, the relevant changes in labour

costs will happen in the firms that do not go out of business, and will be fully passed on to the consumer. Any price effect of minimum wage increases will therefore be a function of the share in total cost of those who are minimum wage-reliant. The elasticity of demand for low skill labour will be higher the greater the elasticity of substitution between labour and other factors of production and the greater the elasticity of demand for the final product. It follows that, other things being equal, price rises are likely to be more extensive in Australia than in other countries, because more of the Australian workforce is minimum wage-reliant.² Clearly, theory suggests that price effects depend on product market structure and the level of reliance on minimum wages in the workforce, but, as noted above, there is little data to support testing such theoretical propositions.

Most papers neglect the role of market structure in determining price outcomes. An exception is the paper by Aaronson, French and MacDonald (2008), which starts with the assumption that employers are price takers in both product and factor markets. Then we would expect the higher labour costs following a minimum wage increase to be passed on to the consumers in the form of higher prices. In contrast, in a monopsonistic factor market, output would increase with the introduction of a binding minimum wage, so that prices should fall. The direction of the price change then indicates the prevailing type of market structure. A further implication is that employment should increase in the monopsonistic case and decrease in the competitive case, illustrating the inter-dependence of prices and employment. However, we also need to know what is happening to prices in the uncovered sector, as well as whether there are compensating productivity improvements, close substitutes not subject to the same cost pressures and the price elasticity of demand for the product concerned.

The restaurant industry is often used as an example of a competitive industry. Fougère, Gautier and Le Bihan (2010) noted that in France 40 per cent of employees in this sector are paid the minimum wage. But, while the level of the minimum wage had a significant effect on prices, it took more than a year for this to take effect. A similar point was made by Wadsworth (2010) in relation to a range of low paid industries in the United Kingdom. The finding of lagged effects has implications for the design of research projects which attempt to measure the size of any price effects. It also seems appropriate to consider a range of industries (both competitive and monopsonistic), so that one can compare the wage bill shares of minimum wage workers, their share of total costs and price indices in the main minimum wage sectors compared to the uncovered sector. Difference-in-differences approaches are appropriate for such studies, data permitting.

2.4.4 Productivity and related effects

The effects of minimum wage increases on productivity are complex and in theory can be either positive or negative. Positive effects could occur through a shock effect on employers (such as causing the removal of inefficient practices) or efficiency wage effects on employees (such as increases in effort). In addition, if increases in the minimum wage compress the lower tail of the wage distribution without affecting individual levels of productivity, there is an incentive for employers to substitute skilled labour for unskilled labour which, with no marked change in employment, would cause measured productivity to rise (though this may be regarded as a statistical artefact). In this case, a reduction in employment for unskilled workers would be masked by an increase in employment for skilled workers.

In principle, negative productivity effects could occur if the implied compressed wage relativities reduce the incentives for the unskilled to invest in training, as may happen if the higher minimum wage prevents low-wage workers from accepting wage cuts in order to finance the training. On the employers' side, if

² As evidence that minimum wage reliance is relatively high in Australia, the United Kingdom LPC has estimated that approximately 6 per cent of adult employees were in jobs eligible for the 2006 increase in the UK NMW (Low Pay Commission, 2009, p.25). By comparison, Healy (2010, p.112) has estimated using data from the 2006 ABS Survey of EEH that 18 per cent of adult employees in Australia were reliant on award minimum wages to set their pay.

the level of the minimum wage is set higher than the value of the affected workers' marginal productivity, firms may over-invest in labour-saving innovations and reduce their investment in innovations, which would lead to a greater long-term improvement in product quality and productivity growth. In the Australian context of multiple minimum wages, the possible effects of adjusting minimum wages on training incentives and investment in labour-saving technology will be considerably more complex to model theoretically and to test empirically.

Productivity-related studies are even less common than price effect studies and are usually indirect. Exceptions include a study of various OECD countries (Bassanini and Venn, 2007) and a study of the United Kingdom residential care homes sector (Georgiadis, 2008). Bassanini and Venn analysed data for 11 countries (not including Australia) over the period 1979 to 2003, using instrumental variable difference-in-differences estimation. Their key identifying assumption was that changes in minimum wages would have a greater impact on productivity in industries that are more heavily reliant on low-wage workers. They found that an increase in the ratio of statutory minimum wages to median wages of 10 percentage points was associated with an *increase* of between 1.7 and 2.0 percentage points in long-run levels of both average labour productivity and multi-factor productivity, and this was explained at least in part by the substitution of unskilled labour by skilled labour. Georgiadis (2008) examined the United Kingdom residential care homes sector, where 92 per cent of the workforce was female, and focused on one aspect of efficiency wages, namely the monitoring of staff in a sector where continuous operation meant that owners could not effectively monitor performance on their own. He found that, in care homes where the minimum wage had a larger bite, his proxy for monitoring intensity (namely the ratio of senior to junior staff) fell by more than it did in firms which were less affected by the minimum wage. This he took to be consistent with productivity-enhancing effects of the minimum wage. Two other United Kingdom studies have considered a wider range of enterprises. Forth and O'Mahoney (2003) found that the introduction of the UK NMW in 1999 did not have an appreciable effect on labour productivity in the low-paying sectors which they examined. In a further similar study (Forth, Rincon-Aznar, Robinson, and Harris, 2009) evidence was found both for positive productivity effects in some industries and negative effects in others. Farmakis-Gamboni and Yuen (2011) argued that the relationship between minimum wages and productivity is ambiguous in international and Australian literature, although there is an absence of empirical studies similar to those above in Australia.

A few studies have focused on the effects of minimum wages on the incidence of training. Thus, Arulampalam, Booth and Bryan (2004) considered the effects of the introduction of the UK NMW on training from an employee perspective. Unless special provisions are made for trainees, the effect should theoretically be to reduce general training, as this is normally paid for by the individual trainee in the form of lower wages, which may no longer be permissible. Their difference-in-differences approach was unable, however, to detect any negative effects. In contrast, McLaughlin (2009) argued that the introduction of a minimum wage may encourage firms to invest more in training to offset increased wage costs. This possibility was not, however, formally tested in his study.

Another indirect approach is to focus on educational attainment. In the United States, Neumark and Wascher (2003) suggested that minimum wages may impact negatively on rates of educational attainment, though the precise mechanism whereby this occurs is somewhat obscure. Possibly the pull of higher wages in minimum wage jobs encourages students to leave school for employment before they have completed their studies. Yet, Warren and Hamrock (2010) could find no such link, and there appear to be definitional problems surrounding some of the key variables.

Missing from the Australian evidence are detailed studies of productivity improvements following minimum wage increases, in the form of efficiency wage or 'shock' effects.

2.4.5 Other effects and miscellaneous studies

The diversity of research on minimum wages reflects their importance in a modern economy and society. This section contains studies that span across many of the aspects of minimum wages.

The position of minimum wages in the history of Australia is set out in good detail by Burgess (2004), who gave a noteworthy account starting with how arbitration developed in Australia from the late 19th century and concluding with a view on how it has helped shape the modern Australian institutions and economy. Burgess enumerated many aspects of importance, focusing primarily on the ways that institutional and economic factors interacted in Australia to produce the present system, and how well this system has served the country. Burgess is generally sympathetic to setting minimum wages, arguing they are consistent with the more general national economic objectives (as opposed to those by specific industries and/or unions), they can help during economic crises (a point that may be relevant to the 2009 Australian minimum wage pause), and they can do all this avoiding unnecessary industrial conflict. However, he concluded his paper by recognising that some of that national-level function has now been taken over by the role of the Reserve Bank, 'with its "inflation first" strategy in which unemployment is the tool to be used in the case of increasing inflation and/or inflationary expectations' (Burgess, 2004, p.427).

Burgess (2004) provided a valuable context, but neglected to acknowledge the need for working through the economic micro-foundations and evidence to understand minimum wages. Machin (2008) spoke to the AFPC 2008 Forum with the benefit of hindsight from the almost 10 years of evidence collected by the United Kingdom LPC after the introduction of a UK NMW in 1999. The objectives of the UK NMW are similar to those of the Australian FW Act, in that they both set out to be explicitly mindful of inflation and employment. The difference is that Australia has a broad range of minimum wages set at relatively high levels, whereas the United Kingdom started with a very conservative level of its NMW and later moved to increase it considerably when research evidence did not identify any 'significant adverse impacts on inflation or employment'. Machin (2008) provided a good, but brief, overview of the main research findings from the United Kingdom. Notable in the United Kingdom is the absence of any spillover effects in relation to earnings above the UK NMW. The opposite evidence has been found in the United States. Machin (2008) emphasised the importance of the methodological design of the research commissioned by the LPC and the necessity that researchers have the appropriate data to carry out their analyses. He reported that no negative employment effects were found in the United Kingdom after the introduction of the UK NMW and that the research shifted towards non-employment indicators, such as the longer-run growth in prices, and the effect on profitability in certain sectors. He noted that work has increased on enforcement mechanisms and their possible influence on the impact of minimum wages.

Machin (2008) also made an important point about not finding any evidence of negative employment effects, which should be fed into the Australian thinking about related research. He mentioned that: 'However, it does seem appropriate that "something else has to give" and that has become the focus of newer research' (Machin, 2008, p.21). If we do not find any negative employment effects, we must look for other effects. These do not have to be negative effects. For example, Stigler (1946), after presuming that, other things equal, negative employment effects should be observed, went on to argue that other things do not have to remain equal in this context. He suggested that the new (higher) minimum wage, accompanied by the threat of a job loss, could generate a new incentive to increase the productivity of the marginal workers. This could happen either by additional worker effort or by additional training, and it could be sufficient to counteract the minimum wage increase.

A number of papers with diverse content are worth noting independently here. Reports by ACIL Tasman and Colmar Brunton Social Research (ACIL Tasman and Colmar Brunton Social Research, 2009a, b), Wheatley (2009), and Pech et al. (2009) profile aspects of industries with relatively high rates of award reliance.

The study by Buchanan and Considine (2008), stressing the importance of measuring the possible effects of minimum wages on those covered as well as those not covered by the awards, should be noted. The work of Rozenbes (2010) suggests that the composition of award reliance be monitored over time. The general monitoring strategies proposed by Access Economics (2007) make sense, but should be updated after the recent financial crisis. McDonald's (2008) call for a broader view of the underlying macroeconomic theory and policy for the design of minimum wage merits further investigation, especially due to the predicted longer run disconnect between Australia and other Western countries in terms of our growth outlook. McDonald (2008, p.27) notes that 'because the employment prospects of the minimum wage pool, that is those people who are employed or would potentially be employed at minimum wages, are strongly influenced by aggregate employment outcomes, minimum wage policy can best improve the welfare of the minimum wage pool through strengthening the inflation targeting policy'. Three papers by Yuen and Mowbray, Rozenbes and Mowbray, and Wheatley (collected together in Mowbray, Rozenbes, Wheatley, and Yuen, 2009) provide valuable background and context information on the relevant parts of the Australian labour market, such as the industries and skill levels of workers most likely to be receiving award rates of pay. Watts (2010) raised the issue of the interaction between minimum wages and the tax/transfer system. This is an important issue as it could introduce distortions in the effects of minimum wages.

Hansen and Machin (2002) studied the broader social impacts of having a minimum wage in place. They found that the introduction of the UK NMW resulted in crime reduction in the areas that had the most cases of low pay prior to its introduction. Their analysis was carried out within police force areas. Simon and Kaestner (2004) examined whether minimum wage increases lead to changes in non-wage components of the job. Using United States data, they looked at employer health insurance, employer pension coverage, job safety, and access to training and concluded that there are no such empirically discernible adjustments.

3 The workplace

The role and significance of minimum wages in workplace-level structures and performance.

3.1 Overview

The research conducted under the workplace theme focuses on workplace-level impacts of minimum wages, and the responses that minimum wage adjustments elicit from employers and employees. Potential changes in workplace-level structures and behaviours are monitored through quantitative surveys, qualitative interviews, case studies and focus groups, and combinations of these methods. Studies included in the workplace theme assist in providing insight into causal links and examine varieties of minimum wage effects that may not be detected at the aggregate level by studies included in the national economy theme.

The issues explored in the workplace theme include:

- the characteristics of workplaces in which minimum wage employees are concentrated, and how these differ from other workplaces;
- the mixture of wage-setting instruments and minimum wage rates present within workplaces, and whether this mixture is affected by minimum wage adjustments;
- what other changes to their operating practices employers may make in response to minimum wage adjustments; and
- the relative importance of minimum wage levels and increases in business decision-making, with particular reference to:
 - employment levels and working hours of current staff;
 - hiring activities and hiring intentions;
 - changes in product or service prices;
 - cost-saving measures introduced at the workplace level, such as reduced numbers of staff receiving paid leave or penalty rates;
 - productivity-raising initiatives, such as provision of on-the-job training and work redesign;
 - use of alternative employment arrangements, such as subcontracting and labour hire; and
 - attitudes towards wage bargaining.

3.2 Relevant provisions of the *Fair Work Act 2009*

The minimum wages objective at section 284(1) of the FW Act states that Fair Work Australia must establish and maintain a safety net of fair minimum wages, taking into account:

- Section 284(1)(a) the performance and competitiveness of the national economy, including productivity, business competitiveness and viability, inflation and employment growth.

The modern awards objective at section 134(1) of the FW Act states that Fair Work Australia must ensure that modern awards, together with the National Employment Standards, provide a fair and relevant minimum safety net of terms and conditions, taking into account:

- Section 134(1)(b) the need to encourage collective bargaining;
- Section 134(1)(d) the need to promote flexible modern work practices and the efficient and productive performance of work;
- Section 134(1)(f) the likely impact of any exercise of modern award powers on business, including on productivity, employment costs and the regulatory burden—only insofar as it relates to the adjustment of minimum wages; and
- Section 134(1)(g) the need to ensure a simple, easy to understand, stable and sustainable modern award system for Australia that avoids unnecessary overlap of modern awards—only insofar as it relates to the adjustment of minimum wages.

3.3 Research framework

Macro-level studies cannot reveal precisely how employers and employees react to, or are affected by, minimum wage adjustments in terms of labour utilisation or employability. Micro analyses at the level of particular industries, firms or establishments can, however, be a useful complement to macro studies. They divide naturally into quantitative and qualitative analyses. Quantitative analysis has three separate strands. The first deals with the characteristics of employers of minimum wage recipients, including their sizes and the competitive environment in which they operate. The second strand uses more detailed workplace-level data to test *the performance and competitiveness of the national economy, including productivity, business competitiveness and viability, inflation and employment growth*, at a more disaggregated level. The third examines specific issues, such as how location decisions, employment arrangements, pricing policies and operating hours are affected by minimum wage adjustments. One area where detailed information is lacking in Australia is the impact of minimum wages by size of firm or establishment, although it is known that low-paid workers, who are more likely to be affected by minimum wage changes, are also more likely to work in small establishments and in particular sectors.

Qualitative studies include case studies of how particular employers or groups of employees react to minimum wage increases and the degree of knowledge which they possess about minimum wage provisions. Case studies can also focus on the attitudes of both employers and employees to minimum wages, and their impact on *collective bargaining, flexible modern work practices and the efficient and productive performance of work, the impact of modern award powers on business including productivity and employment costs and the regulatory burden*. Another important aspect of minimum wages, explored further in the safety net theme, is their ability to provide fairness. Key groups that may be affected by criteria such as providing a comprehensive safety net, equal remuneration and employment participation are women, part-time workers, ethnic minorities, disabled people, immigrants, youths and older workers, and people without qualifications. Each of these groups can be considered using either quantitative or qualitative analysis, and with respect to key industries, occupations, regions and firm sizes. However, few Australian studies focus on the effects of minimum wages on minority groups. Further selective sampling in the case of qualitative studies means that it is difficult to generalise the findings from such research, so that such approaches should be seen as a complement to, and not a substitute for, quantitative research.

3.4 Supporting research evidence under the workplace theme

3.4.1 Quantitative studies

Three strands of research evidence are discernible in the literature that uses quantitative data to study minimum wage effects at the workplace level. In one strand are studies that describe the characteristics of the employers of minimum wage recipients and the characteristics of minimum wage recipients. Their implicit aim is to determine whether minimum wage employers operate in product or labour markets that impose particular constraints which will affect their capacity to pay higher minimum wages. In a second stream are studies that use (or generate) workplace-level data to retest propositions that have been explored separately using aggregate data and the methods described previously under the national economy theme. Generally these studies focus on particular industries or types of employers/employees where there is prior evidence of substantial minimum wage reliance. A third strand of studies develops evidence about questions that can only be adequately investigated with workplace-level data. Examples here are studies of how business location decisions, employment arrangements, pricing policies and operating hours are affected by minimum wages.

In research for the United Kingdom, Mason, Carter and Tagg (2006) utilised data from the Federation of Small Businesses' biennial membership survey to investigate the effect of the UK NMW's introduction on smaller United Kingdom businesses operating in diverse regional areas. These authors found that a minority of United Kingdom firms in scope of their survey (21 per cent) had any employees eligible for the minimum wage. There is significantly more work to be done in this area in Australia, to understand how the various award minimum rates of pay are utilised within different workplaces, including how they may be used in conjunction with overaward bargaining to maintain particular wage relativities between different groups of employees. Research is being commissioned or undertaken on these questions in Fair Work Australia projects on 'Award reliance' and 'Minimum wage-reliant small businesses' that are due to be completed after the 2010–11 Annual Wage Review.³

Many of the existing quantitative studies, discussed below, use workplace-level data to retest the conclusions of other studies using economy-wide or time-series data.

Hyslop, Maré, Stillman and Timmins (2008) conducted a thorough investigation of how teenage employment responded to substantial increases in their minimum wages (relative to older workers) in New Zealand for the period 2000–07. They concluded that teenage employment was reduced over this whole period by approximately 3 percentage points in the industries with highest initial employment of teenage workers, and by approximately 1 percentage point in other industries. They also presented preliminary evidence indicating lower survival rates at the end of the period for firms with the highest initial teenage employment shares. Another study examining the employment effects of a very similar minimum wage increase for teenagers in Portugal used 'worker flows' data to measure changes in both hiring and separations (Portugal and Cardoso, 2006). Their results suggested that while there was some reduction in the number of newly-hired teenagers, this was offset by an equivalent reduction in the number of separations. They concluded that the varied responses can account for some of the ambiguity in implied teenage employment elasticities from previous studies that fail to account for both types of worker flows. Finally, O'Neill, Nolan and Williams (2006) surveyed approximately 1000 firms in Ireland to gather information on their employment structures before and after the introduction of that country's national minimum wage in April 2000. Restricting their attention to firms that would not have increased their lowest rates of pay in the absence of the minimum wage, they found evidence of negative employment effects, but noted that 'the estimated elasticity of labour demand is relatively modest in size, especially given the relatively low skill levels of the workers involved' (O'Neill, *et al.*, 2006, p.84). Two other recent studies warrant mention in light of the aggregate evidence we presented

³ Further information on these projects is available at the Fair Work Australia website: <http://www.fwa.gov.au/index.cfm?pagename=wagereview2011&page=research>

earlier for the price and productivity effects of the minimum wage. MacDonald and Aaronson (2006) used firm-level data to study price-setting behaviour in the restaurant industry for the United States. They reached the subtle, but important, conclusion that firms do not respond uniformly to minimum wages by raising all prices to cover the additional employment cost. Instead, they selectively raise some prices, while leaving others unchanged. Their data are sufficiently detailed to show that price increases occur most frequently at 'cluster points', i.e. for items with prices that are close to others on the menu. This result makes intuitive sense—since customers may be less likely to notice such price increases—but MacDonald and Aaronson are the first to demonstrate it empirically. They argue that the cost imposition of higher minimum wages may also cause employers to alter their training practices, though there is some ambiguity about the direction of this effect. The competitive prediction is that training will be reduced in the presence of a minimum wage, because price-taking employers will no longer be able to finance training through wage cuts. However, there is also the theoretical possibility that higher minimum wages induces employers with some market power to increase training provision as a way of lifting the productivity of their existing (and potential) workers to match the minimum wage.

