The Extent and Consequences of Underemployment in Australia

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Abstract

Underemployment is generally conceived as excess labour supply associated with employed persons – that is, as a situation where employed persons would like to work more hours at prevailing wage rates. Using information collected by the 2001 Household, Income and Labour Dynamics in Australia (HILDA) survey, this study seeks to investigate the extent of underemployment and its effects on outcomes such as income, welfare dependence and subjective well-being. It is found that over one in six employed persons is underemployed, corresponding to a failure to utilise 5 per cent of hours supplied by employed persons. Underemployment is more frequently associated with part-time employment for females, but for males is more frequently associated with full-time employment. Models estimated of the effects of underemployment on outcomes imply that, while unemployment clearly has greater adverse consequences, underemployment is nonetheless associated with significant detrimental effects on the outcomes examined. Negative effects are found for both part-time employed and full-time employed workers who would prefer to work more hours, but effects are greater for underemployed part-time workers, and are particularly large for part-time workers who would like to work full-time. Indeed, for part-time workers seeking full-time employment, effects attributable to underemployment are, for some outcomes, not far short of those attributable to unemployment.
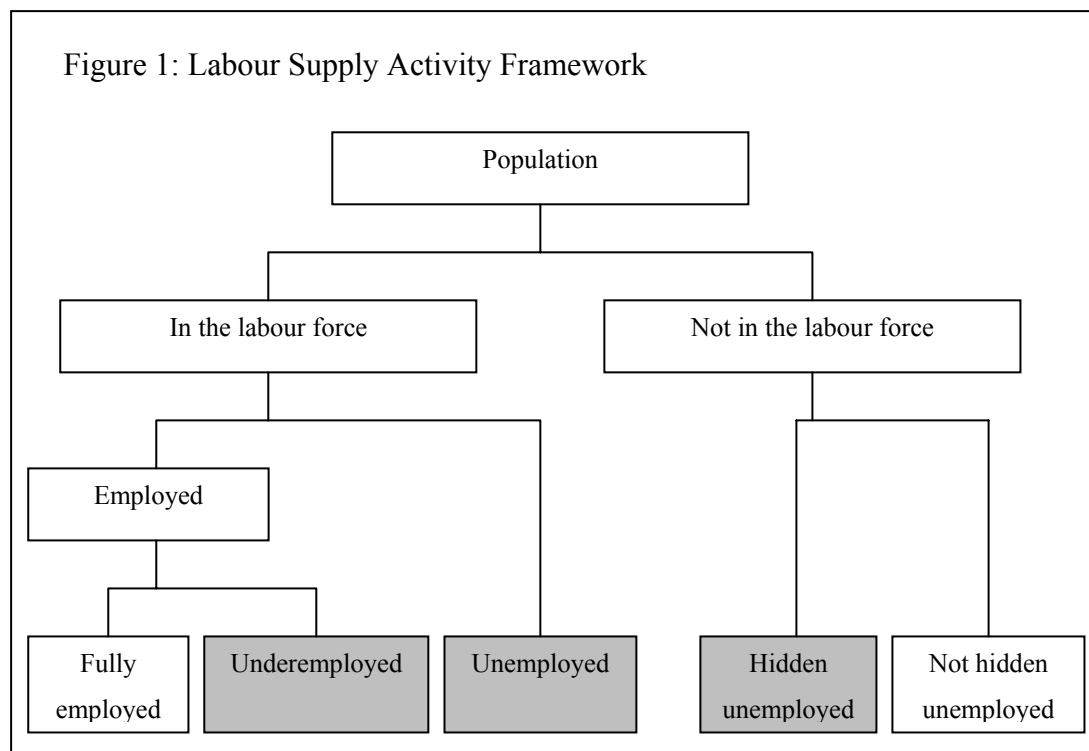
1. Introduction

It is widely acknowledged that the unemployment rate understates the extent to which labour is 'underutilised' (e.g. Ross (1985), Bosworth and Westaway (1987), Bregger and Haugen (1995), Mitchell and Carlson (2001), Denniss (2003)). An important component of underutilisation that is not captured by unemployment statistics is underemployment, which occurs when employed persons would like to work more hours at the prevailing wage rates than they actually work.[1]

To place underemployment in context, Figure 1 presents a conceptual framework for labour market activity which shows the three main components of (time-related) labour underutilisation: underemployment, unemployment and hidden unemployment. All three groups represent individuals who would like to work more hours at prevailing wage rates. The underemployed are distinguished from the unemployed by the fact that at least some employment is held. Both the underemployed and unemployed are distinguished from the hidden unemployed by the fact that they are in the labour force – the hidden unemployed are not in the labour force because of perceptions that gaining employment is unlikely.

A question that naturally arises from examination of Figure1 is "how concerned should we be about underemployment vis-à-vis unemployment?" The answer to this question certainly depends on how many people are underemployed. However, it also depends on how outcomes for the underemployed compare with outcomes experienced by the unemployed. The underemployed are clearly very different from the unemployed in that they already have a foothold in the labour market and are earning wage and salary income. But, in other respects, are the underemployed more like the employed or more like the unemployed? The policy significance of underemployment is greater the more it is associated with the low incomes, high rates of welfare receipt and other adverse outcomes that are in evidence for the unemployed. If, on the other hand, the underemployed tend to reside in high income households and experience outcomes more like those experienced by the employed than by the unemployed, policy concern is reduced compared with concern for the unemployed.

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[1] In this paper the narrow 'time-related' definition of underemployment (ILO, 1998) is adopted, excluding, for example, inadequate use of worker skills. See Section 4 for further discussion of this issue.

Figure 1: Labour Supply Activity Framework

Population

In the labour force | Not in the labour force

Employed

Fully employed | Underemployed | Unemployed | Hidden unemployed | Not hidden unemployed

In light of uncertainty about the policy-importance of underemployment, using information collected by the 2001 Household Income and Labour Dynamics in Australia (HILDA) survey, this study seeks to assess the extent and significance of underemployment in Australia. Specifically, two lines of inquiry are pursued. First, estimates are produced of both the number of people underemployed and the extent of underemployment of the underemployed. Second, investigation is undertaken of the effects of underemployment on outcomes. That is, how do outcomes such as income, life satisfaction, quality of working life and income support use for the underemployed compare with outcomes of the unemployed and the employed?

These two lines of inquiry involve ascertaining the significance of the problem of underemployment by examining, first, its pervasiveness and extent, and second, the outcomes associated with underemployment. The population examined is restricted to persons aged 15-64 years, interpreted as the workforce-age population. Furthermore, all of the analysis in this study is undertaken for males and females separately, on the basis that the nature and effects of underemployment are likely to be quite different for males and females.

The plan of the paper is as follows. Section 2 provides a brief background discussion and reviews the literature, Section 3 discusses the dataset used, while Section 4 then discusses, in light of the previous literature and available data, the adopted definition (and associated measures) of underemployment. Section 5 presents descriptive statistics on the extent of

underemployment, and Section 6 examines the effects on outcomes associated with underemployment. Section 7 concludes.
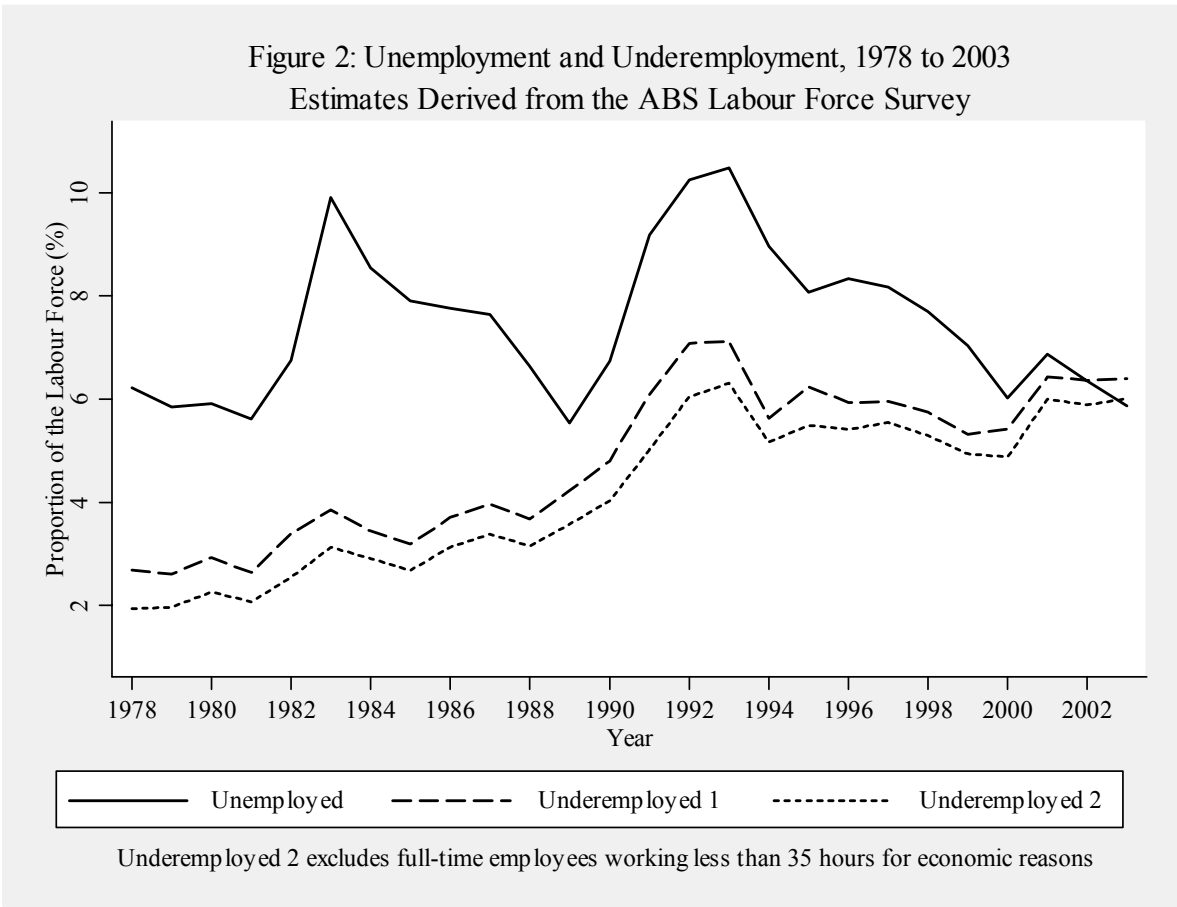
2. Background Discussion

Although underemployment is not identified by standard labour market statistics, it has long been recognised as a form of underutilisation of labour. The concept was 'accepted' (recognised) by the Sixth International Conference of Labour Statisticians (ICLS) in 1948, and a resolution formally defining underemployment was adopted at the Eleventh ICLS in 1966. Correspondingly, since 1966 the Australian Bureau of Statistics (ABS) has produced statistics based on the notion that underemployment exists, beginning with identifying part-time workers who would prefer to work full-time in the August 1966 Labour Force Survey.

In each year since 1978, the ABS has produced information allowing estimation of the level of underemployment, whereby a person is regarded as underemployed if he or she is working fewer than 35 hours per week and prefers to work longer hours. Specifically, as part of its August labour force survey up until 1993, and as part of its September labour force survey thereafter, the ABS has gathered information on (i) the number of persons who normally work less than 35 hours per week who would prefer to work more hours (underemployed part-time workers); and (ii) the number of persons who normally work 35 or more hours per week but did not work 35 or more hours in the reference week for 'economic' reasons, which comprise 'stood down', 'short time' and 'insufficient work' (underemployed full-time workers).[2]

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[2] This measure restricts underemployment to those working fewer than 35 hours per week. As noted, statistics produced by the ABS on number/proportion of persons who 'normally work part-time, but prefer to work 35 or more hours' also allow construction of an underemployment measure over the period 1966 to 1977. This measure is, however, not comparable, since it excludes part-time workers who prefer more hours, but not as many as 35 hours, and full-time workers who are temporarily working less than 35 hours for 'economic' reasons. Also note that an irregular ABS publication 'Underemployed Workers, Australia' (Cat. No. 6265.0), providing information on the number and characteristics of underemployed workers, was first published for May 1985. The ABS released subsequent issues for May 1988 and May 1991, and has produced an issue for September of each year since 1996. Prior to 1998, the definition of underemployment used by the ABS in this publication was the same as is possible to construct from the labour force survey since 1978. However, beginning with the 1998 issue, the ABS has adopted a definition of underemployment which imposes the additional requirement that part-time workers preferring additional hours also be *available* to work additional hours within four weeks of the survey. Published ABS data make it possible to construct estimates of the number underemployed under this definition for each year since 1994. Comparison of estimates under the new definition with those under the old definition show the number

Figure 2 presents estimates, derived from the ABS labour force surveys, of the proportion of the labour force unemployed and underemployed in each year from 1978 to 2003. It indicates that the proportion underemployed has converged over the period to the proportion unemployed – that is, the number underemployed is now as large as the number unemployed. Thus, underemployment appears to be a growing problem relative to unemployment. Note, however, that the extent of excess supply represented by underemployment is still likely to be smaller than that represented by unemployment, since the shortfall of actual hours of work from desired hours is likely to be greater on average for the unemployed.[3]

Figure 2: Unemployment and Underemployment, 1978 to 2003
Estimates Derived from the ABS Labour Force Survey

Underemployed 2 excludes full-time employees working less than 35 hours for economic reasons

Source: ABS Cat No. 6203.0

underemployed to be approximately 10 per cent lower under the new definition. This ratio is reasonably stable between 1994 and 2003, suggesting trends since 1978 are likely to be robust to the more restrictive definition.

