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Nappies, Books and Wrinkles: How Children, Qualifications and Age Affect Female Underemployment in Australia

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NON-TECHNICAL SUMMARY

This paper examines the factors contributing to female underemployment across Australia. 'Underemployed' in this document refers to females in part-time employment, who, if given the choice, would take on more hours of paid employment relative to their current hours. The notion of underemployment is particularly relevant to policy makers at the moment given the increasing rates of part-time employment in the country, and the preponderance of females in this type of work contract. The rise of part-time employment can be both beneficial for a willing employee, but high rates of underemployment suggest that a sizeable minority of females working limited hours would prefer to work full-time instead, and that this is an inefficiency to the labour market, one not picked up by unemployment figures.

This paper also raises the question of the relevance of providing commentary on 'female employees', as there is a significant amount of heterogeneity between different female labour force participants. For example, part-time work may be ideal for females who have children at home but wish to balance their homemaking responsibilities with professional duties but not necessarily match the expectations of young and/or educated females who possess labour market characteristics similar to their male counterparts. In this situation, underemployment will be more prevalent among the latter than the former and references to the 'average female labour force participant' may not actually paint as accurate a picture of the situation faced by females with varying labour market characteristics.

Based on our research, we find that age, qualifications and the presence of children at home are leading factors in determining whether females find themselves underemployed or not. It appears that young females who are tertiary educated and do not have children at home have a higher likelihood of being underemployed than those who are older with no tertiary education and children at home. On the other hand, the rate of underemployment for younger females in part-time employment fall when they have young children, as they are more likely to be satisfied with working restricted hours given the need of young children to have additional supervision in the home.

In sum, this study highlights the complexity of the heterogenous female workforce and the need for a multi-dimensional approach. Policy prescriptions to ease the underemployment conundrum amongst females in part-time employment must tackle a multitude of impeding factors that bring together policymakers encompassing the education, childcare and labour market sectors (among others).

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ABSTRACT

Using 2001-17 panel data, this paper investigates the determinants of underemployment among females in part-time employment. This is a matter of policy relevance given the high and growing rate of part-time employment in Australia and the preponderance of females in this work role. Statistical analysis shows a significant and persistent presence of such underemployment, with further bifurcations based on age, qualifications and the presence of children at home. Econometric results suggest that the young, tertiary educated and those with no children at home are likelier to be underemployed. The underemployed do however, surprisingly, enjoy a 'compensatory effect' with respect to being happier than the non-underemployed with the nature of their work tasks and work-life balance. In all cases, those part-timers who are also casually employed are also more likely to be underemployed.

Keywords: underemployment; females; part-time employment; job satisfaction; Australia

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INTRODUCTION

Changing cultural, social and economic norms have seen significant increases in the labour force participation rate of Australian females over the decades (Gregory et al., 1985), increasing from 43.7% in July 1978, breaching the 50% threshold in September 1988, and reaching an all-time high of 61% in July 2019. This increased participation has also led to a rise in female employability (WGEA, 2019), with a significant bump in their employment rate (relative to the size of the female population) from 40.3% to 57.8% in the same period. Indeed, by July 2019, females made up 47% of the employed. Their presence in the workforce is however delineated by hours worked, forming the majority of workers in part-time (68.03%) but not full-time employment (37.37%) (Australian Bureau of Statistics [henceforth ABS], 2019). The growth of part-time employment (just about doubling to 31.46% between July 1978 and July 2019) has been posited as a prime reason for the rise in the rate of female employment, as it has allowed those with children, particular those with pre-school aged children, to (re-)enter the workforce without having to choose exclusively between homemaking and professional duties (Fleming and Kler, 2014; Kler et al., 2018).

Part-time employment benefits not just to the greater economy (by reducing unemployment, and increasing labour market efficiency) but also to the part-time employed individual as working limited hours would suit their personal circumstances. This would include university students, primary carers of children (who are overwhelmingly female), and older labour force participants transitioning out of the workforce as well as those with health issues, among others. The availability of limited-hours jobs increases the engagement of these sub-groups with the labour market, increase their incomes (thus lowering government expenditure on welfare assistance), and minimize the under-utilization of human capital of those with requisite labour market skills but unwilling or unable to work full-time (e.g. females who have had interrupted careers due to childbirth and subsequent childrearing duties). Australia's deployment of part-time employment far exceeds both the OECD and European Union average, which consist of countries with comparable economies, and is thus worthy of further study (OECD, 2019).

One way to gauge the effectiveness and efficiency of part-time employment at the individual level is to investigate the rate of underemployment[1] among such employees. High and

[1] Definitions vary. The main confusion can arise when the term 'underemployment' is used instead of 'overeducation', which measures the skill or qualification mismatch between that held by an individual and the requirements of their job (where the individual has excess skill/qualification they are defined as being underemployed or overeducated). This is different to the manner in which underemployment is increasingly defined, whereby an individual is viewed as being underemployed if they work less hours than they desire.

persistent rates of underemployment among part-time employees might imply that the part-time job market consists of some disaffected participants and that a low rate of unemployment may be a misleading and biased measure of the health of the labour market (Kifle et al., 2019). Statistical data shows that the rate of underemployment among part-time employed Australians is both high and persistent, coinciding with the fact that part-time employment has grown at a faster pace than full-time employment (Kler et al., 2018) and this is partially due to some part-time employees settling for such jobs in the face of their inability to land full-time positions.[2] For instance, the rate of underemployment among part-time employees is stable when comparing July 2014 and July 2019 (28.02% to 27.81%), and is the case for both gender[3] (ABS, 2019). Underemployment is more prevalent among males (38.22% relative to 24% for females in July 2014 and 36.20% relative to 24.15% for females in July 2019), which is unsurprising given males in part-time work express a higher preference for wanting to work more hours compared to their female peers (Kifle et al., 2019). Statistical data from the Household, Income and Labour Dynamics in Australia (HILDA) panel dataset (covering the period 2001 to 2017) also paint a similar picture, albeit with higher magnitudes, and a greater (though still stable) variation among males (see Figure 1).[4]

The data for the female sample may, however, hide significant variations in outcomes given previous studies on female labour market characteristics. Specifically, the literature has established that females in the labour market are not a monolithic bloc (Green et al., 2018; Kifle et al., 2014; Long, 2005), and hence the econometrically derived 'average female' in the labour market is not necessarily an accurate depiction of the female working cohort given the vast heterogeneity in characteristics of female labour force participants. Females possess significant variations in labour market targets and goals depending upon their educational qualifications (a proxy for skills), age as well as presence of children in their lives (Long, 2005). These differences have been shown to lead to clear variations in their rates of over education and job satisfaction (Fleming and Kler, 2014; Green et al., 2018; Kifle et al., 2014;Long, 2005),

Nevertheless, variations occur even within this broad definition, and this is addressed in greater detail by Wilkins (2004, 2006, and 2007) and Wilkins and Wooden (2011).

[2] We find that 28.63% of underemployed part-time employees working one job (excluding full-time students) reported that they settled for their part-time job as they were unable to find jobs that were full-time in nature. This was gender sensitive, and is higher for males (39.58%) than females (24.23%).

[3] Due to a change in the wording of questions to define underemployment, the ABS does not recommend comparing their underemployment data post-2014 with that pre-2014.

[4] This is partially due to the differing question between ABS's Labour Force Survey and HILDA's questionnaire (see Kifle et al, 2019 for more details) but in essence the latter asks respondents if they would like to work more, less or the same hours after taking into account how that decision would affect their income, whereas the ABS question does not ask respondents to consider the impact of their decision on their income.

and statistical results (see figures 2a-c and 3) from the HILDA dataset (2001-2017 average) also points to similar variations with respect to underemployment among females in part-time employment.

