Job Creation and Destruction: Evidence from the Slovak Republic 2000 – 2004[1]

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Abstract

In this paper, job flows and their determinants in the Slovak labor market over the period 2000 – 2004 are documented and analyzed. Using the dataset that covers a substantial part of the Slovak enterprise environment (the sample is restricted to enterprises with at least 20 employees), we focus on different issues of gross job reallocation. We find that job destruction dominates over job creation and job reallocation rates are comparable to those found in other transition economies. We show that most of the job reallocation emerges within the groups considered rather than between groups, the pattern that prevails in mature market economies. Finally, we investigate the enterprise growth and our results indicate that the probability of employment growth depends positively on ownership type and negatively on the initial size.

Keywords: *job creation, job destruction, enterprise growth, Slovak Republic*

JEL Classification: E24, J23, J63, P20

1. Introduction

The transition process from centrally planned to market economies in the countries of Central and Eastern Europe (CEE) started already in the early 1990s. The process of restructuring has resulted primarily into reallocations and restructuring of inefficient economic activities and labor resources into more efficient uses.

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[1] The views presented in this paper are those of the authors and do not necessarily represent those of the Ministry of Labour, Social Affairs and Family of the Slovak Republic.

Process of economic restructuring has been studied intensively and series of both theoretical and empirical literature emerged. The theoretical studies on transition contain two main classes of models. The first view is built on the Schumpeterian notion of "creative destruction", which refers to the process when emerging technologies push out the old, i.e., inefficient firms close down to make room for the expansion of newly established firms and the main force of transition is the rapid growth of the private sector (for a survey, see Caballero and Hammour, 2000). The second is the class of "optimal speed of transition" models, where the reallocation of labor from inefficient state sector to new private sector is studied and it is assumed that the job creation in the private sector depends on the speed of the job destruction in the inefficient state sector (for a survey, see Boeri, 2000). However, testing of the macroeconomic models is rather difficult in practice and only few studies have attempted to test these theories empirically (as an exception see, e.g., Jurajda and Terrell, 2002). On the other hand, a vast number of empirical studies on job flows and their determinants in CEE transition countries emerged over the last decade. These are considered as convenient indicators of labor market flexibility and restructuring processes and their dynamics and heterogeneity is usually measured in terms of job creation and job destruction based on the microeconomic data at the firm level. The main findings of this literature, the so-called "stylized facts", were summarized and extensively discussed by Haltiwanger et al. (2003).

First stylized fact is that the patterns of job flows differ in different stages of transition. During the initial transition period, in the early 1990s, practically all CEE countries experienced massive job destruction and a little job creation, which usually led to high unemployment rates, see Konings et al. (1996), Estrin and Svejnar (1998), or Bilsen and Konings (1998). Later, convergence of these two rates (job creation and destruction) has been observed and job reallocation rates became comparable to those in mature market economies, see studies by Faggio and Konings (2003) or Masso et al. (2005).

Second important finding is that the bulk of job creation was concentrated in self-employment and small and private firms, while the most job destruction took place in the unsuccessful state sector. Moreover, job flow differences are strongly linked to changes in ownership structure, i.e., shifts from former state-owned sectors to the new private-owned sectors were identified. New private enterprises seem to behave, on average, better than enterprises still in state hands, in terms of both employment and output performance, see Konings et al. (1996), Bilsen and Konings (1998) or Haltiwanger and Vodopivec (2002).

Finally, the heterogeneity of job creation and destruction has been observed; the higher share of job reallocation takes place *within* rather than *between* narrowly

defined sectors of the economy. However, as documented by Faggio and Konings (2003) or Masso et al. (2005), also the between industry reallocation is in transition countries higher than in market economies.

To date, the most recent empirical analysis on the subject of job dynamics in the Slovak Republic covers the period 1994 – 1998 and can be found in the World Bank Country Study (2002). The study documents the fact that net employment growth was low during the analyzed period. Using the firm-level data, job turnover rates for the Slovak Republic were found significantly lower than those for other countries (such as OECD countries or Poland) and job creation was well below the rates for neighboring transition countries, indicating a limited process of restructuring and a stagnant labor market. In addition, Studená (2004) studied the relationship between firm growth and firm size on a sample of medium and large Slovak industrial firms covering the period 1993 – 1996. The main message of the study was that no evidence for general firm growth and firm size relationship was detected.

The purpose of this paper is to fill in the gap in the existing literature and document the dynamics of job flows in Slovakia in the period of late transition over the years 2000 – 2004, also with respect to the so-called "stylized facts" described above. Using the firm-level database that covers a substantial part of the Slovak enterprise environment, we compute standard measures of job creation and destruction and we analyze net job flows also with respect to enterprise characteristics (i.e., industry, region, ownership, number of employees). We also investigate various decompositions of gross job reallocations and model the firm level employment growth.

