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The Annual Employment Mix of Workers and Firms, and the Part-time Earnings Gap in New Zealand

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Abstract

In this paper we document patterns of annual employment across jobs, workers and firms, and examine the relationship between these patterns and job-level earnings rates using data from Statistics New Zealand's Linked Employer-Employee Database (LEED). First, we characterise workers' annual employment along the intensive (or full-time, within month) and extensive (or full-year, across months) dimensions, and firms' mix of full-time and full-year jobs. We use this characterisation to describe the nature of employment matching between workers and firms, and find that part-time workers are overrepresented in firms with a lot of part-time work. Second, we examine the relationship between the intensive and extensive margin characteristics of jobs and their earnings. Although there is a strong raw earnings penalty associated with part-time jobs, we estimate only a modest direct part-time impact on earnings after controlling for other worker and firm factors; and we estimate a part-year earnings premium.

JEL Classification: J22, J31, J71

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The tables in this paper contain information about groups of people so that the confidentiality of individuals is protected. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person or firm. The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. These tax data must be used only for statistical purposes, and no individual information is published or disclosed in any other form, or provided back to Inland Revenue for administrative or regulatory purposes. Any discussion of data limitations or weaknesses is in the context of using the LEED for statistical purposes, and is not related to the ability of the data to support Inland Revenue's core operational requirements. Careful consideration has been given to the privacy, security and confidentiality issues associated with using tax data in this project. Any person who had access to the unit-record data has certified that they have been shown, have read and have understood section 87 of the Tax Administration Act 1994, which relates to privacy and confidentiality. A full discussion can be found in the LEED Project Privacy Impact Assessment paper (Statistics NZ, 2003).

1. Introduction

Part-time jobs are often viewed as poor jobs, associated with low pay or limited career prospects. International studies generally find a part-time wage penalty (Bardasi and Gornick 2003), although recent analysis by Hirsch (2005) for the US, and Rodgers (2004) and Booth and Wood (2008) for Australia, find little or no evidence of a part-time wage penalty after controlling for observed and unobserved worker differences.

In this paper we use data from Statistics New Zealand's Linked Employer-Employee Database (LEED) to investigate the nature of work in New Zealand, and the existence of an earnings premium or penalty for different types of job, as characterised by their full-time/part-time and full-year/part-year dimensions. We investigate two related issues. First, we characterise workers' annual employment experiences across their intensive (or full-time, within month) and extensive (or full-year, across months) margins, and use the term 'employment intensity' to refer to the annual labour input supplied by a worker.time and full-year/part-year dimensions. We investigate two related issues. First, we characterise workers' annual employment experiences across their intensive (or full-time, within month) and extensive (or full-year, across months) margins, and use the term 'employment intensity' to refer to the annual labour input supplied by a worker.[1] We similarly characterise a job's annual employment intensity across its full-time and full-year margins, and firms' mix of full-time and full-year jobs. We describe the extent of worker-firm job matching along these dimensions, and how the nature of employment is related to other worker and firm characteristics. These measures are then used to investigate the incidence and concentration of employment across workers and firms, and the extent to which the separate employment characterisation of workers or of firms adequately summarises job employment patterns.

Second, we examine whether a job's employment intensity directly affects its earnings rate, or whether any earnings differential reflects worker and/or firm heterogeneity across different intensity jobs. Our estimates imply that the raw part-time penalty is 25 per cent in terms of a full-time equivalent (FTE) annual earnings rate, which matches closely standard part-time wage gap estimates using hourly wages from the Household Labour Force Survey, Income Supplement (HLFS-IS). We then analyse the relationship between the earnings premium associated with a job's employment intensity, controlling for the worker's and firm's employment intensity, and other observed characteristics. We also control for unobserved earnings-related characteristics of, first, workers and firms using two-way worker and firm fixed effects, and second, jobs using job fixed effects. In these fixed effects specifications, the estimated earnings impact of intensity is identified from workers and firms that experience changes in intensity, or from jobs (worker-firm pairs) that have different intensities in different years. After controlling for such factors, we estimate only a weak direct relationship between a job's earnings and its employment intensity.

The paper is organised as follows. The next section contains a brief overview of recent relevant literature on non-standard and precarious work and on part-time

[1] Although the LEED data does not contain information on hours worked to identify part-time work directly, we construct proxy measures of workers' and jobs' employment intensities and earnings rates.

wages. In section 3, we describe the LEED data, provide a brief discussion of the algorithm we adopt to estimate the employment intensity associated with each job, and how we aggregate the monthly LEED data up to the annual level. Section 4 first describes the characterisation of workers' and firms' annual employment experiences along the full-time and full-year dimensions, and then analyses the interaction patterns over the period. In section 5 we analyse the relationship between the annualised earnings rate associated with a job and the characterisation of worker and firm employment experiences. The paper concludes with a discussion and summary of the main findings.

2. Background Literature

The focus of our analysis is the composition of annual employment observed across both the extensive (or full-year) and the intensive (or full-time) margin, and the relationship between the size of a 'job', as measured along these two margins, and its earnings rate. The analysis relates to two strands of literature: first, literature on non-standard and precarious work and, second, that pertaining to part-time wage gaps.

Departures from full-year, full-time work can take many forms. A number of studies examine the range of arrangements under the headings of non-standard work and precarious work. Non-standard employment is defined as employment that is not full-time and permanent, and precarious employment is defined as low-quality, with high health and safety and/or poverty risks associated with it.[2] While there is an association between non-standard and precarious work, there is neither a definitive nor causal link between them. Many non-standard jobs with 'good' working conditions and prospects are attractive both to firms and workers because of the employment flexibility they offer; conversely, many standard employment jobs may be precarious. Furthermore, although there are some objective measures of precarious work, such as poor employment and/or health and safety protection, limited non-wage employment benefits (such as leave entitlements), little scope for training or skill development, irregular and/or uncertain hours, low wages and little prospect for wage growth, not all workers in such work may perceive it as precarious.

In the LEED data, we can observe the interactions between workers and firms, and are able to make some inferences about whether a job is non-standard based on the full-time and full-year dimensions of the job.[3] However, the LEED data do not provide any qualitative measures to gauge the precariousness or otherwise of a job, other than an estimate of the job's (FTE annual) earnings rate. To the extent that our estimated earnings rate is correlated with other dimensions of precariousness, this provides a reasonable proxy measure for analysis.

The full coverage of wage and salary employment in LEED, together with the longitudinal nature of the data and the link between workers and firms, facilitates

[2] See Mangan (2000) and Houseman and Ozawa (2003) for international comparative reviews, and Tucker (2002), Web Research (2004), and McLaren *et al*. (2004) for reviews and analysis from a New Zealand perspective.