Fairris and Pedace (2004) tested these alternatives with establishment-level data for the United States and found no evidence of training reductions following minimum wage increases, either in terms of the number of workers receiving training, or the average duration of training for those receiving it. Their evidence does not support the argument that minimum wages can lead to more training (e.g. McLaughlin, 2009), nor does it suggest that minimum wages are counter-productive.

A small set of studies make use of workplace-level data to examine minimum wage issues that are specific to this level, and unsuited to investigation with either aggregate-level or employee-level data. Regrettably, no studies of this kind have yet been undertaken in Australia because of the absence of equivalents to the rich firm-level panel, and linked employer-employee, datasets that are increasingly becoming available in other countries. It is appropriate that there be some understanding of the approaches and conclusions of these studies within Fair Work Australia, however, if only for the purposes of understanding the full range of useful research that could be undertaken as data availability and quality improves in Australia.

A very recent paper by Rohlin (in press) used a combination of establishment data taken from Dun and Bradstreet marketplace surveys and sophisticated geographical area (GIS) data to study business location decisions in response to minimum wages. His methodology is a variant of the recognisable difference-in-differences approach, in which business locations are compared for bordering states with different minimum wage regimes. His important conclusion is that minimum wages have a significant 'deterrent' impact on the location decisions of firms that are new to an area, but not on existing establishments. As noted in the paper, this difference implies that the total impact on business location is necessarily small, because existing establishments constituted 96 per cent of total business activity in the areas selected for comparison. In the Australian context, where minimum wage coverage is national, business location remains important as it reflects the local balance between demand and supply of labour, which in turn influences locally prevailing wages. In areas where demand exceeds supply, wages will be higher and it is likely that the 'bite' of minimum wages set in national decisions will be lower.

Two important studies led by David Fairris have examined the workplace-level consequences of the Los Angeles living wage ordinance, which required that employees covered by contracts with the Los Angeles city council (or working on city property) be paid a living wage of \$8.50 per hour. While the concept of the living wage as understood in the United States context is quite different from the nationwide adjustment of existing minimum wage rates in Australia, the specificity of the instrument, and the associated interest among city lawmakers and local researchers in understanding its effects, has provided a rich additional source of data on the workplace-level effects of prescribed wage floors.

In an initial paper, Fairris (2005) examined a variety of outcomes from the Los Angeles ordinance by comparing establishments that were and were not obligated to pay the living wage. He concluded that the

impact for affected establishments was very mixed, including reduced worker turnover and absenteeism, but also reduced training. There was no evidence that the law significantly increased reliance on part-time workers in living wage establishments. A second study (Fairris and Bujanda, 2008) tested for the possibility of substitution between different types of workers in response to the living wage. This is an important but underexplored area of potential effect. The issue is who benefits from the higher wage floor. If employers respond by reallocating their labour pool toward already higher paid (and presumably more productive) workers, who become relatively cheaper as a result of the wage floor, there may be notably less benefit for the low-skilled workers who are the intended beneficiaries of the law. Fairris and Bujanda found that there was significant substitution in response to the Los Angeles living wage. Employers shifted their workforces towards men, workers with prior formal training and workers with other more valuable unobservable skills and characteristics. This substitution towards groups that already attracted higher wages in the low-paid labour market was estimated to dissipate approximately one-quarter of the total wage benefit associated with the living wage.

A related paper by Dube, Naidu and Reich (2007) considered various effects of a municipal minimum wage law adopted in San Francisco in 2003 on employment practices in the restaurant industry. Among many other results, they concluded that there was no detectable employment loss, some increase in prices, and a large improvement in job quality and worker attachment, measured by increases in job tenure and the proportion of employees working full time.

The overall impression from the studies reviewed in this set is of what Hyslop et al. (2008) described as 'heterogeneous firm responses' to minimum wages. It is a picture of diversity, rather than one of predictable or universal change. The picture is complicated further by the fact that few studies—perhaps only with the notable exception of Dube et al. (2007)—attempt to study all of the potential workplace responses. In some industries and for some employers, minimum wages contribute directly to employment reductions and/or higher prices. Some other employers appear to take steps that create a version of the core-periphery employment model, in which some workers are let go, but others are drawn closer to the firm through initiatives to offer longer working hours, more stable arrangements or further training. Still other employers appear to use the minimum wage as a justification for reconfiguring their existing employment pools towards types of workers who will be, or are expected to be, more productive in the future. There are few signposts in economic theory for predicting in advance which of these outcomes will prevail. We stress again the importance and need for broad-ranging studies that are attuned to the range of potential employer responses. This diversity may well mean that the traditional form of quantitative study, where hypotheses are stated and tested against secondary data, will not always be suited to appreciating complex undercurrents of change. Qualitative research has much to add, in terms of its openness to, and capacity to reveal, unexpected and unintended consequences of minimum wage adjustments, so mixed evidence studies that combine both should be considered.

3.4.2 Qualitative studies

In 2010, Fair Work Australia sponsored a program of case studies to examine the impact of minimum wage increases on enterprises and their employees. In Phase 1 of their study, Evesson, Oxenbridge, Schutz, Baldwin, Moensted and Buchanan (2010) conducted 20 case studies, interviewing 28 owners and managers and 74 employees in the Retail, Hospitality, Community Services and Manufacturing industries. Enterprises with award-reliant employees were chosen. These were mostly small- to medium-sized enterprises. The research program is ongoing and the first report has been released. The recent financial crisis appears to have had a lasting impact on all but the Care industry. Competition from larger firms, and from overseas firms, was reported still to be affecting these industry segments. The response to competition included intensification of sales efforts and improvements in customer service, but the principal response was to reduce labour costs. This was achieved by reducing staff hours to 'skeleton'

levels and in some cases by reducing (mainly casual) staffing levels. Additional permanent and casual staff would be taken on to deal with peak demand periods. These strategies were being implemented before the downturn, but were implemented more strongly during it. Some employers reported a reluctance to lay off their core staff for fear of not being able to hire after the downturn ended. Even during the downturn, employers reported difficulties in attracting high quality or skilled staff. They responded by substituting untrained new staff for qualified trades staff and offering different training opportunities to them.

The main employer-reported response to minimum wage rises was to aim for labour cost reductions in the ways described above, yet on the whole employment decisions regarding minimum wage rises were seen as part of a greater issue of decreased revenues, rather than the sole problem. Again, a majority of employers considered minimum wages to be just one among a range of cost and trading pressures being faced during the financial crisis. Some employers reported being more worried about weekend penalty rates than minimum wage increases. There was little concern over or knowledge about the changes associated with award modernisation.

Employer practices were mixed, but they accorded largely with the predictions of economic theory in relation to responses to decreased revenue. Both headcount (where absolutely necessary) and hours were cut. Then, for those who stayed, different measures aiming to increase the value of labour were implemented, some through better organisation of hours, some by intensification of effort and some through additional training. These are valuable insights which fit well with the complementary nature of qualitative and quantitative information. One potential problem with this study is that it focuses on minimum wage issues at a time when the main concern was the external shock of the financial crisis.

A large number of studies on employer responses appeared in the United Kingdom after the introduction of the UK NMW. Generally, they report similar reactions to those reported by Evesson et al. (2010) for Australia. Adam-Smith, Norris and Williams (2003) showed for the hospitality industry that the work-wage balance was adjusted to match the new constraints introduced by the UK NMW in a way that avoided conflict and even enhanced workplace relations. Arrowsmith, Gilman, Edwards and Ram (2003) looked at small firms in the hotel and catering and clothing industries. The prediction was one of disruption which, however, was not fulfilled. The patterns of adjustment were explained by size and industry characteristics. The minimum wage effects were largely mediated by effective informal employment relations, more so in the smaller firms. Druker, White and Stanworth (2005) examined the hairdressing industry in the United Kingdom, which has a high prevalence of minimum wage recipients. A 'regulatory shock' was predicted, but did not occur. Firm responses were very diverse and reflected their location, size and type of service. Responses did not elicit any new directions or strategies; rather, firms used existing practices and management philosophies to adjust to the new UK NMW environment. Warhurst, Lloyd and Dutton (2008) also reported that management and employment strategies limited the effect of the minimum wage in the case of the hotel room attendants, who are among the lowest paid employees in the market. Heyes and Gray (2004) focused on the pay and training practices of small firms in the United Kingdom Hospitality, Caring, Retail, Hairdressing and Motor Services industries. They used a mix of survey and interview data to examine how small firms adjusted their behaviour after the added costs the UK NMW brought. They show that quality-enhancement measures and increased work intensity coincided in some cases. They also discuss the use of development wages for subgroups of workers with lower productivity in their initial months of employment. Their results accord with those of economic theory.

The qualitative United Kingdom studies align with the Australian research by Evesson et al. (2010) in some notable respects. First, minimum wage rises appear not to be causing major shocks to employers. Second, employers appear to recognise the potential employment effect and how this could make them uncompetitive in their market. The effect seems to be small, but easily recognisable. Most employers appear to respond through internal bargaining and through existing strategies, rather than through needing to devise new strategies to tackle the minimum wage effects. Unlike the Australian study, the United Kingdom studies were carried out before the financial crisis, so their implications for the contemporary United Kingdom labour market may not be as pertinent.

Ram, Gilman, Arrowsmith and Edwards (2003) describe the very mixed picture of the Clothing industry in the United Kingdom being at the same time in long-term (structural) decline and being confronted with the added burden of a newly introduced minimum wage. The employers' responses focus on 'the long term' and the minimum wage does not seem to cause a lot of concern among employees. Some of the clothing firms studied treated the implementation of the UK NMW as a 'critical' event, which drove the business to move into niche markets, but this reaction was taken again in response to the pressures of long-term structural decline within the manufacturing industry and was not exclusively a response to the minimum wage.

It is possible that the low and very cautious level used to introduce the UK NMW contributed to these responses. Ram, Edwards and Jones (2007) examine the response of the informal economy to the introduction of the UK NMW. They report the presence of deeply embedded informal relations, which were not affected by the minimum wage. Tacit negotiations and agreements were effective in preserving the status quo. This is an important finding because it refers to a period after the introduction of the UK NMW had had time to 'bed in' and work its way through the whole of the economy. Their study suggests that evidence should be gathered to reflect long-term strategies rather than just initial responses, which could be a weakness of many of the United Kingdom studies from the early 2000s.

Reich, Hall and Jacobs (2005) describe the case in which a large firm (the San Francisco Airport) decided to implement a policy of virtual elimination of low pay among its staff. The low-paid percentage went from 55 per cent down to 5 per cent after the implementation of the new policy, which indicates that the firm in effect introduced its own minimum wage at a level of considerable 'bite'. Earnings inequality was also reduced within the firm. The immediate cost of the policy was passed on to the firm's customers, and was not considered to be large. Secondary effects—including lower staff turnover, improved worker morale and greater effort—counterbalanced some of the added costs. No negative employment effects were reported, but there was limited worker-for-worker substitution within the context of stable overall employment. While this study reveals remarkable changes in one location, the longer-term effects of the initiative and the idiosyncrasies of the study site need to be assessed before the results are generalised.

An important aspect of minimum wages is their ability to provide fairness with regard to workers' conditions, and in so doing, to protect specific groups of individuals that may otherwise be disadvantaged in the labour market. In research conducted by the AFPC, Pointon, Leggett, Archer, Maltman, Pung and Leung (2009) describe in detail the wage-setting arrangements in the disability enterprise sector. In particular, the research undertook a statistical profile of the sector, a detailed wage assessment tool audit, surveyed all businesses in the sector and undertook employee focus groups to obtain detailed knowledge of the wage-setting experiences of employers and employees in the sector.

Schneider and Dutton (2002) investigated attitudes towards disabled employees in the United Kingdom. They collected information from 100 employers and 100 Disability Employment Advisors, and then asked them about the effect of the UK NMW on their views. Notably, these authors find that employers and DEAs think differently regarding many aspects of the employment of people with disabilities. These include the perceived costs and obstacles to employers in hiring and retaining people with disabilities, as well as the problems presented by specific disabilities and the associated staff motivation. There was general agreement that the UK NMW benefited people with disabilities, although a minority of respondents thought that it had made hiring people with disabilities harder. The authors conclude that understanding the employers' perspective may facilitate the promotion of work opportunities for people with disabilities.

Two reports, the first one sponsored by the AFPC and the second by Fair Work Australia (Southwell, Elliott, Stafford, and French, 2010a; Southwell, Elliott, Zappelli, and French, 2009) offer insights into the experiences and views of Australians directly affected by minimum wage adjustments. A useful feature of these studies is that they ask first for views which sum up the experiences of the last 12 months at about the end of 2008 and 2009 respectively, and then they ask the same people again for their (possibly different and revised) views in March–April in the years 2009 and 2010, respectively. These studies use a mix of data-gathering techniques, including in-depth interviews, focus group discussions and online discussion forums with employers, employees and job seekers. The research finds that employers act with differing degrees of caution about the future, and that they respond to difficult economic conditions by using strategies that target revenue, operating cost and cost control, productivity, efficiency and work design, and workforce management and development. The report describes the rich diversity of the factors influencing both employers and employees, but cannot be used to understand their relative position in the range of possible and probable responses when faced with economic adversity. As well as the insights they provide, these reports offer guidance on the design of quantitative analyses.

Wearne, Southwell and Selwyn (2008) also explored employer responses to minimum wage adjustments, and their data provide a contrast to recent studies, as they were collected before the global downturn. While there was a range of opinions over current industrial performance, varying from 'existing within a buoyant local economy' to 'industry pressures of increased cost and declining profit margins', many employers commented that overall their industry was performing well. The authors identified a basic dichotomy of 'planners'—namely employers with proactive responses to wage-rate management—and 'responders'; those who did not budget for increases in wage rates. Ranges of adjustment variables included increased prices and short term inclusion of wage increases, but similar to current methods, increasingly relied on casual labour, reduced staff hours and numbers, and increased expectations of productivity. This range of reaction led to the conclusion that impacts of minimum wages on business are inherently reliant on business owners' individual behaviours. The range of responses of businesses to minimum wage adjustments both before and after the global downturn indicates a continuity of strategies that employers and owners implement in response to economic and market challenges.

The Social Research Interim and Consolidated Reports commissioned by Fair Work Australia (Southwell, et al., 2010a; Southwell, Elliott, Stafford, and French, 2010b) considered both employers' and employees' responses to the adjustment of the NMW. Widespread responses to the economic climate and notably the global financial crisis at the time of the study included reduced working hours, increased work intensification, and changes to shifts and reduction in overtime payments to reduce wage costs.

Responses from employees in this study noted the consequences of these measures in relation to a reduced income coupled with increased living costs, but there was a strong sense of gratitude for employment during the time of economic instability. Optimism was present in that the 'worst was over' in terms of the global financial crisis, however caution also dominated many employees' decisions for

the foreseeable future. Greater attachment to current jobs, and an increased concern with job and income security was also present. Spending habits were modified and reduced, in addition to budget modifications. Employers were usually seen to 'hold the power' in this economic landscape and, while this dynamic was seen to be gradually shifting, the precarious nature of casual employment, if present, was seen to maintain the employers' advantage within the market. Employees with lower skill levels and experience reported the least amount of confidence in negotiating wages, emphasising the importance of having marketable skills, and highlighting the acknowledged need for training. Training was seen to be a conduit for higher pay and 'better' employment, as skills reduce vulnerabilities in a competitive market. Some employees indicated a preference for on-the-job training as opposed to formal study. However, the authors reported a sense of defensiveness present in this perspective, as workers justified their own career situations. Jobs in many sectors were seen to be highly competitive. Thus it was desirable to stay in employment, even with reduced or basic conditions, except for select industries in which skill shortages increased the power of the employee. The authors conclude that employees appreciated the benefits of workforce participation, especially in regard to social inclusion, and appeared to have lowered expectations of working during 2009, with greater acceptance of 'basic' work with lower overall pay, under-employment or short-term employment. Yet these conditions of employment did challenge conditions in workers' quality of life, which were real considerations in employees' continuance of work.

Qualitative studies show some of the detail that large dataset quantitative research is often unable to identify. A core prediction of Stigler (1946) about an increase in the minimum wage is that the marginal workers may become unemployable and the employer's choices will be either to help them increase their productivity and/or effort, or to lay them off. The qualitative research reviewed in this report suggests that these predictions may be at least partially correct, especially as seen in industries in which workers are largely minimum wage-reliant.

Qualitative research also shows a much richer diversity of employer-employee responses than those predicted by the simple economic model. Namely, employers appear to find it more natural to respond with changes that affect the whole of their workforce. Responses to the challenges of minimum wages were seen in the context of a broader range of challenges. However, firms differed in their responses. It was found in several cases that very few employers planned for increases in the minimum wage, but rather reacted by offsetting wage increases through reducing labour costs, further emphasising the difficulty of extracting the specific effect of the minimum wage upon business from the wider array of market pressures. Despite this, a proportion of businesses' reactions indicated that employers have the strategy for implementing these responses relatively well thought out in advance, and that they implement their responses in consultation with all their staff based on both efficiency and equity/fairness considerations.

Whereas the economic model would predict a layoff, qualitative research suggests that layoffs may be resisted and that the whole staff of a firm may be involved in the firm's response to a cost/revenue shock, including minimum wage increases. When it comes to increased training and effort, qualitative research may support the predictions of economic theory and provide some useful intuition regarding the potential origin of skill gaps in the workplace. However, it is difficult to know whether the findings would apply to industries and firms with lower concentrations of minimum wage recipients, or with other economic characteristics. Patterns are much harder to establish because of the intended selective sampling of the participating subjects. Further, it is difficult to evaluate secondary or macroeconomic effects in qualitative studies. These are effects which Machin (2008) has argued to be essential elements in the evaluation of minimum wages. While these limitations do exist, qualitative research does not inherently aim to produce generalisations, but rather to understand causal processes and inform development of hypotheses for quantitative testing and instrument design. The use of qualitative research is strongly recommended as a complement to the evidence provided by quantitative research, and mixed-method studies should also be considered wherever possible.

4 The safety net

The impact of minimum wages coverage, levels and increases on the safety net for employees.