The rest of the paper is organized as follows. Methodology is presented in section 2, while data and measurement issues are described in section 3. Empirical results, i.e., the aggregate job dynamics, job flows by different enterprise characteristics, together with the results of the decomposition of the excess job reallocation and the enterprise growth regressions are investigated in section 4. Conclusions and summary are presented in section 5. Finally, Appendix with detailed numerical results follows.

2. Methodology

Following conventions defined by Davis et al. (1998), the primary concept used in this analysis is job, which is understood as an employment position filled by a worker at the enterprise level. Formally, consider the change of employment in enterprise i in the subset s (which could be an economy or sector) between the sampling dates in t and $t-1$: $\Delta EMP_{is,t} = EMP_{is,t} - EMP_{is,t-1}$. Gross job creation

in an economy or sector s at time t equals all employment gains in all expanding enterprises between $t-1$ and t and gross job destruction is the sum of employment losses in all enterprises that contract or shut down, expressed as a positive number. Job creation and job destruction rates (JCR and JDR) are computed dividing the gross measures by total employment in a sector at $t-1$:

$$JCR_{st} = \frac{\sum_{i \in S^+} \Delta EMP_{is,t}}{EMP_{s,t-1}} \tag{1}$$

$$JDR_{st} = \frac{\sum_{i \in S^-} \left| \Delta EMP_{is,t} \right|}{EMP_{s,t-1}} \tag{2}$$

where S^+ and S^- denote the set of enterprises in sector s with $\Delta EMP_{is,t} > 0$ and $\Delta EMP_{is,t} < 0$, respectively.

The employment dynamics can be retrieved from the net employment change rate (NEC), which is given by the difference between job creation and job destruction rates:

$$NEC_{st} = JCR_{st} - JDR_{st} \tag{3}$$

Thus, job creation and job destruction rates decompose the net employment change into two parts, one associated with growing enterprises and the other associated with declining enterprises. Higher job creation rates mean that it is easier for unemployed workers to find a job, while higher job destruction rates imply less stability in the labor market and a higher probability of becoming unemployed.

The labor market flexibility is measured in terms of the job turnover (or job reallocation) rate (JTR), which is defined as the sum of job creation and job destruction rates:

$$JTR_{st} = JCR_{st} + JDR_{st} \tag{4}$$

Finally, the measure of the reallocation of jobs that is above the amount of job turnover, which is necessary to accommodate net changes in employment, is the excess job reallocation rate (EJR), computed as the job turnover rate less the absolute value of net employment change:

$$EJR_{st} = JTR_{st} - \left| NEC_{st} \right| = 2 \min \left\{ JCR_{st}, JDR_{st} \right\} \tag{5}$$

In particular, this measures the percentage of jobs that were reallocated from enterprises reducing the number of employees to expanding enterprises.[2] The

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[2] For example, an excess job reallocation rate of 10 per cent implies that 5 per cent (i.e., 10/2) of jobs were shifted from contracting enterprises to expanding.

excess job reallocation rate can be interpreted also as an index of restructuring, that is, if the reallocation of resources from declining to expanding sectors takes place, the ongoing restructuring process will be reflected in high excess job reallocation rates.

Measures defined above allow us to analyze fundamental patterns of gross job flows. Following the approach of Davis and Haltiwanger (1992), we investigate also the role of between and within sector employment shifts and decompose the excess job reallocation rate at time t into two components:

$$EJR_t = \sum_{s=1}^{S}\left(\left|NEC_{st}\right|-\left|NEC_t\right|\right)+\sum_{s=1}^{S}\left(\left|JTR_{st}\right|-\left|NEC_{st}\right|\right) \qquad (6)$$

The first bracket on the right-hand side is a part of the excess job reallocation that is due to *between* sectors shifts measured as the sum across sectors ($s = 1,...,S$) of the difference between the absolute net employment change for every sector and the absolute net employment change for the overall economy. The second bracket measures the contribution of *within* sector heterogeneity as the sum across sectors of the difference between the absolute job turnover rate and the absolute net employment change for every sector. This implies that if the high level of aggregation induces the heterogeneity in the employment across enterprises, the second component will approach zero as the economy is divided into different sectors.

Gross job flows are closely tied with individual enterprise's employment decisions, thus factors that affect these decisions are likely to determine also patterns of job flows on the aggregate level. Therefore, we specify major determinant factors and examine joined effects of these factors by using probability models that determine the likelihood of employment growth in individual enterprises. In particular, we will test the dependence between the number of employees and enterprise growth, a relationship in the economic literature known as Gibrat's Law, which assumes that enterprise size follows a random walk and its growth is statistically independent on the initial size. However, the empirical literature on firm growth frequently documents the fall of this hypothesis, i.e., the main finding is that firm growth decreases with firm size (for a survey, see Sutton, 1997).