Figure 1: Underemployment rate among part-time employees using HILDA data (2001-17)

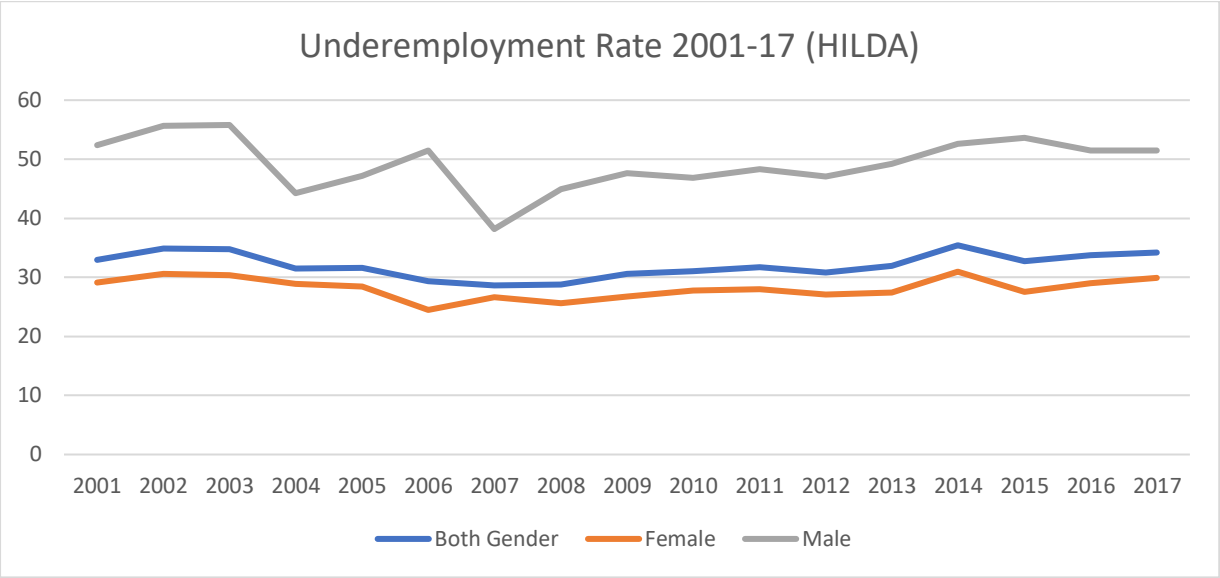


Figure 2a: Female Underemployment rate among part-time employees by age using HILDA data (2001-17)

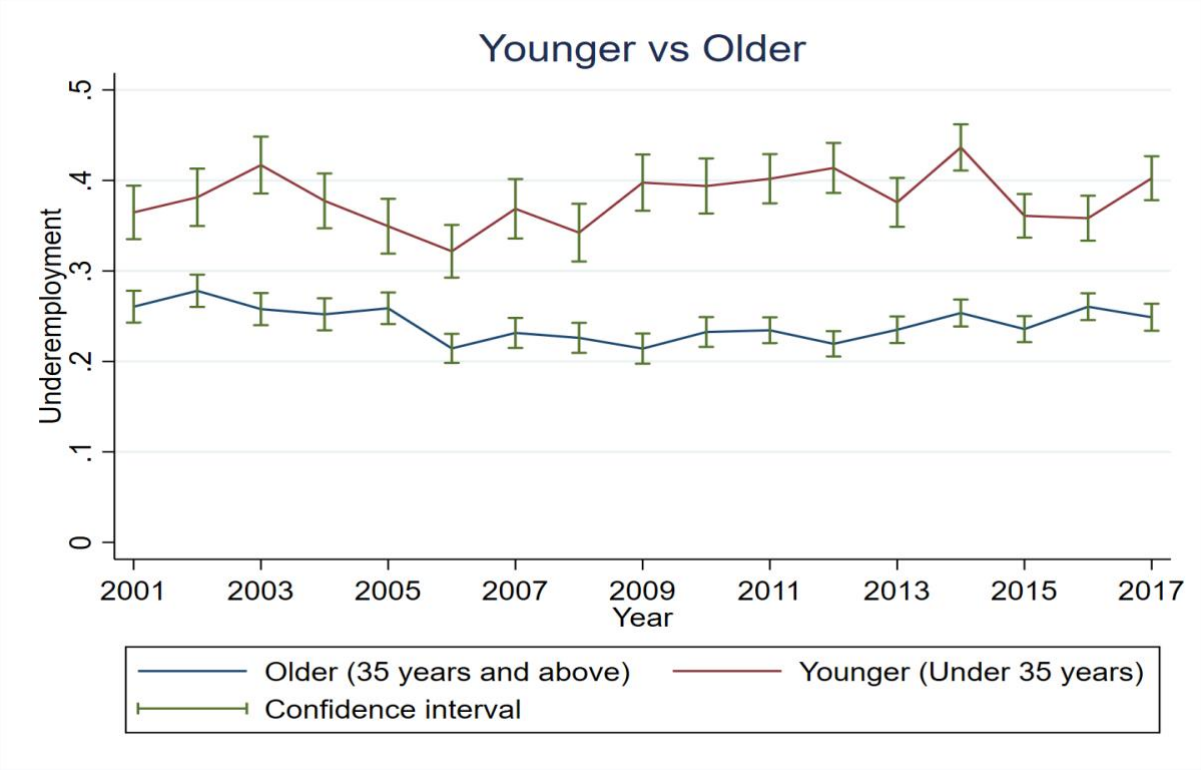


Figure 2b: Female Underemployment rate among part-time employees by qualification using HILDA data (2001-17)

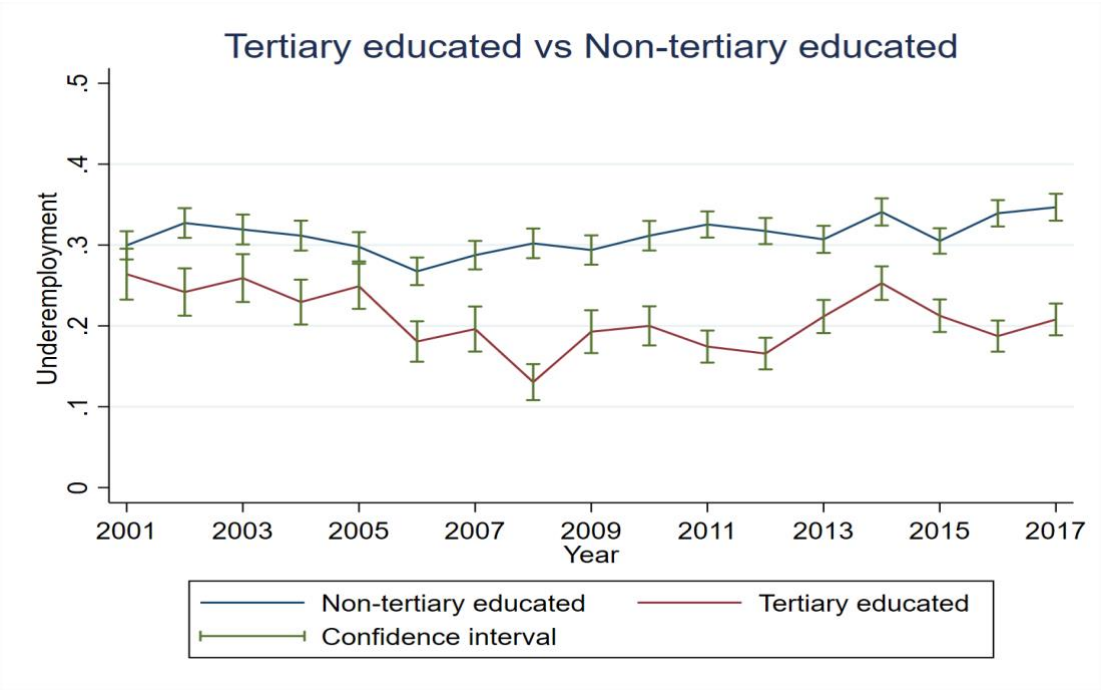


Figure 2c: Female Underemployment rate among part-time employees by presence of children at home using HILDA data (2001-17)

