



THE WILLIAM DAVIDSON INSTITUTE  
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*A Comparative Look at Labor Mobility in the Czech Republic:  
Where Have All the Workers Gone?<sup>1</sup>*

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**A COMPARATIVE LOOK AT LABOR MOBILITY IN THE CZECH  
REPUBLIC: WHERE HAVE ALL THE WORKERS GONE?<sup>1</sup>**

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## **A COMPARATIVE LOOK AT LABOR MOBILITY IN THE CZECH REPUBLIC: WHERE HAVE ALL THE WORKERS GONE?**

### **ABSTRACT**

In this paper we provide a comparative analysis of the extent and determinants of labor mobility in the Czech Republic during 1994-1998. Our analysis is motivated by the fact that labor mobility is crucial for an efficient allocation of resources and the transition economies are often viewed as suffering from inadequate reallocation of labor. We find the Czech labor market has shown a great deal of flexibility. There has been significant movement into the newly created finance, trade and tourism sectors and considerable outflows from the agricultural and industrial sectors. Over half of the people who change jobs have changed sector of employment. Although flows out of employment are small relative to other transition countries, there is a high degree of turnover in the pool of unemployed and job-to-job flows are relatively high (except compared to Russia). These flows are very responsive to demand conditions. The younger and more educated are the ones experiencing the most mobility and the more positive directions of mobility. The existing problems of inadequate restructuring appear to have their origins outside the labor market.

*Journal of Economic Literature* Classification Numbers: C41, H53, J23

## Non-Technical Summary

In this paper we provide a comparative analysis of the extent and determinants of labor mobility in one of the more mature transition economies. Our analysis is motivated by the fact that (a) labor mobility is crucial for an efficient allocation of resources in market economies and (b) the transition economies are often viewed as suffering from inadequate reallocation of labor. We analyze worker mobility during 1994-1998 in the Czech Republic, and to the extent possible, we compare our findings to those from recent or ongoing studies of the other transition economies.

Our analysis proceeds at two levels. We first calculate overall and sector-specific gross probabilities of mobility and then estimate multinomial logits with the micro data. In assessing the functioning of the transitional labor market, we focus on three characteristics: i) how much restructuring has occurred in terms of sectoral shifts; ii) to what extent has the adjustment been carried out efficiently (i.e., with job-to-job rather than job-unemployment-job flows and with relatively short rather than long spells of unemployment); iii) which demographic groups are the winners and losers in the adjustment process; and iv) how does mobility in the Czech labor market compare with other transitional economies.

There has been a significant shift in the structure of employment by industrial sector. This restructuring occurred mostly during the 1989-93 period, although there have been continued shifts in the 1994-1998 period as well. The largest declines in employment were in the two largest sectors: agriculture and industry. The sectors creating employment most rapidly were the ones that had not been considered important under communism: financial services and trade and hotels and restaurants.

We show that the changes in the employment structure were brought about relatively efficiently: generally with shorter spells of unemployment compared to the other transitional economies and relying increasingly on job-to-job mobility and less on sending people out-of-the labor force. Whereas, the extent of job-to-job and unemployment-employment mobility has been relatively high in the Czech Republic compared to the other transitional economies for which we have data (except Russia), it has not approached the high levels in the US.

From the analyses of labor market transitions by sector of job, we find that people previously employed in agriculture were less likely to change jobs, or find employment if previously unemployed and more likely to leave the labor force. The most interesting finding is that the highest turnover is actually in the growing (rather than declining) sectors of the economy: trade, construction and hotels and restaurants.

About one half of the people who change jobs (with or without a spell of joblessness) also change their sector of employment. The change in sector is occurring more among people who find a job out of unemployment or out-of-the labor force than among the job-to-job movers. The fast growing financial service sector is hiring people who are unemployed and out-of-the labor force at the same rate they are hiring people who are employed. We see this as evidence that the unemployed are not being scared by the experience.