[3] However, our measure of a (non-)standard job is based on the ex-post realisation of how long the job exists, rather than an objective measure of permanence. In addition, while we can infer something about the 'size' of a job from its earnings, we have no direct measure of the number of hours worked nor (e.g.) the time of day worked, etc.

analysis of whether any relationship between non-standard employment and earnings may be due to the job per se, or whether it is associated with the worker in the job, or the firm in which the job resides. If the non-standard or precarious nature of a job is mainly associated with the worker, then we would expect to see most jobs held by such workers characterised as non-standard or precarious. Similarly, if the characteristic is mainly associated with the firm, then we would expect to see a disproportionate number of jobs in such firms are non-standard or precarious. Alternatively, if the relevant characteristic of the job is idiosyncratic to the job, we would expect a wide distribution of non-standard or precarious jobs across both workers and firms.

Although part-time jobs are widely observed to pay lower wage rates than full-time jobs, the international evidence on whether this differential reflects a part-time penalty is at best mixed. For the US, Lettau (1997) estimates part-time wage penalties on the order of 20 per cent, using Employment Cost Index data on part-time versus full-time jobs within establishments and occupation, but is not able to control for differences in individual characteristics. Blank (1990) estimates similar sized part-time penalties using standard regression analyses of cross-sectional data, but highly variable estimates using either instrumental variables (IV) or selection model corrections. Using fixed effects models and panel data, Hirsch (2005) estimates weakly positive part-time wage differences, compared to negative raw and regression-adjusted differences.

Using Australian panel data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, Rodgers (2004) and Booth and Wood (2008) both estimate positive part-time effects based on selection (Rodgers) and fixed effects (Booth and Wood) models, compared to negative raw and regression-adjusted estimates. Finally, using cross-sectional data for New Zealand, Dixon (2000) estimates negative but typically small (and statistically insignificant) part-time wage effects for women after controlling for observed demographic and human capital differences.

3. Data Description

The analysis in this paper uses Statistics New Zealand's Linked Employer-Employee Database (LEED). The LEED uses information from tax and statistical sources to construct a record of paid jobs.[4] Since April 1999, all employers in New Zealand are required to file Employer Monthly Schedules (EMS) with Inland Revenue (IRD), which lists all their paid employees during the month, the earnings they received and the amount of tax that was deducted at source. Our analysis uses data from the period April 1999 – March 2005, correspond to the New Zealand March tax-years, 1999/2000 – 2004/05. Two types of recipients are covered by EMS: those who have pay-as-you-earn (PAYE) tax deducted, who are employees; and those who pay withholding tax, who are a subset of the self-employed. Because the selection and coverage of which self-employed workers have tax withheld is unknown, we use only information on PAYE-deducted jobs.

Firms (employers) and workers (employees) are identified by unique confidentialised identifiers based on their respective IRD tax numbers. For workers, this

[4] See Statistics New Zealand (2003), Kelly (2003), and Crichton, Stillman and Hyslop (2010) for more detailed discussions of the LEED.

represents a single identifier over time, enabling workers to be tracked longitudinally and across the firms that they work for. In the IRD data, employers are identified as the legal or administrative unit to which the EMS return relates, and do not equate to any consistent conception of a firm. That is, legal and/or other administrative changes can trigger a change in an employer's IRD identifier, with no effective change in the economic structure of the firm. For this reason, we use a version of the LEED that has allocated EMS returns to geographic units, identified by a unique permanent business number (PBN) in Statistics New Zealand's Longitudinal Business Frame (LBF) (Seyb, 2003), and adopt such geographic units as our concept of firms.[5]

Throughout the analysis we refer to a 'job' as a unique match between a worker and a firm, and the job observations are all observations on the unique worker-firm match. This classification will ignore any job changes within a worker-firm match as might occur with a promotion. However, our analysis concentrates on annual job observations so that, to the extent that any within worker-firm match role changes also involve changes in its employment intensity and earnings, this will have no adverse effect on the results.

In addition to firm-worker employment matches being identified, several other non-employment PAYE tax deductions can be identified in the LEED by particular 'employer' identifiers. These are taxable working-age social welfare benefits; earnings-related accident compensation payments from the Accident Compensation Corporation (ACC), student allowance (SA) payments, paid parental leave (PPL) payments, and New Zealand Superannuation (NZS) retirement pensions. In what follows, we make a distinction between LEED earnings from employment and other LEED income from these other sources.

Conceptually, the LEED covers the universe of PAYE employment relationships and earnings in New Zealand over the period. LEED also contains limited information on the characteristics of workers (age, sex, and location), and firms (industry and location). However, there are some significant weaknesses with the LEED. Perhaps the main weakness of the LEED for the current analysis is that the EMS returns report only monthly earnings for each employee and contain no information on hours worked. As a result, among those with low earnings, we cannot accurately distinguish low hourly wage rates from low monthly hours. Similarly, high earnings may result from either a high wage rate or long hours worked.

Given the absence of measured hours worked in LEED, we derive a proxy which we refer to as 'employment intensity' using the monthly information on workers' earnings and non-work income.[6] We first assume that a worker can work up to one full-time equivalent unit of employment in any month. We then scale down a worker's monthly employment if their total monthly earnings are less than minimum wage earnings and/or they receive any 'non-work' income payments from Benefits, ACC, PPL, or SA.[7] Employment intensity is calculated as the minimum of the proportion of

[5] The algorithms used in identifying PBNs in the LBF don't correct for all false births and deaths. Also, allocation procedures will tend to generate some false job changes between geographic units within multi-unit enterprises.
[6] A more detailed description of the algorithm is provided in Hyslop and Maré (2007).
[7] NZS pension income is not included in non-work payments for this exercise, as NZS is not subject to a work-test requirement.

total LEED income accounted for by work earnings and their earnings as a fraction of full-time minimum wage earnings during the month. Each of these adjustments will tend to overstate monthly employment intensity for affected workers because work is generally rewarded more highly than both income support and minimum wage levels.

Second, each job's monthly employment intensity is then determined by allocating the worker's total employment intensity across the jobs they held in proportion to the earnings received in each job. Thus any job held by a worker with multiple jobs will necessarily have employment intensity less than one, and be classified as part-time. A firm's monthly employment intensity is then estimated by aggregating the employment intensity across jobs in the firm. Third, aggregating the monthly LEED data to an annual basis smoothes out the more noisy monthly earnings patterns and lessens the impact of seasonal earnings variation, both of which are prevalent in the LEED data. The monthly employment intensity of workers and jobs are aggregated across months in the April-March tax year, and expressed as a proportion of the year, to give the annual employment intensity (or full-time equivalent, FTE, employment), while a firm's annual employment intensity is the sum of the annual employment intensity of all jobs in the firm during the year. Finally, the FTE annual earnings rate of workers, jobs and firms during the year is calculated as the relevant total annual earnings divided by annual employment intensity.