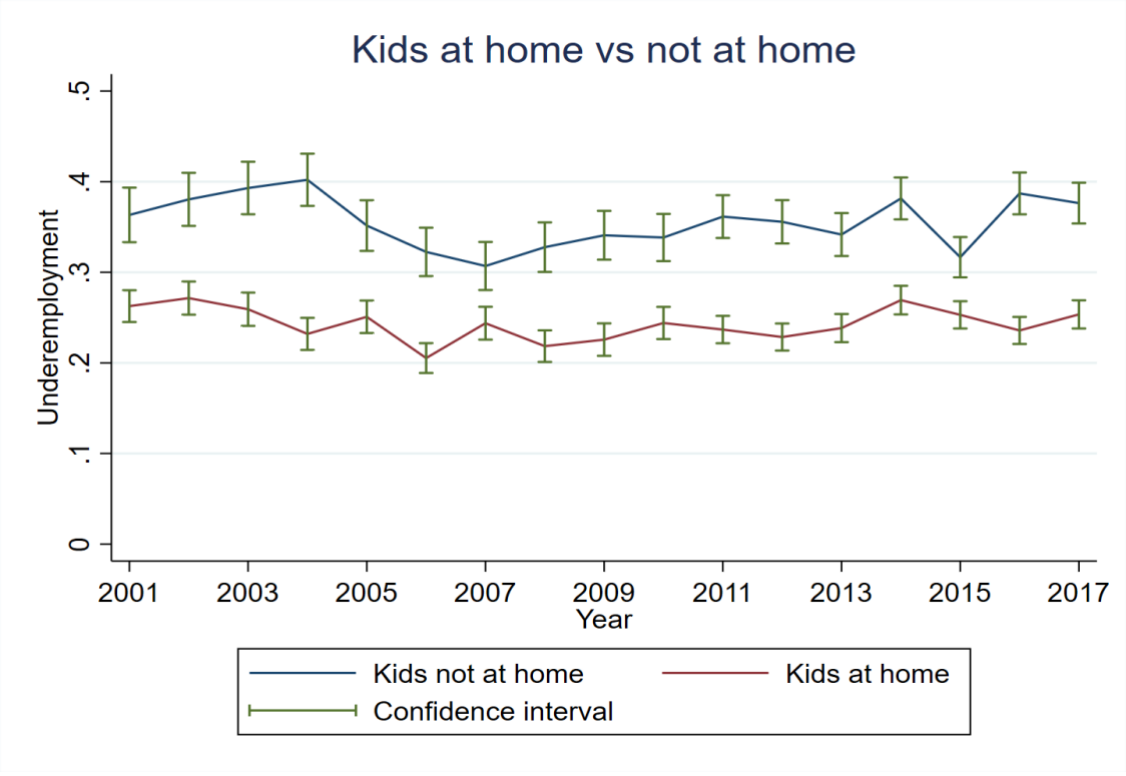
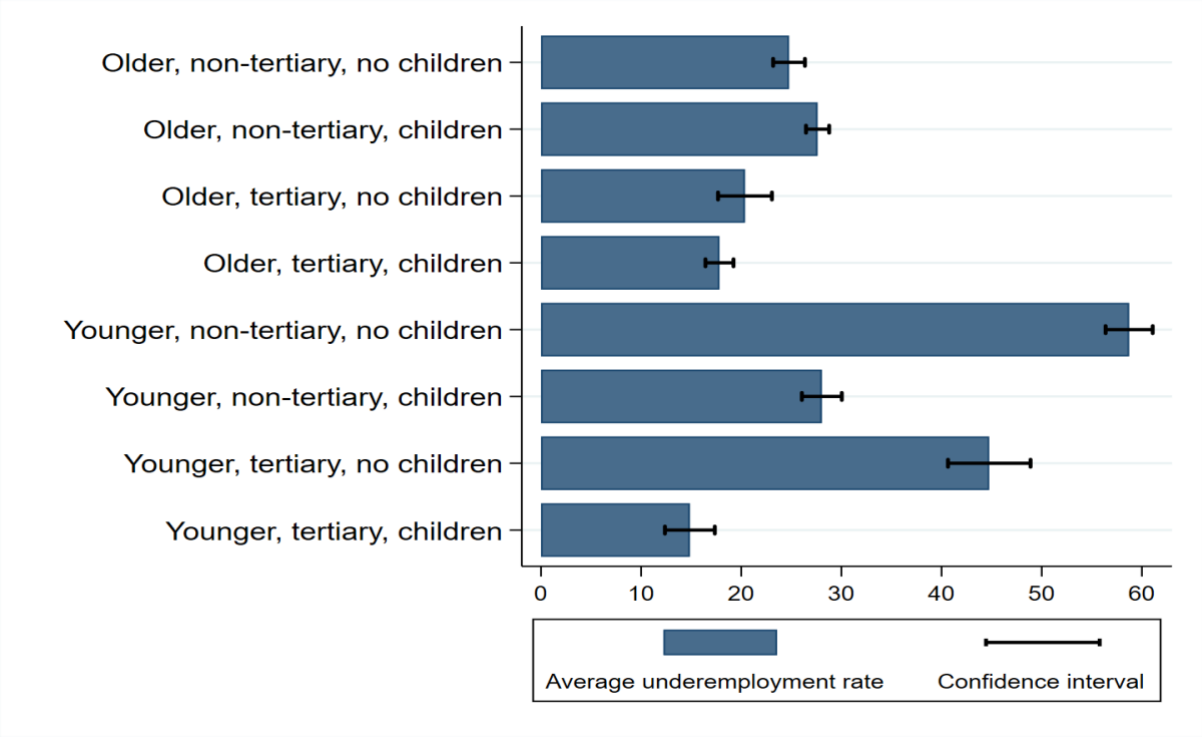


Figure 3: Rate of underemployment among part-time female employees by sub-groups.



There is, at first glance, a demarcation in the rate of underemployment among females in part-time employment by age, qualification and presence of children at home. Interactions between the various relationships also highlight the inter-play between these factors when studying the (statistical) rate of underemployment among females in part-time employment. From Figure 3 for example, we see a significant decline in underemployment rates for younger females when they have children at home regardless of their education qualifications. However, this drop cannot be observed for older females. Likewise, education plays a role in determining underemployment, but only for younger females. This is consistent with previous Australian studies on female job satisfaction and also overeducation (Fleming and Kler, 2014; Kifle et al., 2014; Long, 2005). As well, previous Australians studies on underemployment have also highlighted the role of age, qualifications and presence of children in determining the likelihood of reporting underemployment (Kler et al., 2018; Kifle et al. 2019;Li et al., 2015; Wilkins, 2004, 2006, 2007), though none have related it directly to female part-time employees specifically, as done in this study. As such, while informative, prior studies have not shed significant light on the underemployment phenomenon faced by females in part-time employment, who form the largest cohort of the underemployed in Australia.

It is thus necessary to demarcate the female labour force cohort into sub-groups that better delineate between female participants who possess significantly different needs (or wants) from

their labour force participation. This provides for a more accurate representation of the determinants of underemployment amongst female part-time employees, thus potentially generating not just a more nuanced understanding of female labour force participation but also leading to more sophisticated policy responses to tackle underemployment among female participants.

METHOD AND DATA

Data are obtained from waves 1–17 (2001–2017) of the HILDA survey. It seeks to provide longitudinal data on the lives of Australian residents by collecting information annually on a wide range of aspects of life, including employment, education, income and wellbeing. The survey provides a rich source of information on labour market outcomes and performance. There is information on occupation and industry type, qualification levels attained and earnings. After excluding observations with incomplete information and restricting the sample to females in part-time employment not in full-time study, the dataset is left with 17,333 employee-year observations, of whom 4,890 (28.21%) are underemployed.[5] The full set of variables used are presented in Appendix Table A1. Table 1 below provides statistical information on selected variables of interest.