The labor market has shown a great deal of flexibility and responsiveness to changes in demand conditions both at the local and national level. We estimated an

elasticity of 0.12 for the job-to-job hazard with respect to a change in the local vacancy rate. The probability that an employed person became unemployed ( $P_{eu}$ ) declined by 0.24 percent with a one percent increase in the local vacancy rate. The probability that an unemployed person found a job ( $P_{ue}$ ) increased by 0.34 for a one percent increase in the local vacancy rate. None of the other hazard rates (to and from out-of-the labor force) were affected significantly by the local demand conditions. However, all were affected by national conditions, as estimated with annual dummies in the logit model. For example, we find that the  $P_{eej}$  rose rapidly from 1994 to 1996 and then began to decline in 1997 and again in 1998 as GDP growth declined in those two years. Nevertheless, the  $P_{eej}$  in 1998 was still higher than the  $P_{eej}$  in 1994. Conversely, the  $P_{eu}$ 's declined in 1995 and 1996 but then grew again in 1997 and 1998. Similarly, the  $P_{ue}$ 's declined as the economy worsened and were much lower in 1998 than in 1994, indicating that the duration of unemployment spells began to grow in that year.

Finally, the multinomial logit analysis enables us to answer the questions about who, in terms of demographic characteristics, is more likely to leave employment, change jobs, exit unemployment etc. We find that younger people seem to be experiencing the most mobility and the more positive directions in mobility. The younger are more likely to change jobs; they are more likely to lose their job and become unemployed although they are less likely to leave a job to go (be pushed) out of the labor force. Once unemployed, the younger are more likely to find a job and less likely to leave the labor force. Once out of the labor force, the younger are more likely to find a job or be seeking work (become unemployed). People with less education do not fare as well as those with more education. The less educated are less likely to stay employed, more likely to change jobs (which is positive) but more likely to lose their job to unemployment or out-of-the labor force and more likely to stay unemployed or out-of-the labor force. In terms of gender and marital status, we find that married men are most likely to keep their jobs (although the differences in the probabilities are small), single men are most likely to change jobs (with women's probabilities about one half of theirs). However, single men are also most likely to become unemployed. Married men are most likely to leave unemployment for a job. Men (single and married) are more likely to enter/return to the labor force than women.

Overall, the Czech labor market has demonstrated a great degree flexibility in that there has been significant movement into the newly created finance and trade sectors, as well as into the growing tourist and construction sectors, and considerable outflow from the over-staffed agricultural and industrial sectors. There have been relatively small flows out of employment and a relatively small proportion of the employed have been changing jobs, but the high degree of turnover in the pool of unemployed has been signaling the workings of a vigorous labor market. We hence conclude that the Czech labor market has been flexible. The existing problems of inadequate restructuring appear to have their origins outside of the labor market – the legal framework, corporate governance and functioning of the capital markets.

## 1. Introduction

In this paper we provide a comparative analysis of the extent and determinants of labor mobility in one of the more mature transition economies.<sup>1</sup> Our analysis is motivated by the fact that (a) labor mobility is crucial for an efficient allocation of resources in market economies and (b) the transition economies are often viewed as suffering from inadequate reallocation of labor as a result of factors such as an undeveloped housing market, inadequate restructuring of firms and limited transportation infrastructure. We analyze worker mobility during 1994-1998 in the Czech Republic, a country that underwent one of the most thorough economic and political transformations among the Central and East European (CEE) countries. To the extent possible, we compare our findings to those from recent or ongoing studies of the other transition economies.

Our analysis proceeds at two levels. We examine labor mobility across the three fundamental labor market states (employment, unemployment and out-of-the-labor force) as well as mobility to and from jobs across the principal sectors of the economy. We quantify the magnitudes of these flows over time to assess the extent to which workers are being reallocated across the industries and the efficiency of this reallocation (i.e., the ability to minimize joblessness in the process). In the sectoral analysis, we examine the extent to which workers are moving out of sectors that were traditional under central planning and into the sectors needed by the market economy. Given the availability of rich micro data, we are also able to analyze the determinants of these transitions across labor market states. For example, we identify which groups are at greater risk of

becoming unemployed or have a higher probability of finding a job defined by both their demographic characteristics and local demand factors.

In synthesizing the two prongs of our analysis, we provide evidence on labor market adjustment by examining the extent, direction and determinants of mobility across the three labor market states. We answer questions such as: i) How much mobility is there and how does it change over time? ii) Which sectors have the highest labor turnover (through job creation and job destruction)? iii) Are the unemployed less likely than the employed to find a job?<sup>2</sup> and iv) Which demographic characteristics are associated with mobility out of employment to unemployment or from unemployment to a job?