In order to predict a probability of individual enterprise employment growth,[3] we will estimate the following specification:

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[3] As a first approach, we wanted to determine the enterprise-level job reallocation by estimating models with job creation and/or job destruction rates set as dependent variables and with different enterprise characteristics chosen as controls. However, regression coefficients estimated with conventional OLS technique were in most of these models not significantly different from zero and no clear dependencies were identified. Since relations among variables were found to be non-linear, a probit instead of ordinary linear regression model has been designed.

$$\Delta NEC_{i,t} = \beta_0 + \beta_1 \ln\left(EMP_{i,t-1}\right) + \sum_j \beta_j X_{i,j} + \varepsilon_{i,t} \qquad (7)$$

In the above equation, $\Delta NEC_{i,t}$ denotes "net employment creator", which is defined as a dummy that takes on value 1 if an enterprise i, from period $t-1$ to t, expands and 0 otherwise. $\ln\left(EMP_{i,t-1}\right)$ is the natural logarithm of the lagged enterprise size, measured in terms of number of employees. $X_{i,j}$ is a vector of additional characteristics related to enterprise i that consists of dummies for ownership types (state, domestic private and foreign), geographical regions, four aggregate sectors of economic activities (agriculture, industries,[4] business services[5] and public services[6]). Finally, $\beta = \left(\beta_0, \beta_1, ..., \beta_j\right)$ denotes a vector of unknown parameters and $\varepsilon_{i,t}$ is a random disturbance term. Models are estimated using a probit specification, on a pooled dataset that comprises data aggregated from periods 2000 – 2004.

3. Data and Measurement Issues

In the Slovak Republic two sources of the firm-level data, that are necessary for a job flows analysis, are available. First, the Statistical Office and its Firm Register collect such data. Second, firm-level data are gathered by the Slovak enterprise survey *Information System on Average Earnings* (ISAE). Since data from the first source were not available to us, we were left with the latter.

The ISAE is a part of the Information System on Labor Costs that is collected by a private firm for the Ministry of Labor, Social Affairs and Family of the Slovak Republic. The ISAE data is collected on the worker level on a quarterly basis. The database contains detailed information on enterprises and their workers. For the enterprise, the number of employees, legal form, branch of economic activity (coded according to NACE[7]), geographical location and ownership type is reported. Ownership types are divided into domestic private, foreign and state owned.

In the paper, data covering the period from 2000 to 2004 and corresponding to the fourth quarter of each year are used. In order to correct for possible sampling biases,[8] we have restricted the data used to enterprises with at least 20 employees.

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[4] Mining, manufacturing, utilities and construction.

[5] Wholesale and retail, hotels and restaurants, transport, communications, banking and insurance, business services.

[6] Public administration, education, health and social work, personal services.

[7] Classification of Economic Activities in the European Community.

Before the job flow estimates are presented, it should be mentioned what we could have measured and what not due to the limitations in the data. In particular, the data does not provide financial information on enterprises, such as turnover, profits, and value added, which considerably limits any analysis. Moreover, no information on the age of the enterprise is available. Thus, for new entries to the sample it is not possible to distinguish between newly created enterprises and those enterprises that were just added to the database by the data-collecting agency, but were already in operation before. Analogically, if an enterprise drops out of the sample, no information as to whether this was due to its closure (bankruptcy) or some other reason is provided. This implies that (i) standard decomposition of job flows in an "openings" and an "expansions" component is not possible, and (ii) the analysis is restricted to "continuing enterprises" (i.e., only enterprises that are present in the sample during two consecutive periods are considered). This has important limitations for the values of the indices we use in this analysis. The job creation and job destruction rates computed using these data grossly underestimate the true values of the flows, as they neglect the employment flows in newly created companies and in those that cease to exist.[9] Thus, bearing these caveats in mind, the absolute values of the flows that emerge from this analysis should be taken with some caution and the value of the analysis should be placed more on the profile and emerging patterns.

4. Results

4.1. Aggregate Job Flows

The average job creation rate in the sample considered in 2000 – 2004 is 7.2 per cent and the average rate of destruction is 10.9 per cent, which leads to a negative net employment change rate, on average –3.7 per cent. The rates of changes year by year are detailed in Table 1 in the Appendix.

