Centre of Full Employment and Equity

Working Paper No. 04-10

Small business employment dynamics in Australia

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November 2004

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1. Introduction

With the conservative parties winning control of both houses of the Parliament after the 2004 Australian Federal election the pertinent question is how much industrial reform they will attempt to get into law. It is expected that exempting small business from unfair dismissal laws will be a top priority. The small business lobby is highly organised at Peak level under the guise of the Australian Chamber of Commerce and Industry (ACCI) which regularly requests preferential treatment for its constituency from governments. It is also highly active in State and Federal industrial tribunals, generally opposing wage demands and pushing for less regulation and more 'workplace flexibility'. Their conception of flexibility is generally to cede more control to employers and reduce influence of regulation and unions. The alternative view that a highly paid, highly productive workforce is the most flexible route is eschewed by the employer groups in the industrial tribunals.

In ACCI's pre-election survey (1685 respondents), around 77 per cent of the respondents indicated that Workers Compensation costs were "a major or moderate concern" while 73 per cent expressed some concern both about Termination, Change and Redundancy Regulations and Unfair Dismissals legislation. The next largest concern, Wages was expressed by some 60 per cent of the respondents. ACCI (2004) concluded that small business should be exempted from the unfair dismissal regime under the Workplace Relations Act 1996.

Several studies reveal that labour markets in countries like Australia are in a constant state of flux (Davis and Haltiwanger, 1990, 1992; Borland, 1996). Specific jobs are continually created and destroyed as firms expand, adjust to changing labour force characteristics, restructure, contract or close. This process of job creation and destruction (JC&D) is mirrored by movements of workers between labour force states (employment, unemployment and not in the labour force). Over the last decade or so, a number of researchers have attempted to measure and describe JC&D in advanced economies (for example, U.S. studies by Blanchard and Diamond, 1990; Davis and Haltiwanger, 1990, 1992; Ritter, 1993, 1994; Davis, Haltiwanger and Schuh, 1996a, 1996b; U.K. studies by Konings, 1995; Blanchflower and Burgess, 1996; and Australian work by Borland, 1996; Mumford and Smith, 2004). Most authors use manufacturing data to compute measures of JC&D and job reallocation (JRA = JD + JC) to study their evolution across the business cycle. The U.S. evidence indicates that gross job flows are both highly cyclical and asymmetric. *JD* exhibits sharp increases during recessions, while *JC* is less volatile and has been found to both counter- and pro-cyclical (Davis and Haltiwanger, 1992). Ritter's (1994) wider-ranging study demonstrated that it was dangerous to generalise from the JC&D dynamics found in manufacturing data only.

Small business is often considered to be the 'engine' of the Australian economy in terms of job creation (Revesz and Lattimore, 1997). In this paper, we use Australian Bureau of Statistics (ABS) definition of small business which embraces less than 20 persons employed in the service industries and less than 100 persons employed in manufacturing. If small businesses are so significant then to devise policies to reduce unemployment, it is essential to understand the factors that influence employment dynamics in this sector.

Relevant to this study, are OECD-led trends which have focused on the importance of small firms in JC&D processes. Some Australian work concludes that small firms

have disproportionately higher *JC* rates (Borland and Home, 1994) and net employment growth is lower in large workplaces (Mumford and Smith, 2004). This supports arguments for a proactive small business policy as a way of increasing Australia's employment levels (Revesz and Lattimore, 1997). However, the validity of these studies has been questioned. A major issue is in differentiating the statistical facts of employment generation from what has caused that generation. Revesz and Lattimore (1997: 9 say that "Many of the new jobs were created in small business, not because that size of firm is particularly able to generate new jobs, but because the products for which demand has increased are mainly supplied by small business." Davis, Haltiwanger and Schuh (1996) found that smaller plants have both high JC and high JD rates. It is also unclear whether smallness *per se* matters or whether it is correlated with the underlying job generation factors.

Given the current political agenda noted above we seek to determine whether there are industrial or regulative constraints on the employment dynamics of small businesses. This paper is part of a large research project studying employment dynamics in Australia and Taiwan. In particular this research paper focuses on small business and the Australian Bureau of Statistics (ABS) Business Longitudinal Survey (BLS) which ran from 1994-95 to 1997-98. Specifically, we explore models of job creation rates (*JCR*) and job destruction rates (*JDR*) to determine: (a) whether size is a significant factor once we control for other industry and firm characteristics; and (b) do 'industrial factors' retard *JCR*s in small businesses.

The paper is organised as follows. Section 2 presents a critical literature review of small business employment dynamics. We identify the differing policy prescriptions which follow from contrasting interpretations of the small business sector's role in employment generation. Section 3 provides an extensive analysis of the BLS CURF and discusses the problems and pitfalls that await researchers who seek to use it. Section 4 outlines the econometric model and the estimation results. Concluding remarks follow.

2. Small business employment dynamics

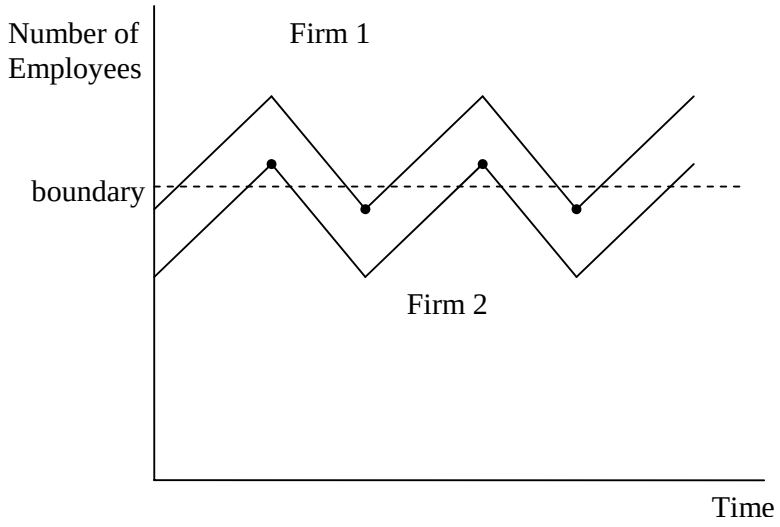
Recent debates about the supposed virtues and vices of small to medium-sized enterprises (SMEs) return to the distinction clearly established by Schumpeter (1911, 1942), who contrasted the 'creative-destruction' of small but energetic new entrants with the institutionalised efficiencies of large corporations. While innovative small firms 'ring in the new' and 'ring out the old', large, well-run corporations prosper through the exploitation of economies of scale, not only in the production of goods and services, but also in the production of knowledge and ideas.

