



MEASURING JOB TENURE USING LINKED EMPLOYER- EMPLOYEE DATA

Tas Papadopoulos

*Work, Knowledge and Skills,
Statistics New Zealand*

Abstract

The publication of job tenure statistics from Statistics New Zealand's Linked Employer-Employee Dataset (LEED) in 2006 provided the first comprehensive source of information in this area for New Zealand. The most noteworthy aspect of the new statistics was the high number of jobs with short tenure. LEED job tenure statistics are constructed from administrative data that is collected for tax, not statistical, purposes. For this reason, Statistics NZ has had to address a number of issues before determining the appropriate methodology to measure job tenure. Two key issues were: (1) How breaks in job tenure are best identified from monthly data. (2) How to best correct for administrative churn in the dataset. This paper looks at the impact on the level of short-tenured jobs when varying the treatment of these two issues and the appropriateness of doing so. Consequently, it also explores the challenges of deriving longitudinal statistics from administrative data. This work is part of a review of LEED methods and outputs that Statistics NZ has been undertaking over the past year.

Introduction

The publication of job tenure statistics from Statistics New Zealand's Linked Employer-Employee Dataset (LEED) in 2006 provided the first comprehensive source of information in this area for New Zealand. The most noteworthy aspect of the new statistics was the high number of jobs with short tenure. For example, the proportion of jobs lasting 12 months or less¹ was nearly twice the level of that observed in cross-sectional surveys in the US and Australia (Timmins, 2008).²

LEED links employer monthly schedules (EMS) from Inland Revenue with Statistics NZ's Business Frame (BF). It is possible that some of the differences in the distribution of job tenure between the LEED-based New Zealand numbers and those in overseas cross-sectional surveys are due to differences in the data sources.

LEED job tenure is measured by the successive monthly receipt of earnings from the same employer. A month in which the employee did not receive earnings from that employer usually results in a break in tenure. These statistics are constructed from administrative data that is collected for tax, not statistical, purposes. For this reason, Statistics NZ has had to address some issues before determining the appropriate method to measure job tenure. Two key issues were:

- how breaks in job tenure are best identified from monthly data
- how to best correct for administrative churn in the dataset.

The current method for the first issue involves imputing one-month breaks with at least six successive months of earnings receipt from the same employer either side of the break, as it is assumed that in these circumstances the employment relationship continues.

Timmins (2008) looked at the impact of additional imputation of employment breaks on job tenure. Such additional imputation may be necessary if apparent gaps in employment in LEED are actually hiding an ongoing employment relationship. It found some evidence that some broken job spells are in fact continuing employment relationships (especially holiday breaks in January). However, even if all inter-job-spell non-employment periods were imputed (and thereby imputing gaps of more than a year) the share of jobs with tenure of 12 months or less would only decrease to 38.0 percent.

This paper begins by looking at the second issue. The published LEED job tenure statistics are specified at the establishment (or plant) level. This corrects for some, but not all, of the administrative churn in LEED. How much does this specification contribute to the high level of short-tenured jobs?

I then revisit imputation, looking at its impact once some of the administrative churn is removed. This paper ends by looking at an issue that may also affect tenure statistics – multiple job holding.

In doing this, the paper explores the challenges of deriving longitudinal statistics from administrative data. This work is part of a review of LEED methods and

outputs that Statistics NZ has been undertaking over the past year.

Data

Linked Employer-Employee Dataset

LEED was constructed by integrating two longitudinal administrative data sources. These are IRD's EMS and a longitudinal version of Statistics NZ's Business Frame (BF). The resulting longitudinal nature of LEED allows the creation of job tenure statistics (see Statistics NZ, 2007 for more detail).

Business Frame

The BF is a business register of all economically significant businesses and other organisations in New Zealand. These organisations are represented on the BF by an enterprise (ENT). Each ENT is a separate legal entity. An ENT has one or more establishments, known as geographic units (GEOs). Each GEO represents a separate physical location engaged in a specific economic activity. Whether LEED job tenure, given the nature of the dataset, should be measured at the ENT or GEO level is the primary research question being asked by this paper.

LEED uses the BF to provide information such as industry, sector, and region for each employer. The BF was designed to provide a current, point-in-time snapshot of businesses and their attributes. LEED needed information on employers and their attributes across time and this necessitated the creation of the longitudinal BF (LBF) (see Seyb, 2005 for more detail), which allows an employer's attributes to be identified at any point in time.

To produce accurate longitudinal statistics, like job tenure and worker turnover, LEED also needed to correct administrative churn in employer births and deaths. This churn comes from ownership and/or structural changes in the BF and from organisations changing the IRD number they use. The longitudinal nature of the LBF, along with LEED's ability to track employee jobs over time, can correct much of these administrative changes in the GEOs on the LBF (see section 2.4). These corrected LBF GEOs are referred to as Permanent Business Number (PBN) units.

Employer monthly schedule

Each EMS contains monthly earnings for each employee taxed at source.³ By following the individual in EMS forms across time and employers, it has been possible for LEED to create new statistics on labour dynamics, such as job tenure.

The EMS data is of high quality but a number of transformation processes have been implemented to improve the quality of published LEED statistics. Key processes involve repairing links between the same

employees over time and allocating employees to a specific employer location (PBN) on the LBF. There are two processes that attempt to repair the longitudinal history of employees affected by incorrect or missing employee IRD numbers in a particular month.

Another key transformations step in LEED is the allocations process. Employer IRD numbers generally relate to ENTs on the LBF (sometimes more than one ENT relates to a single employer IRD number and vice versa). However, to estimate correct industry and regional information for jobs at ENTs with more than one PBN, they need to be allocated to each PBN in an ENT. This is done in the allocations process.

In allocations, the monthly LBF employment count for each PBN is used as the target. These LBF employment counts come from the BF. For multi-GEO ENTs they are generally based on survey responses to either the Annual Frame Update Survey or the Quarterly Employment Survey.

Jobs paid by a particular employer IRD number each month are allocated to its equivalent ENT's PBNs in proportion to these PBN targets. An algorithm is then used to select which employees are allocated to which PBN. This algorithm minimises the distance between an employee's home address and that of the PBN, while aiming to keep the employment counts in proportion to the PBN targets.

In subsequent allocations, a second algorithm aims to keep continuing employees at the same PBN. This is done to minimise the amount of artificial noise that is added to longitudinal statistics, such as job tenure, from reallocating employees between PBNs of the same employer over time. However there are some conditions when continuing jobs are allowed to be reallocated. They are:

- the territorial authority (TA) that an employee resides in has changed since last month (reallocates one job)
- there has been a significant restructuring of the ENT since last month (reallocates all jobs in that ENT)
- rebalancing – this is done to prevent the number of continuing jobs at a PBN increasing far beyond their PBN target. Rebalancing often occurs when the BF updates the GEO employment counts that form the basis of the PBN targets, using survey responses.

Business repairs in LEED

As mentioned in section 2.2, the LBF has two repair processes that attempt to ensure each unchanging business location is represented by an unchanging PBN across time. Each process attempts to correct for spurious GEO births and deaths on the BF that arise from

administrative changes, rather than from real world changes. Examples of events that prompt such spurious births and deaths include:

- A GEO is transferred from one ENT to another. If this situation is not ascertained from survey information, the BF may incorrectly birth a new GEO at the new ENT and/or cease the old GEO.
- An existing ENT starts using a new employer IRD number to file its EMS form for administrative reasons. If the BF is not aware of this link it will birth a new ENT and GEO and cease the old units.

In both of these cases, jobs that in reality are continuing would be identified as new jobs at the new GEOs. This administrative churn would therefore be added to worker turnover and affect job tenure statistics.

Before new births on the BF are introduced to the LBF, the GEO repair process attempts to identify which of them are duplicates of existing PBNs on the LBF. Where births are identified as duplicates they are removed from the LBF and the existing PBN is transferred to the new ENT.

The second repair process, employer repair, looks for businesses that have changed the employer IRD numbers they use to file EMS returns. It tracks employees from the old employer IRD number to see whether they are employed by another employer IRD number in the following month. If at least 70 percent of these employees 'move' to a new employer IRD number a similar correction is made to that in geo repair (see Jer et al, 2007 for more detail on the business repair process).

Should tenure be specified at the establishment or enterprise level?

How tenure is measured in LEED

LEED uses monthly EMS tax data to define the length of job tenure. In LEED, tenure is a period of successive months in which the person received some earnings each month from the same employer. This is not always equivalent to continuous employment. For example, an individual who works for short periods (a day or even an hour) each month for the same employer would be considered to have unbroken job tenure (much of this section comes from Statistics NZ, 2007).

In addition, retrospective payments may increase the length of job tenure by extending it into the next month. For example, holiday earnings may be paid in the month after employment ends.

EMS tax data is only available from April 1999. Therefore, for job tenures that began before May 1999 it is impossible to determine their exact start month. All that is known is that the employee received wages and

salaries from that employer in April 1999 (the first period of the EMS).

Note that self-employment is excluded from job tenure statistics. This is because most self-employment tax records cover annual, not monthly periods.

Tenure is measured in LEED for all jobs that exist at a particular date (31 March). As such, it is measured for jobs that are right censored. During the development of LEED, the production of tenure statistics for non right-censored jobs was considered, in particular for jobs that ended in a particular year. However, this approach provided even higher proportions of short-tenured jobs. This is because the wider the time period that is used to select the population of jobs to measure tenure on, the higher the proportion of short-tenured jobs.