As we can see from Table 1, negative net employment change rate has an increasing tendency in 2000 – 2003, and the job creation rate is always dominated by the job destruction rate. This overall negative trend seems somewhat at odds with the estimates of employment trends at the national level, which – as is evident from Table 2 – show positive, although modest, increase. Two main justifications can be advocated for this apparent contradiction. First, the fact that this

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[8] In particular, insufficient coverage of small enterprises with less than 20 employees, and certain over-representation of manufacturing industry have been detected.

[9] In several transition economies, e.g. Bulgaria, Lithuania and Poland, it has been documented that startups account for around one-third of annual job creation (Rutkowski 2001, 2003a and 2003b).

analysis focuses on "continuing firms" and ignores the effects of enterprise creation, which, in the context of the Slovak Republic in recent years, could be substantial and is probably in excess of enterprise destruction.[10]

T a b l e 1

Job Flow Rates (in %)

	Job Creation	Job Destruction	Net Employment Change	Job Turnover	Excess Job Reallocation
2000/2001	6.3	9.6	–3.3	15.8	12.5
2001/2002	8.1	12.1	–3.9	20.2	16.3
2002/2003	6.9	11.0	–4.1	17.8	13.8
2003/2004	7.6	11.0	–3.4	18.5	15.2
Average	**7.2**	**10.9**	**–3.7**	**18.1**	**14.4**

Source: Authors' calculations based on ISAE.

Second, there is a recent marked change in the employment structure over the studied period. Table 2 shows that the small increase in employment in the Slovak Republic is the result of a reduction in the number of employees which is more than compensated by a sharp rise in the number of self-employed persons (22 per cent growth in 2004). As the self-employed and the small enterprises (with less than 20 employees) are excluded from the analysis, the positive trends in this sector are not picked up by the job flows examined here, while the reduction in the number of employees is.

T a b l e 2

Number of Employed Persons in the Slovak Republic, 2000 – 2004
(in thousands of persons)

	Employed Persons						Self-empl. to Total (in %)
	total	change (in %)	of which employees	change (in %)	of which self-empl.	change (in %)	
2000	2 101.7		1 931.0		167.4		8.0
2001	2 123.7	1.0	1 943.4	0.6	177.9	6.3	8.4
2002	2 127.0	0.2	1 940.9	–0.1	183.1	2.9	8.6
2003	2 164.6	1.8	1 947.6	0.3	210.9	15.2	9.7
2004	2 170.4	0.3	1 904.2	–2.2	256.8	21.8	11.8
Average SR 2000 – 2004	**2 137.5**	**0.8**	**1 933.4**	**–0.4**	**199.2**	**11.6**	**9.3**

Source: Labor Force Survey. Statistical Office of the SR.

In international comparison, when compared to the average in the Euro Area,[11] the excess job reallocation rate in CEE transition countries[12] including

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[10] By comparing the average net job creation (–3.7 per cent) with the average change in the number of employed persons (–0.4), we can quantify the underestimation of job creation in our analysis to be approximately of 10 per cent.

the Slovak Republic is significantly higher, indicating the presence of a dynamic restructuring process in national labor markets.

4.2. Job Flows by Enterprise Characteristics

In this section we analyze job flows by different enterprise-related character-istics. In particular, we examine disparities in job dynamics by industrial sectors, enterprise size and ownership types.

T a b l e 3
Job Flows by Industries (in %), Average Over 2000 – 2004

Industry	Job Creation	Job Destruction	Net Employment Change	Job Turnover	Excess Job Reallocation
Agriculture, Forestry, Fishing	7.7	16.3	–8.6	24.0	12.7
Mining, Metallurgy	1.8	19.2	–17.3	21.0	3.7
Manufacturing	6.4	9.8	–3.4	16.1	12.6
Utilities	4.9	5.8	–0.8	10.7	4.4
Construction	11.4	13.9	–2.5	25.3	21.0
Wholesale, Retail Trade	14.9	11.7	3.2	26.6	19.1
Hotels and Restaurants	10.8	13.3	–2.5	24.1	9.2
Transport, Communication	7.7	13.5	–5.8	21.3	12.5
Banking and Insurance	11.4	8.3	3.2	19.7	12.2
Business Services*	10.4	10.4	0.0	20.8	11.4
Public Administration	8.1	9.4	–1.2	19.7	9.7
Education	5.8	8.3	–2.5	13.4	10.7
Health and Social Work	5.1	6.2	–1.1	11.3	5.6
Other, Personal Services	10.1	10.7	–0.6	20.8	18.9

Source: Authors' calculations based on ISAE.