[3] The HILDA 2001 survey shows that the shortfall of hours worked is on average greater for the unemployed. See Section 5.

As well as collecting data on underemployment, the ABS (1984) is also responsible for initiating research into underemployment in Australia, attempting to document trends in the proportion of the labour force underemployed between 1966 and 1983 based on the information collected in ABS labour force surveys. The ABS estimates show a trend increase between 1966 and 1983 in the proportion of the labour force that is underemployed. Since then, others to have produced estimates of the extent of underemployment in Australia include Ross (1985), Bosworth (1986), Bosworth and Westaway (1987), Wooden (1993, 1996), Denniss (2001) and Mitchell and Carlson (2001). Most of these studies have been primarily concerned with obtaining a more accurate picture of the extent of labour underutilisation than is provided by official unemployment rate statistics. All use ABS published data to measure underemployment, and those that examine trends over time therefore concur with the evidence presented in Figure 2 of a trend increase in underemployment.

In addition to measuring the extent of underemployment, Wooden (1993) also describes the key characteristics of the underemployed using unit record data from the May 1991 Labour Force Survey. He finds the underemployed were, compared with the fully employed, more likely to be female, young (less than 25 years of age), single and a non-English speaking background (NESB) immigrant. The probability of being underemployed was also higher for persons working in less skilled occupations (sales and personal service workers, plant and machine operators, labourers and related workers) and for those working in the recreation and personal services and construction industries. Wooden (1996) builds on Wooden (1993) by looking at *changes* in the characteristics of underemployed workers between 1985 and 1995 using aggregate ABS data (published in 1985 and 1995 as 'Underemployed Workers, Australia'). He finds increases in the proportion who are over 45 years of age, NESB immigrants and males. He also estimates the implications of the existence of underemployment and hidden unemployment for the relationship between output growth and the unemployment rate.

International research has, like the Australian research, attempted to document trends in the extent of underemployment (e.g. Bregger and Haugen (1995), Sorrentino (1995)) and examine the factors associated with, or determinants of, underemployment (e.g. Leppel and Clain (1988), Ruiz-Quintanilla and Laes (1996)). Research has also attempted to account for underemployment in models of labour supply in order to accurately infer labour supply elasticities (e.g. Ham (1982), Kahn and Lang (1991), Dickens and Lundberg (1993), Stewart and Swaffield (1997)).

The contribution of this study to existing research primarily derives from using an alternative data source to the ABS labour force surveys, the HILDA 2001 survey. First, in addition to

examining the extent of underemployment as measured by the ABS, this study also considers a broader notion of underemployment which includes persons working full-time hours. Second, the HILDA survey collects information on a wide range of characteristics and outcomes of respondents, which facilitates investigation of the consequences of underemployment for the underemployed along a number of important lines. This study is therefore able to make a significant contribution to our understanding of the significance of the problem of underemployment in Australia.[4]

3. The HILDA Survey Data

The Household, Income and Labour Dynamics in Australia (HILDA) Survey, described in Watson and Wooden (2002), is a nationally representative household panel survey. The first wave, data from which are used in this study, was conducted in 2001, seeking information about all members of sampled households, and specifically seeking personal interviews with all household members who turned 15 years of age prior to 1st July 2001. Completed interviews with all eligible members were obtained for 6,872 households, out of a total of 11,693 households selected for inclusion in the sample. Interviews with at least one eligible household member were obtained for a further 810 households. The result is (at least partial) data on 13,969 persons aged 15 years or more, 11,920 of whom are aged less than 65 years.[5]

The first wave of the HILDA survey collected information on a wide range of personal and household characteristics, including income; sources of income; labour force and employment status; hours of employment; industry and occupation of employment; trade union membership status; tenure with current employer; employer characteristics; labour force history; educational attainment; family circumstances; health; country of birth; and, if born outside Australia, year of arrival in Australia. It also obtained from respondents their views or opinions on a wide range of issues, including satisfaction with life circumstances, satisfaction with employment circumstances and attitudes to work and gender roles, the respondent's job and workplace, and parenting. Importantly for the purposes of this study, the data collected include information on

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[4] A further advantage of the HILDA survey with respect to the study of underemployment is that its richness permits much more comprehensive examination of the factors associated with underemployment than was possible for Wooden's (1993, 1996) studies. This line of inquiry is taken up in Wilkins (2004).

[5] There are 5948 enumerated persons for whom no person records are available (non-respondents). Of these, 4317 are aged 0-14 years and are therefore out of scope; the remainder are actual non-respondents. Information on the existence of these individuals was used, however, in generating information about household and family characteristics.

both actual and preferred hours of paid work, making possible the construction of measures of underemployment.

The HILDA Survey unit record file contains 'responding person population weights' which are set according to external population benchmarks (and discussed in detail in Watson and Fry (2002)). These are used in all of the descriptive analysis to facilitate population inferences, but not in the regression analysis undertaken in Section 6.

4. Measuring Underemployment

4.1. The definition of underemployment

The notion of underemployment that this paper seeks to investigate is what the International Labour Organization (ILO) calls 'time-related' underemployment, the measure of underemployment adopted at the Sixteenth ICLS (ILO, 1998).[6] According to the ILO definition, persons in time-related underemployment comprise all persons in employment who satisfy the following three criteria during the reference period used to define employment:

1. Willing to work additional hours, i.e. wanted another job (or jobs) in addition to their current job (or jobs) to increase their total hours of work; to replace any of their current jobs with another job (or jobs) with increased hours of work; to increase the hours of work in any of their current jobs; or a combination of the above;

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[6] The ILO distinguishes underemployment associated with insufficient hours of work (time-related underemployment) from other forms of 'inadequacy of employment situations'. Inadequate employment situations comprise '…situations in the workplace which reduce the capacities and well-being of workers compared to an alternative employment situation' (ILO (1998)). This is an exceptionally vague notion, although the ILO describes some specific situations that might be considered inadequate employment situations, including: inadequate use of occupational skills; excessive hours of work; inadequate tools, equipment or training for the assigned tasks; travel to work difficulties; inconvenient work schedules; and recurring work stoppages because of delivery failures of raw material or energy. The ILO currently has the position that '…the statistical definitions and methods necessary to describe such situations still have to be developed further' (ILO (1998)). Prior to the ICLS 1998, the ILO definition of underemployment was that adopted by the ICLS 1966. This definition distinguished 'visible' underemployment from 'invisible' underemployment. 'Visible' underemployment approximately corresponds to 'time-related' underemployment. 'Invisible' underemployment comprises workers employed in jobs not making full use of the skills held by the workers (because the job itself is low skill and/or the worker is idle part of the time), and is therefore a subset of 'inadequate employment situations'. See ILO (1990) for further details on visible and invisible underemployment.

2. Available to work additional hours, i.e. are ready, within a specified subsequent period, to work additional hours;

3. Worked less than a threshold relating to working time, i.e. persons whose hours actually worked in all jobs in the reference period, were below a threshold, to be chosen according to 'national circumstances'.

The ILO definition of underemployment is not entirely consistent with the notion of underemployment as a form of excess supply in the labour market. First, this definition does not require *active search* for additional hours of work (which is usually a requirement for a person to be classified as unemployed). This is possibly because of the view that a worker can be underemployed simply if more hours with the current employer are sought. Second, the ILO definition does not require that workers desire more hours *at prevailing wage rates*, which is likely to reflect practical difficulties imposing this requirement. Finally, the third requirement, that a worker be working less than a chosen threshold, is not a necessary condition for a situation of excess supply. The logic for this requirement appears to be that underemployment is only likely to be associated with the adverse consequences associated with unemployment when hours worked are less than some norm. Defining this norm is a potentially difficult task, but a common approach is to adopt full-time hours as the threshold (e.g. the ABS adopt a threshold of 35 hours per week), implying full-time workers cannot be underemployed. For this reason, underemployment is often referred to as 'involuntary part-time employment' by researchers in the field (e.g. Bednarzik (1975), Leppel and Clain (1988) and Jacobs (1993)).

The HILDA survey asks all employed persons how many hours they usually work per week in all jobs (usual actual hours), and, furthermore, how many hours per week they would like to work, taking into account the effect this would have on their income (desired hours). Attempting to remain consistent with the ILO definition where possible, this information allows us to employ the following definition of underemployment:

HILDA Underemployment Definition: Underemployment occurs when employed persons who usually work less than 35 hours per week would like to work more hours than they currently usually work.

This is broadly consistent with the ILO definition (and also current ABS practice), but has several weaknesses:

1. It will potentially include people who express a preference for more hours of work, but who are not *available* to work more hours.[7] For example, workers who work fewer hours than desired because of ill health or family commitments are not truly underemployed. If an individual would like to work more hours but chooses not to supply them because of reasons such as these, then they are not constrained by inadequate labour demand, which is the principle underpinning the concept of underemployment. The survey does not ask workers if they are available to work additional desired hours of work. Therefore, we are unable to impose this requirement of the ILO definition on a measure of underemployment based on the HILDA data. ABS data gathered in 2001 show that approximately twelve per cent of part-time workers expressing a preference for additional hours of work were not actually available to work those additional hours within a four week period.

2. It excludes full-time workers who are temporarily working less than 35 hours for economic reasons. This is because the HILDA survey collects information on *usual* hours of work, not hours in the survey week (or, to be consistent with the ILO definition, during the reference period used to define employment). ABS estimates of underemployment in 2001 show that full-time workers temporarily working fewer than 35 hours for economic reasons represent approximately eight per cent of all underemployed workers.

3. It potentially includes worker who would like to work more hours, but only at higher wage rates than on offer. For underemployment to represent excess labour supply requires workers to prefer more hours *at prevailing wage rates.*. However, 'prevailing wage rates' is not a well-defined concept, and failure to impose this requirement is consistent with the ILO definition and usual practice internationally.

4. It excludes full-time workers who would like more hours. This is based on the ILO requirement that, for a worker to be regarded as underemployed, actual hours need to be less than the 'normal' duration. In this paper, 'normal' has been assumed to be 35 hours per week. There is, however, no reason in principle to exclude persons working 35 or more hours per week, and the ILO definition therefore does not seem appropriate on this count. If a worker wants more hours, this constitutes a situation of excess supply of labour, and it arguably should not matter what is the 'normal' duration of work. Exclusion appears to be based on a judgement about the relative social welfare costs of underemployed full-time

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[7] In common with the ILO definition, and at odds with the concept of unemployment, the adopted definition also does not require *active search* for the additional hours.

workers vis-à-vis underemployed part-time workers. To some extent, this is assuming the outcome which this study seeks to investigate – the consequences of underemployment. For this reason, underemployment of full-time workers is also investigated in this study.[8]

Two other issues with respect to the definition of underemployment warrant mention. First is that measures of underemployment are likely to be sensitive to the time frame over which underemployment is measured. For example, results will likely differ if the time frame is one week versus one year. The nature of the HILDA survey data creates a somewhat imprecise time frame, since respondents are asked about *usual* weekly hours, and whether they would like to work more hours than this. While usual weekly hours will be a well-defined concept for many workers, it may be ambiguous for respondents with variable hours, and the time frame over which such respondents construct their notions of 'usual' is likely to vary across respondents.[9] A second issue is that Wave 1 of the HILDA survey was conducted in the third and fourth quarters of 2001. We should therefore note the potential for seasonal factors to impact on underemployment measures, and on the outcomes and factors associated with underemployment.

4.2. Measures of underemployment

There are two main types of measures of underemployment, headcount measures (number of persons underemployed) and volume measures (number of hours of underemployment). Headcount measures provide information about the pervasiveness of underemployment (how many people are affected), while volume measures provide information about the extent of excess supply represented by underemployment (how many hours of supplied labour are not utilised because of underemployment). Estimation of volume measures are possible using the HILDA survey data, because the unit record file contains data on both actual and preferred working hours of all those in employment (both full-time and part-time employed). Underemployment measures are most informative if expressed as relative measures, which is the approach adopted in this paper. For example, the volume measure can be represented as:

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[8] Also note that the ILO (1998) does suggest that information should be collected on full-time workers who express a preference and availability for more hours, implying this is in fact of interest to studies of labour underutilisation.

[9] Respondents who, in response to the question asking them their usual weekly hours, initially indicated that working hours varied, were asked to take the average over the preceding four weeks. However, it is likely that many respondents with variable hours simply constructed their own definition of 'usual' and gave an estimate without first revealing that working hours varied.

$$V = \frac{\sum\limits_{i=1}^{n} U_i}{\sum\limits_{i=1}^{n} S_i} \qquad (1)$$

where U_i is the number of hours of underutilisation of individual i and S_i is the preferred ('supplied') number of hours of work of individual i. The definitions of both U and S can be varied to produce different volume measures, the main constraint being that U should be a subset of S. For example, U could be 'additional hours wanted by part-time workers', and S 'total desired hours of part-time workers' or 'total desired hours of all workers'; or U might be 'additional hours wanted by part-time workers, up to a maximum of 35 per week inclusive of hours already being worked', and S might then be 'hours desired by employed persons, up to a maximum of 35 per week'.[10]

Statistics presented comprise the mean proportion of persons underemployed, the proportion of supplied hours that are not utilised because of underemployment, and the mean, median, standard deviation and inter-quartile range of the number of hours of underemployment (among the underemployed). Distributional features other than the mean are of some interest for volume measures of underemployment. In particular, the degree of dispersion of the extent of underemployment among the underemployed is considered via the standard deviation and inter-quartile range.

