Labour Turnover and Firm Performance

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Abstract: We argue that labour turnover can increase profitability, contrary to conventional wisdom. We analyse an extension of the Salop (1979) model of the impact of turnover that differentiates between incumbent and newly hired workers in the production function. An exogenous increase in the turnover rate can increase profits if firms do not choose wages unilaterally. Evidence from UK establishment-level data supports our theoretical priors and suggests that increased turnover can indeed increase profitability.

Keywords: Firm Performance; Labour Turnover; Quit Rates

JEL Classification: J21, J23, E3, F4

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1. Introduction

Labour turnover is a pervasive feature of the labour market: in OECD countries approximately 10-15% of workers quit their jobs every year; 15% in the United States alone (OECD Employment Outlook, 1999, 2005). Labour turnover affects both workers and firms: workers may need to learn new job-specific skills, whilst firms incur the costs of hiring and training new workers. Incoming workers, however, may be better

educated and more highly skilled. Hence, turnover may actually enhance firm performance, a possibility which has attracted limited attention in the existing literature, which has focused on the impact of turnover on workers rather than on firms. The existing theory is mostly based on Salop (1979), where workers are identical and firms incur turnover costs; in this context, turnover reduces profits. We analyse an extension to the Salop model that distinguishes between newly hired and incumbent workers. A higher turnover rate implies that the proportion of new hires in the workforce is larger: if this causes a sufficiently large increase in productivity and wages cannot be chosen unilaterally, then an increase in turnover can increase profits.

2. Theory

Output depends on the labour input of newly hired and incumbent workers. New hires and incumbents have different levels of job-specific human capital and are imperfect substitutes. The production function is given by $Y = F(h, I, \lambda, \sigma)$, where h is the number of new hires, I is the number of incumbents, λ denotes exogenous production-specific factors and σ is the elasticity of substitution between new hires and incumbents.[1] Firms pay all workers the same wage, $w > 0$, and the fixed unit cost of hiring and training new workers is $\tau > 0$. The per-period turnover rate, i.e. the proportion of the existing workforce who quit, is a fixed function q of wages and exogenous factors, including the general market wage that workers expect to earn if they quit, θ:

$$q = q(w, \theta) \qquad (1)$$

where $q_w < 0$, $q_{ww} > 0$, $q_\theta > 0$, $q_{\theta\theta} < 0$ and $q_{w\theta} < 0$. In every period, qN workers quit implying $h = qN$ and $I = (1 - q)N$. We consider the steady state and normalise

[1] See Garino and Martin (2007) for a more detailed analysis of aspects of this model.

output prices to unity.[2] Profits are:

$$\Pi = F(qN,(1-q)N,\sigma,\lambda) - (w+\tau q)N \tag{2}$$

Assume the firm chooses employment and wages. At an interior solution, the first-order conditions are:

$$\Pi_N = qF_h + (1-q)F_I - (w+\tau q) = 0 \tag{3}$$

$$\Pi_w = N\left[q_w(F_h - F_I) - (1+\tau q_w)\right] = 0 \tag{4}$$

If new hires and incumbents are perfect substitutes then $F_h - F_I = 0$ and the model reduces to Salop (1979). The response of profits to turnover factors is obtained by comparative statics:

$$\Pi_\theta = \Pi_q q_\theta = N(F_h - F_I - \tau)q_\theta = N\frac{q_\theta}{q_w} < 0 \tag{5}$$

The negative sign arises because a rise in θ can only increase profits if, for a given turnover cost, new hires are sufficiently more productive than incumbents at the margin. Since $q_w < 0$, equation (4) implies that $F_h - F_I - \tau < 0$. At the optimal wage, new hires are less productive than incumbents and an increase in θ reduces profits.

Now suppose firms do not choose the wage unilaterally.[3] There is only a first-order condition for employment, so the impact of turnover on profits is:

$$\Pi_\theta = \Pi_w w_\theta + \Pi_q q_\theta = N\left[(F_h - F_I - \tau)(q_w w_\theta + q_\theta) - w_\theta\right] \tag{6}$$

The number of new hires increases by $q_w w_\theta + q_\theta$ and incumbents decrease by the same amount. The resulting change in output, $(F_h - F_I)(q_w w_\theta + q_\theta)$, is ambiguous, since the signs of both $q_w w_\theta + q_\theta$ and $(F_h - F_I)$ are ambiguous. In $q_w w_\theta + q_\theta$, w_θ is expected to be positive, $q_w < 0$ and $q_\theta > 0$, while the sign of $(F_h - F_I)$ depends on the relative

[2] A dynamic version of our model is available on request.
[3] E.g., if a firm negotiates wages with a union, wages will reflect all factors relevant to both firm and union, as well as their relative bargaining power (Garino and Martin, 2000).

productivities of incumbents and new hires. The remaining term $\tau(q_w w_\theta + q_\theta) + w_\theta$ represents the impact on profits of the change in total labour costs induced by a rise in θ, which is itself ambiguous. Overall, therefore, the sign of equation (6) is ambiguous. For sufficiently high levels of q_w and F_h, it could be positive.

3. Data and Methodology

We analyse a sample of 1900 workplaces from the 2004 cross-section Workplace and Employee Relations Survey (*WERS*) (see Chaplin et al., 2005). The average quit rate in our sample, i.e. the proportion of employees on the payroll 12 months ago who stopped working at the workplace as they resigned or left voluntarily, is 13.28%.