Advocates of policies to support the SME sector recognise that small firms tend to operate well below minimum efficient scale. For that reason, while successful firms tend to grow rapidly, their survival probability is usually low. Compensating for their smaller size, though, is the fact that they frequently introduce innovative products and processes that have the potential to transform whole industries. U.S. commentators often attribute responsibility for the technology boom to Anglo-Saxon systems of corporate governance overtaking their Japanese, European, and East Asian rivals, primarily through effective provisioning of risk finance to new ventures and technology firms. Undermining an earlier literature championing German and East-Asian credit-based systems based on 'voice' rather than 'exit', a new literature focused on specific regimes of legal rights and protections, which operated to protect the providers of external finance from extortion, theft, and deception on the part of

'insiders' (La Porta *et al*., 2000). Early in the 1990s it was apparent that U.S. productivity growth was largely confined to the computer hardware sector. However, by the mid-90s productivity growth became more widespread: the resulting 'IT revolution' has undoubtedly promoted corporate decentralization, outsourcing, and formation of inter-firm networks, clusters and alliances. But high levels of net job destruction and declining real wages in the manufacturing sector over the last twenty years have also been observed (Lazonick and O'Sullivan, 2000). These developments coincided with a move towards 'downsizing' across the US corporate sector, and were aggravated by the outsourcing of low-technology jobs to Mexico and other cheap-labour economies within NAFTA.

It was against this backdrop that Davis *et al.* (1996) investigated net job creation and job destruction in U.S. manufacturing. They studied fifteen years of US Bureau of the Census longitudinal data. Net job creation rates were calculated for nine different size classes ranging from 0-19 through to 5,000 employees or more. Using employment levels at the end of the period (1988), the smallest firms exhibited the greatest employment loss and the largest firms exhibited the smallest net job losses. In broad terms these findings are reversed if employment levels at the beginning of the data period (1973) are used to determine size classes. Davis *et al.* (1996: 15) interpret these findings as evidence of 'regression-to-the-mean' bias. Figure 1 uses a diagram from Davidsson *et al.* (1998) to explain this phenomenon.

Figure 1 The regression fallacy



Source: Davidsson *et al* (1998).

With upper and lower size boundaries, regression to the mean results in a large proportion of net job creation being assigned inappropriately to smaller plants and a similar proportion of net job destruction being assigned to the larger plant category. Accordingly, Davis *et al*. (1996) prefer plant size to be calculated based on a simple average of beginning and end-of-period employment. Using this measure the authors they find that large firms and plants dominate JC&D in U.S. manufacturing.

Many subsequent studies have adopted their methodology. For example, drawing on U.K. data from the Workplace Industrial Relations Surveys (1980, 1984 and 1990), Blanchflower and Burgess (1996) studied JC&D and found very high rates of concentration, with 50 per cent of each accounted for by just 4 per cent of continuing establishments. They also found that employment growth was more volatile in manufacturing plants than in the private sector as a whole. In their study employment growth was found to be negatively related to unionization, establishment size, establishment age, and location within manufacturing.

Picot, Baldwin and Dupuy (1994) use six different definitions of size and apply these to a Canadian longitudinal data base for four sectors of the economy over three different time periods. Over both short and long run time horizons, they found that gross job gain and gross job loss, as well as net employment increases, were 'disproportionately located' in the small firm sector (also Picot and Dupuy, 1996).

The methodology espoused by Davis *et al*. (1996) was not without criticism. Kirchoff and Greene (1996) accuse them of adhering implicitly to a static equilibrium analysis: one assuming price taking firms, homogenous products, full information, and static economies of scale. They contrast the mathematical formalism of comparative static analysis (aimed at producing the 'numbers' for policy makers) with a creative-destruction view that entrepreneurs simultaneously create wealth and destroy market structures. The methodology they espouse would combine 'non-Newtonian dynamics' with a detailed cohort analysis based on unit record data. Citing the stylised fact that all firms are born small, grow large, and yet the overall static share of SMEs is constant, their response is therefore to embrace a dynamic rather than static analysis, which they suggest would confirm that SMEs are the major source of net job growth. Their simple policy prescriptions are to promote resource mobility, and destroy barriers to new entry.

Rodrigeuz *et al*. (2003) have replicated an earlier study by Dunne and Hughes (1994), which draws on learning theory to study factors such as age, size, and activity sector in explaining the growth dynamics of SMEs. Their regression-based analysis employs data on 1,092 non-financial firms in Tenerife that were active between 1990 and 1996. The approach adopted is similar to earlier studies of cumulative causation, where age rather than accumulated output is employed as a proxy for 'experience'. As such, it cannot capture the nuances of current approaches to organisational learning, which emphasise the generation and transmission of largely tacit forms of knowledge about production.