This estimated employment intensity will generate two offsetting potential components of bias for our analysis of the relationship between a job's earnings rate and its employment intensity. First, because the employment intensity of truly part-time workers (and their jobs) is typically overstated, their measured job-earnings rate will be downward-biased. Second, truly full-time jobs of workers who have secondary jobs (or work-tested income support) will have less than full employment intensity, thus be misclassified as part-time and result in those jobs' earnings rates being upward-biased. In order to provide some assessment on the reliability of the employment intensity measure, appendix table A.1 compares the average employment intensity estimated in LEED together with the fraction with employment intensity equal to one (i.e. employed full-time), with analogous constructs from the HLFS and estimates based directly on reported hours. These comparisons imply that the employment intensity provides a reasonable proxy for hours of work, although the summary statistics for females match better based on a full-time threshold of 30-hours per week. Furthermore, our estimate of the raw part-time earnings gap (reported in section 5 below) closely matches wage gap estimates using HLFS-Income Supplement data.

4. Characterising the Annual Employment Experiences of Workers and Firms

In this section we describe the LEED annual employment experiences of workers and firms over the sample period, and the interactions at the job-level between these. As described above, we focus on two dimensions of a job's employment status over the course of a year: the number of months with LEED earnings during the year (the full-year dimension), and the average employment intensity during those months (the full-time dimension). Using these dimensions, we characterise a job as full-year (FY) if it exists in each of the 12 months during the year, and as part-year (PY) otherwise. Similarly, using the employment intensity measure that we construct, we characterise a job as full-time (FT) if its monthly employment intensity is always one during months

that the job exists, and part-time (PT) otherwise. Note that the requirement that the job has employment intensity of one in each month to be classed as FT is quite strict. For example, it rules out any ostensibly full-time jobs associated with workers who may have secondary jobs, income from a benefit or ACC income in any month, as well as jobs associated with workers who have earnings from two jobs in a month due to a (full-time) job change – each of these jobs will be classified as part-time for the year. As a result, this measure will tend to understate the level of full-time jobs.

Similarly, we characterise workers according to their total employment across all jobs held in a year, as full-year (FY) if they work during each month of the year, and as full-time (FT) if they work full-time during each of the months that they are employed. This means that workers who either receive working-age employment-tested income support and/or have low (i.e. less than full-time minimum wage) earnings during any month will be classified as a part-time worker. Also, although any worker associated with a FY (or FT) job is necessarily a FY (or FT) worker, the converse is not true: i.e. workers may be FY (or FT) by an accumulation of jobs. For example, full-time workers with more than one job during a month, because of either a secondary job holding or a full-time job change, will be (correctly) classified as full-time. Similarly, workers who experience a job change during the year will be full-year workers so long as they have earnings in each month.

Somewhat analogously, we characterise a firm's annual employment by its mix of jobs during the year, as summarised by the average full-year and full-time content of the firm's jobs.[8] In particular, we characterise a firm's job mix as predominantly full-year (FY) during a year if, on average, its jobs last for at least 0.75 of the year (i.e. nine months), and as predominantly full-time (FT) if its average job employment intensity is at least 0.95 during months the jobs exist.[9] One advantage of characterising firms' job mix by the average job rather than aggregated jobs, is that it controls for the firm 'size' effects , such as the number of jobs a firm has at a point in time.

In the analysis that follows, we weight job-year observations by the FTE employment of that observation. This choice is partly driven by the existence of multiple job holdings by workers, and a desire not to give undue importance to such workers. Because the analysis weights each unit of employment equally, part-time and part-year jobs and workers will contribute less weight to the analysis than full-time and full-year jobs and workers. For example, although job-year observations associated with full-time, full-year workers account for less than one-third of all job-year observations, and such worker-year observations account for less than 40 per cent of all worker-year observations, they account for 57 per cent of total effective employment.

[8] There are alternative ways to characterise a firm's employment patterns which are, arguably, less dependent on the worker intensity, such as by seasonal fluctuations in the number of jobs at the firm. However, one consideration with such alternatives is how to identify part-time work, which is handled in a conceptually consistent way in the approach adopted here.

[9] To take account of firms entering or exiting LEED partway through a year, we have scaled the number of jobs at each firm by the fraction of the year the firm appears in LEED. So this measure should be interpreted as conditional on the firm existing for the full-year, and may bias upwards the estimate of full-year status for truly part-year firms engaged in, e.g. seasonal employment. About 70 per cent of firms have stable FT, 50 per cent stable FY, and 43 per cent stable FT,FY employment mix over the period. Also, 'between' firm variation accounts for 98.9 per cent of the total variation in firms log(Employment Intensity); 91.1 per cent of firms that exist in all six years.

Table 1 - Characteristics of Jobs, Workers and Firms in LEED, 1999-2005

	All Job-Year Obs (1)	Worker Employment Status				Firm Job Mix			
		Full Time		Part Time		Full Time		Part Time	
		Full Year (2)	Part Year (3)	Full Year (4)	Part Year (5)	Full Year (6)	Part Year (7)	Full Year (8)	Part Year (9)
Job Characteristics									
No. Obs	18,676,324	6,016,515	1,115,879	4,332,277	7,211,653	1,517,025	1,321,089	1,897,874	13,940,336
FTE Employment	8,018,349	4,544,086	446,374	1,764,507	1,263,381	1,189,180	802,722	1,059,222	4,967,224
Job FTE Emp	0.782	0.928	0.612	0.710	0.416	0.918	0.834	0.831	0.730
Fraction FT	0.549	0.849	0.877	0.035	0.074	0.788	0.752	0.547	0.460
Fraction FY	0.624	0.839	0	0.675	0	0.797	0.621	0.756	0.555
Fraction FT,FY	0.430	0.759	0	0	0	0.674	0.532	0.475	0.345
Earnings	$36,501	$49,362	$34,962	$20,965	$12,486	$52,531	$49,113	$36,053	$30,721
FTE earnings	$44,077	$53,175	$58,485	$28,589	$27,891	$56,947	$58,470	$41,684	$39,179
Worker Characteristics									
No. Obs	11,716,402	4,544,086	850,338	2,303,008	4,018,970	…	…	…	…
Age	38.0	39.9	37.2	36.7	33.4	39.3	37.4	40.3	37.3
Female	0.462	0.400	0.394	0.594	0.523	0.314	0.327	0.523	0.506
Rec'd Benefits	0.123	0	0.088	0.241	0.413	0.050	0.073	0.093	0.155
Rec'd NZS	0.015	0.009	0.020	0.023	0.023	0.011	0.008	0.024	0.016
Fraction of Year:									
Employed	0.936	1	0.698	1	0.700	0.972	0.947	0.962	0.920
Rec'd Benefits	0.055	0	0.022	0.099	0.204	0.014	0.023	0.042	0.073
Rec'd NZS	0.013	0.008	0.016	0.021	0.021	0.009	0.007	0.021	0.014
In LEED	0.954	1	0.727	1	0.802	0.977	0.958	0.972	0.943
FTE Employed	0.878	1	0.698	0.851	0.537	0.962	0.934	0.901	0.843
Fraction FT	0.622	1	1	0	0	0.843	0.813	0.629	0.537
Fraction FY	0.787	1	0	1	0	0.898	0.825	0.862	0.738
Fraction FT,FY	0.567	1	0	0	0	0.789	0.723	0.592	0.483
No. Jobs	1.57	1.32	1.42	1.90	2.06	1.25	1.45	1.40	1.70
Total Earnings	$40,455	$53,175	$40,009	$25,252	$16,091	$54,885	$54,557	$39,027	$35,025
FTE earnings	$44,077	$53,175	$58,485	$28,589	$27,891	$56,864	$58,116	$41,737	$39,245