The underemployment rate between sub-groups vary substantially. The younger, non-tertiary educated and those without children at home are statistically speaking, around 50% more likely to report wanting extra hours of work relative to older, tertiary educated and those with children at home participants.[6] While the age profile of children at home obviously differ between the younger and older group, this is also evident by education status, with the tertiary educated being far more likely to have younger children[7]. Given females are more likely to be secondary income earners if in a live-in relationship, and more so if in a part-time job (Elliott, 1991;Pixley and Moen, 2003), it is worth commenting that there is a sizeable gap between the tertiary and non-tertiary educated with respect to this variable (*couple*) as well. The gap when comparing by age profiles and presence of children is obvious and not at all unexpected.

[5] The exact question used in the HILDA survey to determine underemployment in this study reads: if you could choose the number of hours you work each week, and *taking into account how that would affect your income*, would you prefer to work (a) fewer hours than you do now (b) about the same hours as you do now, (c) or more hours than you do now, (d) don't know? Those responding (c) are defined in this study as being underemployed.
[6] A significance test (Two-sample Wilcoxon rank-sum or Mann-Whitney test) was conducted comparing the underemployment rate for younger vs older, tertiary vs no tertiary and kids at home vs no kids at home categories. In all cases we reject the null hypothesis.
[7] T stat=-20.73, p-value=0.00

In terms of labour force profiles, we report that the rates of casualisation also vary considerably with the younger, non-tertiary educated and those with no children at home being more likely to be in such contractual employment. Given that the casual and non-casual workforce, even within the part-time employed grouping is likely to differ considerably given the former's lack of access to non-wage benefits and job security (but in return gain an hourly wage premium), this study will return to this issue as an extension to the main results later in this paper. All sub-groups report non-trivial levels of tenure with their current occupation and employer, suggesting that the average female in each sub-group is well-acquainted with her supervisory team and is well-versed with the nature of her job. The tertiary educated apart, there has also been very low levels of unemployment spells, replaced instead with longer spells of being out of the labour force (the opposite is the case for males). This does show that spells out of work have been largely voluntary, and in large part (we assume) due to childbirth and childrearing duties, though it would also encompass spells of re-training and education.

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Table 1: Summary statistics. Aggregated and sub-groups of female part-time employed

	All	Younger	Older	Tertiary	Non-Tertiary	Kids	No Kids
Underemployment (%)	28.21 (0.45)	38.21 (0.49)	24.17 (0.43)	20.78 (0.41)	31.30 (0.46)	24.33 (0.43)	35.61 (0.48)
Age	41.51 (11.64)	27.11 (4.94)	47.32 (7.92)	41.61 (10.32)	41.47 (12.14)	41.04 (8.72)	42.40 (15.73)
Age 16-24	0.10 (0.29)	0.33 (0.47)		0.04 (0.21)	0.12 (0.32)	0.03 (0.16)	0.23 (0.42)
Age 25-34	0.19 (0.39)	0.67 (0.47)		0.22 (0.42)	0.18 (0.38)	0.22 (0.41)	0.15 (0.35)
Age 34-44	0.30 (0.46)		0.42 (0.49)	0.36 (0.48)	0.27 (0.44)	0.41 (0.49)	0.08 (0.27)
Age 45-54	0.27 (0.44)		0.37 (0.48)	0.24 (0.43)	0.27 (0.45)	0.28 (0.45)	0.23 (0.42)
Age 55-65	0.15 (0.36)		0.21 (0.41)	0.13 (0.34)	0.16 (0.37)	0.07 (0.25)	0.31 (0.46)
Kids home	0.66 (0.48)	0.55 (0.50)	0.70 (0.46)	0.72 (0.45)	0.63 (0.48)	1.00 (0.00)	0.00 (0.00)
Kids 0-4	0.21 (0.41)	0.43 (0.50)	0.13 (0.33)	0.31 (0.46)	0.17 (0.38)	0.33 (0.47)	
Kids 5-14	0.37 (0.48)	0.25 (0.43)	0.41 (0.49)	0.40 (0.49)	0.35 (0.48)	0.55 (0.50)	
Kids 15-24	0.24 (0.43)	0.01 (0.09)	0.33 (0.47)	0.20 (0.40)	0.25 (0.44)	0.36 (0.48)	
Kids 25+	0.04 (0.20)	0.00 (0.00)	0.06 (0.23)	0.02 (0.15)	0.05 (0.21)	0.06 (0.24)	
Couple	0.75 (0.43)	0.65 (0.48)	0.80 (0.40)	0.82 (0.39)	0.73 (0.44)	0.83 (0.37)	0.60 (0.49)
Hourly Wage ($)	27.54 (22.16)	25.58 (19.89)	28.33 (22.97)	35.72 (25.85)	24.14 (19.45)	28.30 (22.29)	26.08 (21.84)
Casual	0.34 (0.47)	0.44 (0.50)	0.29 (0.46)	0.23 (0.42)	0.38 (0.49)	0.30 (0.46)	0.41 (0.49)
Tenure - Occupation	9.41 (9.49)	4.42 (4.08)	11.42 (10.28)	10.86 (9.87)	8.81 (9.27)	9.10 (8.41)	10.00 (11.25)
Tenure – Employer	6.45 (6.92)	3.25 (3.36)	7.74 (7.55)	7.55 (7.34)	5.99 (6.69)	6.39 (6.23)	6.57 (8.09)
Years Worked	18.78 (10.77)	7.63 (4.55)	23.28 (9.17)	18.88 (9.92)	18.73 (11.11)	18.11 (8.54)	20.04 (14.00)
Years Unemployed	0.60 (1.46)	0.54 (1.04)	0.63 (1.59)	0.34 (0.84)	0.71 (1.63)	0.54 (1.28)	0.71 (1.74)
Years out of Lab. Force	5.01 (5.99)	1.60 (2.33)	6.38 (6.45)	3.71 (4.56)	5.55 (6.41)	5.13 (5.66)	4.77 (6.56)
Uni	0.29 (0.46)	0.27 (0.44)	0.30 (0.46)			0.32 (0.47)	0.24 (0.43)
Obs.	17,333	4,988	12,345	5,092	12,241	11,372	5,961

Standard deviations in brackets. The age group of children at home is not a sum of the number of those with children at home, as a female with children at home may have more than one child, and the age spread of her children could be across the delineated age categories. Each individual appears three times depending on their age, qualification and presence of children at home.

Sub-group Formation

As alluded to in Figure 3, the rate of underemployment can vary significantly even when age, education and children profiles are interacted, allowing for a more detailed split in the female, part-time employed sample. Based on the following *a priori* beliefs, a total of eight sub-groups are used in econometric modelling (described in the next sub-section).

Belief 1: Those with no children at home face a smaller work-life balance predicament and are thus freer to pursue additional hours at work; as such, *ceteris paribus* they are more likely to report underemployment relative to their peers with children at home (as highlighted in Table 1).[8]

Sub-belief 1a: The age of the children should also matter insofar as younger children (especially pre-school aged children) require greater parental attention, thus reducing the rate of underemployment among the female parent with young children relative to those with older children. This will be studied as an extension of the eight sub-groups.

Belief 2: Qualifications (education) matter, but the relationship between education and underemployment is ambiguous. Theoretically, those with university qualifications could potentially be more likely to report underemployment if in part-time work as they have invested far greater time and money to obtain higher-level qualifications, and may thus be expecting to work full-time. This is however, inconsistent with the evidence in Table 1. An alternative take would suggest that those with tertiary qualifications have far greater access to full-time employment, and thus those in part-time employment are doing so voluntarily. This matches with the HILDA data, which shows that only 4.83% of tertiary educated part-time employed females report being unable to find full-time employment as opposed to 10.15% of the non-tertiary educated sub-group.

Belief 3: Age matters, but only when combined with qualifications and presence of children. Given a strong positive correlation between age and older children, and a negative one with younger children, not to mention that younger cohorts are more likely to have obtained tertiary qualifications, age cannot be excluded as a potentially significant determinant of underemployment. At a more basic level, we expect younger participants to report higher levels of underemployment given that they have less children (albeit younger aged children in proportion to the older participants). This is borne out by statistical data indicating that among

[8] As well we note that 15.20% of those with no children at home report working part-time because of their inability to gain full-time employment, as opposed to only 5.20% of those with children at home.

those aged below 35, 13.01% reported being in part-time employment due to being unable to secure full-time employment; this is as opposed to 6.80% among those aged 35 and above.

