

EMPLOYMENT VOLATILITY AND LABOR PRODUCTIVITY OF CZECH COMPANIES

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Abstract

Multiple past authors found evidence of negative effects of job insecurity on labour productivity. However, it is not clear whether the relationship is purely linear, or it contains nonlinear components. Moreover, to the best of our knowledge, no study evaluated the relationship in the Czech Republic. In this paper, we investigate the relationship between fluctuation of employment and labour productivity among 13,546 Czech companies. Using the financial data from the period 2013-2017 extracted from the Bureau van Dijk's Amadeus database and linear regression analysis, we find a significant inverse U-shaped relationship between firm-level employment volatility and labour productivity. This finding partly contradicts previous studies and suggest that job insecurity and labour productivity are first positively related and then negatively related. Possible reasons and implications are discussed.

Key words: employment volatility, job security, labour productivity, Czech Republic

JEL Code: M30, M31

Introduction

Labour productivity is traditionally defined as the output over the number of employees. At first glance, it might seem that high labour productivity in a firm cannot be achieved if employment levels are stable. However, many past studies suggest that these two phenomena are not conflicting.

Job security may be defined as the probability of retaining a job (Lindbeck & Snower, 1988) and as such, it may be seen as a non-financial benefit to employees. A relatively large body of literature acknowledged that job security is positively associated with labour productivity (Huselid, 1995; Frenkel & Orlitzky, 2005; Sun et al., 2007). On the other hand, several other studies found that job security is negatively associated with the effort of employees, which could be harmful to labour productivity (Ichino & Riphahn, 2005; Leung,

2009). The mixed findings might be explained by the fact that the relationship between job security and labour productivity is curvilinear.

Overall, several questions remain unanswered. First, it is not clear if the relationship is purely linear, or it contains nonlinear components. Second, in the Czech Republic, to the best of our knowledge, no study examined how job insecurity affects productivity. Hence, the goal of this paper is to test whether and how the volatility of employment affects labour productivity of firms in the Czech Republic.

1 Literature Review

According to the microeconomics theory, the employee turnover has a substitution and income effect (Lindbeck & Snower, 1988). While the substitution effect is positive (a worker will work in a more productive way if he/she can expect to be rewarded his/her effort), the income effect is negative (a lower risk of being fired increases the expected wealth and reduces the work effort). Hence, the two effects act in opposing directions, and the prevailing one will determine the overall relationship between job security and labour productivity.

Often, the effects of job security on labour productivity are explained using the social exchange theory. According to the theory, there is a psychological contract between a firm and its employees. Job insecurity may be viewed as a breach of this contract (Frenkel & Orlitzky, 2005). If the psychological contract is broken, employees will not form relationships at work, and instead, they will be more preoccupied with acquiring the knowledge required by the external labour market rather than the knowledge required by the firm in which they work (Ghoshal et al., 1996). As a result, job insecurity negatively affects the internal knowledge market of the firm (Chadwick et al., 2004).

On the other hand, the social exchange theory assumes that employees will be willing to exchange job security for commitment and loyalty, which have been found to increase individual effort, cooperation and teamwork (Galunic & Anderson, 2000). Job security is also considered to be positively associated with trust, which has been found to improve labour productivity (Frenkel & Orlitzky, 2005) because mutual trust improves co-worker support and information sharing (Frenkel & Orlitzky, 2005). As a result, multiple studies found evidence of a negative correlation between job insecurity and labour productivity (Frenkel & Orlitzky, 2005; Hancock et al., 2013; Huselid, 1995; Sun et al., 2007).

On the other hand, as anticipated in the introduction, several authors found that work effort of employees deteriorates when they have a “too much secure job”. For example, Leung

(2009) found that in the academic sphere, the publication productivity of professors sharply deteriorates after tenure. Employment protection has also been found to increase the absenteeism in work (Ichino & Riphahn, 2005). In an attempt to explain the mixed findings, we test if the relationship between job security and labour productivity contains non-linear components. In particular, we propose that:

H1: In Czech firms, there is an inverse U-shaped relationship between job security and labour productivity.

2 Data and Methods

The research sample is based on the Bureau van Dijk's Amadeus database. We selected all Czech firms owned by individuals or families originating from the Czech Republic with complete financial data for the period 2013-2017. The number of firms which had a non-zero change in the number of employees over 2013-2017 is 13,546. All amounts (sales, total assets) are denominated in Czech crowns (CZK).

To test our hypothesis, we used the linear regression analysis performed in Stata 14. The explained variable is labour productivity, which is measured as the natural logarithm of sales divided by the number of employees (Guthrie, 2001; Sun et al., 2007). The main predictor is job insecurity, which was measured using standard deviations of the number of employees over the selected period (2013-2017). The measurement of year-to-year volatility using standard deviations has been used by multiple authors in the management literature (Capelli & Keller, 2013; Lee, 2006, among others). To be able to compare among firms of different sizes, we normalized the standard deviations by the 2013-2017 mean values of the number of employees.