Table 1 - Characteristics of Jobs, Workers and Firms in LEED, 1999-2005 (Continued)

	All Job-Year Obs (1)	*Worker Employment Status*				*Firm Job Mix*			
		Full Time		*Part Time*		*Full Time*		*Part Time*	
		Full Year (2)	*Part Year* (3)	*Full Year* (4)	*Part Year* (5)	*Full Year* (6)	*Part Year* (7)	*Full Year* (8)	*Part Year* (9)
Firm Characteristics									
No. Obs	1,211,200	…	…	…	…	186,981	79,050	323,638	621,531
Fraction of Year	0.984	0.992	0.959	0.986	0.960	0.983	0.992	0.964	0.987
No. Jobs	300.4	335.5	295.8	229.4	274.9	209.8	156.1	364.1	331.8
No. FYE Jobs	188.8	221.2	183.3	138.0	145.5	172.3	100.7	284.7	186.6
Average Age	36.3	37.1	36.1	35.6	34.5	38.5	36.2	39.2	35.2
No. Females	165.4	185.3	160.4	130.9	144.0	71.0	58.4	256.9	185.8
No. FTE Jobs	162.6	194.7	160.8	112.6	117.5	167.9	97.3	261.4	150.8
Avg Earnings/job	$25,607	$30,478	$27,531	$18,910	$16,765	$46,191	$36,914	$28,776	$18,177
FTE Earnings/job	$44,077	$48,620	$49,551	$36,182	$36,828	$56,947	$58,470	$41,684	$39,179

Notes: There are a total of 9,729,904 jobs, 2,776,361 workers and 322,713 firms observed in LEED over the sample period, April 1999-March 2005. Means are weighted by job annual FTE employment. All earnings are calculated conditional on positive values, and expressed in constant (December-quarter 2005) $-values, adjusted using the CPI. 'Full Year' firms have actual number of worker-months of at least 75 per cent of potential worker-months (Number of workers * Number of months firm observed); 'Full Time' firms have FTE of at least 95 per cent of number of worker-months.

Table 1 summarises the annual job, worker and firm-level characteristics, employment and earnings over the six-year period of LEED, 1999/2000-2004/05. The first column describes the mean characteristics of the full sample of job-year observations across all years pooled. There were a total of 18.7 million job-year observations, 11.7 million worker-year observations, and 1.2 million firm-year observations during the 6-year sample period, averaging 3.1 million jobs, 1.95 million workers, and 200,000 firms annually. These annual observations were generated by 9.7 million distinct jobs held by 2.8 million distinct workers in 320,000 distinct firms over the period. On average, jobs appear in 3.8 years, workers in 5.5 years, and firms in 5.7 years. Of the job-year observations, the weighted average annual FTE employment was 0.78, 55 per cent were full-time jobs, 62 per cent were full-year, 43 per cent were both full-year and full-time, and the average FTE annual earnings rate of jobs was $44,100 (expressed in constant, December 2005, $-values, adjusted using the consumers price index).

The FTE-employment weighted average age of workers is 38.0 years and 46 per cent are female. On average, workers appear in LEED for over 95 per cent of the year, they have employment earnings for 94 per cent of the year, and their annual FTE employment is 0.88 from 1.6 jobs. Furthermore, 62 per cent of workers work full-time (when employed), 79 per cent work full-year, and 57 per cent work full-time for the full-year. In addition to employment, 12 per cent of workers receive non-earnings working-age income support during the year, and such support is received for six per cent of the year.[10] At the firm-level, the FTE-weighted average number of jobs in a firm during a year is 300, and the average annual FTE-employment is 163.[11]

In the next four columns of table 1, the overall sample has been stratified by workers' (i.e. full-year and full-time) annual employment status. Column (2) shows that nearly 40 per cent of worker-year observations are classified as full-time, full-year, covering about one-third of all jobs and 57 per cent of effective employment. These workers are, on average, older (1.9 years), more likely to be male (six percentage points), and have higher FTE annual earnings rates (20 per cent), than the overall sample average. In addition, these workers work in larger firms (10-20 per cent higher number of jobs and FTE employment), whose job-average FTE earnings is 10 per cent higher than the overall average.

Column (3) summarises the characteristics associated with full-time, part-year workers. This sample covers seven per cent of worker-year observations, and six per cent of all job-year observations and effective employment. The workers average annual FTE employment is 0.7 (about 8.4 months), and they are about one year younger, and six percentage points more likely to be male (about the same as full-time, full-year workers), than average. Interestingly, the FTE earnings rate of these workers is over 30 per cent higher than average, and even higher than that of full-time, full-year workers.[12]

[10] This includes working-age taxable social welfare benefits, ACC earnings compensation, student allowance, and paid parental leave.
[11] In contrast, note that the average firm has 15.4 jobs during a year, and annual FTE-employment of 6.6 workers. The reconciliation of these differences comes from the fact that although most firms are small employers, most employment is in large firms.
[12] This could either be due to a real earnings premium for this group, or perhaps timing issues in the payment of part-year earnings in LEED, for example job-end lump-sum payments.

The samples of part-time workers are described in column (4) (full-year) and column (5) (part-year). While the characteristics of these sub-samples are by no means identical, they do share broad similarities. Combined, they account for about 55 per cent of worker-year observations, and 60 per cent of job-year observations, but only 38 per cent of effective employment. Part-time workers are more likely to be younger and female, work in smaller firms, and earn substantially (about one-third) lower FTE annual earnings rates, than average.

In columns six to nine we similarly stratify the sample by firms annual job mix of full-year and full-time employment. The patterns of characteristics across the different firm employment status categories are roughly similar to those across analogous worker categories. Although more than half of effective employment is accounted by full-time, full-year workers, most firm-year observations are classified as part-time, part-year. This covers about one-half of firm-year observations, three-quarters of the job-year observations, and 60 per cent of effective employment. Another one-quarter of firm-year observations are part-time, full-year, associated with 10 per cent of job-year observations and 13 per cent of effective employment. Workers in part-time firms are more likely to be female, while those in part-year firms tend to be younger than average. As with workers, the FTE annual earnings rates are substantially higher in full-time than part-time firms, and these rates differ relatively less across full-year versus part-year firms.