Nonetheless, given these beliefs are not mutually exclusive, it is prudent to test for each inter-relationship. As such, this study will eschew running separate regressions for each group and instead combine them all in one aggregate sample as follows:

a. Younger, tertiary educated with no children at home
b. Younger, tertiary educated with children at home
c. Younger, non-tertiary educated with no children at home
d. Younger, non-tertiary educated with children at home
e. Older, tertiary educated with no children at home
f. Older, tertiary educated with children at home
g. Older, non-tertiary educated with no children at home
h. Older, non-tertiary educated with children at home

Econometric Model

This paper investigates the determinants of underemployment using a random effects probit estimator when determining underemployment among part-time employees, as shown below:

$$\Pr\left(y_{it}=1\middle|Z'_{it},X'_{it}\right)=\Phi\left(\mu_i+Z'_{it}\gamma+X'_{it}\beta\right)\quad i=1,...,N;t=1,...,T \tag{1}$$

where y_{it} is binary dependant variable taking a value of 1 if underemployed (and 0 otherwise), Z'_{it} is a vector of observable time invariant and time-varying variables of interest (for example, in Table 2 Z'_{it} would contain the seven female groups excluding the reference group and different types of job related satisfaction variables) and X'_{it} is vector of control variables including individual socio-demographic characteristics, family and household characteristics, information on working conditions, geographical location, and other related variables, and γ and β represent the corresponding coefficients respectively. The error term, μ_i is assumed to be a random-component constant over time and uncorrelated with the explanatory variables. Such a strong assumption that the individual-specific error term is uncorrelated with the explanatory variable may not hold; thus an approach proposed by Mundlak (1978) is utilized as it controls for unobserved time-invariant individual heterogeneity. However, not all possible

types of unobserved heterogeneity can be solved using Mundlak corrections. There could still exist an issue of time-varying unobserved heterogeneity that stems from macro-level shocks that affect each individual unit differently. Failure to control for such variables may produce biased estimates. Specifically, in the context of this paper two major concerns are that (a) there are shocks to individuals that lead them to become underemployed and (b) jobs / workplaces where underemployment is more likely may differ in unobserved characteristics. To account for these potential time-varying unobserved heterogeneity at the macro-level we included (as part of X'_{it}) two variables in right-side of our model, namely unemployment rate (lagged by one) in each state and territory and GDP by state and territory for each HILDA year used in this study. The parameters of interest for the random effects probit model in (1) are estimated using a maximum likelihood estimator.

As the panel used in this study is relatively short, this implies that differences across individuals rather than changes within an individual have more influence on underemployment. The Mundlak terms can thus be thought of as the 'long term' impacts of a change in a particular variable (Boyce, 2010; Datta and Kristensen, 2008).

RESULTS AND INTERPRETATION

Table 2 presents the results of the determinants of female underemployment.[9] Concentrating on column [1], we note that the interaction terms matter; in all bar one case (younger, non-tertiary educated with no children at home) there is a higher likelihood of being underemployed if a female is (a) younger, (b) tertiary educated and (c) has no children at home. These factors indicate that, early on in a female's career, after completing tertiary studies but before having children (and associated child-rearing duties), her chances of being underemployment are greater in that she may pursue full-time employment but not be successful in securing as many hours as she prefers. This is not evident among younger females who have not completed tertiary studies and do not have children.

[9] Full results presented in Appendix Table A2.

Table 2: Determinants of female underemployment (random effects probit model)

	[1]	[2]
Older, non-tertiary, no children	-0.41*** (0.12)	-0.43*** (0.13)
	[-0.09]	[-0.08]
Older, non-tertiary, children	-0.33*** (0.11)	-0.37*** (0.11)
	[-0.07]	[-0.07]
Older, tertiary, no children	-0.37*** (0.13)	-0.42*** (0.14)
	[-0.08]	[-0.08]
Older, tertiary, children	-0.37*** (0.11)	-0.39*** (0.11)
	[-0.08]	[-0.08]
Younger, non-tertiary, no children	0.07 (0.10)	-0.00 (0.10)
	[0.02]	[-0.00]
Younger, non-tertiary, children	-0.62*** (0.10)	-0.59*** (0.10)
	[-0.14]	[-0.12]
Younger, tertiary, children	-0.60*** (0.12)	-0.60*** (0.12)
	[-0.13]	[-0.12]
Satisfaction with pay		-0.03*** (0.01)
		[-0.01]
Satisfaction with job security		-0.05*** (0.01)
		[-0.01]
Satisfaction with hours worked		-0.34*** (0.01)
		[-0.07]
Satisfaction with type of work		0.08*** (0.01)
		[0.02]
Satisfaction with work-life balance		0.09*** (0.01)
		[0.02]
Observations	17,333	17,333
Groups	5,247	5,247

Note: * p>0.10; ** p>0.05; *** p>0.01; standard errors in parentheses; marginal effects in square brackets

Reference group: Younger, tertiary educated, no children at home.

When it comes to the presence of children in younger females' lives, the pairwise matching results in Table 3 show that having children influences the number of hours those females

prefer to work.[10] In effect, younger females with children – irrespective of their educational status – seem less likely to be underemployed because they may choose to spend more time with their (almost always young) children and thus by implication, less time at paid work. This is presumably because these females prioritize their offspring upbringing and hence choose to seek employment opportunities with limited hours so they can be more readily available during their children's vital formative years. Statistical data from HILDA supports this interpretation of results; younger females with children (irrespective of educational status) are highly unlikely to be in their current position because they failed to find full-time employment (3.25%), as opposed to those who have no children at home (24.92%).

Interestingly, from Table 2, we observe that older females – regardless of their prior education level or family status – also appear less likely to be underemployed when compared to the study's reference group. Table 3 also conveys that education status and the presence of children have no significant bearing on the likelihood of older females being unemployed. We posit that this is due to older females' children being more mature in age (on average), thereby freeing their mothers' time for working.[11]

[10] Younger females who do not have a tertiary education and have no children are more likely to be underemployed than their younger and non-tertiary educated counterparts who do have children (see Table 3, row [5], column [6], which shows a coefficient of +0.69, significant at a 1 percent level). Similarly, younger females who have a tertiary education with no children are more likely to be underemployed than their younger and tertiary educated counterparts who have children (see Table 3, row [7], column [8], which shows a coefficient of +0.60, significant at a 1 percent level).

[11] Please see columns [1] to [4] and rows [1] to [4] in Table 3.

Table 3: Determinants of female underemployment controlling for number of children (pairwise matching – different reference groups)

		Reference groups							
		Older, Non-tertiary, No kids (0, 0, 0)	Older, Non-tertiary, with kids (0,0,1)	Older, Tertiary, No kids (0,1,0)	Older, Tertiary, with kids (0,1,1)	Younger, Non-tertiary, No kids (1,0,0)	Younger, Non-tertiary, with kids (1,0,1)	Younger, Tertiary, No kids (1,1,0)	Younger, Tertiary, with kids (1,1,1)
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Older, Non-tertiary, No kids (0,0,0)	[1]	.	-0.08 0.06	-0.04 (0.10)	-0.04 (0.08)	-0.48*** (0.11)	0.21** (0.09)	-0.41** (0.12)	0.19* (0.11)
Older, Non-tertiary, with kids (0,0,1)	[2]	0.08 0.06	.	0.04 (0.10)	0.04 (0.07)	-0.41*** (0.09)	0.28*** (0.07)	-0.33*** (0.11)	0.26*** (0.10)
Older, Tertiary, No kids (0,1,0)	[3]	0.04 (0.10)	-0.04 (0.10)	.	0.00 (0.10)	-0.45*** (0.13)	0.24** (0.11)	-0.37*** (0.13)	0.23* (0.13)
Older, Tertiary, with kids (0,1,1)	[4]	0.04 (0.08)	-0.04 (0.07)	-0.00 (0.10)	.	-0.45*** (0.10)	0.24*** (0.08)	-0.37*** (0.11)	0.22** (0.09)
Younger, Non-tertiary, No kids (1,0,0)	[5]	0.48*** (0.11)	0.41*** (0.09)	0.45*** (0.13)	0.45*** (0.10)	.	0.69*** (0.08)	0.07 (0.10)	0.67*** (0.11)
Younger, Non-tertiary, with kids (1,0,1)	[6]	-0.21** (0.09)	-0.28*** (0.07)	-0.24** (0.11)	-0.24*** (0.08)	-0.69*** (0.08)	.	-0.62*** (0.10)	-0.02 (0.10)
Younger, Tertiary, No kids (1,1,0)	[7]	0.41** (0.12)	0.33*** (0.11)	0.37*** (0.13)	0.37*** (0.11)	-0.07 (0.10)	0.62*** (0.10)	.	0.60*** (0.12)
Younger, Tertiary, with kids (1,1,1)	[8]	-0.19* (0.11)	-0.26*** (0.10)	-0.23* (0.13)	-0.22** (0.09)	-0.67*** (0.11)	0.02 (0.10)	-0.60*** (0.12)	.