A number of Australian researchers have used the ABS BLS to date. Topics include the *Portrait of Australian Business* (IC and DIST, 1997); the social benefits of exporting (Harcourt, 2000), the characteristics of high growth firms (Hall and Tozer, 2000), innovation processes (Rogers, 2000), and the decomposition of productivity differentials (Rogers, 2000; Rogers and Tseng, 2000). Macmahon (2001) studied used k-means cluster analysis to study growth trajectories for the period 1994-98, with cluster variables including enterprise age, size and growth rate.

3. The ABS Business Longitudinal Survey CURF dataset

The data for this study was taken from the March 2004 version of the Business Longitudinal Survey: Confidentialised Unit Record File (BLS CURF), being a subset of the data collected from the Small and Medium Enterprises - Business Growth and Performance Surveys (SME-BGAPS) for years ending 1995, 1996, 1997 and 1998

(ABS 8141.0.30.001 2004; ABS 8141.0 1999). The record units were based on the 'management unit', being the highest level accounting unit within a business which usually reflected the legal entity owning the business or a 'division' in the case of larger businesses.

The BGAP surveys did not include business units who were not registered as Group Employers with the Australian Taxation Office, government enterprises, or businesses from the following industries: ANZSIC Divisions A-Agriculture, forestry ad fishing; D-Electricity, gas and water supply; J-Communication services; M-Government administration and defence; N-Education; O-Health and community services; or ANZSIC Subdivisions: 96 Other services; 97 Private households employing staff; ANZIC Groups: 921 Libraries, 922 Museums, 923 Parks and gardens.

While not a complete business survey (it excludes large firms, utilities, non-employing firms and agriculture, government, education and health) it still covers around 75% of private non-farm workers. Its main disadvantage is that precludes business cycle analysis (data is in the "middle" of 1990s cycle). The BLS provides advantages relative to the other aggregated available data: (a) it allows measures of JC&D to be computed from firm responses reducing netting-out problems; (b) it allows these measures to be decomposed into changes in existing firms and new entrants/exits in each period; (c) it provides a rich breakdown in employment responses (including reasons for total employment decreases) cross-tabulated with many other business and industry variables.

The 1994-5 BGAP survey contained around 13,000 management units randomly taken from the ABS Business Register. The sample was modified for the 1995-6 and 1996-7 surveys, with only a portion of the previous year's sample included (around 5,600) and supplemented with an additional set (around 800) to give a total sample of around 6,400 each year. The supplementary records were randomly selected from 'new' firms to the Business Register; however the continuing records were not selected randomly. From the initial 1994-5 sample, the records retained for the following year's sample were selected from those continuing to be 'live'; out of which all management units considered to be growing, exporters or innovators were included (around 3,400) along with a portion of other 'live' units (around 2,200).

The 2004 version of the CURF data for all years contained 9,732 records. This was a subset of the BLS MURF records, which had been altered for confidentiality purposes. All business units considered to be 'large businesses', such as those employing more than 200 people were removed. This also suggests that firms that grow to be over the 200 employee mark have been removed from the data set. Additionally, all financial variables were perturbed, with outliers that indicated the records as 'large businesses' also removed.

There are two sources of error with the BLS CURF data, sampling error and non-sampling error. The relative standard errors for sampling errors for each variable can be large depending on the industry, however overall relative standard errors are relatively small (ABS CURF 2000: 6). Non-sampling errors include those due to non-response, reporting errors and coding errors. Additional errors have been introduced through the process of confidentialising the data through removal of records (as discussed above), perturbation of financial data and imputation of missing data.

The ABS dealt with missing information on the survey questionnaires by imputing data (see Will and Wilson, 2001). Where only part of the survey was missing and the

ABS was unable or decided against obtaining the information from the respondent, the data was imputed at the data entry stage in an *ad hoc* and undocumented fashion (Will and Wilson 2001: 13). Will and Wilson (2001: 17-19) found that the use of imputed data affected employment calculations, with JC&D underestimated in the year of imputation; and overestimated in the following year. Thus, while JC&D is understated in the first year of survey the overall direction of the effect of imputation is unknown on the following years, although this effect was not found to be correlated with firm size or sector.

Additionally, the questions on the surveys were revised between 1995-6 and 1996-7 questionnaires. The ABS revised some imputations in response to Productivity Commission concerns regarding the data for part-time employees; however the Productivity Commission found 'unusual patterns' remained (Will and Wilson 2001: 15).

The CURF included a system of weightings to account for population representation by industry, firm size, portion of year actually operating, innovation status, export status growth status and the lag between application and appearance on the Business Register (Will and Wilson 2001: 1). However, because this study has removed additional records the weighting system was not used as the weights provided would not make the results more representative of the population. The Appendix includes details on all the modifications made to the CURF data and further details regarding records that this study included that were removed in other studies.

The CURF provided data for workers newly employed during the year (new workers) and workers ceased employment during the year (ceased workers). Only non-casual data was collected for new and ceased workers, thus worker flows calculations do not include casual workers. The CURF data for 1998 and 1997, the CURF data included casual employment in the total employment data, however for 1996 the total employment data already had casuals removed. Worker flow rates were calculated as the ratio of new workers less ceased workers to average employment (where average employment was calculated for non-casual employment); and varied between -2 and +2.

Casual employment was included for stock employment changes, thus total employment was used for 1997 and 1998, while 1996 total employment was added to the 1996 casual employment. The job flow rates were calculated as the ratio of the change in stock employment to average employment (see Section 4).

4. Empirical analysis

4.1 Constructing the job creation and destruction measures

In this section, we use BLS data to examine whether there is any systematic relationship between, the size of the business and various 'industrial relations' measures and the JC&D process after controlling for other firm and industry influences.