We begin with the analysis how job reallocation varies by industrial sectors (see Table 3). Sectors with the highest rates of restructuring, measured in terms of excess job reallocation rate above the sample average, include construction (46 per cent) and personal services (31 per cent). Restructuring is not surpris-ingly lowest in the utilities and mining sectors. The highest job creation rates are found in retail (106 per cent above the average) followed by banking and insur-ance, and construction. Conversely, major job destruction took place in mining (76 per cent above the average) and the agriculture sectors (50 per cent above the average), the two sectors with the highest amount of job closures. In addition, two clearly growing sectors emerge from this analysis.[13] First, positive dynamics can be observed in the construction industry: the job creation rate is rising over

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[11] The excess job reallocation rate over 1992 – 2001 was 7.4 per cent (Gomez-Salvador et al., 2004). Note that we compare our results with these studies, which analyze comparable time period, i.e., beginning from 2000. Moreover, in order to facilitate comparison, only continuing enterprises are considered, openings and contractions are excluded in all analyzed countries.

[12] The excess job reallocation rate reached in 2000 (in per cent): 13.5 in Bulgaria (Rutkowski, 2003b), 13.8 in Lithuania (Rutkowski, 2003a) and 11.8 in Ukraine (Konings et al., 2003).

the studied period (from 5 per cent in 2001 to 15 per cent in 2004). Second, the banking sector can be characterized by high job creation rates, on average at 13 per cent during 2000 – 2004, despite a 6 per cent decline in 2004. The job destruction rate is the lowest across sectors, with the average level 4 per cent (if 2001 is excluded).[14]

T a b l e   4
Spearman's Rank Correlations among Job Flows in 14 Industries, Based on Pooled Data from 2000 – 2004 (56 observations)

Region	Job Creation	Job Destruction	Net Employment Change	Job Turnover	Excess Job Reallocation
Job creation	1.000				
Job destruction	−0.172 (0.204)	1.000			
Net employment change	0.611 (0.000)	−0.835 (0.000)	1.000		
Job turnover	0.542 (0.000)	0.625 (0.000)	−0.212 (0.117)	1.000	
Excess job reallocation	0.632 (0.000)	0.358 (0.007)	0.058 (0.672)	0.542 (0.000)	1.000

Note: p-values are given in parentheses.
Source: Authors' calculations based on ISAE.

As a next step, we look at the relationship between job creation and job destruction. The results of the correlation analysis in Table 4 show that Spearman's rank correlation coefficient is negative (–0.172) and only approaches significance.[15] This implies that a systematic relation between employment gains in some industries and losses in others is rather weak.

On the other hand, there is a significant dependence between employment growth and job flows. The correlation coefficient between the net employment growth and the job creation rate at the sectoral level, pooled over years 2000 – 2004, equals 0.61. However, the dependence between the employment growth and the job destruction rate is stronger (–0.84). This is in contrast with findings for Poland (Rutkowski, 2001) and Estonia (Masso et al., 2005), where the job creation rate has been identified as a more important determinant of the employment growth at the sectoral level. Another question often discussed in the literature (see e.g. Boeri, 1996) is whether the job turnover exhibit cyclical or counter-cyclical pattern. Correlation coefficient between the job turnover and the

[13] Growing sectors are identified based on the analysis of annual changes over the period 2000 – 2004. Detail estimation results are not reported, but available upon request.

[14] The likely reason for the high level of job destruction (22 per cent) is that in 2000 – 2001 four of the Slovak banks went into bankruptcy. Therefore, year 2001 is not representative.

[15] If these flows were driven by symmetric shocks, their correlation would equal –1.

net employment change is rather weak (–0.212). This means that the job turnover is acyclical for the entire enterprise environment in Slovakia.

Next, the correlation between the excess job reallocation rate, a measure of restructuring, and the job creation rate (0.63) is stronger than with the job destruction rate (0.36). These dependencies suggest that the job creation has been a driving force behind the sectoral restructuring, rather than job destruction.

T a b l e 5

Job Flows by Enterprise Size (in %), Average Over 2000 – 2004

Number of Workers	Job Creation	Job Destruction	Net Employment Change	Job Turnover	Excess Job Reallocation	JC Share	JD Share	Employment Share
20 – 49	4.2	22.1	–17.9	26.3	8.4	1.2	4.1	2.0
50 – 249	5.4	17.6	–12.2	22.9	10.8	11.7	25.6	15.6
250 – 499	6.1	14.5	–8.4	20.6	12.2	10.0	16.0	12.1
500 – 999	8.5	11.8	–3.3	20.3	14.8	24.2	22.8	20.9
>1 000	7.8	7.1	0.7	14.9	11.1	52.9	31.6	49.5

Note: JC (JD) share denotes a fraction of jobs created (destroyed) in a given enterprise size category to the total number of jobs created (destroyed).

Source: Authors' calculations based on ISAE.