4.1 Overview

The research conducted under the safety net theme seeks to understand the effects of minimum wages for employees. The potential effects include a range of outcomes relevant to the minimum wage-setting powers of Fair Work Australia, such as the relative living standards and needs of the low paid, increasing workforce participation, and upholding equal pay principles. Assessing whether these outcomes are achieved in practice usually entails the analysis of complex survey micro-data, and sometimes cross-country comparisons of different wage-setting systems.

The main issues explored in the safety net theme are:

- the coverage of wage-setting instruments and how this has changed over time, in particular for junior employees, employees to whom training arrangements apply and employees with a disability;
- evidence of below-minimum wage employment and possible explanations for it, including non-compliance and data collection issues/limitations;
- the impact of minimum wage levels and increases on real and relative wages for minimum wage-reliant employees;
- the links between minimum wages, annual earnings, non-wage income, household income, and the relative living standards and needs of the low paid;
- the impact of minimum wage levels and increases on work incentives and workforce participation; and
- the dynamics of minimum-wage employment and the attributes associated with progression to higher minimum rates of pay or higher overaward rates of pay.

4.2 Relevant provisions of the *Fair Work Act 2009*

The minimum wages objective at section 284(1) of the FW Act states that Fair Work Australia must establish and maintain a safety net of fair minimum wages, taking into account:

- Section 284(1)(b) promoting social inclusion through increased workforce participation;
- Section 284(1)(c) relative living standards and the needs of the low paid;
- Section 284(1)(d) the principle of equal remuneration for work of equal or comparable value; and
- Section 284(1)(e) providing a comprehensive range of fair minimum wages to junior employees, employees to whom training arrangements apply and employees with a disability.

Under section 134(1) Fair Work Australia must ensure that modern awards, together with the National Employment Standards, provide a fair and relevant minimum safety net of terms and conditions, taking into account:

- Section 134(1)(a) relative living standards and the needs of the low paid;
- Section 134(1)(c) the need to promote social inclusion through increased workforce participation; and
- Section 134(1)(e) the principle of equal remuneration for work of equal or comparable value.

4.3 Research framework

Minimum wages are a key component of the employment safety net that is provided for Australian employees by the National Employment Standards and modern awards. Numerous dimensions of minimum wages and minimum wage determination will influence their relevance and effectiveness as a safety net. First, their extent of reliance is critical, both for adult employees in the mainstream workforce and for a range of minority groups (including junior employees, employees to whom training arrangements apply, and employees with a disability) for which Fair Work Australia is responsible for *providing a comprehensive range of fair minimum wages*.

Second, the levels at which minimum wages are set will have varied impacts on their role as a safety net, by affecting wage relativities, household incomes, incentives for workforce participation, and employment rates. Each of these will help to determine the safety net's performance with respect to the objective of *promoting social inclusion through increased workforce participation*, and the considerations of *relative living standards and the needs of the low paid and the principle of equal remuneration for work of equal or comparable value*. There is some Australian research on these issues relating to employees that are 'low paid' or earning close to what was then the FMW in Australia, but little or no research directly concerned with the larger group of minimum wage-reliant employees. As noted previously, where low-paid is defined by pay ranges it includes employees who are not minimum wage-reliant and excludes employees who are minimum wage-reliant.

A difficulty for data collection and analysis is that 'the needs of the low paid' can be interpreted differently, because 'low paid' is not a clearly defined category.⁴ This point was acknowledged by the Panel of Fair Work Australia in its 2009–10 Annual Wage Review Decision (Fair Work Australia, 2010a, pp.58–59), which included the following passage:

Because there is a continuous distribution of wages, there is no wage threshold just below which people are clearly low paid and just above which people are clearly not low paid. Rather, the lower the wage, the more "low paid" is the employee. People earning above or near median earnings are clearly not low paid in an absolute sense. In considering relative living standards and the needs of the low paid, we have focused mainly on those receiving less than two-thirds of median adult ordinary-time earnings (currently about \$700 per week) and its equivalent hourly rate (about \$18.50). We have also had regard in particular to those paid at the C10 rate, in recognition of past practice, on the C14 rate, which is equivalent to the minimum wage, and on those whose full-time equivalent wages put them in the bottom quintile of the wage distribution. Employees on award wages that are above these rates can be considered to be low paid in a different sense. The comparison here is between the award rate and the bargained rate for similar work.

Third, the rate and frequency of adjustment of minimum wages, especially in real terms, will strongly influence the quality of the safety net when assessed against all of the relevant legislative provisions over time. Developing a representative understanding of these varied effects in the Australian context is complicated by: (1) the range of minimum wages that are set, (2) differences in how quickly the various minimum wages are adjusted, both because of flat dollar increases that are worth different amounts in percentage terms, and decisions that occasionally apply different dollar increases to minimum rates of pay above a certain level or levels, and (3) pronounced variation across sectors in the incidence of minimum wage reliance. In addition to the above complexities, there are data shortcomings, which often prevent researchers from: (a) identifying minimum wage-reliant employees, (b) observing them consistently over time, or (c) linking them to changes in workplace or household circumstances.

⁴ The alternative definitions are discussed in detail in a forthcoming Fair Work Australia paper by Pech, titled 'Relative living standards and the needs of low-paid employees: definition and measurement'. Further information is available at the Fair Work Australia website: <http://www.fwa.gov.au/index.cfm?pagename=wagereview2011&page=research>

4.4 Supporting research evidence under the safety net theme

4.4.1 Reliance

Studies of minimum wage reliance examine in detail the personal attributes and employment of the workers who are reliant on minimum rates of pay. Some of these studies provide evidence for all workers who rely on minimum rates of pay, while others look at the circumstances of particular sub-groups. Data identifying minimum wage-reliant employees have been collected in different surveys and released at various points in time. Such data were first collected in the Australian Workplace Industrial Relations Surveys in 1990 and again in 1995. Information on pay-setting methods was added to the ABS SEEH in 2000 and has been collected in all subsequent EEH surveys (see ABS catalogue no. 6306.0). In 2009, the ABS released the micro-data from the 2006 SEEH in Confidentialised Unit Record File (CURF) format, allowing detailed analysis of minimum wage reliance (ABS, 2009c). Similar unpublished data are available from the previous EEH surveys conducted in 2000, 2002 and 2004. In 2008, a question on pay-setting methods was added to the Household Income and Labour Dynamics in Australia (HILDA) Survey. The question was repeated in Wave 9 (2009), but may be omitted from Wave 10 (and subsequent Waves), due to some concerns about data quality. (For further discussion of these issues relating to data collection and data quality, see section 5.)

Two recent studies undertaken by Fair Work Australia (Bolton and Wheatley, 2010; Rozenbes, 2010) provide evidence about Australian minimum wage reliance. Bolton and Wheatley (2010) investigated the occupations of minimum wage-reliant workers, and their distribution of hourly earnings, using micro data from the 2006 ABS SEEH. They found that the occupations most likely to contain minimum wage-reliant employees in 2006 were in lower-skilled service, sales and labouring areas, including Hospitality workers (61 per cent minimum wage-reliant), Cleaners and laundry workers (56 per cent), Food preparation assistants (46 per cent), and Carers and aides (44 per cent). At more detailed levels of analysis there were also notably high rates of minimum wage reliance among Hairdressers (63 per cent), Prison and security officers (49 per cent), and Checkout operators and Office cashiers (44 per cent).

The largest group of employees receiving minimum rates of pay in 2006 (47 per cent of all these workers) were adults in permanent or fixed-term (i.e. non-casual) jobs. Bolton and Wheatley (2010) found that, while these workers had lower average wages than employees who were not minimum wage-reliant, they were not uniformly low-paid. Indeed, 70 per cent of adult minimum wage-reliant workers in non-casual jobs were paid more than the tradespersons' hourly minimum rate of pay in 2006. This was also true of almost half (45 per cent) of adult minimum-wage reliant workers in casual jobs, after discounting their reported wages by an assumed 25 per cent casual loading. In contrast, they found that almost all (90 per cent) of junior employees—those aged less than 21 years who were subject to junior rates of pay—were earning less than the FMW for adult employees in 2006 (i.e. \$12.75 per hour).

Bolton and Wheatley's (2010) study also provided some evidence of below-minimum wage employment for adult employees, with about 4 per cent of adult non-casual workers and 9 per cent of adult casual workers receiving less than the hourly value of the FMW in 2006. More evidence is needed about the reasons for the existence of below-minimum wage employment in Australia. Fair Work Australia is now undertaking a project to 'explore possible explanations for this phenomenon, including survey reporting errors, significant sources of non-cash remuneration, unpaid overtime (which reduces measured hourly rates of pay), forms of employment outside the coverage of statutory wage-setting, and non-compliance'.⁵ It is expected that this research will be completed in time for its results to be used in the next (2010–11) Annual Wage Review.

⁵ See the Fair Work Australia website: <http://www.fwa.gov.au/index.cfm?pagename=wagereview2011&page=research>

The second Fair Work Australia study, by Rozenbes (2010), provided 'An overview of compositional change in the Australian labour market and award reliance'. Rozenbes found that changes to Australia's industrial relations system are likely to have had an impact on the types of industrial instruments that set employees' pay, but that these effects are difficult to quantify. Labour market composition can affect the overall extent of minimum wage reliance when particular groups with relatively high (low) minimum wage reliance increase (decrease) as a proportion of the total workforce. Some industries with relatively high minimum wage reliance have also had relatively strong increases in their shares of total employment. Changes in industry composition affect female employment and part-time and casual employment.

Within the context of decreasing minimum wage reliance and increasing agreement-making, industry, gender, part-time and casual employment indicators showed increases in labour market segments that had a relatively higher proportion of minimum wage-reliant employees, in opposition to the general trend. It appears from the analysis that the demand for higher skills had a contrasting effect to the above indicators, as employed persons who are reliant on minimum wages are more likely to be lower-skilled and to have lower educational attainment levels, so a decline in the proportion of employed persons without non-school qualifications, other things being equal, is likely to contribute to a reduction in minimum wage reliance.

Another study to describe the characteristics of all minimum wage-reliant employees using data from the 2006 ABS SEEH is Healy (2010). He estimated that of the approximately 1.3 million adult, non-managerial employees who relied on minimum rates of pay in 2006, 62 per cent were female, 58 per cent were employed part-time, 44 per cent were employed on a casual basis, and 39 per cent were employed in jobs that were both part-time and casual (Healy, 2010, pp.113–114.). Healy's analysis reinforced the point that women are especially affected by Annual Wage Review decisions of Fair Work Australia, by demonstrating that the single largest group of minimum wage-reliant employees (accounting for 27 per cent of the total number in 2006) was women in part-time, casual jobs, and by showing that women who received minimum rates of pay were about half as likely as their male counterparts to hold full-time, non-casual jobs. Healy's analysis showed further that, across industries, there was a strong, negative correlation between the levels of trade union membership density and minimum wage reliance. Hence, in industries in which many employees were minimum wage-reliant, trade union membership rates were typically lower than the national average of 20 per cent in 2006. He concluded from this evidence that 'a key role of the wages safety net is to substitute for an effective trade union presence in large segments of the Australian labour market' (Healy, 2010, p.116).

Several other studies have explored in greater detail the attributes and experiences of employees who are subject to special minimum rates of pay below the standard, adult rates. Flatau, Dockery and Stromback (2008) examined the circumstances of young workers aged 15 to 20 years, and found that, among other things, a majority of employees in this age group receive junior rates of pay rather than the full adult rates for the same occupation. This is especially likely to be true for young people employed in the Accommodation, cafes and restaurants industry. A second study, by Leggett, Archer and Leung (2010), discussed the history of wage-setting arrangements for employees with a disability in open employment (i.e. those who work in the mainstream workforce rather than in sheltered workshops). Using administrative data from 2000, they reported that employees with a disability that affects their productivity capacity (and who have been assessed as eligible for sub-minimum wage payments under the Supported Wage System), are typically younger men, with an 'intellectual learning disability', who work part time as trade assistants or factory hands (Leggett, et al., 2010, pp.22-23). Due to various data limitations, they were unable to provide similar evidence about employees with a disability that does not affect their productive capacity (who are thus eligible for the full adult rate of pay in their occupation). Finally, Cully (2008) discussed the history and structure of special minimum wages for apprentices and trainees—i.e. 'employees to whom training arrangements apply'. While this study does not address the issue of the characteristics of apprentices and

trainees, Cully argued that wages under traineeships are too low, relative to the value of trainees' output, and that this allows some employers to capture economic rents without genuinely improving the skills and productivity of their trainee hires. He recommended that traineeships be refocused on the socially inclusive goal of helping disadvantaged young people to enter the paid workforce (Cully, 2008, p.276). Further research on 'Apprentice wages' is currently being undertaken within Fair Work Australia.⁶

Three other studies, all funded by the AFPC, examined the attributes of employees whose hourly rates of pay were close to the then FMW that was established by the Work Choices legislation in 2006.⁷ These studies focused on the low paid, as opposed to minimum wage-reliant employees, reflecting the legislative requirements at that time. As noted earlier, however, studies of the low paid in Australia will include employees that are paid above minimum wages levels and exclude other employees who are minimum wage-reliant. Within the context of the minimum wage-setting powers of Fair Work Australia, the 'low paid' remains a relevant category of analysis in terms of 'the relative living standards and needs of the low paid' criterion.

Studies undertaken by Healy and Richardson (2006) and McGuinness and Freebairn (2007) deflated the then current FMW and applied that figure to the then most recent 2004 Wave of HILDA data to examine the characteristics of low paid employees, as defined in the respective studies. Healy and Richardson (2006) compared the attributes of low-paid workers to other, higher-paid (but still potentially minimum wage-reliant) adult employees. They concluded from a series of bivariate comparisons that the low-paid workers were more likely to be female, young and unmarried, living in remote areas, without post-school qualifications, employed part time or on a casual basis, and less satisfied with their pay but not with their lives generally (Healy and Richardson, 2006).

Focusing on the same year of data, McGuinness and Freebairn (2007) estimated a number of multivariate regression models to predict low-paid employment for adult employees. Their sample restrictions defined the 'low paid' as employees (other than owner-managers) paid up to 10 per cent above the defined wage rate, either in terms of their weekly earnings or their hourly wages. Among adult full-time employees, they found that low-wage workers were more likely to be female, unmarried, with low educational attainment, outside the prime age group (either less than 30 or more than 60 years of age), employed casually, and with a long-term health condition. These results are largely consistent with Healy and Richardson's findings. Among adult part-time employees, however, McGuinness and Freebairn found that the previously statistically significant effects of sex, age and education disappeared (apart from the benefits of a university degree), while being unmarried, employed casually and in poor health remained significant predictors of low pay. Their results were robust to the inclusion of additional controls for firm size, trade union membership, job tenure, and industry (McGuinness and Freebairn, 2007, pp.24–26).

Dockery, Seymour and Ong (2010) provided evidence about an aspect of low-paid workers' experiences that is different from the previous focus on their demographic and work-related attributes, namely, their subjective wellbeing and 'life satisfaction'.⁸ On the premise that the low-paid are vulnerable to employment losses when minimum wages rise, these authors used the unemployed as a comparison group. Their key finding, based on the 2006 HILDA data, was that the unemployed are significantly worse off than low-paid workers on all major indicators of subjective wellbeing. The unemployed have lower self-assessed general health, poorer mental health as indicated by a standard set of survey questions (the SF-36), and lower general life satisfaction (Dockery, *et al.*, 2010). Recognising that low-paid workers may be fundamentally different from the unemployed on important attributes affecting their life satisfaction (e.g. education levels) the authors repeated their comparisons for a subset of unemployed persons whose

6 These authors used the same definition of 'low paid' as McGuinness and Freebairn (2007), i.e., employees other than owner-managers paid up to 10 per cent above the then FMW.

7 Before 2006 there was no single national minimum wage, although the lowest classification rate of pay (C14) in previous iterations of the Metals Award was often referred to as a minimum wage.

8 These authors used the same definition of 'low paid' as McGuinness and Freebairn (2007), i.e., employees other than owner-managers paid up to 10 per cent above the then FMW.

(observable) attributes predicted that they would be low-paid workers, if they were employed. This version of the analysis implied even larger negative welfare effects associated with unemployment, relative to having a low-paid job. The authors concluded that the effects of minimum wages may be asymmetric: the potential benefits in wellbeing arising from higher wages for the workers who keep their jobs appear to be small (given the perceptions of those who are already well paid), while the costs for workers who lose their jobs are substantial (given the perceptions of the unemployed). For this reason, they advised that Fair Work Australia 'should be extremely wary of the potential impact of higher minimum wages on employment' (Dockery, *et al.*, 2010, p.22).

4.4.2 Wage inequality

A widely explored aspect of setting minimum wages is their effects on the overall pay structure and the position of minimum wage workers within it. By mandating a floor on labour remuneration that is higher than the unrestricted market level, minimum wages may reduce the inequality of earnings in the bottom half of the distribution. Whether this is achieved primarily by truncating the distribution, that is, by eliminating the jobs of workers whose expected productivity falls below the newly applicable minimum wage is an issue discussed more fully elsewhere in this document. Our focus here is whether minimum wages do produce a narrower wage structure, which represents one potential aspect of their impact on relative living standards and the needs of the low paid. One reason for taking an interest in this wage structure effect is that the prospects of upward wage mobility for workers who earn low wages appear to be greater in countries with less overall inequality in wages (Richardson, 2005, p.173). We discuss the aggregate evidence first, before considering whether minimum wages can improve the relative positions of specific groups in the labour market, such as women, immigrants and youth.

Healy (2010) provided recent Australian evidence on these questions. His analysis showed that the practice of expressing minimum wage increases in dollar values (rather than percentages), coupled with the legislative emphasis on 'the needs of the low paid' for most of the period since 1996, has resulted in a marked narrowing (compression) of the minimum wage structure enshrined in modern awards. The (nominal) wage increase for workers at the bottom of the award structure (i.e. those receiving the C14 classification rate of pay in the Metals Award or its equivalent in other awards) was more than twice the increase received by workers near the top of the award structure over the 1993–2005 period. Importantly, this compression within the minimum wage structure occurred while inequality increased in the Australian wage structure overall (Healy, 2010). There have consequently been sharply contrasting outcomes for employees that rely on minimum rates of pay. Those minimum wage-reliant employees on low- and semi-skilled rates, below the metal tradespersons' minimum rate (C10), had their wages increased significantly in real terms (i.e. compared with the ABS Consumer Price Index (CPI)) and approximately maintained in relative terms (i.e. compared with the LPI). For workers on award rates above the C10 level, however, wages have declined both in real and relative terms as a result of recent safety net decisions (Healy, 2010, Chapter 6). The overall tendency towards narrower wage differentials in the award sector has been insufficient to offset the increasing inequality in the (larger) bargaining sector.