We use micro-data from *Labor Force Surveys (LFS)* for 1994-1998. Previous research on flows in the Czech Republic was only carried out on flows in and out of unemployment using either grouped or individual data from the administrative records of the District Labor Offices (e.g., Boeri, 1995 and Ham, Svejnar, and Terrell, 1998,1999). Except for a parallel study by Stefanova and Terrell (1998), there has been no research in the Czech Republic that included flows in or out of the other two labor market states: employment and out-of-the labor force. With the recently available micro data from the *LFS*, we are able to construct panel data for large numbers of individuals to calculate transition probabilities for narrowly defined groups. Since comparable surveys are being administered in other transition economies (e.g., Hungary, former East Germany, Estonia, Poland, Russia, Slovakia and Slovenia) the resulting literature will make it possible to compare the Czech transition probabilities with those of other CEE countries. In this paper, we present the first relevant comparisons.

## 2. Overview of the Economy in Transition

The Czech economy experienced one of the more rapid transitions to a market economy in the CEE. Between 1990 and 1993, the Czechs liberalized nearly all prices,<sup>3</sup> privatized much of the economy and opened the country to world trade while maintaining a relatively balanced budget and low inflation. Information on changes in employment by enterprise ownership indicate that privatization occurred rapidly. As the figures in Table 1 indicate, the employment share of the private sector was only 1 percent in 1989, 47 percent by the end of 1993 and full 63 percent by the end of 1997.<sup>4</sup> The decline of the public sector was equally remarkable. Whereas state and local government accounted for 84% of the employed in 1989, its share dropped to 21% by the end of 1997.

[Table 1 about here]

Although the transition in the Czech Republic has been considered exceptional, it was not costless. From 1989 to 1993, GDP declined by more than one-fifth and employment by about one-tenth. In the big bang year of 1991, the consumer price index jumped by 56.6 percent, GDP fell by 14.1 percent and the unemployment rate peaked at 4.1 percent. During the 1994-96 period, GDP grew at a 3-6 percent rate, the unemployment rate remained at around 3 percent and the inflation rate was around 9-10 percent. However, in 1997 the economy began to slow down and GDP grew by only 1 percent. In 1998 output actually declined by an estimated 2.7 percent and the unemployment rate rose to 7 percent, while inflation stood at 10.4 percent.<sup>5</sup>

In 1994 the Czech Prime Minister Vaclav Klaus announced that the transition to a market economy had been completed. However, many analysts questioned how much



restructuring had been undertaken by firms during this period and whether it had been sufficient. In this paper we argue that there is evidence that the firms have undertaken “defensive restructuring” (i.e., laying-off workers). However, we believe (but will not substantiate in this paper) that firms have not undertaken sufficient “strategic restructuring,” i.e., introducing new technologies and products, as well as attracting new strategic partners, in order to increase efficiency and market share. This has been due largely to the lack of a legislative framework that would lead to adequate contract enforcement and corporate governance, the use of banks by the state to prop up non-performing firms and the conflict of interest arising from the banks both lending to firms and owning them through investment funds. In 1995 it was becoming clear that the banking sector had been turning over large amounts of bad firm debt and could no longer sustain this imbalance. These factors, combined with an overvalued exchange rate and serious floods, resulted in an economic downturn in 1997 and 1998.<sup>6</sup>

During the 1990s, the labor market has shown a tremendous amount of restructuring. As may be seen in Table 2, there were very large shifts in employment across industrial sectors over the 1989-1998 period, with most changes having been undertaken by 1993. The largest decrease in employment was in the primary sector (agriculture, hunting and forestry) which was halved between 1989 and 1993. Industry (manufacturing plus utilities) shed about one-fifth of its labor by 1993, but it remained the largest sector throughout the period with one-third of overall employment. As might be predicted, the three fastest growing sectors were the ones that were small during socialism and necessary in an open market economy: financial intermediation, hotels and

restaurants and wholesale and retail trade. However, the share of the total employment in the public administration and defense sector doubled (from 1.6 percent to 3.4 percent), despite “Thatcherite” pronouncements by the Czech government.

[Table 2 about here]

The change in the sectoral employment structure in 1993-1997 followed the same pattern as in 1989-1993 -- continued decline of employment in agriculture and industry and continued increase in the financial, tourist and trade sectors as well as public administration and defense. The reversals in the trend came in the real estate sectors and other service activities, both of which grew in 1993-1997 after declining in 1989-1993.