5. The Extent of Underemployment

5.1. The extent of underemployment among working age persons

Table 1 presents statistics on the proportion of individuals who express a desire to work a different number of hours of work than currently being worked (and who are at least marginally attached to the labour force). This is not intended to provide information on the extent of underemployment, but rather provide a context, in terms of preferences over working time, for the measures of underemployment presented. Over 45 per cent of persons aged 15 to 64 years express a preference for working different hours than they are currently working. This translates to approximately 5.8 million people expressing dissatisfaction with their current hours of

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[10] For volume measures, underemployment is set equal to zero for employed persons who desire fewer hours than usually worked (the 'overemployed'). For estimates of the number overemployed, see Table 1.

employment. Females are more likely than males to prefer more hours, while males are more likely than females to prefer fewer hours.[11]

Table 1: Persons who want more hours and persons who want fewer hours – Workforce age persons – Proportion of the population and proportion of employed persons (%)

	Underutilised		Overemployed	
	Males	**Females**	**Males**	**Females**
Population aged 15-64 years				
All persons	25.1 (0.40)		20.4 (0.37)	
By sex	23.7 (0.56)	26.6 (0.56)	23.7 (0.56)	17.1 (0.48)
Employed persons aged 15-64 years				
All	15.9 (0.55)	17.2 (0.60)	30.6 (0.69)	27.3 (0.71)
By employment status:				
Full-time	10.3 (0.50)	5.8 (0.52)	34.9 (0.78)	42.2 (1.10)
Part-time	46.0 (1.89)	30.3 (1.05)	7.1 (0.97)	10.1 (0.69)

Notes:
Standard errors in parentheses.
Underutilised: Persons with a marginal or greater attachment to the labour force wanting more hours of work.
Overemployed: Employed persons wanting fewer hours of work.
A person is marginally attached to the labour force if he or she: (i) is not available to start work in the reference week, but wants to work and is actively looking for work; or (ii) is not actively looking for work, but wants to work and is available to start work within 4 four weeks.
Among persons aged 15-64 years, 89.0% of males and 78.3% of females have a marginal or greater attachment to the labour force; and 83.6% of males and 66.6% of females are in the labour force.

Patterns for underutilisation and overemployment among employed persons are similar to those for all persons. The important difference is that the rate of underutilisation is almost 10 percentage points lower, while the rate of overemployment is somewhat higher, reflecting the fact that only employed persons can be overemployed. As might be expected, underutilisation is primarily associated with part-time employment, while overemployment is primarily associated with full-time employment. Significantly, given full-time or part-time employment, males are

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[11] Information gathered on preferred hours of work is different for non-employed persons to that gathered for employed persons. The non-employed are first asked their reservation wage and then asked how many hours they would like to work at that wage. Employed persons are asked their preferred hours of work, taking into account the effect this would have on their income, thereby implicitly obtaining their labour supply at their current wage rate. In general, we would expect the actual wage to exceed the reservation wage for the employed and be less than the reservation wage for the non-employed. If labour supply is increasing in the wage rate, this implies underutilisation is overstated for the non-employed relative to the employed.

more likely than females to prefer more hours, while females are more likely than males to prefer fewer hours.

Table 2 presents estimates of time-related labour underutilisation of those with a marginal or greater attachment to the labour force, expressed as a proportion of the workforce-age population.[12] Column (A) presents total underutilisation, with underutilised persons comprising all persons with a marginal or greater attachment to the labour force seeking additional hours of employment. Columns (B) to (E) comprise the components of column (A). Column (B) comprises underutilisation of persons marginally attached to the labour force, and column (C) comprises unemployment. Column (D) contains estimates that approximately correspond to the ABS (and ILO) definition of underemployment. Column (E) comprises estimates of full-time worker underemployment, which might be included in a broader measure of underemployment.

The top panel presents estimates for the headcount measure of underemployment and the lower three panels present estimates for volume measures. The headcount measure tells us the proportion of people who are underutilised (and what proportion is in each category of underutilisation), while the volume measure tells us the proportion of hours being 'supplied' that is not being utilised (and disaggregated by type of underutilisation), under the assumption that supply is equal to actual hours of employment for those not underemployed (i.e., there is no overemployment). The headcount measure is important because it tells us how many people are affected by underutilisation, including how many are in each type of underutilisation group. The volume measures are, however, more informative in terms of the magnitude of underutilisation, and in particular the relative importance of the different types of underutilisation.[13]

The headcount measures of underutilisation suggest that more people are underemployed than are unemployed. Among persons aged 15-64 years, 5 per cent are unemployed, which corresponds to approximately 665,000 people. By comparison, 7.2 per cent (945,000 people) are employed part-time and would prefer to work more hours. A further 4.4 per cent (576,000) are employed full-time and would prefer to work more hours. Thus, consistent with ABS data on

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[12] See Appendix B for estimates of the total *number* of persons underutilised, as well as the total number of hours of underutilisation.

[13] Preferred weekly hours are assumed to be 20 if preferred hours are not recorded (missing) and a person is either marginally attached to the labour force or unemployed and looking for part-time work. Preferred weekly hours are assumed to be 35 if the preferred weekly hours variable is missing and a person is unemployed and looking for full-time work. This affects 95 marginally attached persons and 43 unemployed persons.

underemployment, the evidence from the HILDA Survey is that underemployment is a significant feature of the Australian labour market.

Table 2: Underutilisation, unemployment and underemployment among the workforce-age (15-64 years) population (%)

	(A) Underutilisation	(B) Underutilisation of marginally attached persons	(C) Unemployment	(D) PT worker underemployment	(E) FT worker underemployment
Headcount measure					
Persons	25.1 (0.40)	8.6 (0.26)	5.0 (0.20)	7.2 (0.24)	4.4 (0.19)
Males	23.7 (0.56)	5.4 (0.30)	6.0 (0.32)	5.5 (0.30)	6.8 (0.33)
Females	26.6 (0.56)	11.8 (0.41)	4.1 (0.25)	8.8 (0.36)	2.0 (0.18)
Volume measure 1: Full-time workers can be underemployed					
Persons	17.2 (0.37)	6.9 (0.25)	5.7 (0.27)	3.3 (0.14)	1.4 (0.08)
Males	14.1 (0.44)	3.9 (0.27)	6.2 (0.35)	2.3 (0.16)	1.8 (0.11)
Females	22.0 (0.59)	11.5 (0.48)	5.0 (0.36)	4.8 (0.24)	0.7 (0.09)
Volume measure 2: Only part-time workers can be underemployed (a)					
Persons	16.9 (0.36)	7.6 (0.28)	6.0 (0.27)	3.2 (0.13)	0
Males	13.2 (0.48)	4.4 (0.28)	6.6 (0.37)	2.2 (0.16)	0
Females	21.9 (0.62)	12.1 (0.48)	5.2 (0.36)	4.6 (0.24)	0
Volume measure 3: Only part-time workers can be underemployed (b)					
Persons	13.5 (0.33)	6.1 (0.22)	4.8 (0.22)	2.6 (0.11)	0
Males	10.1 (0.38)	3.4 (0.23)	5.1 (0.29)	1.7 (0.12)	0
Females	18.8 (0.56)	10.4 (0.44)	4.4 (0.32)	4.0 (0.20)	0

Notes:
Standard errors in parentheses. Standard errors for volume measures are derived from 1000 bootstrap samples.
Column (A) is comprised of the components in columns (B) to (E).
Volume measure: Number of additional hours wanted as a proportion of total hours wanted by underutilised persons plus actual hours worked by other employed persons:
- *Volume measure 1:* Reported preferred and actual weekly hours are used for all persons with a marginal or greater attachment to the labour force.
- *Volume measure 2:* Preferred weekly hours are at most 35, and all full-time employees are assigned working time of 35 hours per week, regardless of working hours reported.
- *Volume measure 3:* Preferred weekly hours are at most 35, unless actual hours exceed 35, in which case preferred hours equal actual hours.

For the volume measures of underutilisation, three alternative estimates are presented in Table 2. The first is a relatively 'pure' measure, equal to the difference between desired and actual usual hours for all employed persons who prefer more hours, expressed as a proportion of total desired hours of employed persons. The second and third measures assume only part-time workers can be underemployed, and constrain the extent of an individual's underemployment to be at most 35

minus actual usual hours. The second measure expresses this part-time worker underemployment as a proportion of preferred hours of part-time workers plus 35 for each full-time worker, while the third measure expresses it as a proportion of preferred hours of part-time workers plus actual usual hours of full-time workers.

To assist in the interpretation of these three alternative volume measures, consider the three volume estimates of part-time worker underemployment for persons presented in Table 2 (Column (D)). Each measure presents an estimate of the additional hours desired by part-time workers as a proportion of total desired hours. The estimate for volume measure 1 (3.3 per cent) is simply total additional hours desired by part-time workers as a proportion of total desired hours by persons aged 15-64 years (with desired hours set equal to actual hours for those who prefer to work fewer than actual hours). The estimate for volume measure 2 (3.2 per cent) is the same statistic, but with total desired and actual hours constrained to a maximum of 35 (so a person working 30 hours who prefers 40 hours has underemployment reduced from 10 to 5 hours compared with volume measure 1). Volume measure 3 (2.6 per cent) similarly constrains maximum preferred hours for part-time workers to 35, but sets preferred hours equal to actual hours for full-time workers. Thus, as is the case for volume measure 2, preferred and actual hours are always equal for full-time workers, but are higher than for volume measure 2 for those who work more than 35 hours. Consequently, the estimates for volume measure 3 are always lower than estimates for volume measure 2.

Volume measures are smaller than headcount measures for all groups other than the unemployed, reflecting the fact that marginally attached persons generally want fewer hours than are on average being worked by employed persons, and underemployed persons are partially employed. Unemployed persons generally want full-time employment, which corresponds to more hours than is on average worked by employed persons; consequently, the volume measure is greater than the headcount measure for the unemployed.

The volume measure estimates show that unemployment is, by a significant margin, the most important source of underutilisation of labour for males. However, unemployment alone accounts for less than half of the underutilisation of male labour. For females, unemployment is a poor indicator of the total extent of labour underutilisation, accounting for less than one quarter of the shortfall of actual hours from desired hours of employment. Underemployment among part-time employed females is almost as important as unemployment, while additional hours sought by marginally attached females are over double those sought by unemployed females.

Total underutilisation is also over 50 per cent higher among females than males, at 22 per cent compared with 14 per cent.

The important impression from Table 2 is, therefore, that labour underutilisation is significantly greater than the unemployment rate leads us to believe, and is significantly greater for females than males. Caution is warranted, however, since we are unable to ascertain the extent to which family and other commitments are constraining hours of work, as opposed to insufficient labour demand. The shortfall of actual hours from desired hours due to such 'supply' factors does not constitute true underemployment. Consequently, estimates of underemployment are likely to overstate the true extent of underemployment, and the extent of overstatement will be greater for females, for whom caring responsibilities, in particular, are likely to be a more important factor in labour supply decisions.[14]

5.2. Underemployment among employed persons

Table 3 presents measures of underemployment among employed persons. The first two columns provide information on the extent of underemployment among all employed persons. Estimates of underemployment among all employed persons are presented for part-time and full-time workers separately, with the former group representing the closest approximation to the ILO definition of underemployment. The third column presents the extent of underemployment among part-time workers only.

Over one in six employed persons are affected by underemployment, with the majority of these employed part-time. However, for males underemployment is in fact more frequently associated with full-time employment. The volume measure of underemployment indicates that the number of supplied hours by employed persons that is not utilised is higher for part-time workers, for both males and females. That is, for males, 2.5 per cent of supplied hours are unutilised hours of part-time workers, compared with 2 per cent of supplied hours being unutilised hours of full-time

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[14] The unit record file does contain a variable 'main reason not full-time employed' for those employed part-time, which does allow distinguishing supply-related from demand-related reasons for working part-time. However, this variable can only partially identify underemployment among part-time workers that is due to demand constraints. This is because a part-time employee may want more hours, but not full-time employment; or may report the main reason for not being full-time as a supply-related reason, even though inability to obtain full-time employment is one reason. Of the 905 part-time employees who report wanting more hours, only 229 indicate that the main reason for working part-time is inability to obtain full-time employment. Also note that a further 59 part-time workers who desire the same or fewer hours also report inability to obtain full-time employment as the main reason for working part-time.

workers. For females, 5.7 per cent of supplied hours are unutilised hours of part-time workers, and 0.9 per cent of supplied hours are unutilised hours supplied by full-time workers.

Table 3: Underemployment among employed persons (%)

	As a proportion of all employed persons		As a proportion of part-time employed persons
	PT & underemp.	FT & underemp.	PT & underemp.
Headcount Measure			
Persons	10.2 (0.33)	6.2 (0.26)	34.9 (0.93)
Males	7.1 (0.39)	8.7 (0.42)	46.0 (1.89)
Females	14.1 (0.55)	3.1 (0.28)	30.3 (1.05)
Volume Measure*			
Persons	3.7 (0.15)	1.6 (0.09)	20.5 (0.64)
Males	2.5 (0.18)	2.0 (0.12)	27.2 (1.27)
Females	5.7 (0.29)	0.9 (0.11)	17.4 (0.72)

Notes: * Only Volume Measure 1 is reported. Standard errors reported in parentheses.