Our sample of workplaces which set wages unilaterally comprises those workplaces where no employees have their pay set through negotiations with a trade union (1037 workplaces), with a mean quit rate of 17.52%. The corresponding sample of workplaces where wages are not set unilaterally comprise those where 100% of employees have their pay set via negotiations with trade unions (484 workplaces) with a mean quit rate of 7.82%. Those workplaces where greater than 0% but less than 100% of their employees have their pay set through trade union negotiations form an intermediate category (379 workplaces).

We categorise workplaces according to whether their workplace's financial performance as compared to other establishments in the same industry is: better than average; average for the industry; or below average and construct a three-point index representing financial performance:

$$FP_{wp} = \begin{cases} 2 = Above\,average \\ 1 = Average \\ 0 = Below\,average \end{cases}$$

where *wp* denotes the workplace subscript. We then conduct weighted ordered probit analysis to explore the determinants of FP_{wp}:[4]

$$FP^{*}_{wp} = \pi' X_{wp} + \gamma_1 q_{wp} + \gamma_2 q_{wp} \bullet NUWS + \gamma_3 q_{wp} \bullet UWS + \gamma_4 NUWS + \gamma_5 UWS + v_{wp} \qquad (7)$$

where FP^{*}_{wp} represents a latent variable denoting the unobserved propensity of workplace *wp* to achieve a certain level of financial performance; q_{wp} denotes the quit rate; X_{wp} is a vector of workplace characteristics expected to influence FP^{*}_{wp} ; β is the associated coefficients vector; γ_1 represents the coefficient on q_{wp} ; (*NUWS*) *UWS* is a dummy variable indicating that the workplace is characterised by (non) unilateral wage setting; and v_{wp} is a random error term.

To explore the robustness of our findings, we also adopt the generalised ordered probit approach, which is advantageous in that the cut-off points are allowed to vary between workplaces (see Williams, 2006). Finally, we allow for the possibility of reverse causality between financial performance and quits by adopting a two-stage probit least squares estimator, which jointly models financial performance and the quit rate. Financial performance is measured by a dummy variable taking the value of one if the workplace is in the above average category. The estimates derived from this framework are consistent with corrected standard errors (see Maddala, 1983).[5]

X_{wp} includes: industry; workplace size and age; foreign ownership; union density; an index of the percentage of the establishment's sales revenue or operating costs accounted for by labour costs; operating hours of 24 hours a day; whether the establishment faces competition from overseas based suppliers; whether the current

[4] The data was weighted as workplaces had different probabilities of being selected for the survey. The sampling frame for the 2004 WERS was the Inter-Departmental Business Register maintained by the Office for National Statistics. Differential sampling fractions have been used according to the number of employees and the 2003 Standard Industrial Classification (Chaplin et al., 2005).

[5] A list of our over identifying instruments in the quit rate equation is available on request.

state of the market is growing; and whether over the last two years management has introduced changes in the organisation of work. Workforce characteristics include the proportions of: females, part-timers, fixed term contract workers, agency workers, managers, professionals, associate professional and technical employees, administrative and secretarial employees, skilled trade employees, personal service employees, operative employees and routine unskilled employees.

4. Results

Table 1 summarises our results. We present the marginal effects of an increase in the quit rate on the probability of observing each value of the dependent variable, FP_{wp}. It is apparent that there are distinct differences in the relationship between the quit rate and financial performance depending on whether wages are set unilaterally.

In the case of unilateral wage setting, an increase in the quit rate reduces the probability of observing an above average financial performance and increases the probability of having average or worse performance. Therefore, turnover is inversely related to profits, as predicted by our theory. This finding is robust across the three modelling approaches. For establishments where no wages are set unilaterally, we find the opposite result, as increased turnover increases the probability of observing above average financial performance. In this case, turnover is positively related to financial performance, which is again consistent with our theory. This result is also robust across the three modelling approaches.

5. Conclusions

We have explored the theoretical predictions of an extension to the efficiency wage model of Salop (1979), which separates incumbent and newly hired workers in the production function. Our empirical analysis of WERS 2004 confirms that the relationship between employee turnover and firm performance is influenced by whether workplaces are able to

set pay unilaterally. Our empirical findings accord with the theoretical predictions supporting a standard inverse relationship between quit rate and firm performance where workplaces choose wages unilaterally; and indicate a positive relationship if workplaces cannot choose wages unilaterally.

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Table 1: Firm Performance and Quit Rates

	Overall Marginal Effects		
	Below Average FP_{wp}	Average FP_{wp}	Above average FP_{wp}
Unilateral Wage Setting			
Ordered Probit Model			
Quit Rate	0.0501	0.0851	-0.1352
Generalized Ordered Probit Model			
Quit Rate	0.0356	0.1222	-0.1578
Probit Least Squares Model			
Quit Rate			-0.1167
Non Unilateral Wage Setting			
Ordered Probit Model			
Quit Rate	-0.1268	-0.2153	0.3421
Generalized Ordered Probit Model			
Quit Rate	-0.0791	-0.2498	0.3288
Probit Least Squares Model			
Quit Rate			0.1553
Intermediate Firm Types			
Ordered Probit Model			
Quit Rate	0.2028	0.3445	-0.5472
Generalized Ordered Probit Model			
Quit Rate	-0.0058	0.8287	-0.8229
Probit Least Squares Model			
Quit Rate			-3.9358

Note: With the exception of the below average category, the marginal effects are significant at the 5% level.