A limitation of Healy's evidence is that it provides no counterfactual scenario—i.e. an account of what would have happened to wage inequality if not for the safety net increases that were actually provided by the AIRC and AFPC. If similar changes would have occurred in an alternative system, perhaps because of market forces that are exogenous to safety net cases, then the true effects of those cases will be overstated. One study that sheds light on this issue in the Australian context is Watson (2001). His study exploited the preconditions for a natural experiment that emerged after the Kennett Government's abolition of Victorian state awards in 1992. The decision created a dual safety net in Victoria. In one group were workers previously covered by state awards, who lost their award entitlements but retained a set of five basic employment conditions under what became Schedule 1A of the WR Act. In a second group were employees covered by federal awards who were unaffected by the state-level change. Using data from a phone survey of 835 Victorian workplaces conducted in June 2000, Watson found that

(after controlling for other differences) Schedule 1A workplaces had lower starting wages, less equal pay structures, and a higher proportion of their employees on low hourly wages than workplaces that retained federal award coverage. He showed further that the employees most disadvantaged by the changes were those already at greater risk of low pay: those working in smaller firms, in the service industry, and in regional areas (Watson, 2001, p.306).

Watson's empirical method involves the comparison of outcomes in otherwise similar workplaces operating under different, but adjacent, industrial regimes. Another approach to understanding the impact of minimum wages on inequality is to compare the evidence for the same economy, sector or workplace before and after regulatory change.⁹ This approach is taken by Dickens and Manning in two studies for the United Kingdom. They take advantage of the fact that the UK NMW was introduced to a labour market largely free of other wage floors, to measure its inequality effects in pre/post comparisons. In one study (Dickens and Manning, 2004a) they examined changes at the economy level and found that the UK NMW did reduce wage inequality immediately after its introduction, but the effects were limited by the low initial rate at which it was set and the lack of significant 'spillover' to higher-paid workers. In a second study (Dickens and Manning, 2004b) they examined changes within a single low-wage sector, residential care homes for the elderly, and confirmed these initial findings. Even in a sector where 40 per cent of workers were affected by the new UK NMW, there was widespread compliance, minimal spill-over to higher-paid workers, and very little evidence of employers anticipating the higher wage floor by paying it to their workers before the required date. Dolton, Rosazza-Bondibene and Wadsworth (2010) assess the impact of the UK NMW on inequality over the period 1997 to 2007. Identification is obtained by using the variation in the bite of the minimum wage across 140 local labour markets and the variation in annual increases in the minimum. Their difference in differences approach suggests that an increased bite of the minimum wage is associated with falls in the lower tail wage inequality. The combined conclusion of these studies is that the UK NMW has been successful in raising relative wages for workers at the bottom of the pay structure who were the intended beneficiaries of the intervention, and also in reducing the overall dispersion of wages, albeit only to a limited extent.

United States studies (Autor, Manning, and Smith, 2010) suggest that a decline in the real value of the minimum wage may have contributed to the pronounced rise in United States wage inequality that occurred in the 1980s. Pacheco (2009) examined whether a similar relationship applied to New Zealand, where the youth minimum wage rose by 73 per cent over the period 1997 to 2007, compared to a rise of only 29 per cent in the adult real minimum wage, so that youths should have experienced a significant drop in wage inequality compared to adults. Kernel density estimates of the distribution of log real usual regular hourly wages for an individual's main job were constructed for both adults and youths. The wage distribution for youths made a definite movement to the right over the sample period, whereas the distribution remained relatively stable in the case of adults.

Difference-in-differences and other procedures confirmed the presence of a compressed wage distribution for youths and clearly point to the potential for minimum wage adjustments to reduce wage inequality.

Yet another approach to the evaluation of minimum wage effects utilises international comparisons. The OECD has been highly influential in this area of the research literature. One piece of indirect evidence about wage-setting institutions and inequality is that earnings tend to be less widely dispersed in countries with more 'centralised' or co-ordinated systems of wage determination. In addition, there is some time-series evidence for the period 1970–2000 that relative wages declined significantly for women and older workers (but not for younger workers) in countries that 'decentralised' their wage-setting arrangements (OECD, 2004, pp.159–161). More direct evidence about minimum wages is provided by Oliver (2008) using OECD time-series data for the period 1980–2002. This study is particularly pertinent

⁹ Freeman (1998) first discussed these alternative approaches for evaluating the effects of changing labour market institutions, including the effects of minimum wage increases.

to Australian conditions, because it focuses specifically on the impact of industry-wide minimum wage scales that resemble awards in covering both higher-skilled and lower-skilled workers. Oliver's conclusion is that even where labour demand forces are shifting in favour of the higher-skilled (as posited in the 'skill-biased technological change' thesis developed particularly in recent United States explanations for changes in wage inequality¹⁰), their actual effects on inequality are mitigated by industry pay scales. The essence of Oliver's argument is that these pay scales serve as a powerful reference point that can affect wages outcomes generally even when there is significant scope for bargaining above the established minimum rates (as exemplified in the Australian case). Her key observation is that 'the very presence of a scale that specifies wage minima for all types of workers seems to stabilise the degree of inequality across skill groups over time', in part because they 'alter the degree of conflict about wage differences' between these groups (Oliver, 2008, p.1574).

Related to their impact on aggregate wage inequality is the issue of whether minimum wages can improve the relative positions of particular groups facing greater disadvantage in the labour market. The evidence on this point is relevant to an understanding both of 'relative living standards and the needs of the low paid' and the social inclusion criteria which guide the minimum wage decisions of Fair Work Australia. The most comprehensive Australian evidence on this issue comes from analysis and review, now somewhat dated, by Borland and Woodbridge (1999). On the assumption that, if not for its award system, Australian wage determination would come to closely resemble the United States model of low trade union representation and predominantly individualised bargaining, they provided a series of United States–Australia wage inequality comparisons. On all their measures (including the ratio of the 90th to 10th percentiles, and the variance), earnings inequality among men employed full-time was lower in Australia than in the United States in 1990. While some of the differences appear to be due to observable employee attributes, they showed further that the larger part is unexplained, and potentially due to factors such as differences in wage regulation (Borland and Woodbridge, 1999, pp.105–106). A second part of their analysis compared average hourly wages for several more vulnerable groups to the average male wage in each country in 1995. They showed that relative wages were consistently higher for all these groups—including women, youths (aged 16–20 years), immigrants, part-time workers and employees without post-school qualifications—in Australia than in the United States (Borland and Woodbridge, 1999, pp.108–109). Their evidence strongly suggests that relative wages for these groups are higher under the Australian system of award minimum pay rates than they would be in the United States, where no equivalent pay scales exist. Subsequent research has suggested, however, that the benefits of the Australian system for one relatively vulnerable group—immigrants—are not uniform across the skills or earnings distributions. The lowest-skilled immigrants appear to benefit substantially from the Australian wage system, compared to their counterparts in the United States, whereas the opposite is true for highly skilled immigrants (Chiswick, Le, and Miller, 2008). The authors argue that Australia's high minimum wages result in poorer long-term outcomes for unskilled immigrants, by eliminating jobs and training opportunities that, in the absence of these minimum wages, would improve their prospects.

Particular attention has been paid to the relationship between minimum wages and gender wage inequality in recent studies. In two reports funded by the AFPC, Healy, Kidd and Richardson (2008) showed that the ratio of female to male average hourly wages in 2006 was highest for employees reliant on award minimum wages and lowest for employees with individual agreements, while Austen, Jefferson, Preston and Seymour (2009) estimated that the aggregate gender wage gap was 1.2 percentage points lower (0.864 versus 0.852) as a result of the minimum wage decisions of the AIRC between 1995–96 and 2005–06 than would have been the case if the Commission had accepted the wage increases proposed by the Australian Chamber of Commerce and Industry (ACCI).

¹⁰ Autor, Katz and Kearney (2008) provided a recent discussion of this aspect of the United States debate.

The choice of counterfactual here—i.e. the recommendations of ACCI—underlines the difficulties in finding a plausible Australian approximation for what would have happened in the absence of the minimum wage increases actually granted by the AIRC and its successors. As mentioned earlier, this counterfactual problem has been surmounted more easily by British researchers, who have been able to compare the relevant effects before (without) and after (with) a binding UK NMW. One major study of gender pay inequalities in Britain before and after the UK NMW concluded that its effect was modest, in large part because of its low initial level (Robinson, 2002). A subsequent study, exploiting regional variation in minimum wage reliance across the United Kingdom, found that the gender pay gap narrowed more substantially in areas where more workers were affected—i.e. where a larger proportion had their rates of pay increased to comply with the UK NMW (Robinson, 2005). This evidence is consistent with the conclusions of Dickens and Manning (reported earlier) that the inequality-reducing effects of the UK NMW were concentrated in parts of the economy and on groups of workers who were most disadvantaged in the labour market before its introduction. The same conclusion is likely to hold in the Australian context given the evidence from coverage studies that a larger proportion of minimum wage recipients in this country are women.

4.4.3 Household income, living standards and needs

The Panel stated in its 2010 Annual Wage Review decision (Fair Work Australia, 2010a, pp.59–60):

[242] We agree that minimum wages and the tax/transfer system are both relevant to the maintenance of an effective safety net for the low paid: each has its part to play. Wages play a particularly important role in the maintenance of disposable incomes for households not receiving income support payments. ...

[244] Our view is that the low paid need the highest level of wages that is consistent with all other objectives including low unemployment, low inflation and the viability of business enterprises. At the least, this level of wages should enable a full-time wage earner to attain a standard of living that exceeds contemporary indices of poverty. We are open to evidence that there are particular economic developments that are placing unusual and severe strain on the budgets of the low paid.

A more demanding goal for minimum wages, but one that some of their proponents nonetheless claim they can contribute to, is poverty reduction. Their effectiveness in this function will have a large bearing on whether minimum wages can help to promote social inclusion, and whether they can assist in meeting the needs of the low paid. The objective of poverty alleviation is a worthy, but challenging, aim for minimum wages, because they represent only one of many factors influencing the extent and depth of disadvantage and economic exclusion in society. In addition to the rate of employment, significant non-wage factors include the generosity of social welfare transfers, individual choices about partnering and family formation, access to affordable housing, physical and mental health, and decisions made within households about how income will be shared. Furthermore, what matters most for household income, and thus by extension for the needs of the low paid, is not only the hourly *rate* of pay (which is under the control of minimum wage-setting authorities such as Fair Work Australia), but also the number of hours worked over time, and employees' expectations about whether their working hours will remain much the same into the foreseeable future.

To capture these influences empirically, it is necessary to refocus analysis away from the individual employee's position in the wage distribution (as in the studies of wage inequality cited above) and towards their household's position in the overall distribution of income. Stigler (1946, p.363) was the first to argue that the link between minimum wages and poverty would be 'remote and fuzzy' because of many of the above factors. Notwithstanding his scepticism, and that of many economists subsequently, the aim of poverty reduction remains an important political motivation for regulating minimum wages in Australia and in other developed economies (Neumark and Wascher, 2008, p.141).

There is reasonably clear evidence, from countries with quite different wage-setting arrangements, that the lowest-paid workers and workers affected by minimum wage increases are not strongly concentrated in the lowest income households in 'whole of population' comparisons. A recent Australian study estimated that of the lowest-paid 20 per cent of adult employees (i.e. those aged 21 years or more who were not managing their own business), 4 per cent were in households in the bottom income decile and 13 per cent were in the bottom two deciles (Wooden, Wilkins, and McGuinness, 2007, p.302).¹¹ The employees who benefit directly from Australian minimum wage increases—those who are wholly reliant on awards to set their pay—are even less likely to be found in poor households, according to data collected in the 2008 wave of the HILDA Survey (Wooden, 2010, p.322). For Britain, Bryan and Taylor (2004, pp.28–29) estimated that, of the workers whose wages would have to rise to comply with the UK NMW, 34 per cent were in the bottom three deciles of the household income distribution, and 47 per cent were in the bottom four deciles. One implication of these studies is that, even though the Australian NMW 'bites' much further into the wage distribution than its British equivalent, its benefits are not noticeably better targeted to the poor.¹²

A complicating factor here is the selection of an appropriate comparison population for determining where low-wage and minimum-wage workers are located in the household income distribution. The use of the whole population implies that minimum-wage workers should be compared with retirees and other groups with a limited or no attachment to the paid workforce, for the purposes of determining whether they are poor. The choice to exclude from the comparison population people who are older or not in the labour force has a significant effect on estimates of the proportion of low-wage workers living in low-income households. Leigh (2007, p.440) showed that when the comparison is with only people aged 15–55 years (rather than all ages), the proportion of low-wage workers in the bottom two deciles of the income distribution rose from 19 to 23 per cent. When the population was further restricted to include only people in 'working households' (those in which at least one person was employed) the same estimate increased to 35 per cent. The lesson here is that income poverty evaluations, and hence considerations about the needs of the low paid, are sensitive to the choices of comparison group. A difficult question, which empirical analysis can inform but not resolve, is whether the needs of the low paid should be judged against the whole income distribution, or only against the population of working-age people who rely on paid employment as their principal source of income.

Recent studies for the United States have developed the concept of an 'income-to-needs' ratio (INR), which extends understanding about income poverty, relative living standards and the needs of the low paid. The ratio is calculated by dividing each family's total income by the poverty line specific to its size and composition. Typically, families are defined as either 'poor' (INR<1.0), 'near-poor' (1.0<INR<1.5), or 'non-poor' (INR>1.5). This approach yields information that is different from, but complementary to, the usual Australian approach of identifying where low paid workers are located in the overall household income distribution. Applying the INR method to United States data for 2008, Burkhauser and Sabia (2008) calculated that 18 per cent of workers aged 16–64 years would be affected by proposals to increase the United States FMW from \$5.85 to \$9.50 per hour. Of these affected workers, they estimated that 11 per cent were poor, 12 per cent near-poor, and 77 per cent non-poor, according to the above INR thresholds. It is also noteworthy that the link between the minimum wage and family poverty appears to have weakened in the United States in recent years. Burkhauser, Couch and Wittenburg (1996) estimated that, of the workers who were eligible for the 1990–91 United States FMW increases, 22 per cent were poor, 13 per cent near-poor and 65 per cent non-poor. These results imply that: (1) much of the benefit from contemporary United States minimum wage increases goes to families that are already well above the relevant poverty threshold, and (2) the minimum wage is becoming less relevant to the welfare of very poor families.

11 These and other estimates were derived after first converting reported income into an 'equivalent' income measure that adjusts for differences in household size and composition. Although there are differences in the choice of equivalence scale, there is little controversy about the need for such an adjustment to be made when studying income distribution.

12 OECD data compiled by the United Kingdom LPC show that, as a percentage of full-time median earnings in 2004, the minimum wage in Australia was 0.59, compared to 0.43 in the United Kingdom and 0.32 in the United States (LPC, 2005, p.237).

While there is broad acceptance that minimum wages are not a panacea for poverty, even among economists who support their maintenance (e.g. Freeman, 1996), other issues remain controversial in the literature. One such question is whether poverty rates among particular groups of workers are reduced by minimum wage increases to a greater extent than is revealed by the 'whole-of-population' studies discussed thus far. McGuinness and Freebairn (2007) have shown, for instance, that adult low-wage employees in Australia are much more likely to be found in low-income households (defined as the bottom two income deciles) if they work part time (29 per cent) than if they work full time (14 per cent). This difference demonstrates that employees working part time for low rates of pay in Australia are not likely to be the children or partners of well-paid workers looking to earn some discretionary income, but rather are people from households clustered at the bottom of the income distribution. McGuinness and Freebairn (2007, pp.32–33) also show that these part-time low-paid workers are less likely than their full-time counterparts to move into higher-paid jobs after three years. The links between minimum wages and long-term disadvantage are stronger for these part-time workers than the population-wide analyses allow, implying that they have lower relative living standards and greater needs, at least in the Australian labour market.

In the United States, Addison and Blackburn (1999) investigated whether minimum wages reduce poverty rates for three sub-groups of workers affected disproportionately by them: teenagers (15–19 years), young adults (20–24 years) and 'junior-high dropouts' (workers aged 25 years and over who completed nine or fewer years of high school education). Using state-level data for 1983 to 1996, they concluded that higher minimum wages do reduce the proportions of each of these groups living in poor families, even after controlling for differences in economic conditions. Their estimates implied that a 25 per cent increase in the effective minimum wage would reduce the combined poverty rate for the three groups by 9 per cent (Addison and Blackburn, 1999, pp.402–403). This work suggests that there is likely to be more for Fair Work Australia to learn about how minimum wage adjustments 'play out' through changes in income levels, poverty rates and, ultimately, needs, for the different groups who are most dependent upon them in Australia.

Another controversy is whether minimum wage increases ultimately cause or exacerbate poverty, by reducing employment. Neumark and Wascher (2008) review the United States literature at length (including their contributions) and claim that there is 'some likelihood that, on net, poor or low-income families are made worse off' by minimum wage increases. Their evidence for this assertion comes mainly from before-and-after studies comparing outcomes in United States states that increased their minimum wages with those that did not. Their major study in this area (Neumark, Schweitzer, and Wascher, 2005) found that while poverty rates fall immediately after minimum wages increase, this effect is eventually neutralised by 'lagged' employment reductions for the members of low-income families. Taking both the income and employment effects into account, they concluded that there is a statistically significant, but economically small, increase in the proportion of families that are poor or near-poor (INR<1.5) as a result of higher minimum wages in the United States. This result arises, in their view, because of 'many families making small moves to the left' of the income distribution, rather than from large changes at any point in the distribution (Neumark, *et al.*, 2005, p.889).

A final area of interest in the literature is conceptions of poverty and disadvantage that expand on the income-based definitions used in all of the preceding studies. Hahn and Wilkins (2009) constructed a multidimensional measure of the living standards of low-paid employees in Australia (those paid up to 20 per cent more than the then FMW) using data on household income, wealth, consumption expenditure and 'financial stress'. They showed that while these low-paid employees are typically located in the middle of the (equivalent) household *income* distribution, they are more noticeably concentrated near the bottom of the distributions of household wealth and expenditure (Hahn and Wilkins, 2009, p.22). The next part of their analysis estimated what proportion of the low paid can be considered 'poor', when the poverty definition is varied to include (a) low income only, (b) both low income and low wealth, or (c) all of low

income, low wealth and low expenditure. Adopting a 'low' threshold of less than 60 per cent of the median value in each of the respective distributions, they estimated that, in 2006, 3.6 per cent of the low-paid were poor on definition (a), 2.6 per cent on definition (b), and 1.3 per cent on definition (c). In multidimensional terms, then, few low-paid employees can be considered poor. Of course, their results are, to some degree, sensitive to the choice of poverty threshold. However, when an alternative threshold of less than 75 per cent of the median was used, the estimated proportions of the low-paid in poverty increased only slightly to (a) 6.7 per cent, (b) 5.0 per cent, and (c) 3.1 per cent (Hahn and Wilkins, 2009, p.25). This study makes a very useful contribution to understanding manifestations of disadvantage, poverty and 'need' that are not based exclusively on income differences. It would be useful for more research along these lines to be undertaken.