The measures of JC&D are adapted from Davis and Haltiwanger (1990). As explained in the previous section, we construct those measures using the 1997-1998 stock data to compensate for the noted discordance between stock and flow data in the BLS (Will and Wilson, 2001). To facilitate "an integrated treatment of births, deaths, and continuing establishments", Davis and Haltiwanger (1990: 825) use plant-specific employment divided by the average size of all plants over the year to compute the

employment-weighted average rate of increase (decrease) in plants where employment is expanding (contracting). Borland (1996) uses the same approach even though his more aggregated data precludes separate analysis of births and deaths. In comparison to Davis and Haltiwanger (1990) we use 'firm' instead of plant-level data as noted in Section 3. This is a weakness in the BLS and means we are unable to measure job changes across plants within a firm.

We define employment in firm *i* at time *t* as E_{it}. The size of the firm is defined as:

$$(1) \qquad \bar{E}_{it} = 0.5(E_{it} + E_{it-1})$$

which is the average employment for firm *i* at time *t*.

The growth rate of firm *i* (g_{it}) is defined as the change in firm *i* employment (ΔE_{it}) divided by $\bar{E}_{it}$.

$$(2) \qquad g_{it} = \frac{\Delta E_{it}}{0.5(E_{it} + E_{it-1})}$$

This measure incorporates a denominator that is influenced by two periods to avoid issues with firms starting up in period *t* with $E_{it-1} = 0$.

At the firm level, we define the rate of job creation (*JCR*) for firm *i* at time *t* as:

$$(3) \qquad JCR_{it} = \begin{cases} \dfrac{(E_{it} - E_{it-1})}{\bar{E}_{it}} & if \quad g_{it} > 0 \\ 0 & if \quad g_{it} \neq 0 \end{cases}$$

We define the rate of job destruction (*JDR*) for firm *i* at time *t* as:

$$(4) \qquad JDR_{it} = \begin{cases} \left| \dfrac{(E_{it} - E_{it-1})}{\bar{E}_{it}} \right| & if \quad g_{it} < 0 \\ 0 & if \quad g_{it} \geq 0 \end{cases}$$

Gross job reallocation, *JRA = JCR + JDR*, which is the quantity of employment that would have to be reallocated between sectors to keep constant sectoral employment levels.

$$(5) \qquad JRA_t = JCR_t + JDR_t$$

We can also compute 'average' rates of *JCR* and *JDR* for groupings of firms (say according to size in terms of employees, *s*):

$$(6) \qquad JCR_{st} = \sum_{i \in I, g_{ist} > 0} \left(\frac{E_{ist}}{E_{st}} \right) g_{ist}$$

$$(7) \qquad JDR_{st} = \sum_{i \in I, g_{ist} < 0} \left(\frac{E_{ist}}{E_{st}} \right) |g_{ist}|$$

These rates are the sums of the individual growth rates weighted by firm share in total employment in the *s* category of firms. We summarise these measures in Table 1. We do not examine excess job reallocation which is total job reallocation less the absolute value of net employment changes which indicates the excess of job changes necessary to 'accommodate' employment changes (see Leeves, 2001).

4.2 Summary characteristics of the data

A number of conclusions from Table 1 emerge. First, the two years 1997 and 1998 were growth periods overall with total employment of firms in this sample growing by 6,492 (5.7 per cent) from 114,433 to 120, 925. In net employment growth the rate increases with firm size. Second, there is only a small correlation between net employment change of firms and total rate of job turnover (0.16).

Table 1 Summary characteristics of employment and JC&D BLS data, 1997-1997

	Size of Firm in terms of 1998 Employment							
	1-19	20-49	50-99	100-149	150-200	Deaths 1998	All Firms	Births 1998
No of firms growing	841	461	289	103	54	0	1748	399
% of firms growing	32.1	45.9	54.1	62.8	71.1		37.9	
No of firms contracting	647	313	169	40	16	208	1393	0
% of firms contracting	24.7	31.2	31.6	24.4	21.1		30.2	
No of firms unchanged	1133	230	76	21	6	0	1674	0
Total No of firms	2621	1004	534	164	76	208	4607	399
Total firms reallocating	1488	774	458	143	70	208	2933	399
Average JCR	0.240	0.236	0.259	0.259	0.511		0.277	
Average JDR	0.084	0.058	0.051	0.025	0.015		0.050	
Average JRA	0.324	0.294	0.310	0.285	0.526		0.327	
Employment 1998	18490	32166	37320	20041	12908	0	120925	10727
%All Firms' Jobs 1998	15.3	26.6	30.9	16.6	10.7		100.0	
Employment 1997	18314	29871	33794	17259	9221	5974	114433	0
Total Δ Employment	176	2295	3526	2782	3687	-5974	6492	10727
% Δ Net Employment	1.0	7.7	10.4	16.1	40.0		5.7	
Ave Employment 1998	7	32	70	122	170	0	26	27
Ave Employment 1997	7	30	63	105	121	28	25	0

Third, in terms of unchanged firm employment (given overall growth) the smallest firms dominate. A higher proportion of larger firms (proportion increasing with size) were growing in 1998. Fourth, the job creation rate increases with firm size (measured in employment). The *JCR* for the firms employing 150-200 is twice that of the smallest firms (employment of 1-19). There is a clear break in the *JCR* at the top end of the sample. It is also the case that the larger firms have lower *JDR*s. But combined, given the dominance of the larger firm's *JCR*, total turnover is higher in these firms although the relatively high *JCRs* for the 1-19 employee firms leads that group to

have the next highest reallocation. Fifth, a total of 399 new firms entered the sample in 1998 adding 10,727 jobs, while 208 stopped business (losing 5,974 jobs). The average employment of the births and deaths was 27 and 28, respectively, around the All Firms' sample average.