Permanent business number is the statistical unit for LEED

When the LEED statistics were first specified, a decision had to be made on which statistical unit to use (the PBN or the enterprise). The PBN was selected for the following reasons:

1. In the literature on labour dynamic statistics (similar to those produced by LEED) the statistical unit tends to be the geographic unit (see for example Davis and Haltiwanger, 1995). The decision taken often seems to be for practical reasons – what makes sense given the nature of the dataset.
2. Producing statistics at the PBN level makes it easier, for some statistics, to obtain accurate and detailed regional and industrial breakdowns. ENTs, by their nature, can cover a number of industries and physical locations, while a PBN is a specific economic activity undertaken at a specific location.
3. The LBF, and hence LEED, has been constructed at the PBN level and that is the level at which business repairs are applied. This means that PBNs remove some of the administrative churn generated by administrative GEO births and deaths, while ENTs do not.

To maintain consistency with other LEED statistics, job tenure was also specified at the PBN level. Therefore, in the example of a nationwide retail chain, LEED considers each branch to be a distinct employer, and when employees move from one branch to another, this constitutes a break in job tenure.

How the PBN (as statistical unit) affects tenure statistics

In the last section, three reasons were given for selecting PBN as the statistical unit for LEED statistics. Do these apply to job tenure?

1. Should employee movement within an ENT break job tenure? Intuitively, no. Household surveys that have

questions on job tenure ask respondents about tenure at their 'employer'. It is up to the respondent to define 'employer', but it is likely that most would think of ENTs not PBNs.

2. Tenure can be measured at the ENT level and still have accurate and detailed regional and industrial breakdowns. This can still be done by allocating each job to a PBN (which stores information on region and industry), but defining rules on job change at the ENT level.

3. Specifying at PBN level may remove administrative churn from false GEO births and deaths, but it may add churn from the allocations process. As mentioned in section 2.3, jobs may be reallocated between PBNs at a multi-PBN ENT if there are significant changes in the LBF target GEO employment counts (rebalancing), or a major restructuring of an ENT. Many of the resulting reallocations will break job tenure that is, in reality, continuing.

The rest of this section looks at the differences in specifying tenure at the PBN and ENT level. In doing so, it is really trying to ascertain the relative sizes of the administrative churn that is removed by the business repair processes and the administrative churn generated by the allocations process.

Administrative churn affects job tenure statistics by increasing worker turnover above the real level. Worker turnover within LEED can be broken down into the following categories:

Table A: Worker Turnover Categories

Type	Description
A True – across ENTs	Real worker turnover, caused when an employee starts or stops working for an ENT.
B1. True – within ENTs – captured by LEED	Real worker turnover, caused when an employee transfers from one PBN within an ENT, to another. It is only captured within LEED when the transfer is accompanied by the employee changing TA.
B2. True – within ENTs – not captured by LEED	
C1. False – admin churn (within ENT) – fixed by business repairs	False worker turnover, caused by the birthing and ceasing of GEOs and ENTs on the BF for administrative, not real, purposes. Some of this is corrected for by LBF business repairs. If churn is fixed by business repairs, but happens across ENTs, it will still be included in turnover measured at the ENT level.
C2. False – admin churn (across ENTs) – fixed by business repairs	
C3. False – admin churn – not fixed by business repairs	
E1. False – from allocations – within ENTs	False worker turnover caused by the allocations process in LEED reallocating employees between PBNs belonging to the same employer IRD number. This reallocation happens within multi-PBN ENTs, but it can also happen across ENTs when more than one ENT pays employees from the same employer IRD number.
E2. False – from allocations – across ENTs	

These categories can now be used to explain which worker turnover will be included for each method of measuring job tenure.

Table B: Job Tenure Measurement

Type	Worker turnover that is included
1. Conceptually best, but impossible	A (or possibly A+B1+B2)
2. At the PBN level (existing method)	A+B1+C3+E1+E2
3. At the ENT level	A+C2+C3+E2
4. At a PBN-ENT	A+ C3+E2

The next section will compare job tenure measured using methods 2, 3 and 4.

How the population for tenure statistics is selected

The published LEED tenure statistics are measured for jobs that exist as at 31 March of each year. Jobs that belong to those under 15 years of age or with a missing IRD identifier are excluded. Having a missing identifier prevents jobs being attributed to the same individual over time and therefore precludes tenure being measured. Tenure is measured at the PBN level.

This paper starts by selecting a population of jobs that matches the published statistics as at 31 March 2006. Their characteristics are summarised in column 1 of table 1. There were 1,703,260 jobs that existed at 31 March 2006 with a mean tenure of 27.1 months.

To ensure, as far as possible, that these jobs actually existed on 31 March 2006, they must have received wages and salaries in both March and April 2006. This is because LEED can only identify with certainty that an individual was employed in a particular month, not on a particular day.

Using a population of all jobs that received wages and salaries in March 2006 (whether they did so in April or not) makes a difference to mean tenure. Column 2 of table 1 (from Timmins, 2008) represents such a population. The difference in job numbers between column 1 and 2 (217,000) represent jobs that received wages and salaries in March 2006 but not in April 2006. The effect of removing them from the population, as the published statistics does, is to increase mean tenure from 25.1 months to 27.1 months.

This is not surprising given that around one-third of these 217,000 jobs did not receive wages and salaries in February 2006 either. This is because the population definition used for the published tenure statistics effectively excludes jobs in existence for less than a month.

A comparison of columns 1 and 2 from table 1 shows that these jobs are more likely to belong to younger workers and exist in the agriculture, forestry and fishing industry.

Should these short-term jobs be excluded from the tenure statistics? They seem to involve significantly less hours worked, on average, than other jobs. As such, they may be more likely to be short-term, one-off jobs than continuing employment relationships. For example, these jobs had a median wages and salaries payment of \$380 for March 2006. In comparison, the median payment for all 1,920,290 jobs that received wages and salaries in March 2006 was \$2,760.

Tenure measured at the PBN level

The solid line in figure 1 represents the distribution of tenure for jobs that existed at 31 March 2006, when tenure is measured at the PBN level. In general, the distribution of jobs declines as tenure increases. This is not immediately apparent from figure 1 due to the aggregated categories after 12 months.

Table 2 shows that of all jobs existing on 31 March 2006, a fifth had tenure of 1 to 3 months; one-quarter had tenure of 4 to 12 months; and 45 percent had tenure of 1 to 7 years. The other 11 percent of jobs survived for more than seven years. It can also be seen that tenure has a long right-hand tail, as evidenced by the fact that although mean tenure is 27.1 months, median tenure is only 15 months. The table also shows that across all breakdowns, median tenure is less than mean tenure. In addition, those breakdowns with low average tenure tend to have the largest difference between median and mean tenure, which reveals that these industries tend to have the most skewed distributions.

Figure 1: Impact of varying specification on LEED tenure (no imputation) - New Zealand

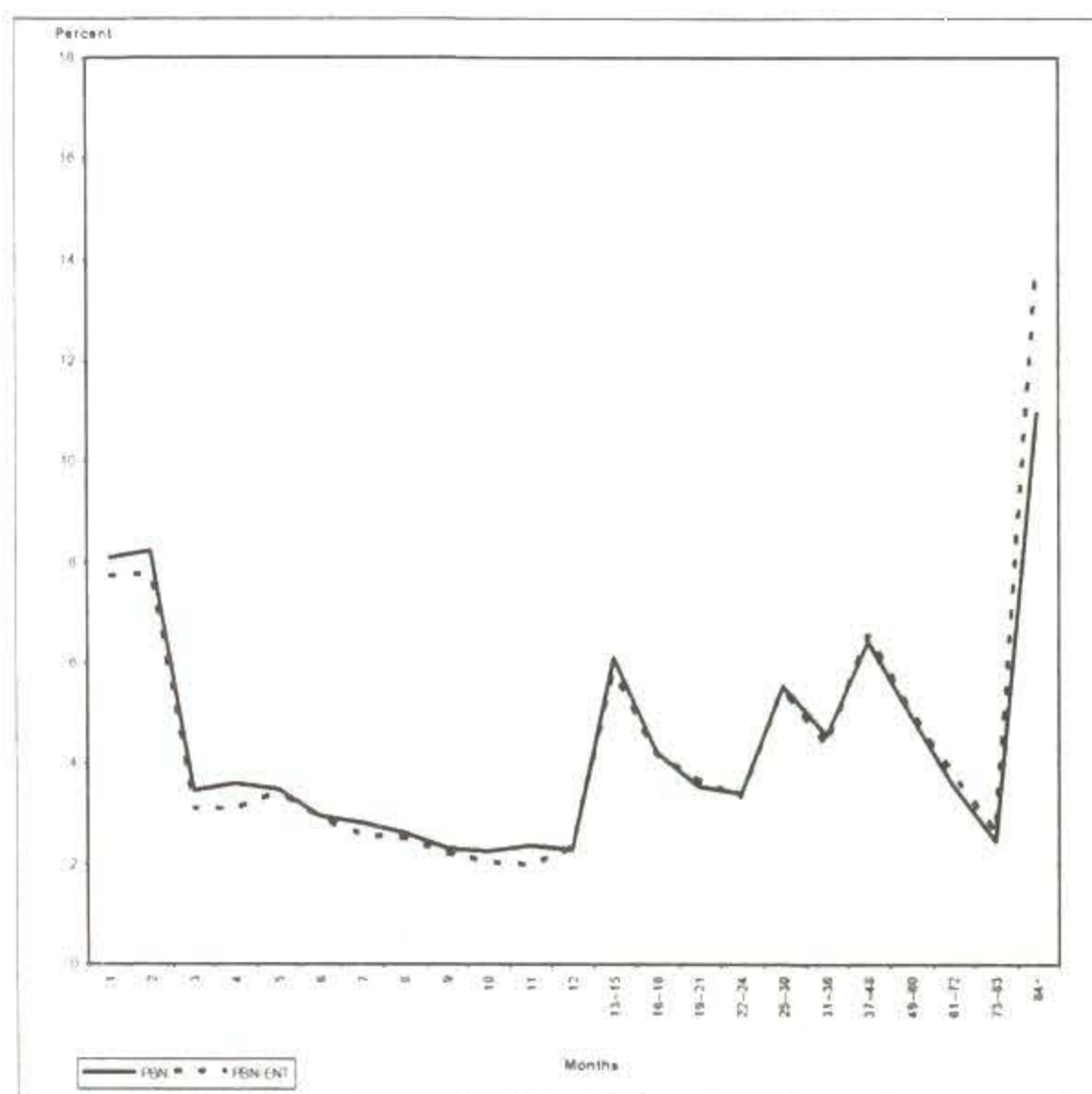


Table 2 shows that males tend to have longer tenure than females. Tenure increases strongly with the age of the worker, up to the 65 years and over group where it falls back. For example, 26 percent of jobs belonging to those aged 60 to 64 years have been going on for over seven years, compared with only 11 percent of all jobs.