It can be expected that the relationship between job security and labour productivity is also affected by firm size and age, since larger and older firms may enjoy learning curve advantages in productivity due to the adoption of high-performance HR practices (Guthrie, 2001). Hence, in our analysis, we control for firm size (natural logarithm of total assets) and firm age (number of years since the date of incorporation). Because labour productivity is likely to be affected by contextual factors, we also use 13 dummy variables to account for industry affiliation of the companies.

To deal with heteroskedasticity, we used linear regression with robust standard errors. To evaluate multicollinearity, we used variance inflation factors (VIF). However, as the mean VIF was of 1.94 and the maximum VIF was of 3.59 (due to the quadratic term in the

regression equation), we assume that there are no multicollinearity issues in our model (Sheather, 2009). Additionally to the classical ordinary least squares (OLS) regression, we test the model using quantile regression, which is robust to heteroskedasticity and skewness typical for financial data (Agbeyegbe, 2015).

3 Results and Discussion

Table 1 presents the descriptive statistics for the firms in the sample. Due to the logarithmic transformation, labour productivity and size are not much skewed. Employment volatility, on the other hand, is very diverse. Since the values are real, however, we do not exclude the extreme observations from subsequent analysis.

Tab. 1: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Labor productivity	1.6158	1.1882	0.0034	5.6182
Employment volatility	0.2816	0.1816	0.0029	2.1649
Age	16.7821	6.7469	5	29
Size	4.0052	0.7239	1.4533	6.7653

Table 2 displays the Pearson correlations among the model variables. All correlation coefficients are significant at the 0.001 level. Labour productivity is negatively correlated with age and size and positively correlated with employment volatility. Also, as expected, age and size are positively correlated.

Tab. 2: Correlation matrix

	Labour productivity	Employment volatility	Age	Size
Labour productivity	1.000			
Employment volatility	0.1866	1.000		
Age	-0.2985	-0.1728	1.000	
Size	-0.6102	-0.1267	0.3453	1.000

Note: All correlations are statistically significant at 0.001

Regression results are presented in table 3. For clarity, 13 industry dummies are not displayed in the table. Both OLS and quantile regression report similar findings, suggesting that the effect is not due to the possible presence of influential observations in the data.

Tab. 3: Regression results

Variable	OLS regression				Quantile regression			
	β	SE	t	p	β	SE	t	p
Constant	5.081	0.049	104.36	< 0.001	5.381	0.064	83.75	< 0.001
Employment volatility	1.298	0.082	15.80	< 0.001	0.974	0.107	9.22	< 0.001
Employment volatility ²	-0.778	0.092	-8.50	< 0.001	-0.411	0.106	-3.85	< 0.001
Age	-0.015	0.001	-12.31	< 0.001	-0.014	0.001	-9.65	< 0.001
Size	-0.904	0.011	-80.75	< 0.001	-0.927	0.014	-64.45	< 0.001
R2 (pseudo-R2)	0.449				0.334			

Note: All coefficients are significant at 0.001. Industry dummies are not displayed.

The results suggest that employment volatility has a positive main effect on labour productivity, but also that there is a significant quadratic term with a negative sign, suggesting that there is a significant inverse U-shaped relationship between job insecurity and labour productivity. Overall, when job fluctuation is low, labour productivity is also low. As job fluctuation increases, labour productivity increases as well up to a certain point; then, the negative effects of job insecurity prevail, and labour productivity deteriorates.

The findings may be explained by the idea that when employment is too secure, employees will not be motivated to work productively, as the income effect of the employee turnover prevails (very high job security increases the expected income and reduces the work effort). Conversely, when employment is too insecure, the social exchange theory suggests that employees will be demotivated, which also reduces their productivity. Such a situation may typically occur under radical downsizing or financial distress of a company. As a result, moderate levels of job fluctuation – which are however individual for every firm – might be beneficial for firm labour productivity.

Several other observations stand out from our analysis. First, labour productivity is negatively related to both firm size and age. Several other authors reported that older firms do

not have better HR practices (Guthrie, 2001; Sun et al., 2017). As young firms are better able to adopt the management practices of the era they are founded, their older counterparts may be more rigid and unable able to adapt to changing conditions (Bloom et al., 2015; Ichniowski et al., 1997).

Conclusion

In this paper, we found a significant inverse U-shaped relationship between job fluctuation and labour productivity. In this regard, we complement previous studies and suggest that when the job security is very high, labour productivity may be low, and when job security is very low, labour productivity will also be low. When formulating HR policies, managers should carefully evaluate the changes in labour productivity and number of employees; observing and analyzing past trends might be useful for establishing a “healthy” level of employee fluctuation.

However, this paper also has limitations. First, we use only a limited timeframe. A longer time series could provide a better understanding of the job insecurity-labour productivity relationship and provide evidence of time-related effects (such as the moderating effect of economic development). Also, we had to rely on the Bureau van Dijk’s Amadeus database, which does not contain data for all Czech companies. Hence, the sample might lack interesting observations.

Future research could be oriented in multiple directions. A multinational sample could reveal whether our findings are valid internationally. Also, other variables, including non-financial ones, may be considered to explain better how job insecurity shapes work performance, and what are the moderating or mediating variables in the relationship.

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