Table 2 - Distributions of Firm and Worker Employment by Industry

	Full Time		*Part Time*		*FTE Employment Share*
	Full Year	*Part Year*	*Full Year*	*Part Year*	
Firm Employment Mix					
A: Ag, Fish, Forestry	5.63	5.12	7.51	81.74	5.23
B: Mining	35.50	19.28	8.72	36.50	0.25
C: Manufacturing	25.89	11.58	12.70	49.82	16.41
D: Elect, Gas, Water	40.49	28.08	8.01	23.42	0.43
E: Construction	18.56	21.11	11.75	48.58	5.58
F: Wholesale Trade	21.66	16.58	13.97	47.79	6.94
G: Retail Trade	6.70	4.50	13.76	75.03	11.17
H: Accom, Cafes, Restaurants	0.56	0.31	4.67	94.46	4.49
I: Transport, Storage	21.65	13.10	11.45	53.80	4.33
J: Communication	13.63	27.79	8.36	50.22	1.44
K: Finance, Insurance	31.79	25.02	12.78	30.41	2.90
L: Property, Business Services	18.02	15.59	12.37	54.01	13.02
M: Govt Admin	23.50	15.98	11.37	49.16	3.98
N: Education	0.80	0.67	4.05	94.48	8.79
O: Health & Community Services	1.93	0.92	31.95	65.20	9.17
P: Cultural & Recreation Services	5.32	5.35	11.18	78.15	2.27
Q: Personal & Other Services	27.71	5.84	19.19	47.26	3.50
Unspecified	35.50	2.84	40.33	21.32	0.11
Total	14.83	10.01	13.21	61.95	100

Table 2 - Distributions of Firm and Worker Employment by Industry (continued)

	Full Time		*Part Time*		*FTE Employment Share*
	Full Year	*Part Year*	*Full Year*	*Part Year*	
Worker Employment Status					
A: Ag, Fish, Forestry	35.82	5.97	25.33	32.88	5.23
B: Mining	72.43	6.32	11.74	9.50	0.25
C: Manufacturing	60.19	5.28	21.64	12.89	16.41
D: Elect, Gas, Water	79.99	5.29	8.55	6.18	0.43
E: Construction	58.08	7.28	19.19	15.45	5.58
F: Wholesale Trade	68.23	6.14	15.34	10.29	6.94
G: Retail Trade	45.13	3.98	32.29	18.60	11.17
H: Accom, Cafes, Restaurants	28.58	4.48	37.33	29.61	4.49
I: Transport, Storage	65.03	5.30	16.90	12.77	4.33
J: Communication	65.94	5.63	17.69	10.74	1.44
K: Finance, Insurance	73.77	6.79	11.59	7.84	2.90
L: Property, Business Services	58.89	7.48	18.62	15.01	13.02
M: Govt Admin	77.94	4.76	10.02	7.29	3.98
N: Education	58.27	5.52	16.61	19.59	8.79
O: Health & Community Services	53.70	4.58	29.65	12.07	9.17
P: Cultural & Recreation Services	53.57	5.90	22.84	17.70	2.27
Q: Personal & Other Services	60.82	4.36	22.00	12.81	3.50
Unspecified	33.64	8.44	30.93	26.99	0.11
Total	56.67	5.57	22.01	15.76	100.00

Notes: For workers with multiple jobs, industry is assigned on the basis of their main (highest earning) job during the year.

Table 2 summarises the distributions of firm employment mix and worker employment status across each 1-digit industry. The patterns of allocation across industries largely accord with common priors. For example, workers in Mining, Manufacturing, Electricity, Gas and Water, and Government Administration industries are more likely full-time workers than average, and firms in those industries also have more predominantly full-time jobs; while the reverse is true for the Agriculture, Fisheries and Forestry, and Accommodation, Cafes and Restaurants industries. The distribution of firms' job mix in Education appears unusual, and deserves some comment. In particular, about 95 per cent of firms (i.e. mainly schools) in the Education sector are classified as having predominantly part-time and part-year jobs, while less than one per cent have mainly full-time, full-year jobs. In contrast, the distribution of workers' employment status in Education is about average although, for part-time workers, a greater proportion are part-year than for all industries. The part-year characterisation is largely due to the seasonal nature of the education jobs on a calendar basis, together with the asynchronisation with the April-March tax-year based observations. In particular, about 60 per cent of the annual jobs in Education last for nine months or less.[13] In addition,

[13] There are about 30 per cent fewer jobs in Education in January, and about 10 per cent fewer in February, than during other months. Also, across all jobs (worker-firm pairs) that we observed over the period, the rate at which the last month a job appears is December is three to four times the rate of other months, and the rate at which the first month a job appears is February or March is much higher than other months. There may also be some reallocation of jobs across schools in the LBF that contributes to the apparent seasonality, however we believe that most of the timing and magnitude of the observed changes is genuine.

the median average monthly earnings of jobs in Education is on the order of full-time minimum wage earnings, implying the sector has a large fraction of part-time jobs.

Table 3 - Employment Interactions, 1999-2005

	Firm Job Mix				
	Full Time		*Part Time*		*Total*
Worker Employment Status	*Full Year*	*Part Year*	*Full Year*	*Part Year*	
Full Time, Full Year	11.70	7.24	7.81	29.91	56.67
	(8.40)	(5.67)	(7.49)	(35.11)	
Full Time, Part Year	0.80	0.90	0.50	3.37	5.57
	(0.83)	(0.56)	(0.74)	(3.45)	
Part Time, Full Year	1.61	1.02	3.58	15.79	22.01
	(3.26)	(2.20)	(2.91)	(13.64)	
Part Time, Part Year	0.71	0.85	1.32	12.88	15.76
	(2.34)	(1.58)	(2.08)	(9.76)	
Total	14.83	10.01	13.21	61.95	100.00

Notes: The main cell entries are percentages of total effective employment. Entries in parentheses are the expected cell percentages assuming independence between the firm and worker marginal distributions.

We next consider the interaction between the workers' and firms' annual employment along the part-time and part-year dimensions. Table 3 summarises the interactions between the characterisations of workers' and firms' annual employment experiences over the period, using the full-time, and full-year constructs described above.[14] First, much of the observed allocation in table 3 is driven by the simple characterisations of workers' and the firms' employment – i.e. the respective marginal distributions. In particular, over 70 per cent of total employment occurs within four cells in table 2: about 30 per cent is (FT, FY) workers employed in (PT, PY) firms; 16 per cent is (PT, FY) workers in (PT, PY) firms; 13 per cent is (PT, PY) workers in (PT, PY) firms; and 12 per cent is (FT, FY) workers in (FT, FY) firms.

Second, in order to provide a sense of how much part-time and/or part-year 'matching' occurs between workers and firms over and above what would be expected from random matching given the marginal distributions, the parenthetical entries in the table are the expected fractions assuming independence between the worker and firm marginal distributions. The actual fractions on the diagonal are each greater than the fractions in parentheses, suggesting that positive matching between workers and firms along the full-time, full-year dimensions does occur. For example, although 57 per cent of employment is from full-time, full-year workers, such workers account for almost 80 per cent of employment in firms with mainly full-time, full-year employment. Similarly, 21 per cent of part-time, part-year firms' employment is from mainly part-time, part-year workers, compared with only 16 per cent of total employment from such workers overall. Although the off-diagonal fractions are not all less than the predicted fractions in parentheses (nine of 12 are lower), the fractions in the two extreme corners are both significantly lower than the predicted fractions,

[14] Hyslop and Maré (2007) provides a more detailed description of the interactions summarised in table 3.

which is also consistent with non-random matching. That is, only 53 per cent of full-time, full-year worker employment is in (PT, PY) firms (compared with 62 per cent of employment in such firms overall), and only four per cent of (PT, PY) workers work in (FT, FY) firms (compared with 15 per cent overall in such firms).