Tenure also increases with the size of the employer, although less dramatically. The electricity, and gas and water; government administration and defence, and manufacturing industries have high mean tenure. Not surprisingly, the lowest mean tenure is in the accommodation cafes and restaurants, and agriculture, forestry and fishing industries.

Interestingly, although education has a mean tenure close to the national average, it has the highest proportion of jobs (37.6 percent) of any industry with tenure of 1 to 3 months, and a below average median tenure of 14 months. This was also found by Timmins (2008) and is caused by two factors. First, there is a high proportion of jobs in primary and secondary education that are not paid in January months. The introduction of imputation, which is discussed in section 4, addresses this to some extent. Second, state primary and secondary school teachers are paid as a group by the Ministry of Education. They are then allocated to schools by the allocations process in LEED which can lead to administrative churn.

Tenure measured at the ENT level

Measuring job tenure at the PBN level removes much of the false worker turnover caused by the birthing and ceasing of GEOs and ENTs on the BF for administrative, not real, purposes (C1 and C2 from table A). However, it adds administrative churn from reallocating employees between PBNs belonging to multi-PBN ENTs (E1).

Measuring tenure at the ENT level reverses this situation. It would exclude administrative churn from reallocation (E1), but include it from administrative birthing and ceasing on the BF, where this occurs across ENTs (C2).

The example in table C shows how these two types of administrative churn affect tenure. It shows a job that has received wages and salaries from the same employer, in reality, every month from March 2005 to April 2006.

However, when measured at the PBN level, job tenure as at 31 March 2006 is only four months. This is because there was an event (such as a significant restructuring) at the employer in December 2005 which caused this job to be reallocated to another PBN within the ENT.

Table C: Job Tenure Example

Month	PBN number	ENT number
April 2006	PB222	EN678
March 2006	PB222	EN678
February 2006	PB222	EN678
January 2006	PB222	EN678
December 2005	PB222	EN678
November 2005	PB111	EN678
October 2005	PB111	EN678
September 2005	PB111	EN678
August 2005	PB111	EN345
July 2005	PB111	EN345
June 2005	PB111	EN345
May 2005	PB111	EN345
April 2005	PB111	EN345

When measured at the ENT level, tenure at 31 March 2006 is seven months. This is longer than at the PBN level, but is still less than reality. In September 2005, the job's ENT changed to EN678, but its PBN number was unchanged. This could have happened because the employer may have changed IRD number, or the PBN was transferred from one owner to another.

Tenure measured at the joint PBN-ENT level

From table C it is possible to formulate a specification of job tenure that corrects for both types of administrative churn. That is, a specification that defines a job at both the PBN and ENT levels, where a break in tenure is only recognised when both the PBN and ENT of a job changes.

As shown in table B, such a specification would correct both types of administrative churn – that caused by reallocations or corrected by the business repairs process. Therefore, it is not surprising when table 1 shows that the use of this joint specification creates more jobs (1,729,930) than at the PBN level (1,703,260) – more jobs are now meeting the March–April condition. In addition, average tenure has increased:

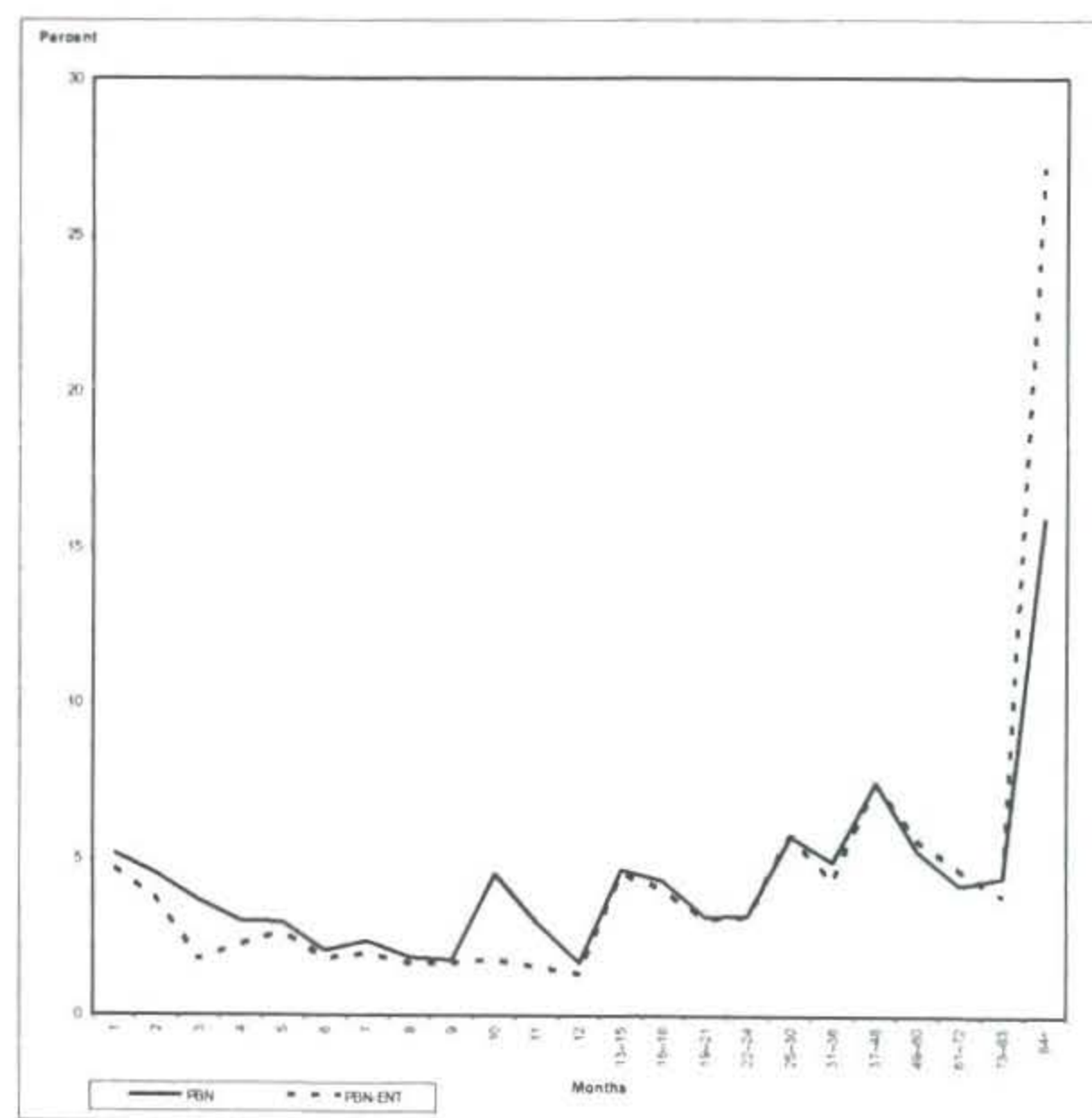
- Median tenure is 15 months and mean tenure is 27.1 months at the PBN level (business repairs only).
- Median tenure is 17 months and mean tenure is 29.7 months at the joint PBN-ENT level (corrects for both business repairs and reallocations).

The impacts of the new specification are more apparent when looking at how tenure varies by employer and employee characteristics, as shown in table 3. There are gains in tenure for larger firms and industries like government administration and defence, and communication services. Mean tenure has increased for both males and females, but for males by slightly more. The average tenure for jobs belonging to 15- to 24-year olds has not really changed, while it has increased for older age groups.

Theoretically the joint PBN-ENT level specification is better than the current PBN specification because it attempts to correct for both types of administrative churn. This can be seen by comparing tables 2 and 4. Although mean tenure has increased for all categories, it has increased the most for those where multi-PBN ENTs are most likely to reside. For example, mean tenure in communication services; finance and insurance, and government administration and defence all increased by over 20 percent from that specified at the PBN level. The effect on median tenure for all three industries is greater, with median tenure in government administration and defence increasing by nearly 50 percent. In fact, around 1 in 4 jobs in government administration and defence had their tenure increased by the PBN-ENT specification.

The impact on the distribution of tenure in this industry can be seen in figure 2.⁴

Figure 2: Impact of varying specification on LEED tenure (no imputation) - Government administration and Defence



By removing the noise from reallocations, the new specification has provided a better picture of how tenure varies by industry and firm size. However, it is important to note that the difference at the aggregate level (see figure 1) between calculation of tenure at the PBN level as per the published statistics (solid line) versus calculation of tenure at the joint PBN-ENT level (dotted line) is not great. The percentage of jobs with tenure of 12 months or less has only decreased from 44.3 percent at the PBN level to 41.5 percent at the joint PBN-ENT level. The biggest impact is the increase in the proportion of jobs lasting longer than seven years (up to 13.8 percent of all jobs from 11.0 percent). Section 4 will look at the impact of combining the new PBN-ENT level approach with increasing imputation as detailed in Timmins (2008).