That underemployment is common among part-time workers, and is a significant problem for such workers, is evident from the third data column of Table 3. Over one third of part-time workers are underemployed, and one fifth of the hours supplied by such workers are not utilised. Underemployment among part-time workers is particularly high for males, with the underutilisation rate at 27.2 per cent, compared with 17.4 per cent for females.

The mean extent of underemployment among the underemployed is presented in Table 4, where the extent of underemployment is defined to be the difference between desired and actual hours of work. Underemployed part-time workers on average desire 13 more hours of work per week, while full-time workers who are underemployed on average desire just over 9 more hours per week. Thus, although part-time workers desire more additional hours, the additional hours wanted by full-time workers who are underemployed are nonetheless of significant proportions. The bottom panel of Table 4 also shows that mean extent of underemployment is higher for males than females, among both part-time and full-time underemployed workers.

To provide additional information on the distribution of the extent of underemployment among the underemployed, Table 4 presents the median, standard deviation and inter-quartile range. The medians presented are all below corresponding means, implying most underemployed persons have less than the mean level of underemployment. Dispersion, as measured by the standard deviation and inter-quartile range, is greater for the part-time employed than the full-time

employed, reflecting the greater scope for variation in the extent of underemployment among part-time workers. Dispersion is also greater for males compared with females.

Table 4: Extent of underemployment among the underemployed – Difference between desired and actual hours.

	Part-time employed		Full-time employed	
Mean	13.09 (0.280)		9.22 (0.255)	
Median	10.0 (0.50)		8.0 (0.73)	
Standard deviation	8.38 (0.258)		5.53 (0.330)	
Inter-quartile range	10.0 (0.85)		5.0 (0.93)	
	Males	**Females**	**Males**	**Females**
Mean	14.34 (0.521)	12.29 (0.320)	9.45 (0.292)	8.41 (0.516)
Median	12.0 (0.90)	10.0 (0.23)	9.0 (0.83)	7.0 (0.83)
Standard deviation	9.25 (0.438)	7.69 (0.297)	5.59 (0.352)	5.26 (0.765)
Inter-quartile range	13.0 (1.09)	10.0 (0.75)	7.0 (0.92)	5.0 (0.62)

Notes:
Standard errors reported in parentheses.
'Underemployed' means preferred hours of work exceed actual hours of work. The measured extent of underemployment is based on Volume Measure 1.

5.3. Underemployment among population subgroups

Table 5 provides a brief indication of how the incidence of underemployment varies across different groups in the working age population. It presents headcount estimates of underemployment across population groups defined by age, ethnicity/country of birth, location of residence, family type, educational attainment and disability status.[15] The first two columns of Table 5 present, for males and females respectively, the proportion underemployed under the 'standard' definition of underemployment, comprising those who are employed part-time and prefer to work more hours. The last two columns present estimates for the additional group considered in this study, full-time workers who would like to work more hours.

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[15] For the purposes of this study, a family is defined to be either a single person or a couple living together, along with any dependent children. This is what the ABS terms an 'income unit' in publications based on household surveys (e.g. ABS (2001b)). See Appendix A for all the details on the definitions and derivations of the variables used to define population subgroups.

Table 5: Headcount measures of underemployment – Comparisons across population subgroups – Expressed as a proportion of all persons in the population subgroup (%)

	Part-time & underemployed		Full-time & underemployed	
	Males	**Females**	**Males**	**Females**
Age group (years)				
15-24	12.7 (1.01)	13.8 (1.03)	7.1 (0.78)	3.7 (0.57)
25-34	4.3 (0.59)	8.7 (0.75)	12.1 (0.94)	2.3 (0.40)
35-44	3.6 (0.50)	10.4 (0.76)	6.9 (0.67)	2.0 (0.35)
45-54	3.0 (0.50)	6.0 (0.67)	4.3 (0.59)	0.9 (0.27)
55-64	3.5 (0.64)	3.3 (0.61)	1.3 (0.39)	0.2 (0.17)
Ethnicity/Country of birth				
ATSI	9.0 (2.98)	6.6 (2.03)	8.9 (2.97)	1.5 (0.99)
Other native-born	5.8 (0.36)	9.1 (0.43)	6.5 (0.38)	1.9 (0.20)
ESB immigrants	3.4 (0.73)	7.9 (1.10)	4.2 (0.80)	1.4 (0.48)
NESB immigrants	5.4 (0.80)	8.3 (0.91)	9.2 (1.02)	2.7 (0.53)
Location of residence				
Major city	5.5 (0.39)	8.4 (0.46)	7.0 (0.44)	2.4 (0.25)
Other location	5.7 (0.48)	9.6 (0.59)	6.2 (0.50)	1.1 (0.21)
Family type				
Couple with dep. children	5.3 (0.46)	9.3 (0.58)	5.7 (0.48)	0.6 (0.16)
Couple	2.9 (0.43)	6.2 (0.57)	4.9 (0.54)	1.8 (0.31)
Sole parent	10.0 (2.32)	11.9 (1.34)	1.8 (1.02)	1.0 (0.42)
Single person	7.9 (0.66)	10.2 (0.84)	10.3 (0.75)	4.8 (0.59)
Educational attainment				
Degree	3.6 (0.57)	7.7 (0.73)	5.3 (0.69)	1.6 (0.35)
Other post-school	3.8 (0.40)	8.5 (0.65)	8.4 (0.58)	2.6 (0.37)
Completed high school	11.3 (1.23)	12.2 (1.19)	6.2 (0.94)	3.2 (0.64)
Did not complete high school	4.9 (0.59)	7.8 (0.62)	7.1 (0.70)	1.4 (0.27)
Disability status				
Disability	4.1 (0.68)	5.4 (0.81)	3.3 (0.61)	4.5 (0.24)
No disability	5.8 (0.33)	9.3 (0.39)	7.3 (0.37)	2.2 (0.20)

Note: Standard errors in parentheses.

For both males and females, part-time underemployment tends to be higher among young people, sole parents and single people and those whose highest educational attainment is 'completed high school'. However, females also have comparatively high rates of part-time worker underemployment among 35-44 year olds and among those in couple families with dependent children. Indeed, for females, it those in couples without dependent children who stand out as the group with a comparatively low rate of part-time underemployment. A further notable difference between males and females with respect to part-time worker underemployment is that the point estimate for indigenous males is over 50 per cent higher than

that for other native-born males; however, the small sample size for the former group means the difference is not statistically significant.[16]

As noted earlier, the rate of full-time worker underemployment is higher for males than the rate of part-time worker underemployment, whereas comparatively few females are underemployed and employed full-time. For males, the rate of occurrence of full-time worker underemployment is highest among those aged 25-34 years. This at least in part reflects the higher rate of full-time employment among this age group than among younger persons. It is nonetheless interesting because of the contrast it offers with the pattern for females, among whom the rate of full-time worker underemployment is monotonically decreasing in age – although this also probably reflects, to some degree, the relatively lower rate of full-time employment among older females compared with males.

Both male and female non-English speaking background (NESB) immigrants have a comparatively high incidence of full-time worker underemployment, but not part-time underemployment. Similarly, the rate of occurrence of full-time worker underemployment also appears to be slightly higher in major cities than in other areas for both males and females, whereas the rate of occurrence of part-time worker underemployment is slightly lower. Sole parents have a very low rate of full-time employment, so unsurprisingly also have a low rate of full-time worker underemployment, in contrast to the high rate of part-time worker underemployment for this group. A final interesting feature of Table 5 is that persons with a disability tend to have a lower incidence of underemployment, which probably reflects lower employment rates, but may also reflect preferences for fewer hours of work because of limitations created by the disability.

6. The Outcomes Associated with Underemployment

The purpose of this section is to investigate the effects on various outcomes that are potentially attributable to underemployment. This is undertaken first by presenting descriptive statistics for a wide range of variables that can be loosely interpreted as reflecting outcomes experienced by respondents. Regression analysis is then undertaken of the association between underemployment and a narrower set outcomes – specifically, those that could reasonably be argued to be directly affected by underemployment status.

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[16] Less than 2% of the (weighted) sample aged 15-64 years identified as an Aboriginal or Torres Strait Islander.

The primary motivation for the analysis is to ascertain whether underemployment is associated with the adverse outcomes associated with unemployment. The population of interest is therefore persons in the labour force. However, the apparent consequences of underemployment for employment outcomes are also examined. Since these outcomes are only observed for employed persons, the analysis of these outcomes is over employed persons only.

6.1. Descriptive statistics

Descriptive comparisons of underemployed workers with both unemployed persons and fully employed workers are presented in Table 6, for the restricted definition of underemployment (whereby only part-time workers can be underemployed). The reasons for employing the restricted definition are, first, comparability with previous research, and second, the view that part-time underemployment is more likely to be associated with adverse outcomes than is full-time worker underemployment. The HILDA dataset contains data items allowing construction of an enormous number of variables for outcomes. Table 6 restricts these to a relatively succinct set of variables for outcomes that are likely to be affected by labour market outcomes (i.e. whether unemployed, underemployed or fully employed). Only sample means are presented.

The primary question is whether the underemployed look more like the unemployed or the fully employed, somewhere in-between, or indeed, different altogether. The descriptive statistics presented suggest that they are somewhere in-between on most counts. Sample means of the variables for life satisfaction, income support receipt, income, experience of financial difficulty and employment histories imply that outcomes are, on average, worst for the unemployed and best for the fully employed. For most of these outcomes, the underemployed are very close to midway between the unemployed and fully employed. Furthermore, among the employed, mean job satisfaction is significantly lower for the underemployed compared with the fully employed and, for males, the mean wage rate is also significantly lower for the underemployed. Interestingly, however, the mean wage of the underemployed is not lower than that of the fully employed for females.[17]

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[17] These findings could potentially reflect a part-time worker composition effect, but this is refuted by the evidence presented in Table 7, which shows them robust to comparison with fully employed part-time workers only.

Table 6: Outcomes of the underemployed, unemployed and fully employed

	Males			Females		
	Unemp.	Underemp.	Emp.	Unemp.	Underemp.	Emp.
Life satisfaction	7.4 (0.11)	7.6 (0.10)	7.9 (0.02)	7.3 (0.14)	7.7 (0.07)	8.0 (0.03)
Job satisfaction	-	7.1 (0.12)	7.5 (0.03)	-	7.5 (0.09)	7.8 (0.03)
Family receives IS (%)	67.9 (2.54)	37.6 (2.80)	9.9 (0.47)	54.8 (3.18)	32.8 (2.01)	12.3 (0.59)
Family equivalent income ($ per year)	17,834 (1,168.9)	26,308 (1,658.2)	43,670 (566.2)	21,100 (1,495.6)	27,052 (1,119.6)	43,469 (628.5)
Family income missing (%)	12.4 (1.77)	11.8 (1.82)	13.0 (0.52)	17.3 (2.37)	17.0 (1.56)	16.3 (0.64)
Personal income ($ per year)	14,597 (1,069.2)	19,631 (1,877.1)	47,609 (660.0)	10,250 (953.1)	16,342 (823.6)	31,121 (442.5)
Personal income missing (%)	7.5 (1.41)	4.7 (1.19)	6.5 (0.38)	8.9 (1.79)	7.4 (1.09)	7.3 (0.45)
Wage ($ per hour)	-	14.63 (0.908)	18.44 (0.321)	-	20.65 (2.665)	16.95 (0.207)
Wage missing (%)	-	7.8 (1.51)	4.4 (0.32)	-	5.4 (0.94)	5.5 (0.39)
Financial difficulty (%)	65.9 (2.54)	48.4 (2.82)	34.6 (0.74)	59.4 (3.08)	53.5 (2.08)	33.3 (0.81)
Looking for work (%)	100.0 (0.00)	34.2 (2.67)	13.7 (0.54)	100.0 (0.00)	28.0 (1.87)	12.9 (0.58)
No. of jobs in the last year	0.69 (0.039)	1.36 (0.042)	1.21 (0.008)	0.54 (0.042)	1.25 (0.033)	1.25 (0.010)
Prop. of last year employed (%)	36.0 (2.08)	81.0 (1.77)	95.3 (0.26)	26.8 (2.34)	83.6 (1.27)	92.4 (0.37)
Prop. of last year not emp. (%)	52.4 (2.20)	10.6 (1.28)	3.2 (0.20)	56.3 (2.65)	11.5 (1.09)	5.1 (0.30)
Prop. of last year unemp. (%)	45.0 (2.23)	6.8 (1.03)	1.7 (0.14)	33.6 (2.58)	5.2 (0.73)	1.3 (0.14)
Prop. of life unemployed (%)	15.5 (1.11)	3.5 (0.47)	1.9 (0.10)	10.6 (1.26)	3.1 (0.36)	1.1 (0.08)
Prop. of life not employed (%)	22.7 (1.26)	10.1 (0.92)	6.0 (0.18)	31.9 (1.89)	19.6 (0.90)	15.8 (0.33)
Usual weekly hours	0.0 (0.00)	17.6 (0.50)	45.2 (0.22)	0.0 (0.00)	16.3 (0.36)	34.3 (0.25)
Usual hours one year ago	-	21.6 (0.97)	43.5 (0.27)	-	17.9 (0.60)	32.0 (0.29)

Notes: Standard errors in parentheses. A person is defined to be underemployed only if employed part-time and preferred hours of work exceed actual hours of work. See Appendix A for explanation of the variables.