4.4.4 Work incentives and labour supply

Persons with low pay in the labour market are also more likely to have a volatile employment relationship and be more influenced by the tax and transfer system. Higher minimum wages at the lower end of the minimum wage distribution can be expected to increase the willingness of those who are in employment to continue working and to reduce the probability of churning and of holding a second job. There is limited Australian evidence, primarily from research funded by the AFPC, focused on the uniquely designed Australian tax and transfer system. The methodologies used—microsimulation and focus groups—may limit the relevance of this evidence in the broader policy arena. Important overseas studies in this area have used extensive administrative micro-data that would not be available in Australia. A major limitation of existing studies is their partial equilibrium nature. This is an area for further research, as differences in institutional frameworks between countries make overseas research less applicable to the Australian situation. Given the endogeneity of education and workforce participation, there are clear links between the incentive to work agenda and the education and productivity agenda.

Buddelmeyer and Kalb (2008) used a microsimulation methodology to suggest that minimum wages at a level that makes them effective will increase the incentive to work in an unambiguous way. They extended their analysis to the distribution of wages in the labour market. Since this is a partial equilibrium framework that does not include the effect of minimum wages on the demand for labour, the policy implications of their results will be limited.

By using data from 12 focus groups, Colmar Brunton Social Research (2006) investigated: (1) the extent of knowledge about tax and transfer provisions that affect the net financial return from paid work; (2) the extent to which changes in net income affect decisions to enter or leave paid work or to change hours of paid work; and (3) other key (non-financial) factors that affect employment decisions. They found that most knowledge was gained by receiving government benefits and that there was little knowledge beforehand about the way benefits may influence decisions to work. They found a widely-held view that current abatement rates were too high and that they reduced incentives to enter employment or to work longer hours. Although the results from this research cannot be generalised, they point towards an important aspect of the tax and transfer system. As is often the case, claiming benefits can be complicated and this research supports the view that this complexity hinders accurate information flows and results in their displacement by less accurate, but widely-held, beliefs.

Harding, Payne, Vu and Percival (2006) looked at the effect of the tax and transfer system on low-wage earners (defined as employees whose hourly wage rate was below \$15.50 per hour in 2006). Their question was: How much of each minimum wages increase is actually finding its way into the pockets of the recipient wage-earners and how much is retained by taxation? They concluded that the average effective tax rate for low-wage earners, across a range of alternative minimum wage adjustment scenarios, was about 30 per cent, implying that most of the increase was retained by these workers in higher income. Looking more closely at the distribution of outcomes, they concluded that 85 per cent of

low-wage earners faced an ETR of less than 40 per cent. The benefits of minimum wage increases also varied significantly by family type, with low-wage earners in sole parent families facing a much higher average ETR (46 per cent) than those living alone (27 per cent) or in couples with or without children (33 per cent and 29 per cent, respectively).

A notable overseas study (Robinson and Wadsworth, 2007) used population representative data and an experimental estimation methodology to examine the holding of second jobs in the United Kingdom. Their hypothesis was that if UK NMW recipients became better off as a result of minimum wage increases, some of them would not wish to continue with their second jobs. They also posited that because UK NMW jobs would become more expensive to employers, some would cease to offer more flexible second jobs. Robinson and Wadsworth found no evidence that the extra pay provided by the 1999 UK NMW introduction had a significant impact on the incidence of second job-holding. However, hours worked in the main job by second job holders may have risen relative to those not covered by the minimum wage; and hours worked in second jobs may have fallen for those whose second job was initially below the minimum. This is an area of considerable interest for Australia, where there is a high incidence of second job-holding and varied forms of employment that may be affected differently by changes in minimum rates of pay.

4.4.5 Employment dynamics and mobility

The coverage, levels and rate of adjustment of the minimum wages safety net may also be relevant to relative living standards and needs in a longer-term sense. Some employees may be employed for long periods of time on minimum rates of pay, especially if there is upward mobility through the different award classifications. Others may experience bouts of unemployment that see them return to the workforce at lower wage levels than their previous employment. For still others, there may be temporary reliance on minimum wages when bargaining processes break down. In considering the legislative requirement for Fair Work Australia to take account of relative living standards and the needs of the low paid, it is therefore useful to examine studies that deal with minimum wages longitudinally.

One part of the discussion in this area is whether being paid minimum wages is a stepping stone to higher wages or simply traps workers in a low wage–no wage cycle. Prolonged reliance may occur because minimum wage employment in the present period increases the probability of minimum wage employment in future periods (state persistence) or because minimum wage employment is caused by other factors that are themselves persistent (e.g. low ability). To distinguish between these explanations requires panel data, so that we can consider flows into and out of minimum wages. Among the relevant related questions are: Do workers who enter minimum wage employment from unemployment experience different durations as minimum wage recipients than those on minimum wages who have not experienced unemployment? What is the average duration of employment on the minimum wage for groups differentiated by age, gender and other attributes? And what are the destinations of those leaving minimum wages—higher pay, unemployment, or inactivity?

Some of these aspects have been analysed in the United States and the United Kingdom. Thus, Smith and Vavrichek (1992) report that more than 60 per cent of United States workers in receipt of the minimum wage in 1984 were earning more than the minimum one year later. Even and Macpherson (2003) used data drawn from the United States Current Population Survey (CPS) over the period 1979 to 1999 to establish that minimum wage jobs tend to be entry level jobs of short duration for the large majority of workers. Factors which are most likely to assist wage growth and exit from minimum wages are education and training, and changes of industry and occupation. For the United Kingdom, Jones, Jones, Murphy and Sloane (2005), in work undertaken for the United Kingdom LPC, also found that minimum wage jobs were of relatively short duration, with an average duration of 1.46 years and an exit probability of 0.68.

The transitions matrix showed that about 44 per cent of those paid at or below the minimum remained in that state from one year to the next, 40 per cent moved into higher paid jobs, 12 per cent became inactive, and four per cent exited into unemployment.

Neumark and Nizalova (2007) investigated the effect of exposure to minimum wages by younger workers in the United States. They found that workers who had experienced a longer exposure to minimum wages by the age of 29 were more likely to be less educated, with lower tenure and, in general, to have worse future labour market prospects. They argued that the long-run effects they identified and measured may be more harmful than the short-term effects usually considered by researchers. Neumark and Nizalova found that adverse effects were more pronounced among less advantaged groups of the population. They suggested that the way research and policy approach the issue of minimum wages may benefit by focusing more on long-run effects. Phimister and Theodossiou (2009) examined the effect of the 1999 NMW introduction in the United Kingdom on the duration of low pay employment spells, by gender. They find that gender differences disappeared at mean values for the whole labour market, but not among those who were most likely to suffer longer spells, whereas females remained with the strongest disadvantage. The use of duration analysis in this context was innovative and valuable.

A number of related papers have appeared in the Australian literature, but not ones that identify minimum wage recipients from other low-paid workers. Buddelmeyer, Lee and Wooden (2010) showed that low pay is a self-persistent state in the Australian labour market. This is a general paper which offers good background in the area. Perkins and Scutella (2008) looked at specific interventions to improve the prospects of low-skill employees. They examined the effect of current employment assistance programs on the way low-skill job seekers retain their employment and advance in the career and wage ladders. They concluded that employment assistance programs should be more explicit about the inclusion of retention and advancement strategies similar to those found in the United States and the United Kingdom. Finally, Watson (2008) considered the long-term harm that may follow exposure to minimum wages by examining whether low-skill workers are more vulnerable to churning. He confirmed the self-perpetuating nature of low pay using multivariate regression. Like Neumark and Nizalova, he found that the adverse effects were more harmful for particular demographic groups that have other disadvantages. Along with Buddelmeyer, Lee and Wooden, Watson's analysis was limited because of the lack of precise minimum wage information in the HILDA Survey, so that low pay is used as a proxy for minimum wage receipt. This may not be a major limitation if minimum wage receipt overlaps extensively with low pay, but both Bolton and Wheatley (2010) and Healy (2010) present evidence that this is not the case.

This part of the literature rarely considers minimum wage reliance, in part possibly due to data limitations, and does not consider the advice offered by Stigler (1946), who raised the difference between annual and hourly earnings and that between individual and family earnings. Both dimensions will have to be explored before reliable statements about the long-run effects of minimum wages in Australia can be made.

4.4.6 Other evidence

A small number of additional Australian studies provide evidence that is compatible with the research foci of the safety net theme, but not directly related to any of the previous sub-themes.

Nelms and Tsingas (2010) provided a thorough discussion of the origins and interpretations of the concept of 'social inclusion' and its relationship to minimum wages. They traced the idea's development in the academic literature and in public policy in Europe and in Australia. Their discussion reveals the multi-faceted nature of social inclusion, and the range of ways in which its presence (or absence) can be defined, measured and improved. A key feature of their review is the discussion of how different forms of paid employment aid or hinder the pursuit of socially-inclusive outcomes. In this light, they considered the scope for minimum wages to contribute positively to the social inclusion agenda, by increasing

participation rates, developing employee skills, and providing the financial resources fundamental to a decent standard of living. Their report provides an excellent starting point for consideration of the issues relevant to social inclusion, and points to several productive avenues for further work (Nelms and Tsingas, 2010, p.37).

Another recent piece that can be seen as extending the social inclusion insights of the Nelms and Tsingas report, but with a narrower focus on young people, is Pech, McNevin and Nelms (2009). These authors provided a summary of data and previous studies on young people (15-year-olds to 20-year-olds) at risk of labour market exclusion. One definition of young people considered at risk of poor labour force attachment is those 'not fully engaged' (NFE)—neither in full-time employment nor full-time education. In 2008, approximately 280 000 youths (16 per cent of 15–20 year olds) were in this category, with young women being somewhat more likely than young men to be defined as such (Pech, et al., 2009a, p. 8). An alternative indicator of poor labour force attachment, more commonly used overseas, including by the OECD, is those 'not in employment education or training' (NEET). That does not include those working part time. In 2008, around 8 per cent of the relevant age group fell in this category (Pech, et al., 2009a, p.22). Their review of the research evidence on risk factors for poor labour force attachment included the effects of early school-leaving, young motherhood, disability, and ethnic background.

Healy and Richardson (2007) recommended a strategy for monitoring the impact of minimum wage increases that focused on people currently or potentially affected by them. They discussed options for measuring two main consequences—the effect on employment and the effect on the quality of the safety net—and linked these to the available data sources. In addition, they highlighted three areas which, in 2007, appeared to warrant further research: workplace-level effects of minimum wages, employment dynamics for minimum-wage recipients, and the extent of and reasons for employment below the safety net. In the intervening years, the quality of evidence about each of these topics has improved and further work is in progress in projects conducted or commissioned by Fair Work Australia, including 'Enterprise-level case studies' and the 'Review of data on people earning below the transitional FMW'.¹³

13 See the Fair Work Australia website: <http://www.fwa.gov.au/index.cfm?pagename=wagereview2011&page=research>

5 Data strategy

5.1 Introduction

Data play a major role in informing minimum wage decisions. This data strategy focuses on the data aspects of the relevant provisions of the FW Act.

The data strategy considers data that are available, as well as data that may not be available but that would be useful if they were available. The data strategy evaluates data needs, reviews the availability of data and identifies core gaps. The data strategy considers the types of evidence that would facilitate short-term and long-term thinking about the role and effects of minimum wages within the scope of the FW Act.

In assessing the availability of data and significant gaps, the data strategy discusses frequency of current data collection, sample sizes, the richness of information, the timing of the data releases, and the overall suitability of each dataset for the purposes of informing minimum wages adjustment under the FW Act. One of the most important determinants of data quality in this legislative context is the degree to which there is identification of minimum wage-reliant employees, that is, employees whose wage is at the level decided by the Panel.

The data strategy also examines some datasets from overseas, discusses their merits and makes several comparisons and suggestions about new, modified, or extended datasets for Australia that could provide further useful information for informing minimum wages adjustment in the context of the FW Act.

5.2 Overview of types of evidence and methodologies

In principle, there are three main sources of data that can be of use in the context of setting Australian minimum wages. The first main source of evidence is data based on large *quantitative* surveys or administrative records. Typically, quantitative evidence will be nationally representative. The second main source of evidence is data based on *qualitative* collections of smaller scale and more depth. Typically, qualitative evidence will not be nationally representative, but would offer a more detailed picture of a part of the labour market that could be of interest. The third source of evidence is data that have been derived using *experimental* methodologies. Typically, experimental evidence will be constructed to be representative of a specific group and to study a specific set of questions. The focus of this discussion is quantitative data sources.

The design and analysis of data will depend on the specific problem at hand. Research will often require data from a combination of different sources and a mix of methods for their analysis. We begin this discussion by outlining some core principles for the collection and analysis of each type of data, before reviewing the specific data sets.

5.2.1 Quantitative evidence

This type of evidence comes in the form of large datasets, which are derived either through survey data collection or from administrative sources or a combination of the two. The most common way to collect this information is by an interviewer asking each survey respondent the same set of questions and then putting all the information together. Online or postal collections can also be used. Collection of information through a third party (a government agency or another organisation that is authorised to collect and hand over the information) is common. By choosing the survey respondents according to appropriate statistical criteria, and by applying sampling weights, surveys can produce samples that are representative of a specific population of interest.

The fact that all survey respondents have been asked exactly the same questions, and in exactly the same way, makes the information comparable across respondents.

5.2.1.1 Sample selection

The unit of observation (i.e. the respondent to a survey) will typically be:

- a person, sometimes defined in the most general sense (e.g. a resident in the country) and other times defined in a specific capacity (e.g. an employee, a student, or a newly arrived immigrant);
- a household, often but not always represented by a nominated head of the household; or
- an organisation (e.g. an employing establishment).

5.2.1.2 Regularity of sampling

The data collected can be either cross-sectional (where each subject contributes information only once) or longitudinal (where the same subjects contribute information repeatedly over time, typically once a year). In many cases, cross-sectional data collection will be repeated several times, but not necessarily using the same subjects; a notable example being the Australian Census of Population and Housing.

Cross-sectional surveys are reliable and accurate sources of information for describing the data at a single point in time. Non-random data collection can be corrected through sampling weights, in order to ensure that the survey sample is representative of the desired population. The use of cross-sectional data beyond describing the population is limited. Repeated cross-sections can be useful, especially if they retain the representativeness of a population over time (although there is the issue of the population changing over time).

Cross-sectional time-series datasets (called panel, longitudinal or cohort data sets) contain repeated observations on individuals. Their main advantage is that:

...the opportunity to compare the same individual under different circumstances permits the possibility of using that individual under different circumstances as his or her own control, so that we can come closer to the ideal experimental situation (Deaton, 1997, pp.105–106).

Through econometric methods that range from the relatively simple to the very complex, panel data have been used to examine questions of causality in the social sciences. Panel data have much potential, but also many limitations. It is a mistake to think of having panel data as a panacea for economic and social research problems. Panel data frequently suffer from attrition, which means that representativeness is hard to maintain. A complex structure of cross-sectional and longitudinal weights is often used for the purpose of retaining representativeness over time. Replacement strategies are also common. Notwithstanding their limitations, panel data offer insights that cannot be obtained with cross-sectional sampling and analysis.

There are cases where the cross-sectional and time-series elements can be combined to produce a dataset consisting of a fixed number of cohorts, each of a limited duration. Each cohort is surveyed multiple times and then dropped and replaced with another cohort. The CPI and the United Kingdom Labour Force Survey follow individuals for four to five quarters, with one-quarter (or one-fifth) of the sample exiting the panel and being replaced by new respondents in each observation period. This design extends the benefits of cross-sectional surveys, but without the attrition problems that afflict panel data. The frequency of collection of large quantitative data is important. For the purposes of evaluating the effects of Australian minimum wage decisions, annual collection is a minimum requirement, but monthly, or at least quarterly, data would be preferable.

5.2.1.3 Bespoke surveys

These are surveys that look at sub-groups within the population. They can be either cross-sectional (the most common) or panel. For example, a survey may sample all graduates once and at the point in time when they complete their studies and are leaving university. It may collect information about the career development of teachers for the first so many years after graduation, sampling them a few times after their graduation. It may collect information on employers and a selection of their employees, linking employers and employees, either in a cross-sectional format (e.g. the Australian Workplace Industrial Relations Survey and the Workplace Employment Relations Survey in the United Kingdom) or in a panel format (see various linked employer-employee data sets in continental Europe—e.g. Denmark and Germany). There are many such surveys, but they do not necessarily constitute population-representative information sources.

5.2.1.4 Using administrative records

Administrative datasets resemble survey data on individuals, but they originate from the collection of information by administrative bodies. They are often derived from official government records that guarantee their accuracy. They also have the potential of being linked with other records to provide a fuller picture of the person they describe, and they typically have the capacity to become a panel data set. Administrative data have been developed and are used widely overseas. The potential of administrative data sets is underutilised and in its infancy in Australia. Efforts by the Australian Government Department of Education, Employment and Workplace Relations to construct a panel dataset from Australian records of welfare recipients should be noted. A major advantage of administrative data sets is that their information is collected in real time and in a continuous fashion, which makes them the most accurate sources of information for the study of labour market turnover and overall change in the economy. A major disadvantage is that they contain little background information on their subjects.

5.2.1.5 Representativeness of quantitative data

The main advantage of quantitative data is that they can be representative of a population. This implies that conclusions made about patterns observed within the sample (e.g. characteristics or behaviour) can be generalised to the population that the data have been designed to represent. The larger the sample (as a proportion of the population of interest), the more likely it is that conclusions about the population characteristics will be reliable. The implication is that the representativeness of a dataset is of the utmost importance, and must be preserved through any analysis that may alter the sample composition.

Large surveys will typically strive to be representative of their clearly specified unit of observation. In order to achieve this, statistical methods are used to construct different types of weights, an enterprise that can be anything from relatively straightforward (e.g. for a single cross-sectional data collection used for making tabulations representative of a population at a single point in time) to very complex (e.g. for a longstanding longitudinal data collection).

5.2.1.6 Asking questions

It is better that a dataset asks questions in the same way they have previously been asked in similar data sets, to permit comparison, cross-validation and verification. When a question is asked in a new or unconventional way, it can be useful to have it also asked in the conventional way. As a general rule, design and thought are critical before data collection occurs. Once data collection has commenced, corrections and modifications can be costly or impossible. A larger sample size is always better for quantitative data as it allows a more detailed split between self-contained cells in the analysis. Ultimately, however, the optimal sample size will be determined by the added cost of more observations and the

added benefits that are likely to emanate from bigger cell sizes and the more disaggregated analysis that they enable.

An important question in the context of minimum wages is the hourly pay of the worker. When workers are paid by the week/fortnight, hours must also be accurately reported. It is important that information on bonus payments, overtime hours, casual loadings and penalty rates is available, and that there is a clear distinction between gross and net pay. Of the various Australian datasets that are discussed in section 5.3, there are several that are of little or no use in evaluating minimum wage effects because they do not provide any information on pay or pay-setting methods, or they do not provide it with sufficient precision.

5.2.1.7 Limitations of large data sets

The main disadvantage of large quantitative datasets is that they often lack depth in some of the information they collect. The reason is that there is only a finite time for which a survey respondent can be expected to remain focused on answering the survey questions. What is termed 'interviewee fatigue' can be a major problem in survey data collection. Low response rates can be a related and important problem. This is divided into *item non-response*, when a unit does not answer some part of a survey, and *unit non-response*, when a unit does not answer any questions at all. Continuing unit non-response in the form of attrition can become a major problem with longitudinal datasets.