Note: * p>0.10; ** p>0.05; *** p>0.01; standard errors in parentheses. Number of observations: 17,333; Number of groups: 5,247. We use the pairwise compare code (pwcompare in STATA). For the full set of controls, refer to Appendix Table A2.

Column categories in this table form a reference group against which all row categories are compared and measured. To correctly read results in pairwise matching cells, compare the relevant row category to the relevant column category. A negative coefficient figure in a pairwise matching cell indicates that females in the relevant row category are less likely to be underemployed than females in the relevant column category. A positive coefficient figure in a pairwise matching cell indicates that females in the relevant row category are more likely to be underemployed than females in the relevant column category. As an example, a coefficient of -0.69 at a 1 percent level of significance in the cell comparing row [6] to column [5] indicates that young females with children but no tertiary education are less likely to be underemployed than females without children and no tertiary education.

Returning to Table 2, column [2], we include five aspects of workplace satisfaction to check for a potential negative relationship between job satisfaction and the likelihood of being underemployed, as suggested by Kifle et al. (2019). Such a relationship would be further evidence that underemployment among part-time employees is an inefficiency in the labour market with deleterious outcomes for the individuals and for their employers via lower productivity due to dissatisfaction at work hampering quality work being undertaken (Tsang, 1987). Statistical analysis is indicative of this relationship, with those non-underemployed in the sample reporting an overall job satisfaction ranking of 7.93 (out of 10), as opposed to 7.40 among the underemployed, and this difference is statistically significant. A disadvantage of using overall job satisfaction lies in that it is a composite of other workplace satisfaction measures and as such, may hide heterogeneity between other domains of workplace satisfaction (Kifle and Kler, 2007; Kifle et al. 2014).[12] As such, it is more prudent to exclude overall job satisfaction and instead present the other domains of workplace satisfaction that make up the composite overall job satisfaction measure as seen in Table 2.[13] However, it is not immediately clear if all aspects of a part-time job are viewed negatively by the underemployed. Aspects like satisfaction with pay and hours worked could potentially be viewed as being negatively related with underemployment, but this need not be the case for satisfaction with job security, satisfaction with the type of work undertaken in the job, or indeed work-life balance. Indeed, with the latter, there are grounds to suspect a positive relationship because while the underemployed would wish to work extra hours, they would in the interim have more leisure to consume, even if it is not their preferred outcome as time away from work is not an unpleasant activity.

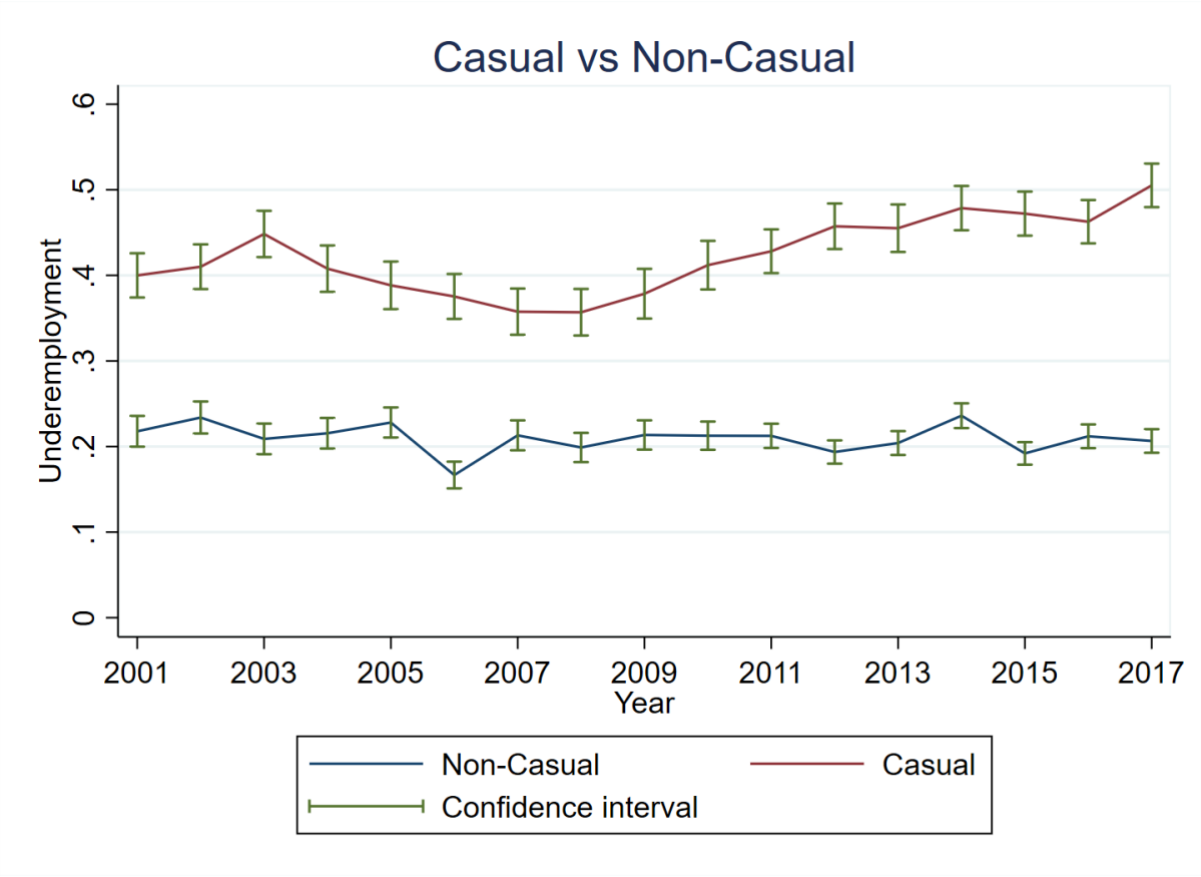
Results from column [2] suggest that utilising only overall job satisfaction would indeed lead to a loss of information. Part-time underemployed females are actually more satisfied than their non-underemployed peers with respect to not just the expected work-life balance but also with their actual tasks at work. The latter would indicate that their need for more hours is related to other aspects, such as pay or promotion opportunities, as opposed to not enjoying their job. They are however, more dissatisfied with hours (for obvious reasons, given the definition of underemployment and thus no further comment is necessary), pay and job security. We are

[12] As an aside, we note that this is also the case with HILDA data on life satisfaction, where more detailed questions on life satisfaction produce results that may be subsumed by the 'overall life satisfaction' variable (Ambrey et al., 2017; Foster and Stratton, 2019).