The data on changes in the stocks of employed by industrial sector and firm ownership suggest that there was significant adjustment in the economy, in spite of the misdirected bank lending and questions about corporate governance in the private sector. We presently examine the extent to which these adjustments were made at a relatively low cost (people moving directly from one job to another job with no unemployment spells) vs. at the relatively higher cost of unemployment. We also assess which demographic groups were more likely than others to change jobs without an unemployment spell or with a short spell.

### **3. Data and Methodology**

The data we use from the *Labor Force Surveys* (LFS) cover approximately 1% of the households in the Czech Republic (e.g., about 28,000 households in 1995). They have been administered at quarterly intervals since the spring of 1993.<sup>7</sup> Since two-fifths of the total sample of households are interviewed at three-month intervals over the course

of a year, it is possible to construct quarterly panel data for individuals in approximately 11,000 households.<sup>8</sup>

For the present analysis we have constructed five separate panels for the cohorts of working age individuals that entered the LFS samples in the first quarters of 1994, 1995, 1996, 1997 or 1998. We identify which of the three labor market states -- employment (e), unemployment (u) or out-of the labor force (o) -- an individual is in and then follow her until she changes states, or until the fourth quarter of each year, whichever comes first. (Hence, each individual has from one to three quarterly-transition observations, depending on how long she remains in the original state.)

An individual's labor market state is defined by answers to questions that are worded according to the International Labor Office (ILO) guidelines. To be *unemployed* the person has to be: a) not working in any permanent job during the two weeks prior to the survey week and b) both seeking work and ready to take a job within the next fourteen days. A person is *employed* if she is working in a paying activity (or, following Czech norms, is on a maternity leave) during the two weeks prior to the survey. The remainder of the working age population is considered to be "out-of-the labor force."

There are nine potential transitions across labor market states as represented by the following P matrix

$$P = \begin{bmatrix} P_{ee} & P_{eu} & P_{eo} \\ P_{ue} & P_{uu} & P_{uo} \\ P_{oe} & P_{ou} & P_{oo} \end{bmatrix} \quad (1)$$

where the first subscript denotes the state of origin and the second the destination. For example,  $P_{oe}$  represents the probability that an individual is observed being employed (e)

at time  $t$ , conditional upon being out-of-the labor force (o) at time  $t-1$ . Assuming that the probability of transition between labor market states depends only on the state currently occupied, the gross probability of transition from state  $i$  to state  $j$  is given by:

$$P_{ij} = \frac{F_{ij}}{S_i}, \quad i, j = e, u, o, \quad (2)$$

where  $F_{ij}$  is the number of individuals in state  $i$  at time  $t$  which flowed to state  $j$  at time  $t + 1$  and  $S_i$  is the stock at origin.<sup>9</sup> The probabilities are calculated as the sum of the quarterly transitions over the year. Hence,  $S_i$  is the stock in the first quarter of each year.

In addition to presenting gross probabilities (equation (2)), we also estimate the determinants of individual transitions using a competing risk hazard model. Using quarterly data, the probability that an individual moves from a state to one of the other two states of the labor market at time  $t$  is:

$$P = \begin{bmatrix} P_{ee} & P_{eu} & P_{eo} \\ P_{ue} & P_{uu} & P_{uo} \\ P_{oe} & P_{ou} & P_{oo} \end{bmatrix} \quad (3)$$

where  $Z$  is a vector of variables describing the individual's demographic characteristics, job characteristics and quarterly demand conditions in the district where the person is residing. Since the data are pooled across the five-year period, annual dummies are used to capture overall changes in the market at the national level (demand shocks). The coefficients from this multinomial logit model are used to derive transition probabilities for people with different characteristics.

#### 4. Empirical Findings

#### 4.1 Gross Transitions across the Three Labor Market States

Our analysis underscores the importance of distinguishing between flow and stock data. As may be seen from Chart 1, between 1994 and 1998 there was relatively little change in the initial stocks of people found in the three labor market states, as indicated by their shares of the total working age population. Moreover, the small proportion of unemployed would make one believe that the incidence of unemployment was rather low.