We next analyze how job flows differ by enterprise size. According to the numbers of workers, there is an inverse dependence over the period 2000 – 2004 between job turnover and enterprise size (see Table 5), what is a common conclusion in the CEE transition countries analyses (Faggio and Konings, 2003), as well as, in the EU countries analyses (Gómez-Salvador et al., 2004). The most dynamic are small enterprises, with 45 per cent job turnover over the sample average, while the job turnover in the category of the largest enterprises is only 82 per cent of the sample average. However, this high job turnover is induced by high job destruction rates, which decline with the increasing number of workers from 22 per cent in small enterprises to 7 per cent in extra large companies. On the other hand, job creation rates are less volatile:[16] in the category of small enterprises job creation equals to 4 per cent and increases with enterprise size up to 8 per cent for large enterprises. The dependencies mentioned above are comparable to those reported for Estonia (Masso et al., 2005). High job destruction rates together with low job creation rates caused lower net employment changes, especially in smaller enterprises. We interpret this finding that the enterprises are still reducing the number of workers in order to improve the productivity of labour and competitiveness on the market.

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[16] Volatility is measured in terms of standard deviations. The standard deviation of the job creation rate equals 2.3 (over 2000 – 2004, using 20 observations) and is significantly less than the value of 7.3 for the job destruction rate.

At this stage it is necessary to point out that according to the Slovak Statistical Office data, the number of employees in small and medium enterprises significantly increased during the period studied. However, our findings do not correspond with these figures and a possible reason has been already mentioned in the section on aggregate job flows. Our data does not allow us to capture the newly established firms and these are created mainly in SME's sector.[17]

T a b l e 6

Job Flows by Ownership Categories (in %), Average Over 2000 – 2004

Ownership	Job Creation	Job Destruction	Net Employment Change	Job Turnover	Excess Job Reallocation	JC Share	JD Share	Employment Share
State	6.0	10.9	−4.9	17.0	12.1	36.1	46.5	39.5
Domestic Private	6.4	12.0	−5.6	18.3	12.7	39.1	31.8	40.3
Foreign	14.7	12.4	2.4	27.1	23.8	25.9	17.8	20.1

Note: JC (JD) share denotes a fraction of jobs created (destroyed) in a given ownership category to the total number of jobs created (destroyed).

Source: Authors' calculations based on ISAE.

According to ownership types, a significant difference over the period 2000-04 exists between state-owned and domestic private enterprises on one side and foreign enterprises on the other. Table 6 shows that state and domestic private companies share similar patterns: there is a substantial gap between job creation and destruction. Since the job creation is on average only a half of the job destruction, this leads in both cases to negative net employment growth. Consequently, their job turnover and excess job reallocation rates are similar in magnitude. However, there is significantly more dynamics in the sector of foreign owned enterprises, where the job turnover rate reached 50 per cent above the average. The job creation rate at 15 per cent is more than two times higher than in domestic enterprises (both state and private). Although the job destruction rate is rather high and at 12 per cent comparable in magnitude with the corresponding rate for domestic companies, it still leads to a positive net employment growth of 2 per cent.

The dynamics of the contribution of different ownership categories to job creation and destruction is measured as a fraction of the total number of jobs created and destroyed in the sample and graphed in Figure 1. In particular, the following can be observed. The developments in foreign enterprises are considerably different from the other two categories: job creation and destruction shares

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[17] For example, 1 704 new enterprises started up doing business in 2004. For more information on SME in Slovakia, see publication *State of Small and Medium Enterprises in the Slovak Republic, 2004* (National Agency for Development of Small and Medium Enterprises, 2005).

were almost constant during the first three periods, with the job creation share always well above the job destruction share. In the last period, the job creation share rose significantly,[18] while the job destruction share experienced a decline. Further, the employment share in foreign enterprises is rising uniformly, and is accompanied by a uniform decrease in the employment share for state-owned enterprises.

F i g u r e 1

Job Creation, Job Destruction and Employment Shares by Ownership Categories in 2000 – 2004

a) Job Creation Share (in %)　　b) Job Destruction Share (in %)　　c) Employment Share (in %)
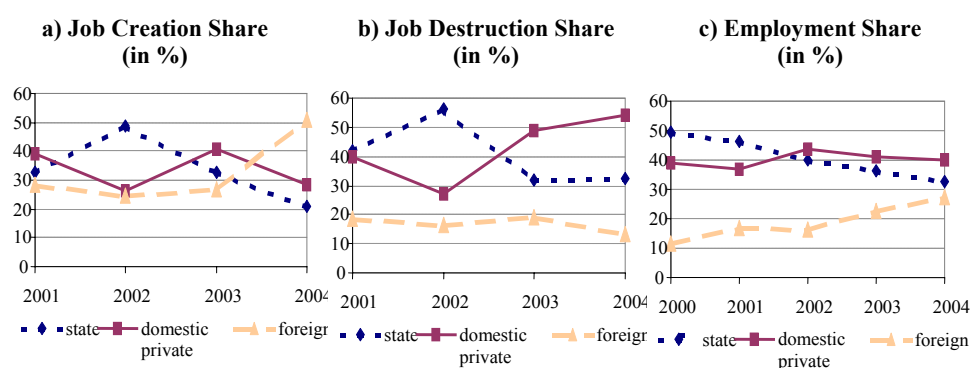
Source: Authors' calculations based on ISAE.