[13] All of these other five workplace satisfaction domains also show a statistically significant difference between the underemployed and non-underemployed.

unable to test further for satisfaction with pay as the question is silent on whether this refers to the overall pay packet or the hourly wage, and while we favour the former (thus necessitating the search for full-time employment, or at least more hours but still part-time employment), we are unable to state this as being anything more than conjecture. Back of the envelope calculations do however suggest that the underemployed earn on average $477.84 a week as opposed to $647.35 to the non-underemployed based on weekly hours of 18.82 (22.81 for the non-underemployed) and an average hourly wage of $25.39 ($28.38), which is not a minute sum when aggregated over extended time periods. While we had no *a priori* expectations on satisfaction with job security between underemployed and non-underemployed part-time employees, we are confident that the lower satisfaction for the former is due to their higher incidence of being hired as casual workers (50.74%) relative to the non-underemployed (26.86%), a gap which seems to be rising post-Global Financial Crisis (see Figure 4).

Figure 4: Female Underemployment rate among part-time employees by casualisation using HILDA data (2001-17)



Model extension I: age of children living at home

In Table 4 the impact of the age of children on the likelihood of underemployed is reported (full results available on request). As expected, those with younger children (less than 15 years of age) are less likely to report being underemployed relative to their peers with no children at home. This is as they have greater pressures to manage their young offspring and are more likely to be satisfied with their allocated working hours. The opposite appears for those with older children at home, and we attribute this to a combination of higher costs of raising older children and the mismatch between now having the ability to work more hours but being unable to find it, and is suggestive of the need for future research. With adult children the likelihood is as expected, insignificant.

Table 4: Determinants of female underemployment influence of age of children living at home

	1	2
Kids at home (age 0 to 4)	-0.40*** (0.04)	-0.34*** (0.04)
	[-0.09]	[-0.07]
Kids at home (age 5 to 14)	-0.14*** (0.04)	-0.10*** (0.04)
	[-0.03]	[0.01]
Kids at home (age 15 to 24)	0.13*** (0.04)	0.13*** (0.04)
	[0.03]	[0.02]
Kids at home (age 25 and over)	0.12 (0.08)	0.02 (0.09)
	[0.03]	[0.00]
Satisfaction with pay		-0.02*** (0.01)
		[-0.01]
Satisfaction with job security		-0.05*** (0.01)
		[-0.01]
Satisfaction with hours worked		-0.34*** (0.01)
		[-0.07]
Satisfaction with type of work		0.08*** (0.01)
		[0.02]
Satisfaction with work-life balance		0.09*** (0.01)
		[0.02]

Observations	17,333	17,333
Groups	5,247	5,247

Note: * p>0.10; ** p>0.05; *** p>0.01; standard errors in parentheses; marginal effects in square brackets

Reference group: No kids at home. The control variables are as show in Appendix Table A2.

Model extension II: casual and non-casual employees

Returning to the issue of casual work, we divide each of our eight sub-groups further by casual status, thus yielding 16 new sub-groups. This is as there is indication that the casual portion of each sub-group is more likely to report underemployment. Results are shown in Table 5 (full results available on request).

Relative to the base case, all sub-groups consisting of non-casuals are less likely to be underemployed, irrespective of age, education status and presence of children. As well, it is also evident that for each sub-group, casuals are more likely to be underemployed as the non-casuals have higher negative coefficients. For instance, for the older, non-tertiary, no children at home sub-group, the 'casual' coefficient is -0.69 compared to -1.05 for the non-casual members. This means that casuals are more likely to be underemployed relative to non-casuals. This is consistent across all the other sub-groups as well. Overall, this highlights a further bifurcation within an already heterogeneous workforce; a stark division between casual and non-casual part-timers, with the former forming a less preferred sub-division within this workforce. They are for instance, more likely to be underemployed (42.61% as opposed to 20.93%), earn a lower hourly wage ($24.99 versus $28.83) despite earning a wage premium for a loss of non-wage benefits, and work fewer hours in a week (17.72 against 23.69). They are also far more likely to have unsuccessfully looked for a full-time job (14.60% versus 5.55%).

Table 5: Determinants of female underemployment - casual vs non-casual

	Coeff.	S.E	M.E
Older, non-tertiary, no children, not casual	-1.05***	(0.16)	[-0.20]
Older, non-tertiary, with children, not casual	-0.91***	(0.15)	[-0.18]
Older, tertiary, no children, not casual	-1.08***	(0.18)	[-0.21]
Older, tertiary, with children, not casual	-1.08***	(0.15)	[-0.21]
Younger, non-tertiary, no children, not casual	-0.49***	(0.15)	[-0.10]
Younger, non-tertiary, with children, not casual	-1.16***	(0.15)	[-0.23]
Younger, tertiary, without children, not casual	-0.83***	(0.16)	[-0.16]
Younger, tertiary, with children, not casual	-1.24***	(0.16)	[-0.24]
Older, non-tertiary, no children, casual	-0.69***	(0.17)	[-0.13]
Older, non-tertiary, with children, casual	-0.75***	(0.15)	[-0.15]
Older, tertiary, no children, casual	-0.63***	(0.201	[-0.12]
Older, tertiary, with children, casual	-0.43***	(0.16)	[-0.08]
Younger, non-tertiary, no children, casual	-0.39***	(0.14)	[-0.08]
Younger, non-tertiary, with children, casual	-0.93***	(0.15)	[-0.18]
Younger, tertiary, with children, casual	-0.85***	(0.20)	[-0.17]
Satisfaction with pay	-0.02***	(0.01)	[-0.01]
Satisfaction with job security	-0.05***	(0.01)	[-0.01]
Satisfaction with hours worked	-0.34***	(0.01)	[-0.07]
Satisfaction with type of work	0.09***	(0.01)	[0.02]
Satisfaction with work-life balance	0.09***	(0.01)	[0.02]
Observations	17,333		
Groups	5,247		

Note: * p>0.10; ** p>0.05; *** p>0.01; standard errors in parentheses; marginal effects in square brackets

Reference group: Younger, tertiary education, no children, casual. The control variables are as show in Appendix Table A2.

CONCLUSION AND SUMMARY

Underemployment is a persistent labour market inefficiency in Australia. Its high rate is partly due to the easy accessibility of part-time employment, the latter which allows a significant number of females to enter the workforce who otherwise would have to choose almost exclusively between professional and childrearing duties. It is, however, also replete with females who are in these limited hours jobs because they have been unsuccessful in obtaining

greater hours. This study has shown that females in part-time employment exhibit considerable heterogeneity in labour market characteristics, particularly by age, qualification and the presence of children at home, all of which impact upon voluntary and involuntary entry into part-time employment. It is the latter that exhibits itself into underemployment, and disproportionately includes females who are younger, tertiary educated and have no children at home. We note that due to social, economic and cultural changes over the decades, there is an increasing presence of young females with higher level qualifications who have delayed (perhaps even permanently) their decision to have offspring. This allows them to concentrate more on their careers, and presumably chase employment with greater hours. Insofar as they are unable to find the requisite hours to match their preference, underemployment not also arises, but becomes increasingly pronounced as this cohort becomes increasingly the norm among female labour market participants. Outcomes vary depending on how many of the tripartite factors noted above exist, and is particularly strong when controlling for the age of children in the home. For example, the rate of underemployment for younger females in part-time employment fall when they have young children, as they are more likely to be satisfied with working restricted hours given the need of young children to have additional supervision in the home.

Overall job satisfaction suggests that the part-time underemployed are less satisfied with their status but this finding needs to be treated with caution. When eschewing this composite measure to concentrate on specific workplace satisfaction domains, a more nuanced picture emerges. The underemployed are less satisfied with hours (for obvious, definitional reasons), pay and job security but are actually more satisfied with respect to the type of work undertaken and work-life balance. This suggests that while not the preferred working option, underemployed females in limited hours jobs are at least partially compensated by being happier with their work tasks and life flexibility. On a more worrying note, casual workers, irrespective of any combination of age, qualifications and offspring status are more likely to be underemployed. This is potentially a significant trend given the high and growing rate of casualisation, particularly within part-time employment, and is deserving of further detailed analysis going forward.