**Chart 1: Distribution of Working Age population by LF Status**

	E	U	O
1994	62.0%	2.3%	35.6%
1995	61.1%	2.4%	36.5%
1996	60.7%	2.0%	37.3%
1997	60.2%	2.5%	37.4%
1998	57.6%	3.4%	39.0%

However, as we show in Chart 2 for 1994, the flows into unemployment ( $P_{eu}$  and  $P_{ou}$ ) over the year were substantial, indicating larger numbers of people were affected by unemployment over time than is revealed by the stock data. Moreover, the data also show that there were large flows out of unemployment ( $P_{ue}$  and  $P_{uo}$ ), suggesting that the duration of unemployment is low.<sup>10</sup> The flow data for 1994 hence reveal that the incidence of unemployment was more significant than indicated by the unemployment rates (stock data) and that the length of unemployment spells was low.

[Chart 2 about here]

In Table 3 we examine the nine transition probabilities for the Czech Republic for all five years --1994-1998 -- and compare them with the transition probabilities for other transitional countries and the US. In making the comparison, a methodological caveat is in order. Whereas we calculate the probabilities  $P_{ij}$  of moving from state  $i$  to state  $j$  in any

quarter over the course of the year, the other studies calculate the probabilities by comparing the state an individual is in at the beginning of the year with the state at the end of the year. Moreover, it should also be noted that the probabilities for Bulgaria are based on a shorter (nine-month) interval. Hence the other studies do not capture a move away from the original state during the course of the year if the individual returned to the original state by the end of the year (a phenomenon termed round-tripping). Our method captures the first move made and does not include round tripping. As such, our probabilities of “exiting” a state are not downward biased as in the other studies. Or conversely, compared to us, the other studies generate an upwardly biased probability of “staying” in a state (e.g.,  $P_{ee}$  and  $P_{oo}$ ). If there were no “round tripping” in the population and people only moved once during the year, our estimates would be identical to those of the other studies.<sup>11</sup>

Table 3 reveals several interesting patterns in the dynamics of the Czech labor market and the other transitional economies. First, it is clear that the probability that an individual stays employed throughout the year ( $P_{ee}$ ) is much higher in the Czech Republic than in any of the other countries for which we have data.<sup>12</sup> In the Czech Republic, this probability is between 0.95 and 0.96 over the entire five-year period analyzed. The estimates for the other transitional economies are all below, ranging between 0.84 and 0.93, and the US estimate for the early 1990s is 0.92.

[Table 3 about here]

One explanation for the high  $P_{ee}$ 's in the Czech Republic may be that firms have not been restructuring and shedding redundant labor. Many observers have criticized the

Czech government for allowing enterprises to operate without the necessary restructuring by keeping pre-1995 wages low and allowing banks to roll over bad debt. While this may be to some extent true, it should also be noted that outflows from unemployment ( $P_{eu} + P_{eo}$ ) and the number of vacancies were much higher in 1990-1991 than in 1994-98.<sup>13</sup> One argument advanced is that labor hoarding may not have been as great as it had seemed. Econometric evidence by Basu, Estrin and Svejnar (1999) for instance indicates that by 1992-93 the Czech firms were operating on their labor demand curves, adjusting labor with changes in wages and output. The economic downturn and rise in the unemployment rate in 1997-98 is consistent with both views.

In Russia, the other country for which we have transition probabilities several years apart, the pattern is one of declining  $P_{ee}$ 's. This can be explained in part by the fact that 1992-93 was the first year of the market-oriented reforms in Russia and not much adjustment had yet taken place. Basu, Estrin and Svejnar (1999) show that Russian firms were not systematically adjusting employment with respect to changes in wages and output in 1992-93 and the Russian unemployment rate was low (5 percent). However, by 1995-1996 the Russian  $P_{ee}$ 's fall in line with the other countries and unemployment rises to 8 and 9 percent.

The second interesting pattern observed in Table 3 is that the probability that one stays out-of-the labor ( $P_{oo}$ ) force in the Czech Republic is relatively high compared to the other transition economies (except Slovakia) and the US. Moreover, the stability over time of these probabilities is notable. Whereas in the US 0.20 of those out of the labor force at the beginning of the year find a job ( $P_{oe}$ ) or are actively seeking a job by the end

of the year ( $P_{ou}$ ), the probability that someone returns to the labor force ( $P_{oe} + P_{ou}$ ) in the Czech Republic is about 0.06 and in the other transition countries it ranges from 0.10 to 0.20. This reflects in part government policies in the Czech Republic that provided disincentives for retired people to return to the labor market (e.g., reduction of pension or higher tax on earnings for pensioners).