It must be noted that what matters with non-response is not so much whether non-response happens at all (since larger sample sizes can 'correct' for this), but whether non-response happens in a systematic way that cannot be explained, and therefore cannot be corrected, by the remaining information collected in full. In practice, the problem is that it may be unknowable whether non-response is random or systematic. In a similar way, there may be problems with the information that has been reported, in the form of systematic misreporting. Systematic misreporting comes in different forms, occurs for different reasons, and results in different biases (e.g. reporting bias or justification bias). Econometric modelling and (or) extraneous information can, in some instances, help to correct or mitigate the effects of some misreporting biases. In other cases, systematic misreporting is almost impossible to measure accurately. An example relevant to minimum wages is the reporting of cash-in-hand wage payments.

5.2.2 Qualitative evidence

Qualitative data can be collected in a variety of ways, including from interviews, focus groups, bulletin boards and open-ended questions in surveys. Qualitative data can be extremely versatile. Interviews can have different levels of structure, the trade-off being between depth and individuality, when using less structure, and comparability and a better ability to see the broader picture, when using more structure. A skilful interviewer will invariably allow the interviewee sufficient freedom to express their views and allow them to produce thought-provoking results, while introducing minimal interviewer-related bias. However, interviews can be time-consuming and an intensive experience for interviewer and interviewee, which makes qualitative data costly to collect in some instances.

As a form of information collection, qualitative data can supplement quantitative data, inform the development, interpretation and analysis of large quantitative surveys and, above all, they can offer insights that may not be apparent, or even achievable, through quantitative data collection. They can provide novel insights and highlight sometimes surprising new types of evidence. Appropriately focused qualitative evidence can augment and improve the value of quantitative data in specific, practical ways. For example, qualitative evidence may be used to inform the development of quantitative instruments and to improve understanding of the strength and direction of different types of reporting bias, which can be a serious underlying problem in estimation using quantitative data. Qualitative data may then be

supplemented by smaller-scale surveys in order to allow probability matching of the qualitative information within the larger size quantitative datasets.

The major disadvantage of qualitative data is that the information they contain is not representative of the wider population. This implies that, whatever message qualitative data and their analysis provide, this message cannot be readily generalised. While we can know in good detail what the subjects think about the questions we ask them, qualitative interviews do not provide us with the capacity to extrapolate and generalise what we learned directly to other people who were not interviewed. Simply put, qualitative data can inform the researcher extensively about those who were interviewed, but cannot provide any information about, or allow comparisons with, those who were not interviewed.

5.2.3 Evidence from experimental data

Experimental data is usually smaller-scale evidence that has been generated using experimental methods, ranging from Discrete Choice Experiments to data generated in experimental laboratories. Although one can include 'natural' experiments in the sources of information that may be of use here, this type of evidence has not yet played a prominent role in evaluating the effects of Australian minimum wage decisions.

Experimental datasets lend themselves more than any other datasets to pure scientific analysis, as they are designed to allow researchers to study 'what if?' questions with the exact 'counterfactual' scenario in place. Only a carefully randomised experimental dataset can allow this, by containing identically designed 'treatment' and 'control' groups (e.g. workers who are and are not affected by minimum wage increases). This is achievable in many sciences, and the analysis of experimental evidence can be very powerful in understanding patterns of causality in the data, and hence in the evaluation of policy changes.

The experimental principle is simple: there is a treatment group and a control group. Through random assignment, both groups are as close as possible to being identical before the experiment starts. The treatment group is offered some stimulus and the control group is not. Communication of any type between the two groups is not permitted. We collect information before and after the treatment, and evaluate the difference that treatment makes regarding the outcomes of interest. If the experiment has been well-designed, we should be able to estimate the effect of the treatment using 'difference-in-difference' estimation. Simply put, we can compare how things changed over time between the two groups, knowing that the only difference between them was that one group was subjected to the treatment being studied and the other group was not.

To some extent, the quantitative evidence, and many of the methodologies, used in econometric research attempt to simulate the design of an experiment. A common example is longitudinal data combined with 'fixed-effects' estimation, where the information for an individual unit of observation over time is used as its own control group.

There are some occasions when a 'natural experiment' may present itself in social and economic data that have not been specifically designed for this purpose. This typically occurs where one group in the population has been subjected to a stimulus while another has not. This type of evidence will work better, the more similar the two groups are in the attributes that matter, and the less communication there has been between them (especially communication of the type that could be attributed to the availability of the stimulus). That is, people who like the stimulus and are in the control group would not have been able to move into the treatment group, and vice versa.

Natural experiments have been used extensively in the design of minimum wage studies in the United States, where the levels and frequency of adjustment in minimum wages vary significantly between states.

While finding a clear natural experiment is not straightforward, the United States experience should be borne in mind, given that the federal structure has lent itself to the generation of natural experiments. Some use of quasi-experimental techniques has also been made in evaluating the introduction of the UK NMW, typically by comparing changes in employment or hours of work between groups of workers or geographical regions that were differentially affected by it (Connolly and Gregory, 2002; Stewart, 2002).

The different state and federal industrial relations jurisdictions in Australia may also provide conditions suitable for natural experiments, but the data design and collection will have to be carefully thought out. Fair Work Australia is currently considering the possibility of using a version of the natural experiment approach to study whether differences in the size and timing of recent minimum wage increases between the various Australian jurisdictions can be used to evaluate their employment effects (Fair Work Australia, 2010b). This will be more difficult given the increasing coverage of a single federal jurisdiction.

5.2.4 Evidence from mixed data sources

All different types of information and datasets have advantages and limitations. It is good to work on the premise that there is no such thing as a perfect dataset. There is also the possibility of combining data to create a fuller picture of the problems under investigation. There is no single way of doing this, although there are some principles that can be useful regarding the linking of different sources of data. Of particular interest in the context of minimum wage-setting under the FW Act is the potential for using mixed sources of information (qualitative plus quantitative data) and mixed methods of analysis (e.g. where the methods used to analyse interviews complement econometric modelling and analysis). Approaches along these lines are comparatively rare in the existing Australian research literature and may offer a direction for future endeavours to create a more advanced understanding of the workings of minimum wages throughout the economy.

5.3 Major Australian data sources for setting minimum wages

Research carried out in Australia regarding minimum wages reveals two important differences between Australia and our main overseas comparators. First, the Australian minimum wage system has, through the modern awards system, not only one but many minimum wages. Second, data content and availability are more limited in Australia than in the United States and most European countries. To quote the Productivity Commission (2010, p.11): 'Policy formulation in Australia, especially in the human capital areas that are [the Council of Australian Governments'] current focus, has been hampered by data limitations'.

Australian minimum wage-setting is more complex than in most other countries. The reason for this is that, in Australia, the setting of minimum wages entails changing not only one minimum wage, but a range of minimum wages prescribed by the modern awards system. It is at the discretion of the Panel of Fair Work Australia to adjust the various award rates, either by a single amount (as in the 2010 decision), or by different amounts (as the AFPC did in 2006 and 2007).

The possibility of flow-on effects in the wage structure, and in the broader Australian economy, goes beyond traditional concerns about a 'low paid' segment of the labour market. Flow-on effects could become a broader issue, as they would influence a large part of the wage distribution through the awards system. However, it would not be unreasonable to expect that the wage-setting process would take these constraints into account, especially if it were to be faced with an overheating economy. This places further demands on the data that need to be in place to inform the setting of minimum wages. The data have to enable evaluation across the whole economy and not focus on outcomes at the bottom of the wage distribution.

In what follows, we review the major existing Australian data sources, summarising their frequency, scope, sample sizes and degree of identification of minimum wage-reliant employees. We provide comments on the types of analysis that can be undertaken with each dataset and their limitations. We also offer

suggestions for how these existing datasets may be modified or extended to allow more informative analysis of minimum wage-setting issues.

Appendix Table 4 provides an overview of this discussion, showing which data sources could be used to answer which types of research questions and how regularly these analyses can occur (given current data collection frequency and timing of releases). It outlines a series of indicative analyses that could be undertaken. To tie the data strategy back to the research framework component of this report, we indicate which theme of the research framework applies for each suggested analysis in Appendix Table 4.

5.3.1 Household Income and Labour Dynamics in Australia (HILDA) Survey

- Household-based survey.
- Collected annually, with a lagged Confidentialised Unit Record File (CURF) release.
- A question on pay-setting methods was introduced in 2008 (Wave 8), but previous Waves have no information identifying minimum wage-reliant workers, and the question may be omitted from Wave 10 (and subsequent Waves) due to some concerns about the quality of the responses.¹⁴
- Longitudinal dataset, with rich demographic and labour market information.

5.3.1.1 Description

The HILDA Survey is commissioned and funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs and is managed by the Melbourne Institute of Applied Economic and Social Research at the University of Melbourne. HILDA is a nationally-representative household panel survey that began in 2001 and has been releasing a new wave annually since that time. Wave 1 contained 13 969 individual respondents in 7 682 households. Wave 8 (in 2008) contained 12 785 respondents in 7 066 households. Of the total 12 785 respondents in Wave 8, only 9 354 were originally sampled in Wave 1, the rest having joined the survey at later waves as part of the replacement strategy of the HILDA. The HILDA survey was largely modelled on the British Household Panel Survey (BHPS) and it has an attrition rate which is similar to that of the BHPS (see further in section 5.4.3).

The HILDA Survey provides a number of longitudinal and cross-sectional weights which are renewed with every new release to reflect changes in the composition of the sample. The HILDA survey data CURFs are publicly available to researchers and organisations. The latest data (Release 9) became available in December 2010. Given the rich information that is available about the individual worker and their household, the HILDA Survey is the best vehicle for studying the movements of low-paid employees into and out of work (relevant to the needs and living standards of the low paid), but it may be less useful in its present form (because of data quality concerns) for identifying minimum wage-reliant employees and monitoring the effects of minimum wage adjustment.

The HILDA survey respondents in paid employment were asked for the first time in Wave 8 about the method used to set their pay. About 28 per cent reported that they were paid exactly the award rate. By contrast to the HILDA data, the August 2008 ABS SEEH data (which were collected from employers rather than employees) indicated that only 17.4 per cent of employees were award-reliant. The difficulties involved in collecting accurate information from employees in relation to their pay-setting methods are well known among analysts in this research area. For instance, in their submission to the 2000–01 *Safety Net Review—Wages* case in the Australian Industrial Relations Commission, the Joint Governments (representing the Commonwealth, South Australia and the Northern Territory) made the following observation:

¹⁴ See discussion of 'possible changes to future content' in the HILDA News of 11 March 2010, available on the Melbourne Institute website at: <http://www.melbourneinstitute.com/hilda/news/news-2010.html>

The data from the various income surveys...does not [sic] separately identify employees who are paid at award rates. Unfortunately these surveys will probably never allow such an identification as they are household surveys and previous experience suggests that the only way to obtain accurate data on payment system coverage in Australia is from employers (DEWRSB, 2001, p.75).

Similarly, in using the HILDA Wave 8 pay-setting data to describe the household incomes of employees that reported being award-reliant, Wooden (2010, p.322) acknowledged that these data are 'far from perfect' and that employer-provided data still represent 'the "gold standard"'.

5.3.1.2 Limitations and potential modifications

The HILDA wage variable is based on main job earnings and does not distinguish between overtime and ordinary-time earnings. McGuinness, Freebairn and Mavromaras (2007) argued that this implies an under-estimation of the incidence of NMW coverage among full-time employees, to the extent that overtime pay overstates the hourly earnings. There is no obvious incentive for the HILDA respondents to exclude 'cash in hand' payments from their reported weekly earnings, which is an advantage of the HILDA data over the ABS data which rely on employers' payroll records. Finally, the fact that full-time workers are identified in the HILDA on the basis of the hours *usually* worked per week in their main job, based on their average for the year, means there can be some confidence that a measure of hourly pay derived from the HILDA data is based on a sensible approximation of the true weekly hours worked (but not necessarily paid for).

McGuinness *et al.* (2007) used the 2001–2004 HILDA survey data, combined with ABS data, to estimate that there were 868 000 low-wage employees (or 12.5 per cent of the total Australian workforce) who were earning below or around the deflated value of the FMW that was established in 2006. These authors could find no information in the HILDA data to explain the high incidence of below-minimum wage employment. They provided a number of speculative explanations, and carried out various sensitivity analyses to see how much this percentage reduced for different definitions of 'low pay'. They found that even when the cut-off in the data was set at 50 per cent below the FMW (i.e. only employees who were paid 50 per cent of the then FMW or below), there were still 31 000 full-time and 25 000 part-time employees with wages below that level. They concluded that there may be considerable non-award coverage, non-compliance, non-wage compensation and measurement error at play, and that the figures are an underestimate of the true position because many of these workers were in casual contract jobs and the HILDA data have not been adjusted to remove casual loadings from their reported earnings. The implication is that the use of the HILDA data for the lowest levels of pay may not be as reliable as we would wish it to be.

5.3.2 Survey of Employee Earnings and Hours

- Employer-based survey.
- Collected every two years with a lagged CURF release.
- Direct identification of minimum wage-reliant employees (award-only).
- Large sample of employees that can be reliably disaggregated by occupation or industry.
- Federal/state jurisdiction identification.

5.3.2.1 Description

The major ABS data source for analysing minimum wage-setting issues is the SEEH. This is the only ABS source of individual employee pay-setting data and an important source of earnings data. The survey is conducted every two years, generally during the month of May. SEEH is distinguished from many other

ABS data sources in being an employer-based survey rather than a household survey. The benefit of this is that data reported by employers, relating to employee earnings and pay-setting methods, are likely to be of high quality and, it is generally assumed, more reliable than the equivalent information provided directly by employees. The chief drawback of collecting the data from employers is that it is not viable to gather data on key employee human capital characteristics not readily known to the employer, including qualifications and years of workforce experience. However, because the SEEH provides the capacity to link the information about employees' pay-setting methods to other details of the employing firms, it is possible to produce some useful estimates of the characteristics of minimum wage-reliant firms (see McGuinness, Webster, and Mavromaras, 2006).

The SEEH data are collected in a two-stage process. A probability sample of employers is initially selected from the ABS Business Register. Selected employers then provide information for a random sample of their employees, using payroll records. To ensure representative coverage by industry and state/territory, the SEEH sample is large: information was provided by about 10 000 employers for some 57 000 employees in the August 2008 survey (ABS, 2009a, p.42). There is information about both employees (e.g. sex, weekly earnings, working hours and occupation) and employers (e.g. industry, sector and establishment size). In addition to these variables, employers are asked to nominate how the main part of each randomly-sampled employee's pay is set. This approach yields information which allows the ABS to categorise employees into three main methods of setting pay: (1) award-only, (2) collective agreement, and (3) individual arrangement. There are further details about whether agreements are registered or unregistered, and whether the employer operates in the federal or one of the state industrial jurisdictions can be derived. 'Award only' employees are those for whom awards are the only mechanism for setting pay (at a given point in time). These employees receive a minimum rate of pay, as specified in an applicable award, and no more. They are 'minimum wage-reliant' employees directly affected by decisions of the Panel of Fair Work Australia. While the 'award-only' employees can be reasonably clearly differentiated from the other two categories of employees covered by agreements, it is relevant to note that there is also likely to be a degree of overlap between the three main pay-setting methods as defined by the ABS. The vast majority, if not all, employees have underlying award coverage (or a national minimum wage)—because the award system provides the employment 'safety net'—but they are not formally 'reliant' on awards because they have collective or individual agreements in place that improve on the award and set their actual, effective rate of pay (and perhaps conditions of employment). Similarly, collective and individual agreements may operate in tandem, with each setting part of an employee's pay. The assignment between these categories is determined by how the main (largest) part of the employee's pay is set in each case.

The large SEEH sample size means its estimates of earnings and payment method coverage can be reliably disaggregated in a variety of useful ways. For instance, estimates can be obtained of the number, proportion, and types of employees who are reliant on award minimum wages to set their pay at a given point in time. Changes can be monitored using the back series of data available since May 2000, when the question on pay-setting methods was introduced to SEEH. Comparisons can also be made between the different payment systems, for instance, to investigate which types of employees are more likely to be award-reliant, or what the average difference in weekly earnings or hourly wages is between award-reliant employees and over-award/agreement-covered employees. It is possible to make these comparisons at more disaggregated levels, for instance, to control for occupation and industry differences. Another important use of the SEEH data is to determine where minimum rates of pay set by the Panel of Fair Work Australia are located in the hourly wage distribution. Studies along each of the above lines have recently been conducted by Bolton and Wheatley (2010), Healy (2010) and Peetz and Preston (2009), and there will be a need for updating and retesting of their results as new data emerge.

An important but so far under-utilised innovation in the availability of SEEH data was the release of a CURF in March 2009, containing data from the May 2006 Survey. By providing access to the SEEH microdata, the ABS has facilitated a wider array of analyses at lower cost to prospective researchers. At the time of the release of the May 2006 EEH CURF, the ABS indicated that 'it is expected that a CURF will become part of the standard EEH product set' (ABS, 2009c, p.1), but the August 2008 EEH data have not yet been released in this format, and such a release is not among the 'list of expected CURFs' on the ABS website for early to mid-2011.¹⁵

5.3.2.2 Limitations and potential modifications

Despite the usefulness of SEEH CURF data for some purposes, researchers face several limitations, some related specifically to the CURF and others related more generally to the limitations of the SEEH. A drawback of the May 2006 SEEH CURF (the only one released to date) is the absence of industry data. Industry is collected in the survey, but is not provided in the CURF, presumably because of ABS concerns about the potential for responding businesses to be identified. The exclusion of industry precludes some analyses that would be useful to inform minimum wages analysis, given previous evidence that minimum wage-reliant employees are strongly segmented into particular industries.

A number of further steps could be considered to improve the usefulness of the SEEH data. It would be desirable, first, for the survey to have more information about the groups of employees subject to special minimum wages. There is already an adult/junior variable that identifies younger workers receiving junior rates of pay. Similar information about employees with a disability and employees to whom training arrangements apply—the other two groups for whom Fair Work Australia is specifically required to provide 'a comprehensive range of fair minimum wages'—would substantially improve the value of the SEEH data for understanding Australian minimum wage reliance. Such additions would depend, however, on employers' ability to identify the relevant groups accurately. There are also complicating definitional differences, particularly with respect to the meaning of disability. The ABS uses a broader definition of disability than the FW Act and there is no requirement for the person with a disability to state whether they qualify to receive the Disability Support Pension (a requirement of the FW Act). Consequently, ABS data on employees with a disability are likely to include persons outside the definition of disability in the FW Act, and may exclude some employees who fall within the FW Act definition, particularly if their disability does not impair their productive capacity (Leggett, et al., 2010, pp.29–30).

It would also be valuable for the SEEH to have more information about the employers. As discussed extensively in the Research framework component of this report, employers' responses to minimum wage adjustments depend heavily on the market structure in which they operate. Employers in competitive markets are widely expected to respond differently to employers that can exercise a degree of market power. The ABS Business Longitudinal Database (BLD, discussed further below) provides examples of the questions that may be included in the SEEH to capture market structure. Businesses are asked what share of the market they occupy, how closely they monitor competitors' practices, and how many competitors they face. Such details would provide a useful complement to the details on establishment size and industry that are already collected in the SEEH.