In sum, this study, in concert with sizeable prior studies in the job satisfaction and overeducation literature that investigate less orthodox aspects of the labour market highlights the complexity of the heterogeneous female workforce. Labour market policies that are based on a perception of an ‘average female labour force participant’ suffer from trying to be

representative of a disparate labour force cohort that cannot easily and accurately be pinned down. Policy prescriptions to ease the underemployment conundrum amongst females in part-time employment must tackle a multitude of impeding factors that bring together policymakers encompassing the education, childcare and labour market sectors (among others). Such a multidimensional approach provides the best way from which to create and execute holistic approaches that can ameliorate and possibly reverse the persistent rate of underemployment afflicting females in part-time employment.

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APPENDIX

Table A1. Full list of variables used in estimations

Variable name	**Description**
Personal characteristics	
Age	Continuous variable between 16-65
Kids	Have (a) child(ren) living at home
No kids	Do not have (a) child(ren) living at home
Kids home 0-4	Chil(ren) at home aged between 0-4 years
Kids home 5-14	Child(ren) at home aged between 5-14 years
Kids home 15-24	Child(ren) at home aged between 15-24 years
Kids home 25+	Child(ren)at home aged 25 years or above
Couple	Married or in a *de facto* relationship
Non-couple	Neither married nor in a *de facto* relationship
Healthy	No long-term health issues
Not healthy	Long term health issues present
ABR	Australian born resident
ESB	Immigrant from an English speaking background
NESB	Immigrant from a non-English speaking background
Uni	Bachelor's degree (or higher) qualification
Non-uni	Less than a Bachelor's degree qualification
Workplace characteristics	
Small	Employed in firm with <20 employees
Mid	Employed in firm with 20-99 employees
Big	Employed in firm with 100 or more employees
Labor market characteristics	
Loghw	Log of hourly wage
Casual	Casual contract
Agency	Hired via the use of a labour-hire firm
Tenure with occupation	Tenure in occupation
Tenure with employer	Tenure with current employer
Years worked	Years worked since finishing highest qualification
Years unemployed	Years unemployed since finishing highest qualification
Years out of the labor force	Years out of the labor force since finishing highest qualification
Union	Member of a union
Non-union	Not a member of a union
Supervisory role	Has a supervisory role
Non-supervisory role	Does not have a supervisory role
GSP	Gross state product (i.e. state level GDP) lagged by one year
Unemp	Unemployment rate at state level
Geographical location	

City	Major city
Reg_inner	Inner regional
Oth location	Outer regional, remote and very remote
Industry	
Amm	Agriculture, forestry and fishing, mining and manufacturing
Pc	Electricity, gas, water, waste and construction
Trade	Wholesale and retail trade
Hospitality	Accommodation and foodservices industry
Transport	Transport, postal and warehousing industry
Communication services	Information media and telecommunications industry
Fin_prop	Finance, insurance, rental, hiring and real estate
Technical	Professional, technical and scientific services
Administration	Administrative and support services
Public services	Public administration and safety industry
Education	Education and training industry
Health	Health care and social assistance industry
Aos	Arts, recreation and other services
Occupation	
Managerial	Manager (4 two-digit categories)
Professional	Professional (7 two-digit categories)
Technical trade	Technical or trade work (7 two-digit categories)
Personal services	Community or personal service work (5 two-digit categories)
Clerical	Clerical or administrative work (7 two-digit categories)
Sales	Sales work (3 two-digit categories)
Machinery	Machinery operator or driver (4 two-digit categories)
Labor work	Labour work (6 two-digit categories)
Job Satisfaction	Scale from 0 (lowest satisfaction) to 10 (greatest satisfaction)
Pay Satisfaction	Satisfaction with pay
Job Security Satisfaction	Satisfaction with job security
Hours Worked Satisfaction	Satisfaction with hours worked
Type of Work Satisfaction	Satisfaction with the work itself (what you do)
Flexibility Satisfaction	Satisfaction to balance work and non-work commitments
Overall Job Satisfaction	Satisfaction with your job, all things considered

Table A2: Table 2 results in full

	1		2	
	Coeff.	S.E	Coeff.	S.E
Interactions				
Older, non-tertiary, no children	-0.41***	(0.12)	-0.43***	(0.13)
Older, non-tertiary, children	-0.33***	(0.11)	-0.37***	(0.11)
Older, tertiary, no children	-0.37***	(0.13)	-0.42***	(0.14)
Older, tertiary, children	-0.37***	(0.11)	-0.39***	(0.11)
Younger, non-tertiary, no children	0.07	(0.10)	-0.00	(0.10)
Younger, non-tertiary, children	-0.62***	(0.10)	-0.59***	(0.10)
Younger, tertiary, children	-0.60***	(0.12)	-0.60***	(0.12)
Job Satisfaction				
Satisfaction with pay			-0.03***	(0.01)
Satisfaction with job security			-0.05***	(0.01)
Satisfaction with hours worked			-0.34***	(0.01)
Satisfaction with type of work			0.08***	(0.01)
Satisfaction with work-life balance			0.09***	(0.01)
Labor Market Outcomes				
Log of hourly wage	0.17***	(0.05)	0.25***	(0.05)
Unemployment rate	0.07***	(0.02)	0.07***	(0.02)
GSP	-0.00	(0.01)	0.00	(0.01)
Tenure with occupation	-0.01	(0.01)	-0.01	(0.01)
Tenure with occupation^2	0.00	(0.00)	0.00	(0.00)
Tenure with employer	-0.01	(0.01)	-0.01	(0.01)
Tenure with employer^2	0.00	(0.00)	0.00	(0.00)
Years worked	-0.02**	(0.01)	-0.02	(0.01)
Years worked^2	-0.00	(0.00)	-0.00	(0.00)
Years unemployed	0.16***	(0.05)	0.09*	(0.05)
Years unemployed^2	-0.01***	(0.00)	-0.01**	(0.00)
Years out of the labour force	-0.01	(0.01)	-0.01	(0.01)
Years out of the labour force^2	0.00	(0.00)	-0.00	(0.00)
Not healthy	-0.09**	(0.04)	-0.05	(0.04)
Agency	0.06	(0.09)	0.05	(0.10)
Causal	0.44***	(0.04)	0.30***	(0.04)
Union	0.08*	(0.01)	0.04	(0.04)
Supervisory role	-0.15***	(0.03)	-0.16***	(0.04)
Personal Characteristics				
ESB	0.13*	(0.07)	0.13*	(0.07)
NESB	0.34***	(0.06)	0.34***	(0.06)
Couple	-0.38***	(0.04)	-0.37***	(0.04)
Geographical Location				
City	-0.12**	(0.06)	-0.14**	(0.06)
Inner regional	0.05	(0.06)	0.04	(0.06)
Workplace Characteristics				
Small	0.12***	(0.04)	0.12***	(0.043)
Mid	0.08*	(0.04)	0.07	(0.04)
Occupation				
Managerial	-0.12	(0.10)	-0.02	(0.10)
Technical trade	0.34***	(0.09)	0.37***	(0.10)
Personal services	0.36***	(0.06)	0.37***	(0.07)
Clerical	0.17***	(0.06)	0.30***	(0.07)
Sales	0.60***	(0.08)	0.62***	(0.09)

Machinery	0.47***	(0.18)	0.67***	(0.18)
Labour work	0.51***	(0.08)	0.56***	(0.08)
Industry				
Amm	-0.03	(0.12)	-0.08	(0.12)
Pc	-0.05	(0.17)	-0.06	(0.17)
Trade	0.07	(0.11)	0.05	(0.11)
Hospitality	0.19*	(0.11)	0.14	(0.11)
Transport	-0.02	(0.15)	0.04	(0.15)
Communication services	0.14	(0.15)	0.19	(0.16)
Fin_prop	-0.11	(0.12)	-0.03	(0.12)
Technical	-0.14	(0.12)	-0.14	(0.12)
Administration	-0.06	(0.12)	-0.05	(0.13)
Education	0.26**	(0.10)	0.29***	(0.10)
Health	0.02	(0.09)	0.03	(0.10)
Aos	0.25**	(0.11)	0.19	(0.12)
Observations	17333		17333	

Note: * p>0.10; ** p>0.05; *** p>0.01