Aside from the characterisation of underemployment as between unemployment and full employment, two other features evident in Table 6 warrant mention. The first is that for males underemployment is associated with a relatively high mean number of jobs held in the year previous to the survey. This is suggestive of greater rates of success in obtaining jobs than the unemployed, but less success in obtaining adequate or suitable jobs than the fully employed. The second notable feature is that reported hours worked one year ago are on average higher than current working hours for the underemployed, while they are on average lower for the fully employed. This may derive from endogeneity of self-reported hours worked one year ago with respect to current underemployment status, but it may also derive from adverse labour market events in the past year causing working hours to drop for the underemployed.

Table 7 addresses several concerns with the results evident in Table 6. First, the differences between the underemployed and fully employed may partly derive from the different part-time/full-time employment type composition of the two groups. Second, the fully employed

group contains full-time workers who prefer to work more hours – a dimension of underemployment of potential importance.

Focusing first on comparisons of underemployed and fully employed part-time workers, the ordering of outcomes, from worst for the unemployed to best for the fully employed, is robust to the restriction to part-time workers. Outcomes of fully employed part-time workers do more closely match those of underemployed part-time workers than do outcomes of the group defined as fully employed in Table 6, but qualitatively the results are unchanged.

Turning to full-time workers, for males, outcomes for the underemployed are also generally somewhere between those experienced by the unemployed and those of the fully employed, with one important exception: there is no (statistically significant) difference in rates of income support receipt. Comparison of employment outcomes shows underemployed males to be comparatively low wage earners compared with fully employed – the mean hourly wage rate is $15.81 compared with $18.90 – who do indeed work comparatively low hours, with mean hours per week of 41, compared with 49 for the fully employed. However, in contrast to underemployed part-time workers, current weekly hours of employment are on average slightly higher than one year ago for underemployed full-time workers. Interestingly, job satisfaction is not significantly different between underemployed and fully employed full-time employed males. However, from one perspective this is perhaps not surprising, since excessive disutility of work would discourage a preference for more of it.

Findings on outcomes for underemployed full-time employed females relative to outcomes for other full-time employed females are, for the most part, similar to the findings for full-time employed males. These findings include substantially lower means for incomes, wages and weekly hours of work for the underemployed compared with the fully employed. That the mean wage is significantly lower is interesting given that the point estimate of the mean wage for female underemployed *part time* workers is substantially higher than the mean wage rate of fully employed part time workers. Indeed, underemployed females employed part-time have the highest mean wage rate of any of the groups of employed females identified in Table 7. There is one important difference from males with respect to the relative outcomes experience by underemployed full-time workers, which is that the mean of the measure of subjective wellbeing is not significantly different between the underemployed and fully employed for females.

Table 7: Outcomes of unemployed, underemployed and fully employed persons by part-time/full-time employment status

	Unemp.	Part-time employed		Full-time employed		
		Underemp.	Fully emp.	All	Underemp.	Fully emp.
Males						
Life satisfaction	7.4 (0.11)	7.6 (0.10)	8.1 (0.07)	7.9 (0.02)	7.5 (0.10)	7.9 (0.03)
Job satisfaction	-	7.1 (0.12)	7.6 (0.10)	7.5 (0.03)	7.4 (0.11)	7.5 (0.03)
Family receives IS (%)	67.9 (2.54)	37.6 (2.80)	26.2 (2.28)	8.3 (0.46)	7.0 (1.35)	8.4 (0.49)
Family equivalent income ($ per year)	17,834 (1,168.9)	26,308 (1,658.2)	34,992 (1659.2)	44,545 (598.6)	33,091 (1046.5)	45,865 (651.4)
Personal income ($ per year)	14,597 (1,069.2)	19,631 (1,877.1)	23,888 (1753.1)	49,963 (692.1)	34,900 (1002.8)	51,646 (754.2)
Wage ($ per hour)	-	14.63 (0.91)	17.03 (1.66)	18.58 (0.21)	15.81 (0.42)	18.90 (0.23)
Financial difficulty (%)	65.9 (2.54)	48.4 (2.82)	39.6 (2.51)	34.2 (0.78)	44.5 (2.59)	33.0 (0.81)
Looking for work (%)	100.0 (0.00)	34.2 (2.67)	13.5 (1.75)	13.7 (0.56)	20.5 (2.11)	12.9 (0.58)
No. of jobs in the last year	0.69 (0.039)	1.36 (0.042)	1.22 (0.033)	1.20 (0.008)	1.26 (0.031)	1.20 (0.009)
Prop. of last year employed (%)	36.0 (2.08)	81.0 (1.77)	83.8 (1.58)	96.4 (0.23)	91.6 (1.14)	96.9 (0.22)
Prop. of last year unemp. (%)	45.0 (2.23)	6.8 (1.03)	2.8 (0.68)	1.6 (0.14)	3.6 (0.65)	1.3 (0.14)
Prop. of life unemployed (%)	15.5 (1.11)	3.5 (0.47)	1.2 (0.27)	1.9 (0.10)	3.4 (0.40)	1.7 (0.10)
Prop. of life not employed (%)	22.7 (1.26)	10.1 (0.92)	7.2 (0.78)	5.9 (0.18)	7.5 (0.64)	5.7 (0.19)
Usual weekly hours	0.0 (0.00)	17.6 (0.50)	18.6 (0.46)	47.8 (0.18)	41.2 (0.33)	48.6 (0.20)
Usual hours one year ago	-	21.6 (0.97)	18.9 (0.81)	46.0 (0.25)	39.7 (0.80)	46.7 (0.26)
Females						
Life satisfaction	7.3 (0.14)	7.7 (0.07)	8.2 (0.04)	7.9 (0.03)	7.8 (0.14)	7.9 (0.03)
Job satisfaction	-	7.5 (0.09)	8.0 (0.05)	7.6 (0.04)	7.3 (0.24)	7.6 (0.04)
Family receives IS (%)	54.8 (3.18)	32.8 (2.01)	21.5 (1.16)	6.8 (0.58)	9.8 (3.02)	6.7 (0.59)
Family equiv. income ($)	21,100 (1,495.6)	27,052 (1,119.6)	38,824 (960.1)	46,126 (818.5)	33,638 (2250.0)	46,922 (853.1)
Personal income ($ per year)	10,250 (953.1)	16,342 (823.6)	20,587 (604.7)	37,447 (564.8)	28,805 (1714.6)	37,984 (587.1)
Wage ($ per hour)	-	20.65 (2.67)	17.16 (0.43)	16.82 (0.20)	14.02 (0.55)	16.99 (0.21)
Financial difficulty (%)	59.4 (3.08)	53.5 (2.08)	37.5 (1.32)	30.8 (1.03)	42.8 (4.87)	30.0 (1.05)
Looking for work (%)	100.0 (0.00)	28.0 (1.87)	9.3 (0.79)	15.1 (0.80)	24.8 (4.26)	14.5 (0.81)
No. of jobs in the last year	0.54 (0.042)	1.25 (0.033)	1.23 (0.016)	1.25 (0.013)	1.34 (0.062)	1.25 (0.014)
Prop. of last year employed (%)	26.8 (2.34)	83.6 (1.27)	88.6 (0.71)	94.8 (0.40)	88.4 (2.46)	95.1 (0.40)
Prop. of last year unemp. (%)	33.6 (2.58)	5.2 (0.73)	1.4 (0.25)	1.2 (0.16)	2.4 (0.89)	1.1 (0.16)
Prop. of life unemployed (%)	10.6 (1.26)	3.1 (0.36)	1.1 (0.14)	1.2 (0.10)	1.3 (0.46)	1.1 (0.10)
Prop. of life not employed (%)	31.9 (1.89)	19.6 (0.90)	19.5 (0.58)	13.6 (0.39)	11.8 (1.67)	13.7 (0.41)
Usual weekly hours	0.0 (0.00)	16.3 (0.36)	19.7 (0.23)	43.3 (0.20)	40.0 (0.72)	43.5 (0.21)
Usual hours one year ago	-	17.9 (0.60)	19.2 (0.35)	39.7 (0.32)	36.9 (1.51)	39.9 (0.32)

Notes: Standard errors in parentheses. See Appendix A for explanation of the variables.

6.2. Estimation of models

In this section, various models are estimated of the association between underemployment and outcomes potentially impacted by underemployment status. Models are estimated over two samples: all persons in the labour force and all employed persons. Four outcomes are examined for the models estimated over persons in the labour force:

- whether the family was in receipt of income support at the time of the survey;

- family equivalent income in the last financial year;

- personal income in the last financial year; and

- life satisfaction at the time of the survey

For the sample comprising all employed persons, three outcomes are examined:

- personal income in the last financial year;

- the wage rate at the time of the survey; and

- job satisfaction at the time of the survey.

The explanatory variable used for underemployment is a dummy variable, rather than the difference between preferred and actual hours – that is, the explanatory variable is whether a person is underemployed, not the extent of underemployment. The motivation for this approach is that primary interest is in comparisons of the effects associated with underemployment with those associated with unemployment. It gives the 'average' effect of underemployment on the outcome variable, compared with the 'average' effect of unemployment. Investigation of how the outcomes associated with underemployment depend on the extent of underemployment is considered of secondary importance, and not undertaken in this study. However, for all regression equations, the underemployed who are employed on a part-time basis are distinguished from the underemployed who are employed full-time, by employing separate dummy variables for each group.

Controls are included for a variety of personal characteristics (age, educational attainment, family type, number and ages of dependent children, region of residence, country of birth, years since migration, whether indigenous, health and English proficiency). For the models estimated on employed persons, additional specifications are estimated including variables for industry,

occupation, tenure with current employer, trade union membership and self-employment status. Coefficient estimates for the controls are reported in Appendix C.[18]

All specifications also contain variables for part-time and casual employment, which are reported in the main tables to show the distinct effects of part-time and casual employment from underemployment. The principal motivation for the inclusion of these variables is that they will capture part of the effects of underemployment for part-time/casual workers who prefer to work full-time. To elaborate, the effect of underemployment for a part-time casual employee who prefers a permanent full-time position is the aggregate of the coefficients on the 'part-time underemployed', 'part-time employed' and 'casual employee' variables.

The interpretation of the regression coefficients is largely one of descriptive association. While it may be reasonable to interpret the coefficients as reflecting causal effects of underemployment on outcomes, the possibility that the outcomes examined could impact on underemployment status should be acknowledged. For example, a person's wage rate is likely to impact on preferred hours of work. It should furthermore be acknowledged that underemployment status is potentially correlated with unobserved characteristics which affect the outcomes examined (which is also potentially the case for part-time and casual employment status).

Table 8 presents estimates obtained from equations estimated over all persons in the labour force. The dependent variable for Model 1 is a qualitative variable equal to one if the family receives income support payments and zero otherwise. For this model, a probit equation is estimated, i.e.

$$\Pr\left(y_i = 1 \mid x_i\right) = \Phi\left(\mathbf{x_i}\mathbf{b}\right) \qquad (2)$$

where $\Phi(.)$ is the standard normal cumulative distribution, $\mathbf{x}$ is the vector of explanatory variables and $\mathbf{b}$ is the associated coefficient vector. As is well known, coefficient estimates are not readily interpretable for probit models, and the effects of individual explanatory variables on the outcome variable depend on the values of the explanatory variables at which they are evaluated. Table 8 therefore reports 'mean marginal effects' of the explanatory variables.

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[18] Specifications were estimated which included interactions between the variables for underemployment and the variables for personal characteristics. However, none of these interaction terms was statistically significant at the 5% level, possibly reflecting sample size constraints. Note that the number of observations varies across the specifications estimated because of missing values.

In the case of a continuous explanatory variable, x_k, the mean marginal effect on the predicted probability $\Pr(y = 1 \mid x)$ is given by:

$$MME_k = (1/n) \sum_{i=1}^{n} \phi(\mathbf{x_i} \mathbf{b}) b_k \qquad (3)$$

where $\phi(.)$ is the standard normal density and the summation is over the n individuals in the sample. This is, as the name suggests, the mean marginal effect of the explanatory variable on the predicted probability that the dependent variable takes a value of one, evaluated over all individuals in the sample, and holding all other variables constant at their actual values. For a binary explanatory variable, the marginal effect is obtained by changing the explanatory variable from zero to one for each individual, holding all other variables at their actual values.[19]

The estimates reported in the first column of Table 8 show that, for both males and females, underemployment among part-time workers is associated with a significantly higher likelihood of family income support receipt. The coefficient estimates imply the mean effect of being part-time underemployed is to increase the probability of income support receipt by 0.06 for both males and females. These effects are much smaller than the effects associated with unemployment, which has a mean effect on the probability of income support receipt of 0.59 for males and 0.47 for females.

Also important, however, are the mean marginal effects for the part-time employed dummy variable and the casual employee variable. Being a part-time worker on average increases the probability of family income support receipt by 0.14 for males and by 0.10 for females; being a casual employee on average increases this probability by 0.08 for males and by 0.09 for females. We can therefore infer that, for a part-time worker who prefers full-time work, the mean effect of underemployment on the probability of income support receipt is much larger. The mean effect of underemployment could be argued to be even larger if the worker is a casual part-time employee who is seeking a permanent full-time position. However, it is not clear that adverse effects associated with casual employment should in fact be attributed to underemployment, since such effects might be interpreted as deriving from job insecurity and uncertainty over

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[19] A more common approach is to evaluate marginal effects at mean values of the explanatory variables. However, this is problematic because no-one is actually at the mean when we have binary explanatory variables and, furthermore, marginal effects can vary substantially, and in a non-linear fashion, with characteristics. Mean marginal effects are therefore more likely to produce representative estimates of the effects of characteristics.

future hours of employment.[20] In contrast to part-time worker underemployment, full-time worker underemployment appears to have no impact on income support receipt, which is unsurprising given income support eligibility criteria.