4.3 Econometric analysis

The aim of this section is to examine whether there is evidence that:

1. The rates of JC&D significantly differ in small enterprises relative to the larger enterprises, once other firm and industry characteristics are controlled for (allowing for the fact the sample excludes business with employment over 200)?
2. Is there evidence that 'industrial relations' factors retard JCRs?

Variables used:

Firm size

Size is represented by total 1998 employment.

Age

Three dummy variables distinguish between young, medium and mature firms as follows:

- young firms - dummy is unity if the firm is less than 2 years old in 1998 and zero otherwise;
- medium aged firms - dummy is unity if the firm is between 2 and 10 years old in 1998 and zero otherwise;
- mature firms - dummy is unity if the firm is over 10 years old in 1998 and zero otherwise

We use the latter two dummy variables with young firms being the base case.

Industrial relations variables

The following variables were constructed to measure the impact of 'industrial relations' legislation or activity:

- *Awards* - the percentage of employees covered by an award only to all employees;
- *Wage Rate* - the percentage of wages and salaries paid to total expenses;
- *Union* - the number of unions represented in the workplace;
- *WCompSuper* - the sum of workers compensation and employers' contribution to superannuation expenses as a percentage of total expenses.

Industry effects

Dummy variables were constructed to control for industry effects. The industries included in the BLS are Mining, Manufacturing, Construction, Transport and Storage, Wholesale Trade, Retail Trade, Accommodation, Cafes and Restaurants, Finance and Insurance, Property and Business Services, Cultural and Recreational Services, and Personal and Other Services. The base case is manufacturing and industry dummy coefficients are relative to it.

Other firm measures

- Years of Experience in business of the major decision-maker in the firm.
- Family business – a dummy equal to one if it is a family business and zero otherwise;
- Investment Ratio – capital expenditure as a ratio of total income;
- Exports – the percentage of exports to total sales.

Regression to the mean control

To control for regression to the mean bias we included the 1997 value of the relevant dependent variable in each equation.

All regressions were estimated using OLS corrected with the Newey-West (1987) general covariance estimator, which is consistent in the presence of both serial correlation and heteroscedasticity of unknown form. In most cases the results were robust without the HAC corrections.

4.2 Job Creation

Table 2 reports the results for the *JC* regressions for 1998 for the 4208 on-going firms. The regressions explain only a fraction of the variation in the dependent variable. The size variable is positive and highly significant indicating that, other things equal, larger firms have higher job creation rates.

In terms of the 'industrial' variables, the wage rate and awards coverage are positive and statistically significant, which suggests these factors do not retard *JCR*s in the sample firms. The U*nion* variable is marginally significant at the 5 per cent level and its negative sign suggests that the more unions there are active in the workplace the lower the *JCR*. The other 'industrial variables', relating to workers compensation and employers' contribution to superannuation expenses as a percentage of total expenses (probability value of 0.44) is not statistically significant at conventional levels and thus, does not retard *JCR*.

Investment behaviour is marginally significant and impacts positively on *JCR*s (probability value = 0.10). Variables which have no statistical impact on *JCR*s include experience, age, family business, and export activity. There is also no evidence of a 'regression to mean effects'. The only significant industry effect is construction (positive relative to the base case of Manufacturing).

Table 2 Job creation rate regressions, 1998, Sample = 4208 firms

Variable	Coefficient	*t*-statistic
Constant	-0.010	0.19
Total Employment 1998	0.001	8.83
Job destruction rate 1997	-0.002	0.36
Wage Costs	0.052	3.12
Workers Comp/Superannuation costs	0.054	0.78
Awards	0.032	4.48
Unions	-0.006	1.94
Years Experience	0.000	0.19
Age – Medium 1998	0.063	1.16
Age – Mature 1998	0.039	0.71
Family business	-0.006	1.00
Exports % Sales	0.001	0.14
Investment Ratio 1998	0.004	1.61
Mining	-0.030	1.06
Construction	0.057	4.51
Transport and Storage	0.006	0.75
Wholesale Trade	-0.002	0.16
Retail Trade	0.001	0.04
Accommodation, Cafes and Restaurants	0.015	1.06
Finance and Insurance	-0.004	0.25
Property and Business Services	0.009	0.94
Cultural and Recreational Services	0.010	0.53
Personal and Other Services	0.026	1.38
R^2	0.035	
Standard Error	0.178	

Note: The sample excluded all firms with a JCR = 2, that is, new entrants in 1998.

4.3 Job destruction

Table 3 reports the results for the *JD* regressions for 1998 for the 4208 on-going firms. The regressions explain around 21 per cent of the variation in the dependent variable.

The size variable is negative and highly significant indicating that, other things equal, larger firms have lower *JDR*s.

All of the 'industrial' variables are statistically significant and negatively signed. This indicates that *JDR*s are lower in firms with higher wage rates, wider awards coverage, more workplace unions and higher workers compensation and employers' contribution to superannuation expenses as a percentage of total expenses. The reasons for this effect are however conjectural and may include a higher motivated and productive workplace or costly rigidities being introduced by the presence of unions and higher adjustment costs.

The age variables are statistically significant and *JDR*s decline as a firm enters middle-age and further into maturity. Family businesses have lower *JDR*s relative to non-Family businesses. Variables which have no statistical impact on job destruction rates include the experience variable, export activity, and investment expenditure.

Interpreting the positive significant coefficient on the 'inertia' variable (Job Destruction Rate 1997) is difficult. It would seem to suggest persistence effects exist in *JD* and not *JC* processes. We tentatively suggest that *JC* is more dynamic and subject to bursts, whereas *JD* (non-cyclical) is an unwinding attrition with considerable inertia.

Relative to Manufacturing, Transport and Wholesale Trade have lower *JDR*s and Finance and Insurance and Property and Business Services have higher *JDR*s.