Three other general limitations apply to the SEEH data. First, the information is only for employees, so it is not possible to consider changes in employment or unemployment rates using these data alone. Second, there is no longitudinal information. A random sample of employees is captured at one point in time and a separate sample is taken at the next point in time. There is consequently no scope for using the SEEH to understand the frequency or destinations of mobility into and out of the various pay-setting methods, or what the consequences of such movements are, particularly for pay. Finally, there is limited capacity

¹⁵ The relevant section of the ABS website (accessed on 14 January 2011) is located at:
<http://www.abs.gov.au/websitedbs/D3310114.nsf/home/CURF:+List+of+Expected+CURFs>

to understand spillovers between the pay-setting methods. Some of the employees defined by the ABS as having individualised pay-setting agreements will have overaward wages that are based on or linked to the values of applicable award minimum rates of pay, but the number and types of employees in this position are not yet well understood. This has implications for understanding the macroeconomic effects of minimum wage adjustment.

5.3.3 Labour Force Survey and Labour Force Supplementary Surveys

- Household-based surveys.
- Monthly data collection for the main LFS.
- Less frequent data collection, generally annual, for Labour Force Supplementary Surveys.
- Data content and frequency of release vary (monthly, quarterly, annual and biennial).
- Generally large sample sizes.
- No ability to identify minimum wage-reliant employees.
- Often limited further by the absence of weekly earnings information.

5.3.3.1 Description

The ABS LFS is the principal source of national statistics on the labour force activity of Australians aged 15 years and over. It is the basis on which nationally-representative estimates of labour force participation, employment and unemployment are generated. The LFS is a household survey, containing information for a sample of approximately 60 000 individual respondents at any point in time (about 0.45 per cent of the total in-scope population). Households remain in the sample for eight consecutive months and are surveyed on a monthly basis during this period. A high proportion of respondents are matched from month to month, providing a short longitudinal component to the survey. These matched records are used to estimate 'gross flows'—i.e. the extent of movement between employment, unemployment and labour force non-participation from month to month (at a population-wide level).

Among the most useful LFS data are the monthly and quarterly 'data cubes' (found in ABS catalogue numbers 6291.0.55.001 and 6291.0.55.003). These provide access to data that can be manipulated by users (but with constraints on the number and level of detail of the variables) to produce customised tables. The monthly and quarterly data cubes contain different information. The monthly releases provide estimates of labour force status by attributes such as sex, age and country of birth. Some of the groups identified in these data cubes, such as recent migrants from non-English speaking backgrounds, may be relevant for monitoring the effects of minimum wage adjustments. The quarterly data cubes provide additional information about employed persons, including on their industries and occupations.

A notable current initiative within the ABS is the development of a longitudinal LFS CURF dataset. This would allow individuals to be followed over time as they move through the eight months of the survey. This can be thought of as an extension of the 'gross flows' data which enable estimation of monthly transitions between labour market states (employment, unemployment, not in the labour force) at an aggregate level. The ABS plans to include in the CURF some supplementary data, most likely from the Survey of Employee Earnings, Benefits and Trade Union Membership (EEBTUM, see below) to increase the range of variables available for analysis. The provision of such a longitudinal dataset would significantly increase the value of the LFS. It is not clear whether there will be much benefit in terms of understanding minimum wage-setting issues, however, as minimum wage-reliant employees cannot be identified. Another problem is that there will only ever be one observation of weekly earnings for employees, because the supplementary survey collecting these data occurs annually, and consequently workers observed at Time 1 will have exited the panel by Time 2. It therefore appears that a question of great

importance to Fair Work Australia—what impact do minimum wage increases have on employment?—would be difficult to answer with these data.

In addition to the main LFS, the ABS conducts a range of less regular supplementary surveys using subsets of the LFS population samples. The method of data collection involves posing additional questions to selected LFS respondents at the end of their main interview. Supplementary surveys are intended to be a cost-effective means of collecting data on subsidiary topics that do not warrant inclusion in the core LFS questionnaire, and about population groups of special interest to researchers and policymakers. The topics covered include job search experience, labour mobility, retirement intentions, forms of employment, and employee earnings and benefits.

By far the most useful of these Supplementary surveys, for the purposes of studying minimum wage-setting issues, is the EEBTUM, conducted annually in the month of August. This is the only one of the numerous LFS supplementary surveys to include weekly earnings information. Importantly, EEBTUM also has information on hours (including both hours worked and paid for), enabling the construction of an hourly wage measure. As with other ABS household surveys, however, it does not lend itself to relevant analysis due to the absence of data on pay-setting methods and thus the inability to identify minimum wage-reliant employees. Unless the ABS can be persuaded to include in EEBTUM a question on pay-setting methods, analyses using the former will continue to be restricted to generic groups of 'low-paid' employees (such as those below two-thirds of median earnings) to the extent that it may be applicable to considering relative living standards and needs.

Although the EEBTUM data are collected annually by the ABS, they are released in CURF format only every two years. This is because the ABS rotates the supplementary surveys that are packaged with the main LFS data in CURF format. The EEBTUM data were first released in CURF format in August 2005 (the data were from the August 2004 survey), with two subsequent CURF releases following in 2007 and 2009 (from the August 2006 and August 2008 EEBTUM surveys, respectively). Since 2007, the ABS has released both Basic and Expanded versions of the EEBTUM data in CURF format. Only the Expanded version includes the continuous data on weekly earnings and working hours that is required to construct a measure of hourly wages; both variables are group on the Basic version of the CURF (earnings are in deciles). This aspect of data provision means that researchers with an interest in hourly wage estimation must use the Expanded CURF, which is accessible only via the ABS Remote Access Data Laboratory. This version of the dataset includes continuous data on age (useful for approximating junior rates of pay), plus information on paid leave benefits (for identifying casual employees), and reasonably detailed industry and occupation data.

The EEBTUM Survey would be improved by including questions on highest educational attainment (essential for estimating human-capital wage equations) and training arrangements.

Two other Labour Force Supplementary Surveys conducted by the ABS that have potentially useful information in CURF format, but whose relevance for analysing minimum wage effects is severely curtailed by the absence of data identifying method of setting pay and to a lesser extent earnings data, are:

- Labour Mobility Survey (conducted every two years, with information on highest education attainment, and details about the incidence of and reasons for job changes and losses in the past 12 months).
- Forms of Employment Survey (annual, with information on independent contracting, agency and labour hire employment arrangements that operate at the fringe of safety net reliance).

5.3.4 Survey of Income and Housing and Household Expenditure Survey

- Household-based surveys.
- Collection frequency varies from two to six years, with lagged CURF releases.
- No ability to identify minimum wage-reliant employees.

5.3.4.1 Description

The ABS Surveys of Income and Housing (SIH) and Household Expenditure Surveys (HES) have been used extensively for studying low-wage employment in Australia. As previously discussed in the Research framework section of this report, the identification of the low paid is of limited relevance to minimum wage reliance research (other than for considering relative living standards and needs) as 'low-wage' groups include employees who are not minimum wage-reliant and exclude other employees who are minimum wage-reliant.

The SIH collects information about household income that can be linked to information about individual labour force participation and earnings. The HES has similar data, but also collects additional details about household expenditure and quality-of-life perceptions as represented by measures of 'deprivation' and 'financial stress'. The two surveys therefore provide a wealth of data suitable for analysing the linkage between low wages and the minimum wage-setting criterion of 'relative living standards and the needs of the low paid'.

The SIH and HES are separate surveys. Before 2003–04, they were conducted with entirely separate samples of households. In 2003–04, however, the two data collection cycles were synchronised and the very detailed HES expenditure data were obtained from a subset of the households responding to the SIH questionnaire. The result of undertaking the two surveys jointly is that a broader array of data items can now be analysed, for the same sample of households (and the persons within them), than was possible when the surveys were conducted independently. This intersection between the two surveys occurs only infrequently, however, because HES is conducted every six years, whereas SIH is conducted every two years. The release of the 2009–10 data will thus mark the next occasion on which the results of the two surveys can be analysed jointly.

The analyses that can be carried out with the SIH and HES data, when they are released in CURF format, include: (1) identifying the characteristics of low-paid employees; (2) determining where these employees are located within a distribution of equivalent (size-adjusted) household income; reporting the consumption patterns of low-paid workers' households and comparing these to other types of households; and (4) estimating the incidence of deprivation and financial stress in low-paid workers' households.

5.3.4.2 Limitations and potential modifications

The chief shortcoming of both the SIH and HES datasets, in the context of the responsibilities of Fair Work Australia, is that there is no variable on pay-setting methods and thus no way of identifying minimum wage-reliant employees. A more minor limitation of the SIH and HES is the absence of information on casual employment. While the SIH and HES are likely to remain useful datasets for investigating relative living standards and needs issues, the HILDA Survey has extensive details on casual employment and has the added ability to follow low-paid workers (and low-income households) over time.

5.3.5 Survey of Education and Training

- Household-based survey.
- Collected every four years, with lagged CURF release.
- No ability to identify minimum wage-reliant employees.

5.3.5.1 Description

The Survey of Education and Training (SET) is a large, cross-sectional household survey conducted by the ABS every four years. Its primary purpose is to collect data on educational attainment, education and training participation, and the employment outcomes from education and training participation. It also has, however, a wide range of labour force participation and employment variables that make it suitable for some uses. Unlike many other ABS household surveys reviewed in this section, the SET has information on variables including weekly earnings, working hours and highest qualifications. It also has data on casual employment, overcoming this limitation of the SIH and HES datasets, as noted above. Finally, the SET is unusual in also having information about employee characteristics likely to be associated with employment on special minimum rates of pay, namely, apprentices and trainees.

The most useful of the SET data releases is the 'Expanded' version of the CURF that typically follows a year after the original data collection. For the 2009 SET, which was conducted by the ABS between March and June 2009, a CURF was released in July 2010. (There is also a 2005 version of this CURF, but changes in the coding of industry and occupation variables between the 2005 and 2009 surveys impede comparisons for these variables). The 2009 Expanded SET CURF has observations for approximately 24 000 persons, of whom approximately 16 000 are employees. One use of these data would be to examine the types of training that are undertaken by (or provided to) employees in low-paid jobs. Again the usefulness of this data for analysis minimum wage-reliant employee issues is limited and indicative only of those in the lowest spectrum of minimum wage reliance. The detailed SET data on education and training participation (including completed and abandoned programs and courses) would facilitate a richer understanding than now exists about the opportunities for low-paid workers to improve their skills and productivity. Such an analysis would provide a context for debates about the potential productivity-enhancing effects for low-paid workers, discussed at length earlier in this Report. Another use of the SET data would be to estimate how many employees are likely to be 'employees to whom training arrangements apply' based on the reported incidence of these characteristics.

5.3.5.2 Limitations and potential modifications

The SET shares with other ABS household surveys the major limitation of not identifying the different pay-setting methods. Apart from this, there are at least two other ways in which the SET could conceivably be modified to improve its usefulness for analysing minimum wage-setting issues. Both comments relate to the accuracy of hourly wage measurement. On the earnings side, data available at present are for the usual weekly earnings in current main job. It would be preferable for overtime payments to be distinguished from ordinary-time payments in this measure. With regard to hours, the data available at present refer either to the hours usually or actually worked in current job. It would be preferable to have a measure of the hours *paid for* to ensure that unpaid overtime is not mistakenly included in deriving a measure of the hourly rate of pay. The only other ABS data source that currently makes this distinction between hours worked and hours paid is the EEBTUM. The inclusion of hours paid in that survey suggests that it may be feasible to collect the equivalent information in the SET.

5.3.6 Business Longitudinal Database

- Employer-based survey (sample also includes some non-employing businesses).
- Annual observations followed over a five-year panel, with a lagged CURF release.
- Limited identification of minimum wage-reliant employees.

5.3.6.1 Description

An important recent advance in the availability of data for monitoring minimum wage effects at the workplace level is the ABS BLD. The chief purpose of the BLD is to promote analysis of changes over time in the performance of a cohort of small and medium-sized Australian businesses (ABS, 2009b, p.1). The BLD includes extensive information on business performance, some from administrative sources (tax records) and some from perceptions reported by the business owner. An attractive feature of the BLD is that there are repeat observations on the same businesses over a five-year Panel, although only three waves are included in the CURF dataset that is available for analysis as at December 2010.

Among the BLD variables that appear relevant to an analysis of minimum wage effects are business characteristics (including size and industry division), employment (total, by full-time/part-time and casual), market structure variables (number of competitors, competition intensity, market share), financial indicators (sales, capital and non-capital investment, wage and salary costs), changes to work organisation, and perceived performance indicators (productivity and profitability). A critical inclusion in the BLD is a question on pay-setting methods, with business owners asked to nominate which of the following apply (with the option to select several): 'award', 'individual agreement' and 'other'. One simple use of these data would be to compare the characteristics at a point in time of the businesses that do and do not report having employees paid at the award rate. This exploration would complement the current Fair Work Australia project on minimum wage-reliant small businesses. Another potential use of BLD data would be to examine whether businesses that cease to rely on awards improve their performance significantly over time (either measured or perceived) relative to similar businesses that continue to rely on awards.

5.3.6.2 Limitations and potential modifications

A number of limitations would be encountered in any analysis attempting to use the BLD CURF data to understand minimum wage-setting issues. The question on pay-setting methods is restrictive in its present form. It provides no information about the relative importance of awards or other methods of setting pay for employees in each business. It is not known whether a particular method applies to all, some, or only one employee in the responding business. This makes interpretation of the data problematic, since the sample of firms includes businesses with as many as 200 employees. Strong assumptions would need to be made about what *proportion* of employees in such a firm is minimum wage-reliant, if the employer indicated that awards operated as a pay-setting method in their firm. A more useful questionnaire design would ask employers to report the proportion of their employees covered by each method. Even if this information were collected only in ranges (e.g. under 20 per cent and so on) it would be a marked improvement on the existing data. Similarly, it would be useful to have some information about the approximate proportion of each business's wage and salary costs that minimum wage-reliant workers represent.

Another worthwhile extension of the BLD questionnaire would be to include some information on employers' previous responses to minimum wage adjustments. The goal would be to understand the relative significance of minimum wages in businesses' decision-making processes. Some other previous Australian surveys have attempted to collect information of this kind, as have various qualitative studies,

but it has proved difficult to obtain reliable and nationally representative data, for various reasons. One problem is that employers are sometimes asked how they *would* respond to minimum wage increases, instead of what their actual responses have been. Another issue is that asking about minimum wages assumes their importance. Some employers may exaggerate the role that minimum wage increases have played in their decision-making, simply because their attention has been drawn by the question to minimum wages. A preferable approach is simply to ask employers to stipulate or rank the factors that guided their decisions—about employment, price increases, work organisation, and so on—without prompting them to reflect on minimum wages per se. The absence of responses relating to minimum wages would imply that they have little importance in business decisions. And if minimum wages are explicitly mentioned on the questionnaire, there should always be an option for businesses to state that they were not important.

Another limitation of the BLD is that it has incomplete coverage of the workforce. The sample includes only small to medium-sized businesses, excluding larger entities with more than 200 employees. The range of industries in scope of the BLD is also more restrictive than the SEEH, and one industry with a high number of minimum wage-reliant employees (Health and community services) is excluded. These limitations do not preclude using the BLD CURF for some of the purposes illustrated above, but they do diminish its ability to generate representative national data on minimum wage effects.

The BLD also has limited financial and employment data. Employment data are presented as categorical variables, rather than being measured by the number of employees as is preferable with labour quantity measures. Variables such as effective full-time labour, capital and value-added cannot be generated, and as a result sound quantitative measures of productivity cannot be constructed. Hence, even if there were better information available in the BLD about the minimum wage-setting issues discussed above, firm-level analysis would still be limited in scope.

5.3.7 Other Australian data sources

A number of other ABS surveys provide useful time-series data that can be compared with changes in the levels of Australian minimum wages. Many of these comparisons are relevant for illustrating changes in 'relative living standards and the needs of the low paid'.

The *Survey of Average Weekly Earnings* is the principal source of ABS earnings data. It provides quarterly estimates of 'AWOTE'—average weekly ordinary time earnings for full-time adult employee jobs—which is the series most often compared to changes in minimum rates of pay.

A well-known limitation of the AWE earnings measures is that they are affected by compositional changes in the workforce. Earnings increase in AWE measures not only because of improvements in the rates of pay for a constant workforce, but also because the workforce is changing. The LPI overcomes this limitation by providing an index of the price of ordinary time hourly rates of pay excluding bonuses (but including casual loadings, over-award payments and piece rates). This index can be thought of as providing a measure of wage growth over time (available quarterly since 1997) for a set of constant quality jobs.

Conceptually similar to the LPI is the CPI, which measures quarterly changes in the prices of common consumer goods and services. The inflation measure obtained from the CPI can be used to measure the growth in minimum rates of pay over time in real terms (i.e. net of price changes), which is an important determinant of their impact on 'relative living standards and the needs of the low paid'.

The Multi-Purpose Household Survey (MPHS) was introduced by the ABS in 2004–05, and since then has been taken each month over the financial year as a subset to the Monthly LFS. The MPHS includes

information on retirement and retirement intentions, and barriers and incentives to labour force participation, the latter of which is of particular interest in analysing the effects of minimum wages. The Barriers and Incentives to Labour Force Participation module within the MPHS is conducted every two years, and collects data about people who are either not employed or work less than 15 hours per week, to provide information about the potential labour force and what these groups view as preventing them from commencing paid work or increasing their current working hours. Various aspects of work are explored as deterrents or motivators, including preferred number of hours, the industries of past and current employment, and also the lowest gross wage per hour that the respondent would accept (i.e. the 'reservation wage'). The data highlight contextual factors impinging on labour force participation decisions. By identifying the barriers that people face in joining the labour force or working longer hours, the MPHS points to a range of incentives which can inform the wage-setting decisions of Fair Work Australia in the context of the legislative requirement to 'promote social inclusion through increased workforce participation'. As with other ABS household surveys, however, the main drawback of the Barriers and Incentives to Labour Force Participation module is the lack of information on earnings and pay-setting methods.

The Census of Population and Housing is taken in Australia every five years, and includes information on individual weekly income, qualifications and, for employed persons, hours worked. As a complete (or almost-complete) enumeration of the Australian population, the Census data have the advantage over survey sample data of being able to count and describe small subgroups of the population (e.g. ethnic minorities, detailed industries, and very remote areas of Australia). The drawback of the Census for analysing minimum wage effects is the absence of pay-setting information. Another problem is that the measurement of earnings is quite broad: weekly income is collected in ranges of at least \$100 per week and includes all forms of income, not just earnings. While it would be useful for the Census to have more detailed earnings data, considerations about respondent burden and the attendant risks of increasing non-response rates will take precedence.