Models 2 and 3 of Table 8 have log income as the dependent variable. For Model 2, the income variable is 'family equivalent income', defined as current-year family income from all sources, divided by the square root of the number of members of the family. For Model 3, the income variable is current-year personal income from all sources. OLS regression estimates are reported for both models in Table 8, and can be interpreted as the percentage change in income associated with a one-unit increase in the explanatory variable.

For both males and females, part-time worker underemployment is associated with a significant decrease in family equivalent income – 14 per cent for males and 22 per cent for females. As with income support receipt, the implied decrease is much larger for part-time casual employees who seek permanent full-time positions: the coefficient estimates imply that equivalent family income is 60 per cent lower for males, and 57 per cent lower for females, compared with their counterparts with permanent full-time employment. There is no significant effect evident for full-time worker underemployment, although for both males and females the point estimates of the coefficients suggest negative effects that are approximately half the magnitude of the effects associated with part-time underemployment.

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[20] It is tempting to simply add together the mean marginal effects (MMEs) for the 'underemployed', 'part-time employed' and 'casual employee' dummy variables to obtain the total MME of underemployment for a part-time casual employee seeking a permanent full-time position. However, this will not in general give a completely accurate estimate of the combined effects of these three variables. This is because MME estimates depend on the values of other characteristics being held constant. For the individual MMEs presented in Table 8, all other employment status variables are held constant, whereas they are not when we want to examine the combined effect. For example, the estimate for the part-time underemployed variable is obtained holding constant the 'part-time employed' and 'casual employee' variables at their actual values, whereas if we wanted to obtain the combined effect of all three variables, we would simultaneously change all three variables from zero to one. Models were in fact estimated in which the 'part-time employed' dummy variable was replaced with a 'part-time employed and fully employed' dummy variable. The interpretation of the MME for the 'part time and underemployed' variable then became 'the mean marginal effect of underemployment for a part-time worker who is seeking full-time work.' The MME for this variable was 0.22 for males and 0.18 for females, which in both cases is larger than the estimate implied by adding together the 'part-time underemployed' and 'part-time employed' MMEs in Table 8.

Table 8: Outcomes associated with underemployment and unemployment – All persons

	Males		Females	
	MME/Coef.	SE	MME/Coef.	SE
1. Family income support receipt				
Unemployed	0.591*	0.025	0.468*	0.031
Underemployed – PT	0.056*	0.024	0.056*	0.017
Underemployed – FT	-0.006	0.020	0.016	0.043
Part-time employed	0.137*	0.023	0.099*	0.014
Casual employee	0.078*	0.017	0.092*	0.015
2. Family equivalent income				
Unemployed	-0.988*	0.049	-0.881*	0.053
Underemployed – PT	-0.141*	0.061	-0.223*	0.038
Underemployed – FT	-0.072	0.045	-0.111	0.076
Part-time employed	-0.250*	0.048	-0.130*	0.031
Casual employee	-0.209*	0.038	-0.222*	0.031
3. Personal income				
Unemployed	-1.280*	0.058	-1.410*	0.068
Underemployed – PT	0.057	0.073	-0.150*	0.048
Underemployed – FT	-0.090	0.053	-0.050	0.095
Part-time employed	-0.740*	0.057	-0.450*	0.038
Casual employee	-0.290*	0.045	-0.390*	0.039
4. Life satisfaction				
Unemployed	-0.525*	0.091	-0.568*	0.104
Underemployed – PT	-0.350*	0.116	-0.423*	0.076
Underemployed – FT	-0.298*	0.085	-0.064	0.152
Part-time employed	0.081	0.091	0.286*	0.060
Casual employee	-0.208*	0.072	-0.112	0.061

Notes: *MME*: Mean Marginal Effect. *Coef.*: Coefficient estimate. *SE*: Standard error. *Underemployed – PT*: Underemployed and employed part-time. *Underemployed – FT*: Underemployed and employed full-time. Income support receipt estimates are obtained from a probit model, with the reported statistic the mean effect on the probability of income support receipt of a discrete change of the dummy variable from 0 to 1, evaluated over all persons in the sample. Statistics in parentheses are z statistics for the test that the mean marginal effect is zero. Estimates for models 2-4 are OLS coefficient estimates. * indicates significance at the 5% level. Coefficient estimates for all other explanatory variables used in the estimating equations are reported in Appendix C.
The dependent variables are (see Appendix A for further details):
1. Family currently receives income support payments (dummy variable).
2. Log of family equivalent income from all sources in the last financial year.
3. Log of personal income from all sources in the last financial year.
4. Index of life satisfaction.

As with income support receipt, the effects on family income associated with underemployment are smaller than the effects associated with unemployment. Compared with being a fully employed full-time worker, being unemployed is associated with a decrease in equivalent family income of 99 per cent for males and 88 per cent for females. These estimates are significantly larger than the estimates for underemployment, even when we compare underemployed part-time casual workers with fully employed permanent full-time workers (the 'worst case' comparison),

which gives corresponding estimates of 60 per cent and 57 per cent for males and females, respectively.

Turning to personal income, for males, while part-time employment and casual employment are associated with lower personal income than full-time employment, there is no additional adverse effect associated with being underemployed for such workers. Interestingly, however, underemployment among full-time employees is associated with lower personal income compared with fully employed full-time employees – the coefficient estimate shows a 9 per cent reduction in personal income for an underemployed full-time worker compared with being fully employed (although this is only significant at the 10 per cent level). Based on the evidence in Table 7, this is likely to reflect both the lower working hours and lower wage rates of such workers. For females, no significant effect of full-time underemployment is evident, but there is a significant negative effect on personal income associated with part-time worker underemployment. At 15 per cent, however, this decrease in personal income associated with underemployment is very small compared with the 141 per cent decrease associated with unemployment.

The contrast for males between the results for family income and the results for personal income – specifically, that while underemployment is not associated with lower personal income for part-time employed males compared with other part-time employed males, it is associated with lower family income – is significant. Together, these two findings imply that males who are employed part-time and are underemployed tend to come from families that have lower income *from other sources* than do males who are fully employed and employed part-time. This in turn suggests that the direction of causation runs from family income to underemployment, not the reverse: part-time employed males who seek more hours of work tend to do so because other sources of family income are lower.

The dependent variable for Model 4 of Table 8 is an index of life satisfaction, where respondents were asked to rate overall satisfaction with life on a scale from zero (completely dissatisfied) to ten (completely satisfied). OLS regression may not be appropriate for such a dependent variable. For example, the improvement in satisfaction associated with a unit-increase in the index may not be the same at all values of the index. For this reason, and because the variable is bounded between 0 and 10, both OLS and ordered probit models were estimated for the life satisfaction variable. Implied effects were very similar for both models, and hence only the OLS estimates, which are much easier to interpret, are reported.

The coefficient estimates indicate that part-time underemployment has a large negative impact on the life satisfaction variable for both males and females. Part-time employment is, however, associated with a positive effect on life satisfaction, so that for part-time workers who prefer full-time work, the negative impact of underemployment is actually smaller than the coefficient on the 'part-time underemployed' variable would imply – a lot smaller for females. Significantly, being employed on a casual basis is associated with a negative impact on life satisfaction, which for males significantly outweighs the positive effects of part-time employment. Full-time underemployment also has a significant negative effect for males, only slightly smaller than that evident for underemployed part-time workers. For females there is no adverse effect associated with full-time worker underemployment.

As with the other outcomes examined, adverse effects associated with underemployment are smaller than the adverse effects associated with unemployment. However, an exception to this can be found for underemployed males employed on a casual basis. Adverse effects associated with underemployment are not significantly different from those associated with unemployment for casually employed males who prefer permanent employment. However, as discussed earlier, the combining of underemployment, part-time and casual employment status effects may be confounding two distinct sources of effects: underemployment and insecurity/uncertainty of employment tenure.

To summarise the findings presented in Table 8, part-time worker underemployment for females is associated with significant negative effects for all four outcomes, while full-time worker underemployment is not associated with any significant effects for females. For males, significant negative effects of part-time worker underemployment are evident for income support receipt, family income and life satisfaction, while a significant negative effect of full-time worker underemployment is found for life satisfaction. For both males and females, the negative effects attributable to underemployment are smaller than those attributable to unemployment, generally much smaller. The implication is that underemployment is not as significant a policy issue as unemployment. Importantly, however, inferred adverse effects of underemployment on income support receipt and income are substantial for part-time workers who would like to work full-time, and even more severe for those employed on a casual basis who seek permanent employment. This 'involuntary part-time and/or casual' group therefore represents an important target for government policy.

Table 9 presents OLS regression coefficient estimates for models estimated over employed persons only. Clearly, we cannot infer anything about the consequences of underemployment versus unemployment from estimation of models over employed persons only, but the exercise

nonetheless provides useful information on the effects associated with underemployment. Two specifications are estimated for each of the three outcomes examined, the first using the same controls as in Table 8, the second adding employment variables. Model 1 has the same dependent variable as Model 3 in Table 8, and is primarily presented to examine the effects of adding employment controls. The dependent variable in Model 2 is the log hourly wage rate, while in Model 3 the dependent variable is an index of job satisfaction, similar to the life satisfaction index used in Model 4 in Table 8.[21]

Table 9: Outcomes associated with underemployment – Employed persons

	Males				*Females*			
	(A)		**(B)**		**(A)**		**(B)**	
	Coef.	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
1. Personal income								
Underemployed – PT	0.065	0.070	0.061	0.068	-0.147	0.046*	-0.103	0.046*
Underemployed – FT	-0.090	0.051	-0.070	0.050	-0.055	0.091	-0.033	0.090
Part-time employed	-0.770	0.055*	-0.620	0.055*	-0.457	0.037*	-0.378	0.038*
Casual employee	-0.300	0.043*	-0.270	0.045*	-0.398	0.038*	-0.367	0.040*
2. Wage rate								
Underemployed – PT	0.021	0.042	0.025	0.039	-0.010	0.026	0.013	0.025
Underemployed – FT	-0.028	0.029	-0.013	0.028	-0.032	0.050	-0.002	0.049
Part-time employed	-0.043	0.034	0.054	0.033	0.087	0.021*	0.144	0.021*
Casual employee	-0.071	0.025*	-0.008	0.025	-0.095	0.021*	-0.028	0.021
3. Job satisfaction								
Underemployed – PT	-0.468	0.146*	-0.442	0.146*	-0.424	0.098*	-0.392	0.098*
Underemployed – FT	-0.141	0.107	-0.105	0.107	0.008	0.196	0.062	0.196
Part-time employed	0.168	0.115	0.186	0.118	0.242	0.078*	0.238	0.081*
Casual employee	-0.422	0.091*	-0.374	0.098*	-0.093	0.080	-0.050	0.087

Notes: *Coef.*: Coefficient estimate. *SE*: Standard error. *Underemployed – PT*: Underemployed and employed part-time. *Underemployed – FT*: Underemployed and employed full-time. Specification (B) adds to specification (A) controls for industry, occupation, trade union membership, tenure with current employer and self employment status. Statistics reported are OLS coefficient estimates. * indicates significance at the 5% level. Coefficient estimates for all other explanatory variables used in the estimating equations are reported in Appendix C.
The dependent variables are:
1. Log of personal income from all sources in the last financial year.
2. Log of the current hourly wage rate.
3. Index of overall job satisfaction.

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[21] As with the life satisfaction variable, ordered probit models of job satisfaction were also estimated in place of OLS regression, but are not reported because inferences were not significantly different, and OLS estimates are much more easily interpreted.

Considering first personal income, the negative effect associated with full-time underemployment for all males is still evident, although only for Specification (A) is the effect significant at the 10 per cent level. Similarly, the significant negative effect of part-time underemployment evident for all females is also evident for employed females, and (unlike males) is robust to the inclusion of the employment variables (Specification (B)).

With regard to wage rates, no significant effects of underemployment are evident for males or females, a finding that is noteworthy given the differences in mean wages between the underemployed and fully employed evident in Tables 6 and 7. It follows that it is differences in observed characteristics other than underemployment status that explain the differences in mean wages. Thus, it would appear that male underemployed workers and female underemployed full-time workers have on average lower skills than their fully employed counterparts, while female underemployed part-time workers in fact have higher skills than fully employed females.

Consistent with the descriptive statistics presented in Table 7, part-time underemployment is associated with significant negative effects on job satisfaction, while full-time underemployment has no significant effect (although the point estimate is negative for males). It is not obvious why job satisfaction might be so different for underemployed part-time workers compared with underemployed full-time workers. One hypothesis is that underemployed full-time workers either want more hours in the current job or want a second job – that is, they do not want to leave their current job. By contrast, part-time workers may be more likely to be unhappy with their current job (one of the reasons for which may be the inadequate hours on offer) and be looking for an *alternative* job.