The interaction between workers' employment and firms' job mix differs in predictable ways along several dimensions, as suggested by table 1. For example, females and younger workers are more likely to work part-time than males and/or prime-aged workers, and also to work in firms whose job mix consists predominantly of part-time, part-year jobs. Among workers who are not employed full-time, full-year, those who receive work-tested non-employment income (mainly working age benefits) are far more likely to be both part-year and part-time workers (over 50 per cent compared to 30 per cent for the remainder of this subgroup). These workers are also more likely to work in firms whose job mix is mainly part-time, part-year jobs.

Similarly, firms with a predominance of part-time and/or part-year jobs tend to be in agriculture; accommodation, cafes and restaurants; retail trade; and services industries.[15] These industries are broadly those where precarious jobs have been identified to exist (e.g. see Tucker, 2002, for a summary). In contrast, firms with a large incidence of full-time and/or full-year jobs dominate manufacturing, government administration, and transport and storage industries. This simple characterisation accords with common priors on the industries that contain firms with predominant part-time versus full-time employment.

5. Analysis of Job Earnings Rates

We now turn our attention to the relationship between the employment intensity of a job and its FTE annual earnings rate. We focus particularly on whether the positive correlation between FTE annual earnings and employment intensity may reflect a direct relationship, or whether it may be due to the sorting of workers across firms. We first describe the relationship between job earnings and employment intensity along two important dimensions: across workers life cycle age profiles, and across firm industries.

Figure 1 describes the average job FTE annual employment intensity (solid line), the average worker FTE annual employment intensity (dotted line) and the average job FTE annual earnings rate (dashed line) by worker age.[16] The figure shows there are systematic life cycle patterns in both workers' annual and job-specific employment intensities and in their earnings rates which are likely to confound the estimated relationship between a job's employment intensity and its earnings rate. Each of the lines exhibits an inverted-U shape over the lifecycle. The average FTE employment intensities of workers and jobs follow a very similar profile, although the difference between these declines from about 14 percentage points for teenagers to around five for the over 60, reflecting the greater turnover and job holdings of younger workers. points for teenagers to around five for the over 60, reflecting the greater turnover and job holdings of younger workers.[17] The average FTE annual earnings rate rises steeply to a peak of about $50,000 for workers in their late 30s to early 50s, and then drops off.

[15] For example, these industries dominate across firms with average job FTE employment less than 0.7.
[16] We have censored age below at 15 and above at 70, so that the averages at these extremes are across these respective groups.
[17] Age profiles for Males and Females separately have remarkably similar shapes, with the average Male employment intensity about 6-7 per cent higher than Females'.

Figure 1 - Job and Worker FTE Employment, and Job FTE Annual Earnings, by Age

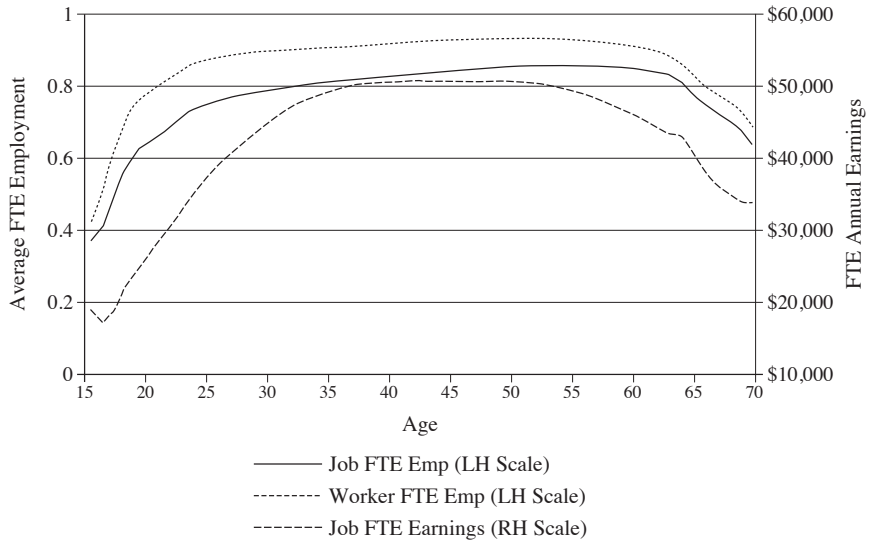
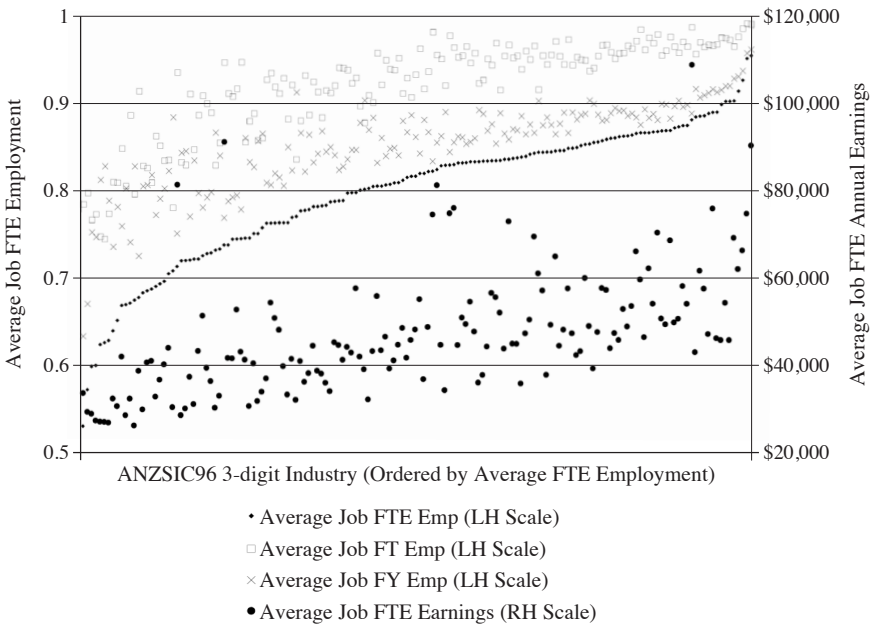


Figure 2 - Average Job FTE, FT and FY Employment, and FTE Annual Earnings, by Industry



Similarly, in figure 2 we plot the average job employment intensity (solid diamond), together with the full-time (hollow square) and full-year (x) intensity components, and the average job FTE earnings rate (solid circle) by 3-digit ANZSIC96 industry. The industries have been arranged in increasing order of average employment intensity. This figure shows the positive correlation between the average job employment intensity and average job earnings rate in an industry, which will confound the estimated (direct) impact of a job's employment intensity on its earnings rate. For example, the average FTE annual earnings in low FTE industries (those with average job FTE employment less than 0.7) is $32,510, compared with the overall average of $44,077. In contrast, the average FTE annual earnings in particularly high FTE industries (those with average job FTE greater than 0.9) is $53,522.