4.3 Job reallocation

Table 4 reports the *JRA* regression results for 1998 for the 4208 on-going firms. The regressions explain around 17 per cent of the variation in the dependent variable.

The size variable is negative and highly significant indicating that, other things equal, larger firms have lower *JRA*s. This suggests that job churning is more common within smaller firms.

All of the 'industrial' variables are statistically significant and negatively signed reflecting their strong negative effects on job destruction. The age variables are statistically significant and *JRA* declines as a firm enters middle-age and further into maturity. Family businesses have lower *JRA*s relative to non-Family businesses.

Variables which have no statistical impact on *JRA*s include the experience variable, export activity, and investment expenditure.

Rrelative to Manufacturing, Transport and Wholesale Trade have lower *JRA*s and Accommodation, Cafes and Restaurants, Finance and Insurance and Property and Business Services have higher *JRA*s.

Table 3 Job destruction regressions, 1998, Sample = 4208 firms

Variable	Coefficient	*t*-statistic
Constant	1.795	14.38
Total Employment 1998	-0.002	9.72
Job destruction rate 1997	0.051	2.20
Wage Costs	-0.666	17.44
Workers Comp/Superannuation costs	-0.673	4.21
Awards	-0.141	8.46
Unions	-0.074	10.99
Years Experience	0.000	0.03
Age – Medium 1998	-1.161	9.29
Age – Mature 1998	-1.199	9.58
Family business	-0.053	4.00
Exports % Sales	-0.033	1.60
Investment Ratio 1998	0.005	0.86
Mining	0.049	0.76
Construction	-0.040	1.37
Transport and Storage	-0.127	6.44
Wholesale Trade	-0.119	5.22
Retail Trade	-0.036	1.05
Accommodation, Cafes and Restaurants	0.066	1.98
Finance and Insurance	0.097	2.77
Property and Business Services	0.068	3.12
Cultural and Recreational Services	0.039	0.85
Personal and Other Services	-0.009	0.20
R^2	0.207	
Standard Error	0.411	

Table 4 Job reallocation regressions, 1998, Sample = 4208 firms

Variable	Coefficient	*t*-statistic
Constant	1.743	13.42
Total Employment 1998	-0.001	5.85
Job reallocation rate 1997	0.027	2.12
Wage Costs	-0.618	15.70
Workers Comp/Superannuation costs	-0.612	3.72
Awards	-0.108	6.29
Unions	-0.079	11.49
Years Experience	0.000	0.16
Age – Medium 1998	-1.060	8.21
Age – Mature 1998	-1.115	8.61
Family business	-0.059	4.27
Exports % Sales	-0.033	1.58
Investment Ratio 1998	0.009	1.48
Mining	0.009	0.14
Construction	0.014	0.47
Transport and Storage	-0.122	6.00
Wholesale Trade	-0.120	5.11
Retail Trade	-0.030	0.86
Accommodation, Cafes and Restaurants	0.084	2.42
Finance and Insurance	0.090	2.51
Property and Business Services	0.076	3.40
Cultural and Recreational Services	0.051	1.08
Personal and Other Services	0.017	0.39
R^2	0.173	
Standard Error	0.423	

5. Conclusion

In addressing the question of whether SMEs 'punch above their weight' it is worthwhile to consider why employment in large corporations is more pro-cyclical in nature. First, through their supply chains, large corporations operate as smoothers of demand shocks, with SMEs more dependent on the income and wealth generated within their local region. Second, SMEs are less dependent on long term credit and equity-raising, the latter of which is characterised by cyclical ebbs and flows. Third, SMEs are more dependent on public R&D and subsidies, which are themselves more stable than their private sector counterparts over the business cycle.

Nevertheless, our findings suggest that, for 1997-1998 (intermediate years in the business cycle) larger firms had higher rates of job creation and lower rates of job destruction. In terms of the 'industrial' variables, the wage rate and awards coverage are positive and statistically significant, which suggests these factors do not retard *JCR*s in the sample firms. The U*nion* variable is marginally significant at the 5 per cent level and its negative sign suggests that the more unions there are active in the workplace the lower the *JCR*. Workers compensation and employers' contribution to superannuation expenses do not appear to retard *JCR*. However, all of the 'industrial' variables were statistically significant and negatively signed in the *JDR* regressions, indicating that job destruction rates were lower in firms with higher wage rates, wider awards coverage, more unions in the workplace and higher workers compensation and employers' contribution to superannuation expenses as a percentage of total expenses.

Advocates for the small business sector generally argue for a more generous dispensation of public support. However, these pleas must be greeted with some skepticism given the evidence that SMEs already receive substantial public support through university research and subsidised education and training. It would be hard to justify further assistance except in areas where markets are missing (for example, where untraded tacit-knowledge flows can be promoted), or in cases where collaborative learning can be fostered by overcoming cognitive barriers to communication (that is, through QA procedures, technical standards, and protocols). Finally, the notion that greater resource 'flexibility' (including the removal of unfair dismissal procedures) and an easing of the 'regulatory burden' will assist SME job creation is not supported by our empirical findings.