Imputation

Current imputation in LEED

In our previous analysis we considered any break in monthly payments from the employer as a break in tenure. However, the published LEED tenure statistics imputes some one-month periods of non-employment as employment. This is done when that month of non-employment occurs between two periods of six successive months with the same employer. In these circumstances it is felt that the imputation is more reflective of the likely employment relationship. This type of employment relationship can be displayed using 1s and 0s as follows:

111110111111

So what is the impact of imputing these employment breaks (which are referred to subsequently as 606 imputations)? Figure 3 shows the distribution of tenure for jobs existing on 31 March 2006 using this method, versus that with no imputation.

Figure 3: Impact of varying imputation on LEED tenure (PBN specification) - New Zealand

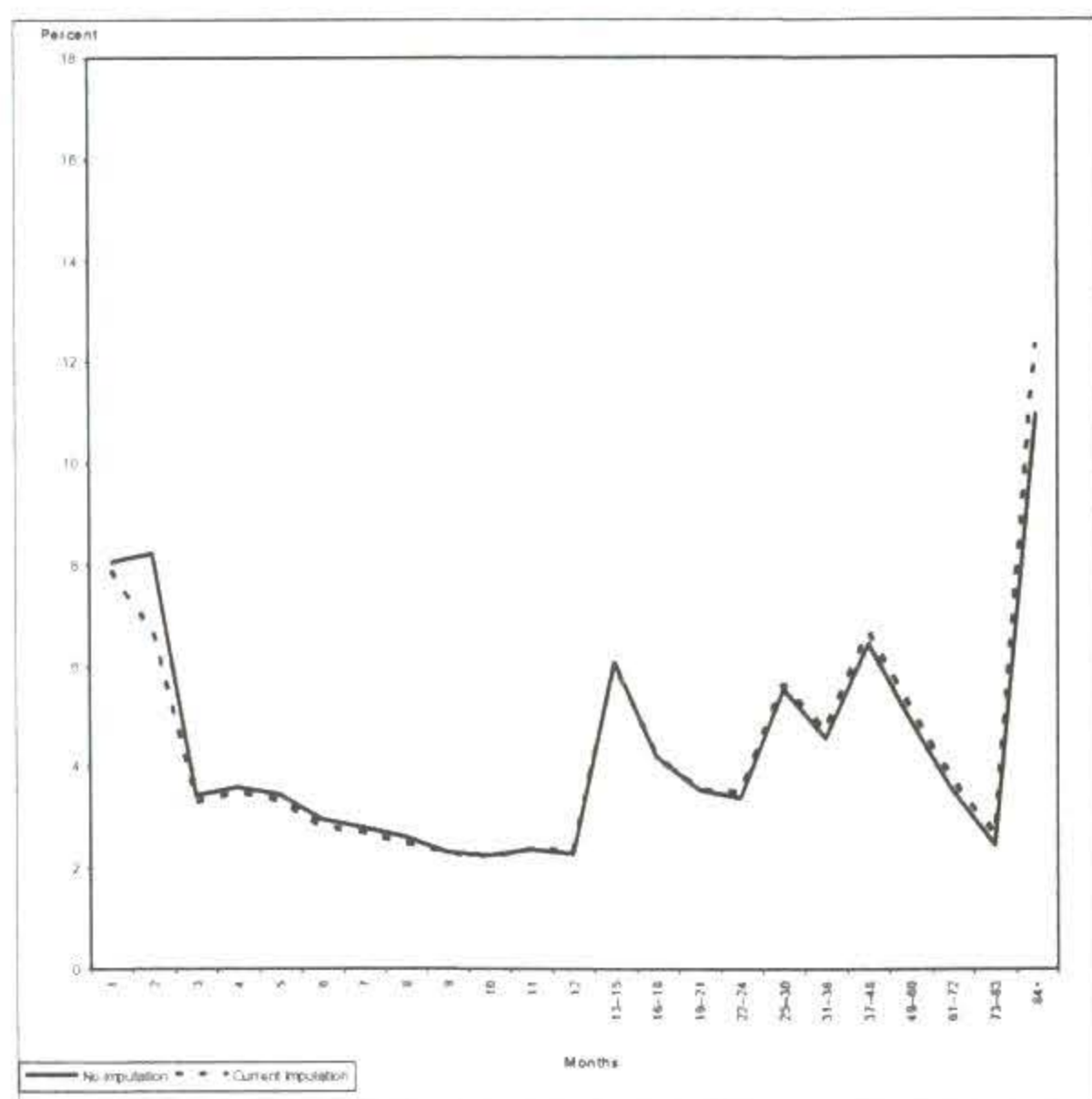
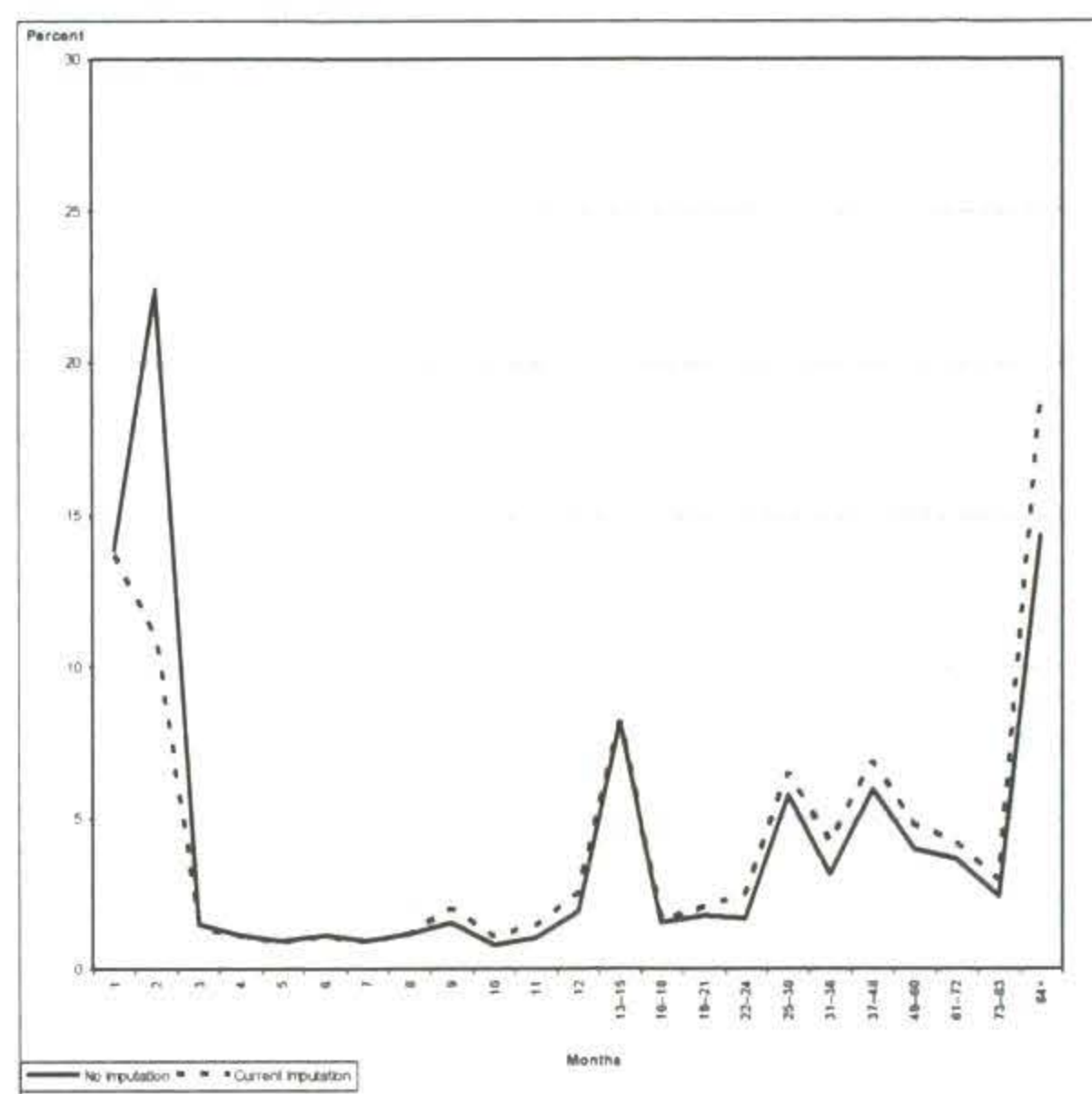


Table 4 shows that compared with the PBN level with no imputation specification (table 2), mean tenure increases from 27.1 to 28.8 months and median tenure from 15 to 17 months. This is not as large an effect as moving to the joint PBN-ENT level specification (table 3) which has mean tenure of 29.7 months (although it also has a median of 17 months). This is partly due to these two changes in methodology having impacts at different points in the tenure distribution. The joint PBN-ENT level specification's biggest impact is increasing the proportion of jobs lasting more than seven years. By contrast, the current imputation methodology's biggest

impact is in decreasing the proportion of jobs lasting 1 to 3 months, from 19.7 percent without imputation to 17.8 percent with imputation.