7. Conclusion

The evidence from Wave 1 of the HILDA survey is that underemployment is widespread and of significant proportions: over one in six employed persons expresses a preference for more hours of paid work, preferring, on average, approximately 12 hours more per week. While underemployment is not associated with as severe adverse consequences for welfare dependence and income as unemployment, it does appear to have detrimental consequences. Particularly telling is that, for both males and females, the adverse effects of part-time underemployment on the measure of subjective well-being are not far short of those associated with unemployment. For males, full-time worker underemployment, which is more prevalent among males than part-time worker underemployment, is also associated with adverse outcomes for income and life satisfaction. This is somewhat at odds with the conventional wisdom that only part-time worker underemployment is likely to have adverse consequences of concern to policy-makers.

Effects are, however, in general significantly more severe for the part-time employed than the full-time employed, and are worst for part-time workers seeking full-time employment. Furthermore, since part-time work is most commonly associated with employment on a casual basis, and full-time employment with employment on a non-casual ('permanent') basis, the move from underemployment to full employment for part-time casual employees seeking full-time employment can be argued to involve a move from casual to permanent employment. Taking this approach increases the adverse effects attributable to underemployment even further. Thus, the 'involuntary part-time (and possibly casually) employed' group would seem to represent a particularly important target for government policy.

While this paper identifies underemployment as a significant policy issue, it provides little guidance for the form policy interventions should take. Indeed, this study does not establish (nor assert) the causal links – if any – between outcomes and underemployment; yet the direction of causation is clearly critical to policy formulation. For example if a sick partner is associated with family income support receipt and low family income, which in turn cause underemployment, it is ambiguous whether the appropriate policy response is to facilitate increased working hours for the underemployed person, rather than, for instance, increasing social assistance.

Even accepting that underemployment is the cause of adverse outcomes, developing appropriate policies requires understanding of the personal characteristics associated with underemployment and, ideally, the determinants of underemployment. This information would permit appropriate targeting of persons at higher risk of underemployment, as well as addressing the underlying causes of underemployment.

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Appendix A: Variable Descriptions

- Ethnicity/Country of birth (dummy variables):
  - *ATSI*: Aboriginal or Torres Strait Islander
  - *ESB immigrant* (English-speaking background immigrant): Person born in New Zealand, the UK, Ireland, Northern America or South Africa.
  - *NESB immigrant* (Non-English-speaking background immigrant): Person born outside Australia who is not an ESB immigrant.
- *Major city* (reside in major city): Place of residence is one of the major cities of Australia (dummy variable). Derived from the Accessibility/Remoteness Index of Australia scores from the 1996 Census (see ABS (2001a)).
- Family type: Families are defined in the same way as the ABS defines income units (see, for example, ABS (2001). Four family types are distinguished (dummy variables):
  - *Single*: Single person (the omitted dummy in regression models).
  - *Couple*: Couple living together (whether legally married or not) with no dependent children.
  - *Sole parent*: Lone parent with dependent children.
  - *Couple parents*: Couple living together (whether legally married or not) with dependent children.
- Educational attainment (dummy variables):
  - *Degree*: highest educational qualification is a bachelor's degree or higher.
  - *Other P-S.*: Highest educational qualification is a post-school qualification other than 'degree'.
  - *Comp H-S*: Have no post-school qualifications and have completed the highest level of secondary school.
  - *NCHS*: Have no post-school qualifications and have not completed the highest level of secondary school (the omitted dummy in regression models).
- *Disability*: Respondent has a long-term health condition or disability that limits the type or amount of work he or she can do (dummy variable).
- *Life satisfaction*: Respondent's recorded score from 0 (completely dissatisfied) to 10 (completely satisfied) in answer to the question 'All things considered, how satisfied are you with your life?'
- *Job satisfaction*: Respondent's recorded score from 0 (completely dissatisfied) to 10 (completely satisfied) in answer to the question 'All things considered, how satisfied are you with your job?'
- *Family receives IS*: One or more persons in the family currently receive income support payments (dummy variable). If no member of the family is observed on income support payments and income support payments are missing for any member, the variable is set to missing.
- *Family equivalent income*: Family gross income from all sources in the preceding financial year, divided by the square root of the number of members of the family. It is missing if personal income is missing for any member.
- *Personal income*: Gross personal income from all sources in the preceding financial year. This is derived from variables for gross wages and salary, pensions and benefits, business income, investment income and 'other' income. It is coded as missing if:
  - both gross wages and salary and pensions and benefits are missing; or
  - one of gross wages and salary and pensions and benefits is zero, and the other is missing; or
  - both gross wages and salary and pensions and benefits are zero and business income is missing; or

- o gross wages and salary, pensions and benefits and business income are zero and either investment or other income is missing.

- *Wage rate*: Current annual wage and salary income divided by (52.14 * current usual weekly hours of work in all jobs). Wages exclude business income; consequently, wage rate information is missing for self employed workers who report no wage or salary income.

- *Financial difficulty*: Household has at least some difficulty in making ends meet (dummy variable). Derived from response to the question 'Thinking of your household's total monthly income, is you household able to make ends meet with great difficulty, with difficulty, with some difficulty, fairly easily, easily or very easily?'

- *Looking for work*: Looked for work in the last 4 weeks (dummy variable).

- *No. of jobs in the year*: Count of the number of full-time and part-time jobs held in the 2000-2001 financial year.

- *Proportion of last year employed (%)*: Percentage of time employed in the 2000-2001 financial year.

- *Proportion of last year not employed (%)*: Percentage of time not employed in the 2000-2001 financial year.

- *Proportion of last year unemployed (%)*: Percentage of time unemployed in the 2000-2001 financial year.

- *Proportion of life unemployed (%)*: Percentage of time since 15 years of age have been unemployed. Derived from data items in the HILDA survey dataset for 'age' and 'years unemployed'.

- *Proportion of life not employed (%)*: Percentage of time since 15 years of age have not been employed. Derived from data items in the HILDA survey dataset for 'age', 'years in paid work', 'years unemployed' and 'years not in the labour force'.

- *Usual weekly hours*: Hours usually worked each week in all jobs. Persons who initially indicated that working hours varied were asked for average weekly hours over the preceding four weeks.

- *Usual hours one year ago*: Respondent's estimate of working hours per week one year ago.

- *Part-time*: Employed part-time, defined as a situation were usual weekly hours are less than 35 (dummy variable).

- *Casual*: Employed on a casual basis, defined as a situation where the respondent is an employee (and not self employed) and has no entitlement to sick leave and/or annual leave (dummy variable).

- *No. dep <15*: Number of dependent children aged under 15 years.

- *No. dep 15-24*: Number of dependent children aged 15-24 years.

- *Poor English*: Respondent speaks English poorly or doesn't speak English at all (dummy variable).

- *YSM* (years since migration): 2001 minus year of arrival in Australia (0 for native-born persons).

- *YSM2*: YSM squared, divided by 10.

- *YSM-NESB*: YSM for NESB immigrants (0 for all others).

- *YSM2-NESB*: YSM-NESB squared, divided by 10.

- *Tenure*: Tenure with current employer (years).

- Industry of employment (dummy variables):
  - o *Indaccom*: Accommodation, cafes and restaurants
  - o *Indcommun*: Communication services
  - o *Indconstr*: Construction
  - o *Indcultrec*: Culture and recreation
  - o *Indeduc*: Education

- o *Indelec*: Electricity, gas and water
- o *Indfinance*: Finance and insurance
- o *Indgovdef*: Government administration and defence
- o *Indhlthcs*: Health and community services
- o *Indmanuf*: Manufacturing
- o *Indmining*: Mining
- o *Indperserv*: Personal and other services
- o *Indpropbus*: Property and business services
- o *Indrtrade*: Retail trade
- o *Indtrans*: Transport and storage
- o *Indwstrade*: Wholesale trade
- o *Indagric*: Agriculture, forestry and fishing (the omitted dummy in the regression models)
- Occupation of employment (dummy variables):
  - o *Occmgr*: Managers and administrators
  - o *Occprof*: Professionals
  - o *Occasprof*: Associate professionals
  - o *Occadvclerk*: Advanced clerical and service workers
  - o *Occintclerk*: Intermediate clerical and service workers
  - o *Occelemclerk*: Elementary clerks, sales workers and service workers
  - o *Occtrade*: Tradespersons
  - o *Occintprod*: Intermediate production and transport workers
  - o *Occlabour*: Labourers and related workers (the omitted dummy in regression models)
- *Union*: Member of a trade union (dummy variable).
- *Self employed*: Employer, own-account worker, owner-manager or family helper (dummy variable).

Appendix B: Population Estimates of Underutilisation

Table B2: Population estimates of the number of people underutilised and the number of hours of underutilisation –
Persons aged 15-64 years

	(A) Underutilised	(B) Underutilisation of marginally attached persons	(C) Unemployment	(D) PT worker underemployment	(E) FT worker underemployment
Number of persons (headcount measures) ('000)					
Males	1571.1	358.1	398.9	366.4	447.7
Females	1746.0	773.2	266.2	578.3	128.3
Persons	3317.1	1131.3	665.1	944.7	576.1
Number of hours (volume measures) ('000,000)					
No maximum on preferred hours per week (as per Volume Measure 1)					
Males	32.9	9.1	14.3	5.3	4.2
Females	32.6	17.0	7.4	7.1	1.1
Persons	65.5	26.1	21.7	12.4	5.3
Maximum preferred hours per individual equal to 35 per week (as per Volume Measures 2 and 3)					
Males	24.8	8.3	12.4	4.1	
Females	29.7	16.4	7.0	6.3	
Persons	54.5	24.7	19.4	10.4	

Notes:
- Population estimates derived from HILDA unit record data and ABS (2003).
- *Underutilised*: All persons who have a marginal or greater attachment to the labour force and want more hours of work.
- Column (A) is comprised of the components in columns (B) to (E).

Appendix C: Additional Coefficient Estimates

Table B8

| | 1. Income support receipt | | | | 2. Equivalent income | | | |
| | Males | | Females | | Males | | Females | |
	MME	SE	MME	SE	Coef.	SE	Coef.	SE
Aged 25-34	0.057	0.020*	0.007	0.020	0.406	0.042*	0.272	0.040*
Aged 35-44	0.049	0.019*	0.038	0.020	0.502	0.043*	0.292	0.041*
Aged 45-54	0.060	0.020*	0.025	0.019	0.392	0.045*	0.268	0.041*
Aged 55-64	0.109	0.027*	0.123	0.030*	0.363	0.054*	0.181	0.054*
Degree	-0.071	0.013*	-0.066	0.014*	0.445	0.037*	0.303	0.034*
Other P-S	-0.017	0.011	-0.003	0.014	0.097	0.030*	0.019	0.031
Comp H-S	-0.017	0.015	0.039	0.019*	0.120	0.042*	-5.33E-04	0.041
Major city	-0.011	0.010	-0.040	0.012*	0.172	0.025*	0.225	0.025*
Disability	0.127	0.020*	0.087	0.023*	-0.158	0.042*	-0.184	0.045*
Couple	0.012	0.016	-0.027	0.016	0.447	0.035*	0.658	0.033*
Sole parent	0.120	0.044*	0.285	0.038*	0.278	0.089*	-0.140	0.057*
Couple parents	0.052	0.019*	-0.037	0.023	0.275	0.048*	0.638	0.052*
No. dep <15	0.022	0.006*	0.006	0.008	-0.154	0.018*	-0.145	0.083
No. dep 15-24	0.048	0.011*	0.042	0.012*	0.196	0.034*	0.142	0.106
ATSI	0.070	0.044	0.121	0.047*	-0.190	0.098	-0.060	0.095
ESB Immigrant	-0.125	0.030*	-0.085	0.048	0.119	0.099	-0.177	0.146
NESB Immigrant	0.036	0.037	-0.013	0.042	-0.431	0.089*	-0.563	0.021*
Poor English	0.109	0.061	0.104	0.071	-0.300	0.136*	-0.417	0.032*
YSM	0.012	0.005*	0.009	0.006	-0.011	0.009	0.012	0.010
YSM2	-0.002	8.48E-04*	-1.80E-03	1.12E-03	0.002	0.002	-0.002	0.002
YSM-NESB	-0.017	0.006*	-0.008	0.007	0.032	0.012*	0.018	0.013
YSM2-NESB	0.003	0.001*	1.51E-03	1.39E-03	-0.005	0.003	-0.002	0.003
Constant					9.744	0.044*	9.768	0.046*
R-squared	0.254		0.232		0.331		0.380	
Sample size	4617		3925		4121		3464	

| | 3. Personal income | | | | 4. Life satisfaction | | | |
| | Males | | Females | | Males | | Females | |
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Aged 25-34	0.784	0.050*	0.741	0.051*	-0.555	0.079*	-0.237	0.081*
Aged 35-44	0.967	0.051*	0.863	0.052*	-0.697	0.082*	-0.254	0.082*
Aged 45-54	0.957	0.053*	0.773	0.051*	-0.600	0.085*	-0.169	0.080*
Aged 55-64	0.950	0.063*	0.669	0.067*	-0.373	0.100*	-0.085	0.106
Degree	0.616	0.043*	0.554	0.042*	-0.211	0.070*	-0.260	0.066*
Other P-S	0.272	0.036*	0.258	0.039*	-0.149	0.057*	-0.239	0.061*
Comp H-S	0.382	0.05*	0.338	0.051*	-0.108	0.079	-0.229	0.080*
Major city	0.175	0.029*	0.121	0.031*	-0.157	0.048*	-0.215	0.049*
Disability	-0.150	0.049*	-0.130	0.056*	-0.504	0.079*	-0.768	0.089*
Couple	0.022	0.041	-0.020	0.042	0.758	0.066*	0.443	0.066*
Sole parent	0.012	0.108	0.076	0.073	-0.150	0.170	-0.592	0.116*
Couple parents	0.115	0.056*	-0.190	0.063*	0.557	0.090*	0.070	0.101
No. dep <15	-0.050	0.021*	-0.080	0.025*	0.006	0.034	0.058	0.040
No. dep 15-24	-0.190	0.038*	-0.050	0.037	0.107	0.060	0.081	0.059
ATSI	-0.190	0.115	-0.020	0.105	0.459	0.190*	-0.283	0.172
ESB Immigrant	0.092	0.116	-0.070	0.134	0.098	0.185	-0.030	0.213
NESB Immigrant	-0.450	0.107*	-0.350	0.119*	-0.014	0.160	0.054	0.178
Poor English	-0.150	0.151	-0.210	0.179	-0.124	0.231	-0.892	0.258*
YSM	-0.010	0.010	0.004	0.012	-0.004	0.017	0.015	0.019
YSM2	0.001	0.002	5.08E-04	0.002	9.50E-04	0.003	-0.004	0.004
YSM-NESB	0.040	0.015*	0.020	0.016	-0.008	0.023	-0.038	0.026
YSM2-NESB	-0.010	0.003*	-0.004	0.003	0.003	0.005	0.009	0.005
Constant	9.418	0.053*	9.414	0.058*	8.213	0.085*	8.299	0.090*
R-squared	0.404		0.384		0.083		0.091	
Sample size	4363		3772		4775		4186	