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Appendix – Data Removal

Table 1 – Records Removed

	CURF data 1997-1998 with Sample as follows:	Sample size (removed) Individually	Sample size (removed) Progressive
1b	Use only those records active for <u>any</u> of the years; (we use non-zero 'active' to catch any figures that may occur with 'active' =2, although these are usually errors which are removed in the next note).	5900 (3832)	5900 (3832)
2b	However, the 'active' indicator is not reliable to be used on it's own. Thus, where total employment is non-zero, the record must also have non-zero wages (non-zero wages were found correspond with non-zero income); Additionally, there are records where 'active'=1, sales/totalin/wages are non-zero and employment is zero. These records are kept because they may have no workers by the end of the financial year, but still have received income etc within the year;	9149 (583)	5322 (578)
3b	Either 1997 or 1998 must have non-zero total employment (incl. casuals).	5525 (4207)	4942 (380)
4	The "totemp98" does not always exactly equal the sum of (Totwpp98 + Totman98 + Totoe98 + Totcas98); Thus, remove records where unequal. If we remove the records where not exact, this equates to approx. 21 records and around 200 employment (this is unfortunate, especially for record 9006 where the sum adds to 192 but totemp98 is nil); We allow for a difference of +-2.	9721 (11)	4932 (10)
	Limit of stocks data changes. Continue below for *worker flows*…		
5b	*<u>WORKER FLOWS</u>* <u>data set</u>: Remove outliers in worker flow rates are greater than 2 or less than -2;	*5462 (4270)*	*4874 (58)*
6b	*<u>WORKER FLOWS</u>* <u>data set</u>: (new – ceased) must be within +-2 or 10% of the change in non-casual employment;	*9427 (305)*	*4607 (267)* …

	CURF data 1996-1997 with Sample as follows	Sample size (removed) Individually	Sample size (removed) Progressive
1a	Use only those records active for <u>any</u> of the years; (we use non-zero 'active' to catch any figures that may occur with 'active' =2, although these are usually errors which are removed in the next note).	5924 (3808)	5924 (3808)
2a	However, the 'active' indicator is not reliable to be used on it's own. Thus, where total employment is non-zero, the record must also have non-zero wages (non-zero wages were found correspond with non-zero income);	9326 (406)	5518 (406)
3a	Either 1997 or 1996 must have non-zero total employment (incl. casuals)	5399 (4333)	4993 (525)
	Limit of stocks data changes. Continue below for *worker flows*…		
5a	*<u>WORKER FLOWS</u>* <u>data set</u>: Remove outliers in worker flow rates are greater than 2 or less than -2;	*4987 (4745)*	*4629 (364)*
6a	*<u>WORKER FLOWS</u>* <u>data set</u>: (new – ceased) must be within +-2 or 10% of the change in non-casual employment	*9473 (259)*	*4385 (244)*

Records retained where removed / modified in other studies

Leeves (2001: 282) and Bland & Will (2001: 29) only used records that were active for the entire study period. However, this study is looking for firm births / deaths and thus only removed records which were inactive for both periods simultaneously, that is, both 'active96' and 'active97' for the 1995-6 to 1996-7 study and both 'active97' and 'active98' for the 1996-7 to 1997-8 study. Because of this, this study retains more records than other studies.

Leeves removed 'dead' firms, however similar to note above, this study included these records (Leeves 2001: 282);

Bland & Will (2001: 29) and Leeves (2001) dropped records with zero sales. This study only removed records with zero sales where there was simultaneous employment; Refer note 1.2;

Leeves removed records where casuals made up 100% of total employment for worker flows (Leeves 2001: 282). In this study, casual employees were only removed from the stock employment figures in 1997 and 1998 when studying the *worker flow rates* (new and ceased) which automatically removes these records.

Bland and Will (2001: 29) dropped all records of firms in the Finance and Insurance industry due to unreliable sales data.

Bland and Will (2001: 31) dropped all records of firms in the Mining, Transport and storage, Cultural and recreation services and Personal services industries as the remaining data was "too small".

Bland and Will (2001: 29) dropped records where at least half of their data was imputed for two or more years preceding 1997-98. However, the imputation data (respp98 or respl98=0 for 'not included' being not operating in this year, =2 for 'historically estimated return', = 4 for 'non-financial data' estimated) is unreliable as it shows non-imputed employment data simultaneously with positive employment and zero wages, income and sales (eg. record 386 – refer note 1.2 also). Will and Wilson (2001, pp.16-19) did not alter the imputed data or remove those records due to the possibility of biasing the data further.

Bland and Will (2001: 29) "reclassified" firms births according to their 'age', so that a correct birth occurred when the 'age'<2years (i.e. 'age'=1 for 0-2years) and employment<30. For example, this study found that out of the firms that first appeared in 1997, 193 firms were below 2years of 'age' and another 216 firms were above that 'age'. This reclassification will only be required when/if this study separates employment changes into new /continuing firms. Note that the questionnaire asks for the length of time the current owners have controlled the firm. Thus, 'age' will not show the correct age of the firm if it has simply changed owners.

Bland and Will (2001: 30) "reclassified" firm deaths according to whether their employment and sales declined in the year prior to death. As for the note above, this reclassification will only be required when this study separates employment decreases into continuing / leaving firms.

Bland and Will (2001: 30) removed zero/missing labour productivity.

Bland and Will (2001: 30) removed outliers in terms of productivity growth (growth must have been between 5 and 1/5) and outliers in terms of productivity levels in both 1997 and 1998.

Bland and Will (2001: 31) modified 1997-98 part-time employment data (multiplying 1997-98 total employment by the 1995-6 part-time to full-time ratio) in an attempt to overcome a possible change in employment questionnaire between 1995-96 and 1996-97. This study did not use the 1995-96 data and thus did not make this modification.

Bland and Will (2001: 31) "The ABS practice of coding deaths in the second half of a financial year as deaths in the following year, and therefore as continuing in the actual year of death means that the 1998 sample of continuing firms contains some firms which actually had ceased operation." However, as these firms were not able to be identified, Bland and Will could not remove them. This may / may not explain the presence of records with Active98=2 and no wages, sales or income and respl98=5, but with positive employment.

Bland and Will (2001: 34) used the population weightings, noting that the weighted results could not be a representation of the population.