As Timmins (2008) points out, this last point may occur because single-month breaks in employment are most likely to occur in January. As tenure is measured at 31 March, filling these January gaps helps to decrease the proportion of jobs with tenure less than 1 to 3 months. The most significant example of this is in education, which can be seen in figure 4. The proportion of jobs with tenure of 1 to 3 months has fallen from 37.6 percent without imputation to 25.9 percent with imputation. While mean tenure has gone from 26.8 to 32.9 months, the effect of median tenure is more pronounced, from a below average length of 14 months to an above average length of 22 months.

Figure 4: Impact of varying imputation on LEED tenure (PBN specification) - Education



Extending imputation

It may be possible that the 606 imputation rule is too restrictive in its definition of a continuing employment relationship. Table 5 shows the impact of relaxing this rule using the PBN level specification. Here, all one-month non-employment periods occurring between single periods of employment with the same employer are filled (ie a 101 rule)⁵.

The effect on average tenure is small. Mean tenure using the 101 rule is 29.2 months, up from 28.8 months using the current 606 methodology. Median tenure is unchanged at 17 months. The rule change causes the biggest increases in mean tenure for small firms, employers in agriculture, forestry and fishing, and jobs belonging to workers aged 65 years and over.

In terms of distribution, the new methodology decreases the proportion of jobs in the 1 to 3 months category (as previously mentioned, most gaps in employment happen in January) and increases the proportion of longer-tenure groups. The largest fall in the proportion of jobs with 1 to 3 months tenure was in education, from 25.9 percent under the 606 rule to 22.2 percent under the 101 rule. As previously mentioned, education has a high number of employment breaks in January.

Therefore, should imputation be extended to all single-month gaps? By further accounting for employment breaks in January in education it probably improves the measurement of tenure in that industry (although the effect on average tenure is small). And the proportion of jobs lasting 12 months or less does decrease marginally, from 41.8 percent under the 606 rule to 41.1 percent under the 101 rule.

However, by extending imputation, would we be assuming, in many cases, a continuing employment relationship that does not really exist? One way to resolve this is to observe the characteristics of jobs with increased tenure under the 101 methodology and compare these with the characteristics of other jobs.

One characteristic that can be observed is the amount of wages and salaries each job received. For all jobs existing on 31 March 2006, the median amount of wages and salaries they received in the month of March 2006 was \$2,920. For jobs that had their tenure lengthened by the 101 methodology the median was only \$1,750. This is only 60 percent of the median of all jobs, perhaps because these jobs have lower hourly pay rates or they are more likely to be part-time jobs. It could also be because these jobs are more likely to be part period jobs (ie they only existed for part of the month of March). Employment lasting for a part of a month separated by a month with no employment is less likely to meet the requirement of a continuing employment relationship.

The industrial composition of the imputed jobs may also help us infer something about the likelihood of a continuing employment relationship. Imputations under the 606 rule mostly affect jobs in education. Most of these jobs are primary and secondary school teachers with employment breaks in January. The assumption of a continuing employment relationship should hold in these cases. In comparison, the industries that have the highest proportion of jobs (where the 101 rule lengthens tenure) include such areas as 'horse and dog racing' and 'shearing services'. It is less likely that continuing employment relationships hold for imputed jobs in these areas.

Imputation at the joint PBN-ENT level

This section looks at how imputation interacts with the new joint PBN-ENT level specification. Table 6 presents the distribution of tenure for jobs existing as at 31 March

2006, where tenure is specified at the joint PBN-ENT level and the 101 imputation rule is used.⁶

In general, the impact of moving from no imputation (table 3) to using rule 101 (table 6) at the joint PBN-ENT level is similar to the impact at the PBN level (tables 2 and 5). However, introducing 101 imputation in the former showed a greater reduction in the proportion of jobs with tenure of 1 to 3 months (from 18.6 percent to 14.9 percent) compared with the reduction at the PBN level (from 19.7 percent to 16.5 percent). Taking account of reallocations at multi-PBN ENTs seems to allow more imputations to arise.

It is also interesting to note that the joint PBN-ENT level and 101 rule specification is the first to produce breakdowns (ie those aged 55 to 64 years), where median tenure is greater than mean. This means the tenure distributions for these age groups are now skewed to the left.

Note that the education industry, although with a greatly reduced percentage (from 37.0 to 20.8 percent), still has a higher proportion of jobs with 1 to 3 months tenure than the national average (14.9 percent). This is partly explained by the fact that some reallocations in state primary and secondary school teachers happen between schools rather than within them. This means employment spells that would otherwise be imputed are not.

What is the combined effect of the joint PBN-ENT specification and the extended 101 imputation rule on the distribution of tenure? As expected, it has the highest mean tenure of 32.2 months and a median tenure of 20 months. It also has the lowest proportion of jobs (37.6 percent) lasting 12 months or less. This is an improvement on the 44.3 percent from the PBN level specification with no imputation but is still higher than that found in household-based surveys.

Multiple job holding

Household surveys and LEED have different methods of measuring job tenure for multiple job holders. The US and Australian cross-sectional surveys mentioned in section 1 ask tenure for the respondent's main job only (which is selected on hours worked), excluding the tenure for other jobs held.⁷ The LEED tenure statistics include all jobs held by multiple job holders. In household surveys, if respondents with multiple jobs tend to report the longer tenured job as their main job, this could lead to lower mean tenure in LEED.

It is possible to identify multiple job holders in LEED and reconstruct tenure statistics that include only one job per person. Table 7 does this by measuring the distribution of tenure as at 31 March 2006 using the new methodology, with the exception that multiple job holders are restricted to one job – that from which they

earned the most in the March month. This results in a moderate increase in mean tenure to 32.9 months from 32.2 months without the main job restriction (table 6), and median tenure rises from 20 to 21 months. The proportion of jobs with tenure of 1 to 3 months decreases from 14.9 percent to 14.0 percent. The industries that have the largest impact on tenure distribution are mining, and cultural and recreational services.

Restricting LEED tenure statistics to LEED main jobs helps produce results that are more comparable with those produced from household surveys. Conceptually however, it does seem more appropriate to continue to measure tenure for all jobs that exist at a certain date.

Summary

The aim of this paper was to determine whether the high proportion of short-tenured jobs in LEED is a construct of how they are measured. In doing so, it has also provided examples of some of the challenges in deriving longitudinal statistics from administrative data.

This paper has shown that specifying jobs at the joint PBN-ENT level rather than the PBN level, as currently done, reduces the impact of administrative worker churn on tenure. By removing this noise from allocations, the new specification has provided a better picture of how tenure varies by industry and firm size. However, the effect at the aggregate level is smaller. The percentage with tenure of 12 months or less only decreased from 44.3 percent at the PBN level to 41.5 percent at the joint PBN-ENT level.

The paper then showed the impact of imputing gaps in employment. The current 606 methodology reduces the proportion with tenure less than 12 months from 44.3 percent to 41.8 percent at the PBN level. Extending imputation was shown to have little overall impact on tenure statistics, and where it has had an impact, it may be assuming a continuing employment relationship that does not exist. Combining imputation with the joint PBN-ENT level specification reduces the proportion with tenure less than 12 months to 37.6 percent, still substantially higher than that found in overseas household-based surveys.

The paper ended by looking at an issue that may also affect tenure statistics – multiple job holding. Restricting LEED tenure statistics to LEED main jobs helps explain some, but not all of the remaining differences with results from household surveys.

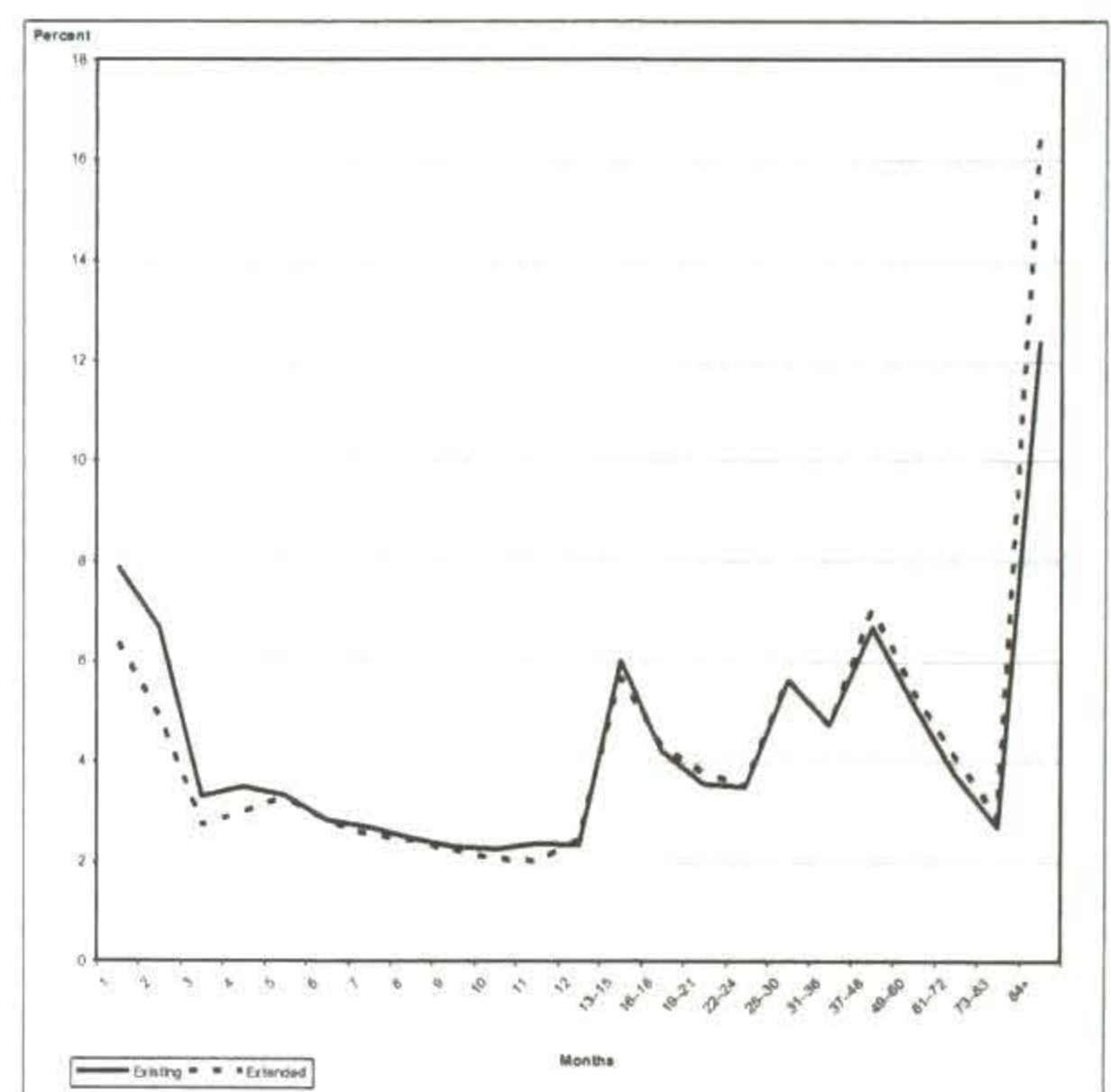
This resulted in a final specification that had three changes to the one that is currently used to produce LEED tenure statistics:

- It measures jobs at the combined PBN-ENT level.

- It extends imputation to all 101 breaks in employment.
- It measures tenure only for the employee's main jobs.

The resulting impact is to reduce the proportion of jobs with tenure of 12 months or less, from 41.8 percent to 36.6 percent (the tenure distribution of the existing method is compared with that from this new extended method in figure 5). From this we can conclude that there is some degree of robustness to the LEED tenure statistics. Despite altering the methodology in a number of ways, the statistics, at the national level at least, tell a similar story.

Figure 5: Existing versus new tenure specifications - New Zealand



The final specification reduced the discrepancy with cross-sectional surveys in the US and Australia from around 20 to 15 percentage points. The following factors may be contributing to the remaining discrepancy⁸:

- LEED probably captures short-tenured jobs (in addition to secondary jobs) that respondents to household surveys do not report on.
- The combined PBN-ENT specification does not remove all of the administrative worker churn from LEED.
- Household surveys and LEED probably measure different things. LEED is more likely to measure unbroken earning/job spells with the same employer. Household surveys are more likely to measure ongoing employment relationships, which span breaks that the LEED measures do not (Timmins, 2008).

Where to go from here

This paper has suggested some improvements that can be made to the methodology currently being used to produce tenure statistics from LEED. Principally, adopting the joint PBN-ENT specification would reduce the impact of administrative churn on the measurement of tenure of jobs at multi-PBN employers. This will improve the measurement tenure for large employers and the industries they dominate.

There is less evidence to support extending the imputation of breaks in employment using the 101 rule. It improves the measurement of tenure in education, but may be imputing in other industries where continuing employment relationships do not exist. Further investigation is warranted to see whether some extension would retain the benefits to the education industry, without over imputing other industries.

Analysis of mean and median tenure have added context to this paper. They are not currently produced as part of the LEED tenure statistics. It probably makes sense not to release mean tenure. This cannot be compared across time due to the changing impact of left-censored jobs. However, medians would not be influenced by this issue and would therefore add value to the statistics released by LEED.

Finally, another avenue of research is to attempt to quantify the different types of administrative churn in the LEED dataset and the effects of the different types of repair processes that attempt to address them. In particular, determining which types of jobs are most affected by these factors may further aid understanding of LEED and the labour market.

Notes

1. As at 31 March 2006, 41.8 percent of jobs had existed for 12 months or less.
2. In the 2006 US Current Population Survey, 24.4 percent of workers reported being with their current employer for less than 12 months. The comparable figure in the February 2006 Australian Labour Mobility Survey was 20.1 percent. The upcoming Survey of Working Life, to be published in December 2008, will present survey-based tenure statistics for New Zealand.
3. A number of these individuals have withholding tax deducted rather than pay-as-you-earn payments. The published job tenure statistics exclude these individuals as they are considered closer in nature to the self-employer, rather than employees. This paper takes the same approach.
4. The spike that has been removed at 10 months is likely due to reallocations caused by the annual

updating of employment counts on the BF. These are used by LEED as targets for allocations.

5. Timmins (2008) relaxes this rule further by imputing any gap between two periods of employment with the same employer.
6. Section 4.2 argued against extending imputation to the 101 rule and in practice the joint PBN-ENT level specification would probably be used with the existing 606 rule. However, using the 101 rule with the new joint specification allows us to see the 'maximum' effect on tenure distribution.
7. The upcoming Survey of Working Life in New Zealand has similarly asked tenure of the main job only.
8. Another potential factor is the differing industrial composition between New Zealand and Australia and the US. However, reweighing the New Zealand tenure data using Australia's industrial composition has a negligible impact on the distribution of tenure (see the last row of table 2).

Acknowledgements

I thank my colleagues Dariusz Bielawski, Christine Bycroft, David Maré, Allyson Seyb and Jason Timmins for their helpful comments and discussion.

The complete research report can be downloaded from the [Statistics NZ website](http://www.stats.govt.nz/leed/default.htm) at <http://www.stats.govt.nz/leed/default.htm>.

The opinions, findings, recommendations and conclusions expressed in this paper are those of the author. They do not represent those of Statistics NZ, who takes no responsibility for any omissions or errors in the information contained here.

Access to the data used in this study was provided by Statistics NZ under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person or firm. The tables in this paper contain information about groups of people so that the confidentiality of individuals is protected.

The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act. 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 Linked Employer-Employee Database (LEED) for statistical purposes, and is not related to the ability of the data to support Inland Revenue's core operational requirements.

References

- Bycroft, C.** (2004). "Repair of Employee IRD Number", Statistics New Zealand, Wellington.
- Davis, S. and Haltiwanger, J.** (1995). "Measuring Gross Worker and Job Flows", *NBER Working Paper*, 5133, 77-119.
- Grey, A.** (1995). "Job Gains and Job Losses: Recent Literature and Trends", *OECD Jobs Study Working Paper Series*, 1, Paris.
- Jer, R., Shrigley, J. and Seyb, J.** (2007). "The Longitudinal Business Frame", *unpublished paper*, Statistics New Zealand, Wellington.
- Seyb, A.** (2005). "Statistics New Zealand's Longitudinal Business Frame", *Maximising Data Value: Data Use and Re-Use Proceedings of the 3rd ASC*

International Conference on Survey Research Methods, September 2005.

Statistics New Zealand (2007). *Employment, Earnings and Income Statistics from LEED: 2006*. Statistics New Zealand, Wellington.

Timmins, J. (2008). "Why are there so many short jobs in LEED? An analysis of job tenure using LEED", Statistics New Zealand, *LEED research report*.

Author

Tas Papadopoulos
Work, Knowledge and Skills
Statistics New Zealand
P.O. Box 2922
Wellington
Tas.Papadopoulos@stats.govt.nz

Table 1

Selected Employer and Employee Characteristics
For jobs existing as at 31 March 2006 or in March 2006

	Jobs specified at the		
	PBN level at 31 March 2006	PBN level for March 2006	PBN-ENT level at 31 March 2006
Mean job tenure (months)	27.1	25.1	29.7
Sex			
Male	50.4%	49.9%	50.3%
Female	49.6%	50.1%	49.7%
Age group (years)			
15–24	19.1%	21.7%	19.1%
25–34	21.9%	23.0%	21.9%
35–44	24.2%	24.4%	24.2%
45–54	20.6%	19.3%	20.6%
55–64	11.8%	9.7%	11.8%
65+	2.4%	1.9%	2.4%
Firm size (employees at enterprise)			
1–5	13.7%	..	13.5%
6–9	7.7%	..	7.6%
10–19	11.4%	..	11.3%
20–49	13.6%	..	13.4%
50–99	8.8%	..	8.7%
100+	44.8%	..	45.4%
Industry			
Agriculture, forestry and fishing	4.8%	5.8%	4.8%
Mining	0.3%	0.3%	0.3%
Manufacturing	13.9%	13.3%	13.8%
Electricity, gas and water supply	0.3%	0.3%	0.3%
Construction	6.3%	6.1%	6.3%
Wholesale trade	6.3%	6.0%	6.3%
Retail trade	12.2%	12.0%	12.2%
Accommodation, cafes and restaurants	5.8%	6.0%	5.8%
Transport and storage	4.1%	4.0%	4.1%
Communication services	1.3%	1.3%	1.3%
Finance and insurance	2.6%	2.6%	2.7%
Property and business services	13.4%	13.9%	13.5%
Government administration and defence	3.6%	3.9%	3.8%
Education	8.8%	8.7%	8.7%
Health and community services	9.9%	9.6%	10.0%
Cultural and recreational services	2.6%	2.7%	2.6%
Personal and other services ⁽¹⁾	3.7%	3.7%	3.7%
Observations	1,703,260	1,920,290	1,729,930

(1) Includes jobs where industry is 'not specified'.