Table B9: Males

	1. Personal income				2. Wage rate				3. Job satisfaction			
	(A)		(B)		(A)		(B)		(A)		(B)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Aged 25-34	0.752	0.050*	0.694	0.050*	0.273	0.029*	0.227	0.027*	-0.275	0.106*	-0.319	0.108*
Aged 35-44	0.937	0.052*	0.857	0.052*	0.372	0.030*	0.296	0.029*	-0.367	0.109*	-0.421	0.113*
Aged 45-54	0.917	0.053*	0.824	0.055*	0.354	0.031*	0.256	0.031*	-0.088	0.112	-0.152	0.119
Aged 55-64	0.967	0.063*	0.862	0.066*	0.316	0.038*	0.218	0.038*	0.199	0.132	0.078	0.143
Degree	0.618	0.043*	0.481	0.050*	0.439	0.025*	0.301	0.029*	-0.249	0.090*	-0.367	0.107*
Other P-S	0.270	0.036*	0.234	0.037*	0.142	0.021*	0.098	0.021*	-0.239	0.075*	-0.283	0.079*
Comp H-S	0.387	0.050*	0.348	0.049*	0.183	0.029*	0.151	0.028*	-0.238	0.105*	-0.251	0.106*
Major city	0.180	0.029*	0.109	0.030*	0.128	0.017*	0.079	0.017*	-0.242	0.062*	-0.224	0.065*
Disability	-0.120	0.051*	-0.070	0.050	-0.116	0.031*	-0.090	0.030*	-0.327	0.107*	-0.328	0.107*
Couple	0.016	0.041	0.006	0.040	0.099	0.024*	0.088	0.022*	0.143	0.086	0.137	0.086
Sole parent	0.047	0.113	0.063	0.111	0.006	0.066	0.022	0.062	-0.119	0.234	-0.054	0.234
Couple parents	0.132	0.055*	0.110	0.054*	0.107	0.032*	0.095	0.031*	-0.070	0.117	-0.072	0.117
No. dep <15	-0.050	0.021*	-0.050	0.020*	-0.013	0.012	-0.010	0.011	0.113	0.044*	0.101	0.044*
No. dep 15-24	-0.150	0.037*	-0.130	0.037*	-0.006	0.022	0.003	0.021	0.120	0.077	0.123	0.078
ATSI	-0.200	0.127	-0.190	0.124	-0.043	0.072	-0.010	0.068	0.798	0.277*	0.875	0.277*
ESB Immigrant	0.064	0.114	0.137	0.111	0.065	0.067	0.130	0.063*	0.106	0.242	0.132	0.242
NESB Immigrant	-0.420	0.111*	-0.330	0.109*	-0.156	0.059*	-0.070	0.056	-0.265	0.219	-0.187	0.219
Poor English	-0.090	0.165	-0.070	0.160	-0.113	0.086	-0.080	0.081	-0.246	0.328	-0.225	0.328
YSM	-0.003	0.010	-0.010	0.010	3.71E-04	0.006	-0.002	0.006	-0.018	0.022	-0.019	0.022
YSM2	4.43E-04	0.002	0.001	0.002	-2.9E-04	0.001	6.30E-05	0.001	0.004	0.004	0.005	0.004
YSM-NESB	0.035	0.015*	0.035	0.014*	0.012	0.008	0.009	0.008	0.036	0.030	0.037	0.030
YSM2-NESB	-0.010	0.003*	-0.010	0.003*	-0.002	0.002	-0.001	0.002	-0.006	0.006	-0.006	0.006
Tenure			0.007	0.002*			0.006	0.001*			0.002	0.004
Indaccom			0.139	0.091			0.068	0.053			-0.297	0.194
Indcommun			0.252	0.103*			0.327	0.059*			-0.600	0.219*
Indconstr			0.281	0.072*			0.260	0.044*			0.057	0.152
Indcultrec			0.022	0.096			0.011	0.058			0.159	0.209
Indeduc			0.050	0.089			0.041	0.052			0.027	0.191
Indelec			0.265	0.127*			0.333	0.071*			-0.207	0.276
Indfinance			0.501	0.100*			0.491	0.058*			0.077	0.217
Indgovdef			0.199	0.086*			0.222	0.050*			-0.021	0.187
Indhlthcs			0.100	0.091			0.164	0.054*			-0.137	0.198
Indmanuf			0.245	0.068*			0.209	0.041*			-0.127	0.145
Indmining			0.555	0.107*			0.549	0.060*			-0.210	0.229
Indperserv			0.077	0.091			0.051	0.055			0.473	0.198*
Indpropbus			0.351	0.074*			0.282	0.045*			-0.158	0.158
Indrtrade			0.048	0.073			0.002	0.044			-0.198	0.155
Indtrans			0.351	0.080*			0.224	0.048*			0.049	0.172
Indwstrade			0.213	0.084*			0.112	0.049*			-0.284	0.180
Occmgr			0.336	0.063*			0.246	0.037*			0.406	0.135*
Occprof			0.308	0.061*			0.250	0.035*			0.337	0.133*
Occasprof			0.228	0.062*			0.156	0.035*			0.242	0.134
Occadvclerk			0.077	0.169			-0.070	0.097			0.757	0.372*
Occintclerk			0.178	0.063*			0.123	0.035*			0.001	0.137
Occelemclerk			-0.100	0.073			-0.040	0.040			0.144	0.156
Occtrade			0.104	0.055			0.088	0.031*			0.294	0.118*
Occintprod			0.156	0.058*			0.034	0.032			0.232	0.125
Union			0.128	0.032*			0.099	0.018*			-0.151	0.070*
Self employed			-0.270	0.038*			-0.190	0.025*			0.012	0.081
Constant	9.425	0.054*	9.138	0.081*	2.286	0.031*	2.060	0.047*	8.016	0.113*	7.951	0.173*
R-squared	0.359		0.398		0.229		0.327		0.036		0.050	
Sample size	4058		4057		3724		3723		4423		4422	

Table B9 continued: – Females

	1. Personal income				2. Wage rate				3. Job satisfaction			
	(A)		(B)		(A)		(B)		(A)		(B)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Aged 25-34	0.692	0.051*	0.621	0.051*	0.297	0.028*	0.237	0.027*	0.106	0.109	0.047	0.111
Aged 35-44	0.805	0.052*	0.702	0.053*	0.332	0.028*	0.258	0.028*	0.133	0.111	0.045	0.114
Aged 45-54	0.728	0.052*	0.595	0.054*	0.315	0.028*	0.220	0.029*	0.247	0.110*	0.135	0.117
Aged 55-64	0.631	0.067*	0.473	0.071*	0.312	0.037*	0.195	0.039*	0.584	0.141*	0.473	0.153*
Degree	0.549	0.041*	0.380	0.051*	0.411	0.023*	0.215	0.028*	-0.505	0.088*	-0.694	0.109*
Other P-S	0.259	0.039*	0.210	0.040*	0.144	0.022*	0.086	0.022*	-0.191	0.082*	-0.285	0.085*
Comp H-S	0.328	0.050*	0.288	0.050*	0.164	0.028*	0.119	0.027*	-0.340	0.107*	-0.349	0.108*
Major city	0.123	0.031*	0.087	0.031*	0.081	0.017*	0.066	0.017*	-0.196	0.065*	-0.228	0.067*
Disability	-0.130	0.057*	-0.110	0.056*	-0.046	0.033	-0.030	0.032	-0.428	0.120*	-0.453	0.120*
Couple	-0.020	0.041	-0.020	0.040	0.046	0.023*	0.030	0.022	0.131	0.089	0.109	0.088
Sole parent	0.094	0.074	0.103	0.072	-0.046	0.041	-0.050	0.039	0.106	0.159	0.095	0.158
Couple parents	-0.170	0.063*	-0.170	0.062*	0.055	0.035	0.033	0.034	0.263	0.135	0.239	0.134
No. dep <15	-0.080	0.025*	-0.080	0.025*	-0.009	0.014	-0.010	0.013	0.020	0.053	0.014	0.053
No. dep 15-24	-0.050	0.037	-0.050	0.036	-0.031	0.020	-0.030	0.020	4.38E-04	0.079	-0.005	0.079
ATSI	-0.150	0.113	-0.150	0.112	0.073	0.066	0.070	0.063	0.335	0.252	0.287	0.251
ESB Immigrant	-0.020	0.135	0.012	0.133	0.004	0.075	0.036	0.072	-0.013	0.292	0.077	0.292
NESB Immigrant	-0.370	0.120*	-0.270	0.118*	-0.183	0.062*	-0.110	0.060	-0.286	0.243	-0.199	0.243
Poor English	-0.130	0.183	-0.090	0.182	-0.277	0.097*	-0.210	0.094*	-0.658	0.368	-0.495	0.371
YSM	0.003	0.012	3.01E-04	0.012	0.005	0.007	0.003	0.007	0.002	0.026	-0.006	0.026
YSM2	4.17E-04	0.002	9.29E-04	0.002	-0.002	0.001*	-0.001	0.001	-0.002	0.005	-9.77E-04	0.005
YSM-NESB	0.023	0.016	0.022	0.016	0.007	0.009	0.007	0.009	0.015	0.035	0.019	0.035
YSM2-NESB	-0.004	0.003	-0.004	0.003	1.94E-04	0.002	-1.68E-05	0.002	-0.001	0.007	-0.002	0.007
Tenure			0.014	0.002*			0.005	0.001*			0.004	0.005
Indaccom			0.046	0.105			0.005	0.065			0.069	0.218
Indcommun			0.344	0.143*			0.195	0.083*			0.166	0.304
Indconstr			0.218	0.133			0.131	0.082			0.248	0.273
Indcultrec			0.103	0.120			-0.030	0.073			0.383	0.252
Indeduc			-0.040	0.099			0.008	0.062			0.611	0.206*
Indelec			0.218	0.331			0.116	0.180			-0.666	0.702
Indfinance			0.226	0.113*			0.137	0.069*			0.025	0.238
Indgovdef			0.037	0.115			0.124	0.070			0.583	0.243*
Indhlthcs			0.105	0.095			0.015	0.060			0.618	0.197*
Indmanuf			0.164	0.103			0.088	0.065			0.455	0.214*
Indmining			0.414	0.258			0.246	0.153			0.536	0.540
Indperserv			-0.050	0.114			-0.070	0.070			0.512	0.238*
Indpropbus			0.198	0.097*			0.103	0.062			0.205	0.201
Indrtrade			-0.002	0.097			-0.060	0.061			0.162	0.200
Indtrans			0.280	0.129*			0.153	0.077*			0.506	0.269
Indwstrade			0.116	0.120			0.145	0.073*			0.265	0.253
Occmgr			0.499	0.090*			0.457	0.053*			0.505	0.191*
Occprof			0.333	0.073*			0.357	0.040*			0.450	0.158*
Occasprof			0.248	0.072*			0.216	0.040*			0.436	0.156*
Occadvclerk			0.289	0.082*			0.300	0.045*			0.737	0.176*
Occintclerk			0.116	0.065			0.092	0.035*			0.287	0.140*
Occelemclerk			0.063	0.073			0.069	0.040			0.343	0.158*
Occtrade			0.147	0.099			0.062	0.056			0.298	0.214
Occintprod			0.047	0.106			-0.030	0.059			0.411	0.229
Union			0.090	0.036*			0.070	0.019*			-0.322	0.078*
Self employed			-0.290	0.052*			-0.010	0.033			-0.011	0.108
Constant	9.452	0.058*	9.21	0.110*	2.247	0.031*	2.090	0.067*	7.824	0.122*	7.318	0.229*
R-squared	0.349		0.380		0.205		0.273		0.041		0.061	
Sample size	3561		3560		3443		3442		3927		3926	

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