To analyse the relationship between jobs' employment intensity and their earnings rates, we adopt regression models of the following form:

$$Y_{ijt} = \gamma E_{ijt} + \gamma_w E_{it} + \gamma_f E_{jt} + X_{ijt}'\beta + \varepsilon_{ijt}$$

where Y_{ijt} is the log(FTE annual earnings) of job-ij in year-t; E_{ijt}, E_{it} and E_{jt} are, respectively, the log(employment intensity) of job-ij, worker-i and firm-j in year-t; X_{ijt} is a vector of control variables associated either with worker-i, firm-j and/or job-ij in year-t; ε_{ijt} captures other unobserved factors; and γ, γ_w, γ_f, and β are parameters. Table 4 contains the results of this analysis based on all jobs.[18]

First, the results in column (1) are for the simple regression of the job's log(FTE annual earnings) on its log(employment intensity). The coefficient of 0.263 implies that a 10 per cent increase in employment intensity is associated with a 2.6 per cent increase in the FTE earnings rates across jobs. Based on the ratio of average weekly hours worked by part-time (14) and full-time (41) workers in the HLFS over the sample period, the implied part-time earnings penalty is 24.7 per cent.[19] This estimate is almost the same as the part-time wage gap estimated from the HLFS-Income Supplement, which provides further support for the FTE employment measure, and suggests that biases associated with using it are small.

We next split the total employment intensity effect into its 'full-time' (i.e. the average intensity across the months the job exists) and 'full-year' (i.e. the fraction of the year the job exists for) components. In line with the patterns observed in table 1, the results in column (2) imply the employment intensity premium is dominated by the full-time margin: a 10 per cent increase in employment intensity within a month is associated with a 5.9 per cent increase in the earnings rate across jobs, compared to 0.8 per cent from an increase in job months.

In the specification in column (3), we add the worker's and firm's log(employment intensities), and the interaction between these variables, to the regression. Including these variables reduces the measured job full-time effect by about one-third, and the full-year effect becomes negative, suggesting that much of the observed simple relationship between a job's employment intensity and its earnings

[18] Although much of the international literature on part-time wage effects finds results differ for males and females, our results are generally very similar (see Hyslop and Maré, 2007).
[19] That is, exp{0.263*log(0.34)}=0.753.

Table 4 -Regressions of log(Job FTE Annual-Earnings Rate)

	Regression Specification						
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
log(Job FTE employment)	0.263	…	…	…	…	…	
	(0.0002)						
log(Job FTE / Job months)	…	0.587	0.378	0.235	0.103	0.058	0.038
		(0.0003)	(0.0004)	(0.0003)	(0.)	(0.0004)	(0.0004)
log(Job months)	…	0.080	-0.046	-0.042	-0.017	-0.031	-0.032
		(0.0002)	(0.0003)	(0.0002)	(0.)	(0.0002)	(0.0002)
Full-time Job	…	…	…	…	…	…	0.033
							(0.0001)
log(Worker FTE employment)	…	…	0.183	0.111	0.074	0.060	0.062
			(0.0005)	(0.0004)	(0.)	(0.0003)	(0.0003)
log(Firm FTE employment)	…	…	0.059	0.050	0.015	0.015	0.015
			(0.0001)	(0.0001)	(0.)	(0.0002)	(0.0002)
log(Worker FTE)*log(Firm FTE)	…	…	0.037	0.030	0.007	0.002	0.001
			(0.0001)	(0.0001)	(0.)	(0.0001)	(0.0001)
Worker demographics	…	…	…	x	x	x	x
Firm 3-digit ANZSIC	…	…	…	x	…	…	…
Worker & Firm Two-way FE	…	…	…	…	x	…	…
Job Fixed Effects	…	…	…	…	…	x	x
R-squared	0.120	0.172	0.239	0.457	0.909	0.959	0.959

Notes: Numbers in parentheses are standard errors. The number of job-year observations used is 18,676,324, accounting for 8,018,349 FTE employment; all regressions are weighted by job-year FTE employment; worker demographics include separate quartic age profiles, and year-specific intercepts, for males and females. Due to computational constraints, we have not estimated standard errors for the two-way fixed effects specification in column (5); we expect these should be bounded by the estimated standard errors in columns (4) and (6).

rate is due to the relative employment intensity of either the worker or, to a lesser extent, the firm. For example, a 10 per cent increase in worker's employment intensity is associated with a 2.5 per cent increase in the job earnings rate. Next, including worker demographic (age and sex), time (year dummies), and firm industry controls, reduces the estimated coefficients on all the employment intensity variables, as shown in column (4), which implies that much of the co-variation between job earnings rates and job employment intensity is associated with these controls rather than employment intensity per se.

Columns (5) and (6) provide alternative controls for unobserved worker and firm heterogeneity. In column (5), we present estimates from a joint two-way worker and firm fixed effects model (see Maré and Hyslop, 2006) – i.e. we specify $\varepsilon_{ijt} = \alpha_i + \theta_j + u_{ijt}$ where α_i is a fixed effect for worker-*i*, θ_j is a fixed effect for firm-*j*, and u_{ijt} is a residual job-year effect. Including the two-way fixed effects reduces each of the estimated coefficients on the (job and worker and firm) employment intensity variables.[20] The estimated direct effect of a job's FT employment on its earnings rate is 0.10, a drop of 60 per cent from that in column (4), while the negative effect of a job's FY dimension also falls by over 50 per cent to -0.02. In addition, the estimated coefficients on workers' and firms' employment intensities dropped by about one-third and two-thirds respectively.

In column (6), we estimate a standard one-way fixed effects model to control for unobserved individual job effects – i.e. we specify $\varepsilon_{ijt} = \omega_{ij} + u_{ijt}$ where ω_{ij} is a fixed effect for job-*ij*, and uijt is an idiosyncratic job-year effect. Note that this specification absorbs the two-way worker and firm fixed effects in column (5) (as well as time invariant variables such as sex and industry). In this specification, the coefficient on employment intensity can be interpreted as the effect of a *change* in employment intensity on the job earnings rate after controlling for permanent unobserved job-level factors.[21] Except for the estimated FY intensity coefficient, which is similar to that presented in column (4), the estimated employment intensity effects on earnings are either similar to, or smaller than, those in column (5). In particular, the estimated job full-time earnings elasticity is now about 0.06, and about the same magnitude as the worker FTE employment elasticity, while the estimated firm average job employment intensity effect is 0.015.

To summarise, these results imply there is a relatively weak relationship between the time variation in employment intensity and earnings of jobs, at least among the subset of jobs whose employment intensity changes over time. This may not seem surprising if there are 'good' and 'bad' jobs independent of employment intensity, however the regression results without controls for job fixed effects for this group and the full sample are similar.