Symbol:

.. not available

Table 2

Distribution of Job Tenure as at 31 March 2006
Specified at the PBN level (no imputation)

	Median tenure	Mean tenure	Tenure			
			1-3 months	4-12 months	1-7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	17	29.0	17.1%	24.4%	46.0%	12.4%
Female	14	25.2	22.3%	24.9%	43.2%	9.6%
Age group (years)						
15-19	5	8.6	36.9%	38.5%	24.6%	0.0%
20-24	8	13.8	29.9%	32.3%	37.5%	0.3%
25-29	11	19.0	22.6%	30.5%	44.0%	2.9%
30-34	14	23.5	18.8%	27.1%	48.1%	5.9%
35-39	17	27.4	17.3%	24.0%	49.5%	9.2%
40-44	21	31.3	16.2%	21.1%	49.7%	13.0%
45-49	25	34.8	14.9%	19.3%	48.8%	17.0%
50-54	29	37.8	13.5%	17.9%	47.7%	20.9%
55-59	33	40.1	12.6%	17.1%	46.5%	23.9%
60-64	35	41.5	12.6%	16.0%	45.4%	26.0%
65+	25	36.4	18.6%	17.3%	42.4%	21.6%
Firm size (employees at enterprise)						
1-5	12	23.5	24.0%	26.3%	41.6%	8.2%
6-9	14	25.4	20.6%	25.9%	44.0%	9.5%
10-19	14	25.2	21.6%	25.1%	43.7%	9.6%
20-49	14	26.0	23.2%	23.0%	43.2%	10.6%
50-99	15	26.9	22.0%	22.6%	44.3%	11.1%
100+	17	29.4	16.3%	24.7%	46.5%	12.6%
Industry						
Agriculture, forestry and fishing	9	19.6	30.9%	28.3%	34.6%	6.1%
Mining	18	27.6	16.8%	23.2%	49.2%	10.7%
Manufacturing	23	33.6	12.7%	22.4%	48.7%	16.2%
Electricity, gas and water supply	27	37.2	8.9%	17.5%	55.2%	18.2%
Construction	16	26.1	16.4%	25.9%	49.2%	8.5%
Wholesale trade	20	30.1	13.7%	24.3%	49.9%	12.1%
Retail trade	13	23.3	19.2%	29.6%	43.4%	7.7%
Accommodation, cafes and restaurants	7	15.3	31.6%	32.1%	32.9%	3.3%
Transport and storage	18	28.9	15.7%	24.3%	48.2%	11.8%
Communication services	16	28.2	13.2%	26.5%	49.2%	11.2%
Finance and insurance	19	29.3	10.9%	29.4%	49.0%	10.8%
Property and business services	13	24.5	21.1%	26.6%	44.1%	8.1%
Government administration and defence	23	33.7	13.4%	23.2%	47.4%	16.0%
Education	14	26.8	37.6%	10.3%	37.8%	14.3%
Health and community services	19	30.8	14.7%	24.3%	47.9%	13.1%
Cultural and recreational services	14	25.4	20.9%	26.3%	42.9%	9.9%
Personal and other services ⁽¹⁾	20	31.0	15.6%	23.0%	46.8%	14.5%
Total	15	27.1	19.7%	24.6%	44.7%	11.0%

(1) Includes jobs where industry is 'not specified'.

Table 3

Distribution of Job Tenure as at 31 March 2006
Specified at the joint PBN-ENT level (no imputation)

	Median tenure	Mean tenure	Tenure			
			1-3 months	4-12 months	1-7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	20	31.9	16.0%	22.6%	45.6%	15.9%
Female	15	27.4	21.2%	23.2%	43.8%	11.8%
Age group (years)						
15-19	5	8.8	36.0%	38.4%	25.6%	0.0%
20-24	9	14.7	28.6%	31.2%	39.9%	0.4%
25-29	13	20.8	21.2%	28.6%	46.5%	3.7%
30-34	16	25.8	17.5%	25.1%	49.7%	7.7%
35-39	20	30.3	16.0%	21.9%	50.0%	12.1%
40-44	24	34.5	15.0%	19.1%	49.3%	16.6%
45-49	29	38.3	13.8%	17.2%	47.5%	21.5%
50-54	34	41.5	12.5%	15.9%	45.5%	26.1%
55-59	39	43.8	11.7%	15.1%	43.7%	29.5%
60-64	43	45.4	11.7%	14.2%	42.1%	31.9%
65+	30	39.4	17.8%	15.7%	40.6%	25.9%
Firm size (employees at enterprise)						
1-5	13	23.9	23.7%	26.0%	41.7%	8.6%
6-9	14	26.0	20.1%	25.5%	44.3%	10.1%
10-19	14	26.1	20.9%	24.7%	44.0%	10.4%
20-49	14	27.0	22.4%	22.5%	43.6%	11.5%
50-99	16	28.6	20.9%	21.7%	44.8%	12.7%
100+	22	33.9	14.6%	21.5%	46.1%	17.8%
Industry						
Agriculture, forestry and fishing	9	20.9	30.0%	27.7%	35.2%	7.1%
Mining	22	32.2	12.8%	21.7%	49.5%	15.8%
Manufacturing	25	35.5	11.9%	21.4%	48.2%	18.5%
Electricity, gas and water supply	33	42.0	7.8%	15.5%	51.5%	25.1%
Construction	17	27.5	15.8%	24.9%	49.4%	10.0%
Wholesale trade	23	33.1	12.4%	22.4%	50.2%	15.0%
Retail trade	14	25.0	17.9%	28.5%	44.4%	9.1%
Accommodation, cafes and restaurants	8	16.1	31.2%	31.2%	33.8%	3.9%
Transport and storage	21	32.4	14.4%	22.2%	47.4%	16.1%
Communication services	22	34.1	12.4%	23.0%	46.1%	18.5%
Finance and insurance	24	35.4	9.6%	21.7%	50.5%	18.1%
Property and business services	15	27.1	19.7%	24.9%	44.4%	11.0%
Government administration and defence	34	42.1	10.2%	16.4%	46.3%	27.1%
Education	14	27.9	37.0%	9.7%	37.9%	15.4%
Health and community services	22	33.5	13.6%	22.6%	47.7%	16.1%
Cultural and recreational services	16	28.4	19.3%	24.2%	43.5%	13.1%
Personal and other services ⁽¹⁾	23	34.9	14.6%	21.2%	44.0%	20.2%
Total	17	29.7	18.6%	22.9%	44.7%	13.8%

(1) Includes jobs where industry is 'not specified'.

Table 4

Distribution of Job Tenure as at 31 March 2006
Specified at the PBN level (current imputation)

	Median tenure	Mean tenure	Tenure			
			1-3 months	4-12 months	1-7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	19	30.3	16.2%	23.5%	46.7%	13.6%
Female	15	27.3	19.5%	24.4%	44.9%	11.1%
Age group (years)						
15-19	5	8.9	35.8%	38.2%	26.0%	0.0%
20-24	9	14.4	28.8%	31.7%	39.1%	0.4%
25-29	12	19.9	21.5%	29.9%	45.3%	3.3%
30-34	15	24.6	17.5%	26.5%	49.3%	6.6%
35-39	19	28.9	15.5%	23.4%	50.9%	10.2%
40-44	24	33.3	13.7%	20.6%	51.3%	14.4%
45-49	28	37.3	12.3%	18.7%	49.9%	19.2%
50-54	33	40.5	11.1%	17.1%	48.2%	23.6%
55-59	37	42.9	10.3%	16.1%	46.8%	26.8%
60-64	41	44.7	10.3%	14.8%	45.5%	29.4%
65+	33	40.6	15.1%	15.6%	43.6%	25.7%
Firm size (employees at enterprise)						
1-5	14	25.7	21.6%	25.0%	43.8%	9.7%
6-9	16	27.5	18.5%	24.8%	45.6%	11.1%
10-19	16	27.5	19.1%	24.3%	45.1%	11.4%
20-49	16	28.5	19.9%	22.6%	44.8%	12.7%
50-99	17	29.1	19.1%	22.2%	45.7%	13.0%
100+	19	30.4	15.4%	24.2%	47.0%	13.4%
Industry						
Agriculture, forestry and fishing	10	21.2	29.9%	26.7%	36.3%	7.1%
Mining	19	28.7	16.0%	22.1%	50.3%	11.6%
Manufacturing	25	35.4	11.9%	21.2%	48.8%	18.1%
Electricity, gas and water supply	28	37.6	8.7%	17.3%	55.4%	18.4%
Construction	17	27.5	15.6%	24.6%	50.2%	9.6%
Wholesale trade	21	31.2	13.0%	23.6%	50.3%	13.1%
Retail trade	14	24.4	18.4%	28.9%	44.1%	8.6%
Accommodation, cafes and restaurants	8	16.5	30.2%	31.1%	34.7%	4.0%
Transport and storage	19	30.4	14.2%	23.5%	49.4%	12.9%
Communication services	17	28.6	12.9%	26.2%	49.4%	11.5%
Finance and insurance	20	29.9	10.5%	29.1%	49.3%	11.2%
Property and business services	14	25.4	20.2%	26.1%	44.9%	8.9%
Government administration and defence	23	34.1	13.1%	23.1%	47.3%	16.6%
Education	22	32.9	25.9%	12.0%	43.4%	18.8%
Health and community services	21	32.4	13.6%	23.3%	48.6%	14.5%
Cultural and recreational services	15	26.8	19.5%	25.7%	44.0%	10.9%
Personal and other services ⁽¹⁾	21	32.3	14.3%	22.3%	47.9%	15.5%
Total	17	28.8	17.8%	24.0%	45.8%	12.4%

(1) Includes jobs where industry is 'not specified'.