Table 2 – Variables

Variables	Details	CURF data - original name	created
Employment	Employment stocks (at June) : can include casual employment. This is used to calculate the job flows. Worker Flows (throughout year) : Because the data collected was non-casual, this data set works with Non-casual employment. This is used to calculate the worker flows.	Employment Stock data set : (using total employment): totemp98, totemp97, (totemp96+casual6); Worker Flows data set (using non-casual employment): (totemp98–totcas98), (totemp97–totcas97), totemp96;	**totemp98** **totemp97 ws6** **wf8 wf7 totemp96**
Job Flow (rate)	The ratio of the change in employment (jobs) to average employment	(totemp98 – totemp97) / (0.5 x (totemp98 + totemp97))	**jfrate97 jfrate98**
Worker Flow (rate)	Workers newly employed less workers who ceased employment as a ratio of the average employment across the year. This gives a value between -2 and +2 due to firm births and deaths.	(newemp7 – ceasemp7) / (0.5 x ((totemp97-totcas97) + (totemp96))) (newemp8 – ceasemp8) / (0.5 x ((totemp98-totcas98) + (totemp97 – totcas97)))	**wfrate97** . **wfrate98**
Business Age	How many years has this business been owned/controlled by the present owners? OR How many years has this public co. been in operation? Age6,7,8 has five categories as follows 1 : 0-2yrs, 2 : 2-5yrs, 3 : 5-10yrs, 4 : 10-20yrs, 5 : 20+yrs;	1996-1997 data set: Age7=1 → ageyoung67 = 1 Age7=2,3 → agemedium67 = 1 Age7=4,5 → agemature67=1 1997-1998 data set: Age8=1 → ageyoung67 = 1 Age8=2,3 → agemedium67 = 1 Age8=4,5 → agemature67=1 [zero for non-operating]	**ageyoung67** **agemedium67** **agemature67** **ageyoung78** **agemedium78** **agemature78**
Size	Business size using employment– Total employment for the stock data set and Non-casual employment for the worker flows data set.	As for employment (above)	
R&D	Expenditure on R&D	**rdvalue6, rdvalue7, rdvalue8**	
Major Decision-maker	Years experience of major decision-maker (note that this aligns with mandirec=yes)	**Yrsexpe**	
Family Business	Considered a family business 0:No, 1:Yes;	**fambus**	
Union Membership	Percentage of employees union members in seven groups; 1 : none, 2 : 1-10%, 3 : 11-25%, 4 : 26-50%, 5 : 51-75%, 6 : 76-100%; (note that unless a birth firm, this data is carried forward from the initial year)	unionme7 = 1 → Unionmember67p1 unionme7 = 2 → unionmember67p2 unionme7 = 3 → unionmember67p3 unionme7 = 4 → unionmember67p4 unionme7 = 5 → unionmember67p5 unionme7 = 6 → unionmember67p6 unionme8 = 1 → Unionmember78p1 unionme8 = 2 → unionmember78p2 unionme8 = 3 → unionmember78p3 unionme8 = 4 → unionmember78p4 unionme8 = 5 → unionmember78p5 unionme8 = 6 → unionmember78p6	
No. of Unions	The number of unions represented.	**unionno6, unionno7, unionno8**	
Award	The percentage of employees	Stock data:	**awards6**

Arrangements	covered by an award only to all (total or non-casual, depending on data set) employees.	Arrawar6 / (totemp96+casual6), Arrawar7 / totemp97, . Arrawar8 / totemp98; Worker flows: Arrawar6 / totemp96, Arrawar7 / (totemp97-totcas97), Arrawar8 /(totemp98-totemp96)	**awards7 awards8** **awardf6 awardf7 awardf8**
Decreased Employment 1997	Excluding casuals, was there a decrease; 0:No, 1:Yes Reasons for decrease. 0:No, 1:Yes; Decrease in demand, contracted out tasks, improved efficiency, Replaced permanents with casuals, Reduced range of activities, Temporary decrease, Other;	**decemp7**; [note that this does not exactly correspond to calculated jd] **decem7, deccon7, decimp7, decrep7, decred7, dectem7, decoth7**; [There are double-ups]	
Exports	Exports as a ratio of Sales	Exports6 / sales6 , exports7 / sales7, exports8 / sales8 ;	**exportperc6** **exportperc7** **exportperc8**
Wages	Wages and salaries as a ratio of total Expenses.	Wages6 / totalex6, wages7 / totalex7, wages8 / totalex8;	**wagerate6** **wagerate7** **wagerate8**
Workers comp. or employer superannuation contribution	Workers compensation and employer contribution to superannuation expenses as a ratio of total expenses.	(Workcom6 + super6) / totalex6, (Workcom7 + super7) / totalex7, (Workcom8 + super8) / totalex8;	**wcompsuper6** **wcompsuper7** **wcompsuper8**
Investment	Capital expenditure investment (not disposable) as a ratio of total income (or sales, whichever is larger; and called "totalincome"). Plant, machinery and equipment; Land; Dwellings, other buildings and structures; Intangible assets;	(capexpm6 + capexla6 + capexdw6 + capexin6) / totalincome6 (capexpm7 + capexla7 + capexdw7 + capexin7) / totalincome7 (capexpm8 + capexla8 + capexdw8 + capexin8) / totalincome8	**Investratio6** . **Investratio7** . **Investratio8**
Industry	Dummy given to industry type. Value of 1 or 0.	Industry =100-199 Industry = 200-299 Industry = 300-399 Industry = 400-499 Industry = 500-599 Industry = 600-699 Industry = 700-799 Industry = 800-899 Industry = 900-999 Industry =1000-1099 Industry = 1100-1199	**inddumx9697i1** **inddumx9697i2** **inddumx9697i3** **inddumx9697i4** **inddumx9697i5** **inddumx9697i6** **inddumx9697i7** **inddumx9697i8** **inddumx9697i9** **inddumx9697i10** **inddumx9697i11** …similar for 97-98

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