[20] Linear age, year and worker fixed effects are not jointly identified in this specification. As a result, we adopt a two-step estimation approach (see Maré and Hyslop, 2006), and estimate unrestricted gender age profiles for each year in the first stage, and treat the residuals from this as the dependent variable in the second stage regression.

[21] The job employment intensity effects in this specification are identified by jobs that change intensity over the period. Roughly speaking, this excludes jobs that are full-time, full-year in all years they exist (10.4 per cent of effective employment over the period), and jobs that exist in only one year (an additional 10.4 per cent).

An implication from the pair of fixed effects regressions in columns (5) and (6) is that much of the variation in the job, worker and firm employment intensity variables over the sample is cross-sectional in nature. For example, the job fixed effects account for over 50 per cent of the total variation in job-year FTE earnings over the period. A consequence of this is that it is difficult to identify the direct impact of employment intensity on a job's FTE earnings rate separately from other persistent effects associated with workers, firms and/or jobs. Although most part-time jobs are short term in nature (the average part-time job is observed for about three quarters of a year during the sample period, compared to about two years for full-time jobs), many of the workers who fill these jobs also have other part-time jobs and, similarly, there is a concentration of part-time jobs in some firms.

Table 5 - Simple, Marginal and Partial R-squareds of Contributions to log (FTE Earnings)

Contribution	*Simple R^2*	*Marginal R^2*	*Partial R^2*
1. log(Job FTE / Job months) and log (Job months)	0.172	0.0003	0.007
2. log(Worker FTE employment)	0.156	0.0002	0.004
3. log(Firm FTE employment)	0.061	0.0000	0.001
4. Worker demographics and time effects	0.262	0.0079	0.160
5. Firm 3-digit ANZSIC	0.199	…	…
6. Job Fixed Effects	0.950	0.535	0.928

Notes: For each contribution (row), the simple R^2 is from the regression of log(job FTE Earnings) on that contribution; the marginal R^2 is the change in the R^2 between the specification in column (6) of table 3 and the regression that omits that contribution; and the partial R^2 is the marginal R^2 divided by (1 - R^2 from the regression that omits that contribution). The firm industry dummies are absorbed by job fixed effects.

To further explore this, table 5 presents the simple, marginal and partial R^2's associated with the contributions of alternative sets of variables on log (job FTE earnings).[22] Although the simple R^2's in the first column show that each of these sets of variables are reasonably correlated with job FTE earnings, the job fixed effects completely dominate and account for 95 per cent of the variation. The marginal and partial R^2's in the next two columns confirm this – i.e. conditional on job fixed effects, the contributions of the other variables are generally negligible. The only exception is that worker demographic and time effects continue to make a noticeable contribution (marginal and partial R^2s of 0.008 and 0.16, respectively).

Finally, as a check of the robustness of the specification in column (6) of table 4, we include a dummy variable for whether the job is full-time in each month it exists during the year. This allows a separation of the earnings premium associated with full-time employment intensity into a continuous component across levels of part-time work, and a discrete component associated with the full-time work. The results,

[22] Each simple R^2 is the R^2 from the regression of log(Job FTE earnings) on that set of variables; the marginal R^2 is the change in R^2 between the regression in column (6) of table 3 (the 'full' regression), and the regression which drops this set of variables; and the partial R^2 is equal to the marginal R^2 divided by (1-R^2) from this latter regression – i.e., the partial R^2 is the fraction of the remaining variation explained by adding the set of variables to the full regression.

presented in column (7), show a further reduction in the gradient along the full-time intensity continuum to 0.038, together with a positive premium of 0.033 (3.3 per cent) associated with discrete full-time employment. Also, the premium associated with the discrete margin appears to be relatively larger for females than males (see Hyslop and Maré, 2007). For example, the discrete full-time work earnings premium is 4.6 per cent for females compared to 2.2 per cent for males; while 10 per cent higher part-time employment is associated with 0.3 per cent higher earnings for females and 0.5 per cent higher earnings for males.

6. Concluding Discussion

This study had two main objectives. The first was to describe and analyse the employment interactions between workers and firms using LEED data, examining departures from full-year full-time jobs from the perspectives of both workers and firms. For this purpose, we characterised workers according to the level of their FTE annual employment, which involves variation at both the extensive (across-month or 'full-year') margin, and also the intensive (within-month or 'full-time') margin. Analogously, we characterised firms by their mix of full-time and/or full-year jobs. Using these characterisations of workers' and firms' annual employment and their interactions at the job-level, we found that part-time workers tend to work in firms with a lot of part-time work, which implies part-time work is concentrated among certain workers and firms.

Second, we examined the relationship between jobs annual employment intensities and their full-time equivalent annual earnings rate. There is a strong correlation between a job's employment intensity, particularly along the full-time margin, and its earnings rate: a 10 per cent increase in the full-time employment intensity is associated with a 5.9 per cent increase in earnings, while a 10 per cent increase in the full-year intensity is associated with a 0.8 per cent increase in earnings. However, controlling for observable worker demographics, worker and firm total employment intensities, and unobservable fixed effects associated with either workers and firms or with their job interactions, the estimated elasticity of earnings with respect to full-time employment intensity is only 0.06, while the full-year elasticity is -0.03. Furthermore, the full-time employment intensity premium consists of both a continuous gradient across part-time employment levels and a discrete premium associated with full-time work: e.g. increasing part-time employment by 10 per cent is associated with a 0.4 per cent increase in earnings, with an additional premium of three per cent for full-time work.

We also estimate a similar magnitude of effect of workers' total employment intensity on job earnings rate, and a smaller effect of firms' average job intensity (0.015). These results highlight the difficulty in measuring the direct impact, if any, of a job's employment intensity on its earnings rate separate from these other time-constant worker, firm and/or job characteristics that are associated with much of the variation in earnings.

Appendix

Table A.1 - Comparison of LEED and HLFS-based Measures of Employment Intensity

	All	*Males*	*Females*
Average Monthly Employment Intensity			
LEED (Earnings)	0.865	0.909	0.818
HLFS-IS (Earnings)	0.888	0.936	0.839
HLFS (40 hours)	0.845	0.921	0.766
HLFS (30 hours)	0.890	0.942	0.837
Fraction Employed Full-time			
LEED (Earnings)	0.733	0.819	0.643
HLFS-IS (Earnings)	0.764	0.868	0.656
HLFS (40 hours)	0.660	0.829	0.484
HLFS (30 hours)	0.778	0.894	0.658

Notes: All estimates are based on workers aged 15 and over. The LEED estimates are based on PAYE employees, and the HLFS and HLFS-IS are based on wage and salary workers. The LEED and HLFS-IS employment intensity is measured as the lesser ratio of employment earnings to total income or full-time (40 hours per week) minimum wage earnings. The HLFS employment intensity is measured as reported 'usual hours' worked, censored at 40 (or 30) hours, as a fraction of 40 (or 30).

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