Table 5

Distribution of Job Tenure as at 31 March 2006
Specified at the PBN level (extended imputation)

	Median tenure	Mean tenure	Tenure			
			1-3 months	4-12 months	1-7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	19	30.6	15.2%	24.0%	47.0%	13.8%
Female	16	27.7	17.8%	25.2%	45.5%	11.4%
Age group (years)						
15-19	6	9.1	33.8%	39.5%	26.8%	0.0%
20-24	9	14.7	27.3%	32.5%	39.8%	0.4%
25-29	12	20.1	20.2%	30.6%	45.8%	3.4%
30-34	15	24.9	16.3%	27.2%	49.8%	6.7%
35-39	19	29.2	14.1%	24.1%	51.4%	10.4%
40-44	24	33.6	12.4%	21.2%	51.7%	14.7%
45-49	29	37.6	11.1%	19.1%	50.3%	19.5%
50-54	34	40.9	9.9%	17.6%	48.5%	24.0%
55-59	37	43.3	9.3%	16.5%	47.0%	27.2%
60-64	42	45.2	8.9%	15.2%	45.9%	30.0%
65+	35	41.7	12.5%	16.3%	44.6%	26.6%
Firm size (employees at enterprise)						
1-5	15	26.4	18.8%	26.2%	45.0%	10.1%
6-9	17	28.0	16.6%	25.6%	46.4%	11.4%
10-19	16	27.9	17.3%	25.2%	45.8%	11.7%
20-49	17	28.9	18.2%	23.5%	45.4%	13.0%
50-99	17	29.4	17.8%	22.9%	46.1%	13.2%
100+	19	30.6	14.7%	24.5%	47.1%	13.6%
Industry						
Agriculture, forestry and fishing	10	21.8	27.1%	28.1%	37.4%	7.4%
Mining	19	28.9	15.5%	22.3%	50.5%	11.6%
Manufacturing	25	35.7	11.3%	21.3%	48.9%	18.5%
Electricity, gas and water supply	28	37.6	8.7%	17.5%	55.4%	18.4%
Construction	18	27.8	14.6%	25.0%	50.6%	9.7%
Wholesale trade	21	31.5	12.3%	23.8%	50.5%	13.3%
Retail trade	14	24.6	17.6%	29.2%	44.4%	8.8%
Accommodation, cafes and restaurants	8	16.9	28.4%	31.9%	35.5%	4.2%
Transport and storage	20	30.8	12.9%	24.1%	49.9%	13.2%
Communication services	17	28.7	12.4%	26.4%	49.5%	11.6%
Finance and insurance	20	30.0	10.0%	29.3%	49.4%	11.2%
Property and business services	14	25.8	18.8%	26.7%	45.5%	9.0%
Government administration and defence	23	34.2	12.7%	23.3%	47.4%	16.6%
Education	23	33.6	22.2%	14.5%	44.3%	19.0%
Health and community services	22	32.8	12.4%	23.7%	49.1%	14.8%
Cultural and recreational services	16	27.4	17.1%	26.7%	45.0%	11.2%
Personal and other services ⁽¹⁾	22	32.6	13.1%	22.8%	48.4%	15.8%
Total	17	29.2	16.5%	24.6%	46.3%	12.6%

(1) Includes jobs where industry is 'not specified'.

Table 6

Distribution of Job Tenure as at 31 March 2006
Specified at the joint PBN-ENT level (extended imputation)

	Median tenure	Mean tenure	Tenure			
			1-3 months	4-12 months	1-7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	22	33.9	13.7%	22.0%	46.5%	17.8%
Female	19	30.5	16.2%	23.5%	46.2%	14.2%
Age group (years)						
15-19	6	9.4	32.4%	39.5%	28.1%	0.0%
20-24	10	15.8	25.5%	31.4%	42.7%	0.4%
25-29	14	22.2	18.4%	28.6%	48.6%	4.3%
30-34	18	27.6	14.6%	25.0%	51.5%	8.8%
35-39	23	32.6	12.5%	21.9%	51.9%	13.7%
40-44	28	37.4	10.9%	19.0%	51.2%	18.9%
45-49	35	41.6	9.7%	16.9%	48.7%	24.7%
50-54	42	45.1	8.6%	15.4%	45.9%	30.1%
55-59	48	47.7	8.0%	14.2%	43.8%	34.0%
60-64	54	50.0	7.6%	13.0%	42.1%	37.3%
65 +	44	46.2	10.7%	14.2%	42.3%	32.8%
Firm size (employees at enterprise)						
1-5	15	26.9	18.5%	25.9%	45.1%	10.5%
6-9	17	28.7	16.0%	25.2%	46.8%	11.9%
10-19	17	28.9	16.6%	24.7%	46.2%	12.6%
20-49	18	30.2	17.2%	22.9%	45.9%	14.0%
50-99	20	31.4	16.4%	21.9%	46.6%	15.1%
100+	25	35.9	12.3%	21.0%	46.8%	19.9%
Industry						
Agriculture, forestry and fishing	11	23.2	26.0%	27.3%	38.0%	8.7%
Mining	23	33.7	11.5%	20.6%	50.3%	17.6%
Manufacturing	29	38.3	10.2%	19.7%	48.5%	21.6%
Electricity, gas and water supply	34	42.8	7.1%	15.3%	51.5%	26.0%
Construction	19	29.4	13.9%	23.9%	50.8%	11.4%
Wholesale trade	24	34.8	10.8%	21.8%	50.7%	16.7%
Retail trade	16	26.7	15.9%	28.0%	45.7%	10.5%
Accommodation, cafes and restaurants	9	18.0	27.5%	31.0%	36.6%	4.9%
Transport and storage	24	34.8	11.0%	21.8%	49.0%	18.2%
Communication services	23	35.5	11.1%	22.7%	46.0%	20.2%
Finance and insurance	26	36.9	8.5%	21.4%	50.5%	19.6%
Property and business services	17	28.9	17.0%	24.9%	45.7%	12.4%
Government administration and defence	37	43.5	8.4%	16.3%	46.4%	28.9%
Education	25	35.1	20.8%	14.0%	44.8%	20.4%
Health and community services	25	36.2	10.7%	21.9%	48.7%	18.7%
Cultural and recreational services	19	31.1	14.8%	24.4%	45.5%	15.3%
Personal and other services ⁽¹⁾	26	37.0	11.8%	20.8%	45.3%	22.1%
Total	20	32.2	14.9%	22.7%	46.4%	16.0%

(1) Includes jobs where industry is 'not specified'.

Table 7

Distribution of Job Tenure as at 31 March 2006
Specified at the joint PBN-ENT level (extended imputation) – main job only

	Median tenure	Mean tenure	Tenure			
			1–3 months	4–12 months	1–7 years	Job began before May 1999
			Months		Proportion of jobs	
Sex						
Male	23	34.5	12.9%	21.9%	47.0%	18.2%
Female	19	31.2	15.1%	23.3%	46.9%	14.7%
Age group (years)						
15–19	6	9.5	31.5%	40.0%	28.4%	0.0%
20–24	10	16.1	24.0%	31.6%	44.0%	0.4%
25–29	14	22.6	17.4%	28.6%	49.6%	4.4%
30–34	19	28.2	13.7%	24.8%	52.4%	9.1%
35–39	24	33.3	11.6%	21.6%	52.7%	14.2%
40–44	30	38.2	9.9%	18.7%	51.8%	19.6%
45–49	36	42.6	8.8%	16.6%	49.2%	25.5%
50–54	44	46.1	7.8%	15.0%	46.2%	31.0%
55–59	50	48.7	7.3%	13.7%	43.9%	35.0%
60–64	56	50.9	7.0%	12.7%	42.0%	38.4%
65 +	46	46.9	10.1%	13.9%	42.3%	33.6%
Firm size (employees at enterprise)						
1–5	16	27.3	17.5%	26.0%	45.8%	10.7%
6–9	18	29.3	15.1%	25.1%	47.5%	12.3%
10–19	18	29.6	15.6%	24.5%	47.0%	13.0%
20–49	19	30.8	16.2%	22.7%	46.6%	14.5%
50–99	21	32.0	15.5%	21.7%	47.2%	15.5%
100+	26	36.6	11.4%	20.8%	47.3%	20.5%
Industry						
Agriculture, forestry and fishing	11	23.7	24.7%	27.6%	38.9%	8.9%
Mining	24	33.8	11.6%	20.4%	50.8%	17.5%
Manufacturing	29	38.6	9.8%	19.6%	48.7%	21.8%
Electricity, gas and water supply	34	43.0	7.0%	15.1%	51.8%	26.3%
Construction	19	29.4	13.6%	24.0%	51.0%	11.4%
Wholesale trade	25	35.2	10.4%	21.6%	51.0%	17.0%
Retail trade	16	27.1	15.2%	28.0%	46.1%	10.7%
Accommodation, cafes and restaurants	9	18.5	25.9%	31.2%	37.7%	5.2%
Transport and storage	24	35.4	10.4%	21.6%	49.4%	18.6%
Communication services	24	36.2	10.6%	22.3%	46.3%	20.8%
Finance and insurance	26	37.0	8.2%	21.3%	50.7%	19.8%
Property and business services	18	29.5	15.9%	24.8%	46.5%	12.8%
Government administration and defence	38	44.2	7.4%	16.2%	46.9%	29.4%
Education	26	36.2	19.1%	13.9%	45.8%	21.3%
Health and community services	27	37.2	9.7%	21.4%	49.3%	19.5%
Cultural and recreational services	21	32.4	13.3%	23.8%	46.5%	16.3%
Personal and other services ⁽¹⁾	27	37.9	11.0%	20.5%	45.4%	23.1%
Total	21	32.9	14.0%	22.6%	47.0%	16.5%

(1) Includes jobs where industry is 'not specified'.