Comparing results for 2004 with previous years, we find out a substantial change in foreign sector, where the rate of job creation is more than two times higher than the job destruction rate. Possible explanations for this growth are a labor market liberalization and a tax reform introduction at the beginning of 2004,[19] which makes Slovakia more attractive location for enterprises. Our analysis confirms significant expansion of foreign enterprises in 2004; thus, we suppose, these enterprises reallocated some of their operations to Slovakia, as it became more profitable.

4.3. Decomposition of the Excess Job Reallocation

The previous paragraphs show that the pattern of job reallocation divers across different groups of enterprises. A possible approach to summarizing these

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[18] This increase in job creation rate (it reached 17 per cent) in foreign enterprises is a sectoral effect, driven by a substantial growth in two industries, namely manufacturing (9.6 per cent) and transport-communications (4.9 per cent). Detail estimation results are available upon request.

[19] Flat 19 per cent rates were introduced for income tax, corporate tax and value added tax. The dividend withholding tax was abolished.

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results is to consider the role of employment shifts between and within groups (i.e., industries, ownership types, enterprise sizes and regional location). Empirical evidence suggests that a misallocation of resources in the economy implies that employment shifts occur mainly between groups – from the declining to the growing groups.[20]

T a b l e 7

The Share of Excess Job Reallocation Due to Employment Shifts within Groups (in %)

	Industry	Region	Enterprise Size	Ownership Category
2000/2001	69.7	69.4	47.8	87.7
2001/2002	50.9	71.5	72.6	84.8
2002/2003	56.9	73.5	54.1	81.1
2003/2004	61.8	67.6	45.7	55.5
Average	**59.8**	**70.5**	**55.1**	**77.3**

Note: Decomposition for particular years is computed using the annual results; the average is computed from the average results reported in Tables 3 – 8.

Source: Authors' calculations based on ISAE.

The per centage of the excess job reallocation that arises due to within groups employment shifts is presented in Table 7. Overall, employment shifts within the same region, industry, enterprise size and ownership category seem to respond to the major part of job reallocation. Similar pattern has been found also in other CEE transition countries (Faggio and Konings, 2003, and Masso et al., 2005).

It is interesting to note that for regions, industries and enterprise sizes no significant pattern or evolution over time in the decomposition of the excess job reallocation can be detected. However, difference in ownership is the most important factor driving reallocation of jobs and, moreover, an increase in the across-group excess job reallocation can be identified. This is consistent with our previous findings in the analysis of job flows according to ownership categories, where a shift in the job creation and employment shares between the state-owned and foreign enterprises has been reported.

4.4. Modeling Enterprise Employment Growth

Using the descriptive analysis, separate effects of different factors (industrial sectors, enterprise size, ownership types, regional location, etc.) on gross job flows were analyzed in detail. The purpose of this section is to figure out major determinants and examine joined effects of these factors on enterprise job crea-

[20] According to Bilsen and Konings (1998), at the beginning of the transition process in CEE countries, the job reallocation was identified mainly between groups; later on it was identified primarily within groups.

tion. Therefore, we estimate three probit models[21] to test the determinants of the likelihood of employment growth in individual enterprises.

T a b l e 8

Restructuralization and Enterprise Growth

Dependent Variable: Net Employment Creator						
Model	(1)		(2)		(3)	
Variable	coef	z-stat	coef	z-stat	coef	z-stat
Constant	–0.216	–7.272	0.398	4.647	0.275	2.241
Ownership (State omitted)						
Domestic private	–0.053	–1.313	–0.080	–1.944	–0.006	–0.119
Foreign	0.214	3.443	0.267	4.246	0.276	3.926
Ln(size)			–0.121	–7.641	–0.114	–6.943
Industries (Agriculture omitted)						
Industries					0.178	2.291
Business Services					0.181	2.254
Public Services					0.297	3.537
Regions (Bratislava omitted)						
Banská Bystrica					–0.160	–2.254
Košice					–0.065	–0.824
Nitra					–0.198	–2.806
Prešov					–0.186	–2.691
Trenčín					–0.165	–2.227
Trnava					–0.124	–1.604
Žilina					–0.323	–4.606
Akaike info criterion		1.354		1.341		1.337
LR statistic		19.090		78.248		117.379
Probability (LR stat)	7.2E-05 (2 df)		1.1E-16 (3 df)		0 (13 df)	
Obs with Dep = 0		2594				
Obs with Dep = 1		1837				
Total obs		4431				

Source: Authors' calculations.