5.4 Gaps in understanding and avenues for new data collection

5.4.1 Linked Employer-Employee Datasets (LEED)

Linked employer-employee data sets (LEEDs) combine matched information collected from households and individuals with information collected from businesses or establishments. They can be based on administrative or survey data and can be cross-sectional or longitudinal. Abowd and Kramarz (1999) review studies from 17 countries using 38 different systems for creating LEEDs. Describing the variety in design and use of LEEDs lies beyond the scope of this report. The main advancement offered by LEEDs is that they can allow the analysis of labour markets using information from both the demand for labour (employers) and the supply of labour (employees). There are some general key advantages that can be gained through a LEED:

- A LEED allows the simultaneous investigation of individual worker heterogeneity, individual firm heterogeneity and joint worker-firm heterogeneity in terms of their effect on wages and job mobility. Without accounting for the individual effect of the firm on a worker-firm match, we cannot identify and estimate accurately the individual effect of the worker on a worker-firm match.
- A LEED with longitudinal information allows the complete study of the dynamics of the labour market. Again, this comes down to distinguishing between the effects of changes in demand from the effects of changes in supply of labour. The dynamics of training and human-capital development and utilisation can be examined in a better informed way.
- To the degree that administrative data can be used, and for the limited information that administrative records can offer, a longitudinal LEED with a large sample size is feasible at little extra cost. Additional survey information may not have as large a sample for it to be useful.

- A LEED can allow the study of firm birth, growth, decline and death in the context of individual firm as well as sector and national productivity.

Examples of likely advances in the understanding of minimum wages that can be gained through a LEED include:

- A LEED will allow for the estimation of productivity in relation to minimum wage reliance. Using the information on firm characteristics will remove biases from the estimation of the differences between workers who are minimum wage-reliant and workers who are not.
- A LEED will allow the investigation of heterogeneous firm responses to changes in minimum wages. Economic theory predicts that these responses may differ by firm size and the extent of product market competition.
- A LEED will illuminate different practices by different firms and how they lead to different economic outcomes.
- A LEED will illuminate the relationship between minimum wages and productivity and profitability. A longitudinal LEED will allow the investigation of the relevant dynamics.

The contents of a LEED have to be designed from the outset with an open mind and an inclusive attitude towards research. This would necessitate extensive prior consultation in order to avoid serious mistakes. Provided an Australian LEED contained precise information on method of setting pay, and to a lesser extent hourly pay and hours worked (which necessitates that the employer provides the information), it would become an invaluable tool for assessing the effects of minimum wage changes on individual workers and their employers, as well as the wider industry and the national economy.

Arguing for an Australian LEED would have to be on the basis of benefits that span across the whole of the Australian economy. Facilitating a considerably better-informed process for minimum wage-setting would be only part of the overall national benefits that such a dataset would provide.

It should be noted that the ABS has recently investigated options for creating an Australian version of a LEED. The latest (August 2010) issue of its biannual publication, *Labour Statistics News* (ABS catalogue no. 6106.0), included the following passage, indicating that while some exploratory work had been undertaken, further progress on developing the LEED would require additional funding:

The ABS has explored and outlined how options for a linked employer-employee dataset could be created. These options include making additional use of existing survey and/or administrative data through integrating existing datasets, and others which would involve new data collection to fulfil emerging research and policy needs, such as workplace relations. The work to date has focussed on outlining the options, therefore any substantial development work on one or more of these options would be contingent on the ABS receiving additional resources (ABS, 2010).

5.4.1.1 Limitations

Representativeness is a complex issue in the case of LEEDs, as the sample can consist of a representative group of employees matched with data on the firms that employ them, or a representative group of firms matched with data on the employees they hire, or a representative employer-employee panel.

Ideally, a LEED would combine high quality administrative data from different sources with high quality survey data collected from employers and employees. The production and the analysis of a LEED can be very complex. The collection of the data is expensive and it typically requires considerable coordination between the various government departments with administrative data responsibility, when the primary source is administrative data. The linking of data may need changes in rules and regulations.

Anonymity and confidentiality are not always straightforward, especially regarding large establishments. Confidentiality issues may still be present even after the most obvious identifying information has been removed.

A major potential limitation of an Australian LEED would be if its composition were restricted to only administrative records (i.e. without extensive employer-employee survey information) and if the access by the research community to the finished product were restricted too heavily. The very complex nature of this type of information suggests that without the enthusiastic contribution of the research community, such a dataset would not be sufficiently utilised. Lessons from overseas may be useful, especially from countries with the similar levels of data protection as Australia.

5.4.2 Federal and state government administrative records

There are many administrative records collected for different statistical and, typically, non-research purposes in Australia. These are only rarely available to the research community, in part due to confidentiality and in part due to the considerable resources that would be needed to turn them into appropriately confidentialised data files. The potential use of these records for evaluating minimum wages cannot be made clear without a systematic review and documentation of these datasets.

5.4.3 Minimum wage evaluation in the United Kingdom

The three main United Kingdom data sources for the analysis of minimum wages are the LFS, the Annual Survey of Hours and Earnings (ASHE) and the BHPS.

The LFS is a household survey of approximately 60 000 households, providing information on approximately 100 000 individuals. From 2006, it has been run on calendar quarters. The random sample design consists of five waves, each consisting of 12 000 households. Income questions on average gross hourly pay, usual pay and basic pay are asked of individuals only in waves 1 and 5. This rotational element creates an 80 per cent overlap between quarters and thus 20 per cent enter and exit the survey each quarter. This produces a longitudinal element of one year's duration. Detailed information is provided on a range of personal and household characteristics, as well as employment status, hours, occupation, industry, second job-holding, education and training, health, region and locality. Derived hourly pay is subject to measurement error, as it is obtained by dividing weekly earnings by hours worked, but includes bonuses and other pay which are not normally included in the basic hourly wage rate. The direct hourly wage rate is better for assessing compliance with the UK NMW, but is available only for a limited number of respondents, namely those paid by the hour. It is estimated, however, that 83 per cent of the beneficiaries of the UK NMW are hourly paid. From April 1998, quarterly estimates have been produced each month and these help the United Kingdom LPC to produce annual reports on the UK NMW. It is unfortunate, therefore, that the Australian equivalent of the United Kingdom LFS contains no method of pay or earnings data, severely curtailing its value for the purpose of analysing minimum wage-setting effects.

The ASHE is a United Kingdom-wide one per cent survey of employees, providing information about the levels, distribution and make-up of earnings and hours within industries, occupations and regions by gender, full-time/part-time status and age group. Data are available on gross weekly pay, pay excluding overtime, basic pay including other pay, overtime pay, gross hourly pay, and hourly pay excluding overtime. The sample each year comprises all employees whose national insurance numbers end with a specified pair of digits. The same pair of digits has been used since 1975 to produce a longitudinal panel of some 175 000 individuals. The frequency of release is annual, with a reference period of April each year and availability some nine months later. Again, considerable use is made of this dataset by the United Kingdom LPC.

The BHPS is an annual nationally-representative survey of households in Great Britain, based on a stratified cluster design drawn from postal addresses. Data from each wave are available within a year of completion of the fieldwork. Wave 1, conducted in 1991, contained five thousand households and 10300 individuals. Additional samples of 1500 households in each of Scotland and Wales were added in 1999, and in 2001 a sample of 2000 households in Northern Ireland was added. Currently there are 18 Waves. The same issue relating to derived pay and the direct hourly wage rate arises as is the case in the LFS, and there is the added complication that it is not possible to calculate wage changes that occur between annual interviews. Wave 9 included additional questions in order to evaluate the impact of the UK NMW. These questions allowed the implied basic wage rate for all non-hourly paid workers to be calculated, thereby increasing the sample size of those receiving the minimum wage. The BHPS is ideal for estimating the persistence of minimum wage employment because of its longitudinal dimension.

Finally, reference should be made to the Workplace Employment Relations Survey, which is conducted every five or six years. This is a matched employer-employee survey of some 1250 establishments and a sample of up to 25 employees in each of them. However, the grouped nature of the earnings data precludes its use for the analysis of the minimum wage. The ideal dataset would be a matched employer/employee panel with detailed ungrouped earnings data, but this does not presently exist. Nevertheless, existing datasets in the United Kingdom are much superior to those in Australia for the purpose of analysing the impact of minimum wages.

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Appendix Tables

Appendix Table 1: Overview of supporting research evidence under the national economy theme

	Commissioned research	Other Australian research	Non-Australian research
Section 2.4.1: Employment effects— aggregate evidence	<ul style="list-style-type: none"> Downes & Hanslow 2009 Lewis 2006 	<ul style="list-style-type: none"> Leigh 2004b (Reply) Watson 2004 (Comment) Leigh 2003, 2004a (Erratum) 	<ul style="list-style-type: none"> Addison et al., in press Belman & Wolfson 2010 Oesch 2010 Doucouliaagos & Stanley 2009 Metcalf 2008 Stewart & Swaffield 2008 Aaronson & French 2007 Singell Jr & Terborg 2007 Machin & Wilson 2004 Stewart 2004 Wolfson & Belman 2004 Neumark 2001 OECD 1998
Section 2.4.2: Employment effects— complementary evidence			<ul style="list-style-type: none"> Sen et al., in press Böckerman & Uusitalo 2009 Fang & Gunderson 2009 Sabia 2009 Thompson 2009 Orrenius & Zavodny 2008 Hyslop & Stillman 2007 Campolieti et al. 2005 Neumark & Wascher 2004 Bazen & Marimoutou 2002 Connolly & Gregory 2002
Section 2.4.3: Price effects			<ul style="list-style-type: none"> Fougère et al. 2010 Wadsworth 2010 Aaronson et al. 2008 Lemos 2008
Section 2.4.4: Productivity and related effects	<ul style="list-style-type: none"> Farmakis-Gamboni & Yuen 2011 		<ul style="list-style-type: none"> Warren & Hamrock 2010 Forth et al. 2009 McLaughlin 2009 Georgiadis 2008 Bassanini & Venn 2007 Arulampalam et al. 2004 Forth & O'Mahoney 2003 Neumark & Wascher 2003
Section 2.4.5: Other effects and miscellaneous studies	<ul style="list-style-type: none"> Rozenbes 2010 ACIL Tasman & Colmar Brunton Social Research 2009a ACIL Tasman & Colmar Brunton Social Research 2009b Mowbray et al. 2009 (3 papers) Pech et al. 2009 Wheatley 2009 Buchanan & Considine 2008 McDonald 2008 Access Economics 2007 	<ul style="list-style-type: none"> Watts 2010 Burgess 2004 	<ul style="list-style-type: none"> Machin 2008 (Edited speech) Simon & Kaestner 2004 Hansen & Machin 2002

Notes: Sorted by date of publication (in descending order) within each cell. Full references provided in the bibliography.

Appendix Table 2: Overview of supporting research evidence under the workplace theme

	Commissioned Australian research	Other research
Section 3.4.1: Quantitative studies	<ul style="list-style-type: none"> • Australian Centre for Research in Employment and Work (ACREW) 2006 • McGuinness et al. 2006 	<ul style="list-style-type: none"> • Rohlin (in press) • Fairris & Bujanda 2008 • Hyslop et al. 2008 • Dube et al. 2007 • MacDonald & Aaronson 2006 • Mason et al. 2006 • O'Neill et al. 2006 • Portugal & Cardoso 2006 • Fairris 2005 • Fairris & Pedace 2004
Section 3.4.2: Qualitative studies	<ul style="list-style-type: none"> • Evesson et al. 2010 • Southwell et al. 2010b (Consolidated Report) • Southwell et al. 2010a (Interim Report) • Pointon et al. 2009 • Southwell et al. 2009 • Wearne et al. 2008 	<ul style="list-style-type: none"> • Warhurst et al. 2008 • Ram et al. 2007 • Druker et al. 2005 • Reich et al. 2005 • Heyes & Gray 2004 • Adam-Smith et al. 2003 • Arrowsmith et al. 2003 • Ram et al. 2003 • Schneider & Dutton 2002

Notes: Sorted by date of publication (in descending order) within each cell. Full references provided in the bibliography.

Appendix Table 3: Overview of supporting research evidence under the safety net theme

	Commissioned research	Other Australian research	Non-Australian research
Section 4.4.1: Reliance	<ul style="list-style-type: none"> • Bolton & Wheatley 2010 • Leggett et al. 2010 • Rozenbes 2010 • Cully 2008 • Flatau et al. 2008 • McGuinness & Freebairn 2007 • Healy & Richardson 2006 	<ul style="list-style-type: none"> • Dockery et al. 2010 • Healy 2010 	
Section 4.4.2: Wage inequality	<ul style="list-style-type: none"> • Austen et al. 2009 • Healy et al. 2008 	<ul style="list-style-type: none"> • Healy 2010 • Chiswick et al. 2008 • Richardson 2005 • Watson 2001 • Borland & Woodbridge 1999 	<ul style="list-style-type: none"> • Autor et al. 2010 • Dolton et al. 2010 • Pacheco 2009 • Oliver 2008 • Robinson 2005 • Dickens & Manning 2004a, b • OECD 2004 • Robinson 2002
Section 4.4.3: Household income, living standards and needs	<ul style="list-style-type: none"> • Hahn & Wilkins 2009 • McGuinness & Freebairn 2007 	<ul style="list-style-type: none"> • Wooden 2010 • Leigh 2007 • Wooden et al. 2007 	<ul style="list-style-type: none"> • Burkhauser & Sabia 2008 • Neumark & Wascher 2008 • Neumark et al. 2005 • Bryan & Taylor 2004 • Addison & Blackburn 1999 • Burkhauser et al. 1996 • Freeman 1996
Section 4.4.4: Work incentives and labour supply	<ul style="list-style-type: none"> • Buddelmeyer & Kalb 2008 • Colmar Brunton Social Research 2006 • Harding et al. 2006 		<ul style="list-style-type: none"> • Robinson & Wadsworth 2007
Section 4.4.5: Employment dynamics and mobility	<ul style="list-style-type: none"> • Mitchell 2009 	<ul style="list-style-type: none"> • Buddelmeyer et al. 2010 • Perkins & Scutella 2008 • Watson 2008 	<ul style="list-style-type: none"> • Phimister & Theodossiou 2009 • Neumark & Nizalova 2007 • Jones et al. 2005 • Even & Macpherson 2003 • Smith & Vavrichek 1992
Section 4.4.6: Other evidence	<ul style="list-style-type: none"> • Pech, forthcoming • Nelms & Tsingas 2010 • Pech et al. 2009 • Healy & Richardson 2007 		

Notes: Sorted by date of publication (in descending order) within each cell. Full references provided in the bibliography.

Appendix Table 4—Data sources, frequency of availability and indicative analyses under each research framework theme

Frequency	Data Source	Indicative Analyses
Monthly	ABS LFS data cubes (cat. no. 6291.0.55.001)	For the national economy theme Plot changes in the real value of the National Minimum Wage against: <ul style="list-style-type: none"> • Employment-to-population ratios for teenagers and young adults • Employment-to-population ratios for recent, non-English speaking migrants • Unemployment rates by age and duration of unemployment categories
Quarterly		For the national economy theme Plot changes in the real value of the National Minimum Wage against: <ul style="list-style-type: none"> • Full-time and part-time employment, as a proportion of total employment, in industries with high minimum wage reliance (e.g., Retail trade) • Full-time and part-time employment, as a proportion of total employment, in occupations with high minimum wage reliance (e.g., Community and personal service workers) • Average hours worked by part-time employees (disaggregated by sex and age) in industries and occupations with high minimum wage reliance
		CPI For the national economy and safety net themes Plot changes in the real value of the National Minimum Wage and other key award minimum rates of pay, such as the C10 tradespersons' rate, by deflating the nominal values of these rates by the value of the CPI in each quarter (perhaps with September 2009 as the base quarter representing the shift in minimum wage-setting powers from the AFPC to FWA).
		AWE For the national economy and safety net themes Plot changes in the nominal value of the National Minimum Wage and other key award minimum rates of pay, such as the C10 tradespersons' rate, against quarterly values of AWOTE (average weekly ordinary time earnings for full-time adult employee jobs).
	LPI For the national economy and safety net themes Plot changes in the nominal value of the National Minimum Wage and other key award minimum rates of pay, such as the C10 tradespersons' rate, against quarterly values of the Wage Price Index series of ordinary time hourly rates of pay excluding bonuses.	
Annually	HILDA	For the national economy and safety net themes Estimate the number and attributes of employees reliant on minimum rates of pay in each year. Trace the transitions through different labour market states for the workers who were minimum wage-reliant at any point in time. The relevant transitions should include into and out of minimum wage reliance, movements to higher pay (whether or not still minimum wage-reliant), into unemployment, and out of the labour force. Also model the determinants of each of these transition probabilities, focusing particularly on groups of workers that have disproportionately high minimum wage reliance at a single point in time (e.g. women, casual workers, and employees in key industries and occupations). Locate minimum wage-reliant employees in the household equivalent income distribution, and compare their reported prevalence of financial stress to the prevalence for all Australian households and (or) households in which the main source of income is wages and salaries.
	BLD Expanded CURF	For the workplace theme Describe the characteristics of businesses that report having some of their employees paid at award rates only, and compare them with other businesses. For the length of the available data panel, explore the relative performance of businesses in these two groups. Examine further the performance of businesses that cease to rely on awards as a pay-setting method (recognising that these are likely to be quite a small group).

Appendix Table 4—Data sources, frequency of availability and indicative analyses under each research framework theme

Frequency	Data Source	Indicative Analyses
Every two years	EEH Expanded CURF	For the safety net theme Estimate the number of employees that are minimum wage-reliant. Identify groups that have the highest numbers of minimum wage-reliant employees, both absolutely and as a proportion of employees in the group (by sex, full-time/part-time, casual status, industry, occupation, and employer size). Estimate the average hourly wage difference between award-only, collective-agreement and individual-agreement workers within each of these groups. Plot the distribution of hourly wages under each pay-setting method and locate the key minimum rates of pay within the respective distributions.
	EEBTUM Expanded CURF	For the safety net theme Derive a measure of hourly wages from the survey information on weekly earnings and hours paid for. Plot the distribution of this variable and locate the key award minimum rates of pay set by FWA (e.g. C14, C10) within this distribution. Examine the characteristics of workers paid close to or less than the hourly value of the National Minimum Wage.
	SIH Expanded CURF	For the safety net theme Derive a measure of hourly wages from the survey information on weekly earnings and hours worked. Locate employees with low hourly rates of pay (near the NMW) in the household equivalent income distribution for: (a) all Australians, (b) households with at least one adult of working age (e.g. 21-59 years), and (c) households in which wages and salaries are the principal source of income.
Every four years	SET Expanded CURF	For the national economy and safety net themes Repeat the EEBTUM analysis described above, but with a closer focus on employees to whom training arrangements may apply and employees with a work-limiting disability. Also examine the types of education and training that low-paid employees have either completed or participated in during the past 12 months, as an indication of offsetting productivity effects from higher minimum wages.
Every six years	HES Expanded CURF	For the safety net theme Derive a measure of hourly wages from the survey information on weekly earnings and hours worked. Calculate the incidence of financial stress in households of employees with low hourly rates of pay (near the NMW) and compare this to the incidence for: (a) all Australians, (b) households with at least one adult of working age (e.g. 21–59 years), and (c) households in which wages and salaries are the principal source of income.