First, we present a baseline specification (see Table 8, model 1), where only the impact of ownership on a probability of enterprise expansion is studied. Results are in line with our expectations: the estimated coefficient for foreign ownership is significant and positive, i.e. this factor positively increases the probability of enterprise employment growth, compared both to the benchmark state owned and also to the domestic private enterprises. Moreover, foreign enterprises were also in the descriptive part of this analysis clearly identified as leaders of the net job creation. Given the results of descriptive analysis, it is not surprising that no statistically significant difference in performance of domestic private and state owned companies has been found. Nevertheless, negative effect of domestic private ownership on enterprise growth compared to state ownership is

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[21] We use three nested specifications; each extension of the model has been tested with the Omitted Variables – Likelihood Ratio Test, which tests the hypothesis that listed variables were incorrectly omitted from the estimated equation.

also in line with previous results; since the average net employment change over 2000 – 2004 is –5.6 per cent for domestic and –4.9 per cent for state enterprises (see Table 6). Note that these results remain robust also when more structure in the models is allowed (see models 2 and 3).

The second specification (model 2) controls in addition for size effects by using the logarithm of the lagged employment level. Our estimate of this variable is significant and negative, which we interpret as a negative impact of the initial enterprise size on the probability of employment growth. Contrary, in the previous analysis of Slovak industrial sector (Studená, 2004), no form of a systematic relationship between firm growth and firm size was confirmed. On the other hand, our finding is in line with the earlier works in the field of firm growth in transition countries (see Faggio and Konings, 2003; Masso et al., 2005), in both of them it has been demonstrated that proportional rate of growth of enterprise is decreasing in size, what implies the fall of Gibrat's Law. Moreover, we also analyzed the size effect on the probability of enterprise growth for each ownership type separately.[22] In all three cases, we found a negative effect on enterprise size and the largest (in absolute value) coefficient was detected in the group of state enterprises. We explain this as an evidence of the ongoing restructuring process in larger state owned enterprises, what might be a sign that transition of the Slovak labor market has not been finished yet. On the other hand, initial size does not have a statistically significant impact on the probability of growth in the foreign owned firms; here the departure from Gibrat's Law is smaller.

The third specification (see Table 8, model 3) takes into account enterprise heterogeneity by using regional and industrial dummies. All estimated coefficients have the expected sign and majority of them remained statistically significant. More precisely, probability of creating new jobs decreases, if an enterprise is located in the different region from Bratislava. If an enterprise operates in different sector than agriculture, the probability of enterprise expansion increases.

Summary and Conclusions

This paper describes and analyses job reallocation within the labor market in Slovakia over the period from 2000 to 2004. An empirical research presented here is based on a large micro data set containing detailed information at the worker level. In order to avoid possible sampling biases we have restricted the data used to enterprises with at least 20 employees.

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[22] Estimated regressions are not reported, but detail results are available upon request.

Estimates of aggregate job creation and destruction are in magnitude similar to those reported for other CEE transition countries; in particular, the average job creation rate in the sample is lower than the average rate of destruction. This leads to a negative net employment change rate, which is more than compensated by a sharp rise in the number of self-employed persons.

Next, we present a descriptive analysis of job flows, where enterprise characteristics are taken into account. As the most dynamic we can consider smaller, foreign owned enterprises.

Several interesting results arise from a correlation analysis. First, we observe strong dependencies between net employment growth and job destruction at the sectoral level. Second, we found that job creation has been a driving force behind the sectoral restructuring, rather than job destruction, during the period studied.

Decomposition of excess job reallocation shows that employment shifts occur mainly within the same group (region, industry, enterprise size and ownership category). It is interesting to note that for regions, industries and enterprise size no significant pattern or evolution over time in the decomposition of the excess job reallocation can be detected. However, a difference in ownership is the most important factor driving reallocation of jobs. We also identified an increase in the between group excess job reallocation in the last year from the period considered.

We estimated several probability models in order to investigate the influence of selected features (ownership types, enterprise size, geographical regions and sectors of economic activity) on probability of the enterprise growth. We found a negative impact of an initial enterprise size on the probability of employment growth, mainly in the state owned enterprises. This we explain as an evidence of the ongoing restructuring process in larger state owned enterprises, which might be a sign that the transition of the Slovak labor market has not been finished yet.

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