In the early years of the transition, the Czech Republic was celebrated among the transition economies for its relatively low unemployment rates and short unemployment spells. As seen from the transition probabilities presented in Table 3, the  $P_{uu}$ 's were still relatively low in 1994 and 1995: only about one-third of those unemployed at the beginning of the year remained unemployed until the end of the year. However these probabilities rose and by 1997 they were comparable to the  $P_{uu}$ 's of the other transition countries. For many transition economies, the high and persistent unemployment rates are the result of stagnant outflows from unemployment to a job (low  $P_{ue}$ ). As Table 3 demonstrates, this is the case in Bulgaria, East Germany, Poland, and Slovakia where approximately one-third (or less) of those individuals who were unemployed in the beginning of the year found employment by the end of the year. According to these data, until 1998 unemployed individuals in the Czech Republic had a much better chance (between 0.37 and 0.51) of obtaining employment than their counterparts in these other transition economies, except Russia in 1992-93.<sup>14</sup> Nevertheless, in none of these countries did the rates of mobility out of unemployment to job approach the values of these rates in the US, where two-thirds of the unemployed find a job over the course of a year.

It is of course also possible to move from one job to another without passing



through unemployment or leaving the labor market (denoted  $P_{eej}$ ). It can be argued that job-to-job flows are a more efficient form of adjustment than the other flows since job-to-job moves result in a smaller loss of GDP. We have not included these probabilities in Table 3 since they are not available for all the other studies. We find that in the Czech Republic the job-to-job flows grew over the three years as the economy pulled out of the 1990-92 recession but then fell in 1997 and 1998 as GDP growth slowed down and subsequently declined. In particular, the  $P_{eej}$  rose from 0.025 in 1994 to 0.058 in 1996, but fell to 0.035 in 1998.<sup>15</sup> A paper by Lehmann and Wadsworth (1999) indicates that 1996 job-to-job flows were relatively high in Russia (0.112) and Britain (0.099) and low in Poland (0.054).<sup>16</sup>

In sum, we find that overall individuals in the Czech Republic were less likely to lose or leave their jobs in 1994-1998 compared to the other transition economies for which we have data and compared to the US in 1992-93. Moreover, we find that the probability that someone who is out of the labor force stays out during a given year ( $P_{oo}$ ) is quite high in the Czech Republic compared to the other transition economies and that the  $P_{oo}$ 's for all of these transition economies are higher than for the US.<sup>17</sup> However, for most of the period, turnover among the unemployed was higher in the Czech Republic. Those who were unemployed in the Czech Republic in 1994-1997 were more likely to find a job compared to their counterparts in the other transitional economies, except Russia in 1992-93, although less likely than an unemployed person in the US. In 1998 the  $P_{ue}$  in the Czech Republic fell to similar levels as those recorded in the early-to-mid 1990s for Bulgaria, former East Germany, Poland, and Slovakia, and Russia in 1995-96.

In the next section we examine the nature of the structural adjustment in the labor market, focusing on the issues of which industrial sectors were generating more labor turnover and how much mobility there was across sectors in the Czech Republic.

#### **4.3 Explaining Changes in the Industrial Structure of Employment**

Using data from large and medium sized firms, we noted in Table 2 above that the industrial structure of employment had changed dramatically from the end of 1989 to the end of 1995. To recapitulate, the sectors with the greatest declines in employment over the period were agriculture (hunting, forestry and mining), industry and 'other services'. The most rapid employment growth occurred in the financial sector, hotels and restaurants, and wholesale and retail trade.

In this section we examine the underlying dynamics of these net changes. Which sectors have the highest turnover?<sup>18</sup> To what extent were the net declines in employment in the job-destructing industries brought about by sending the employed to unemployment or out-of-the-labor force vs. to a job in another industry? To what extent were these declining sectors also hiring?

These flows are being driven by numerous factors in the supply and demand for labor. Whereas the introduction of market forces may be considered the dominant factor in explaining mobility across labor market states within a sector, we must not forget that other determinants are also at play. For example, the extent to which a sector has proportionately more young women, or more older people, may explain why exits out of the labor force are more prevalent than exits to unemployment in that sector. We do not control for all these possibilities at this stage of the analysis, but do so in Section 5.

### ***4.3.1 Labor Turnover by Industrial Sector***

In Panel A of Table 4 we present the gross probabilities that someone who was employed in one of the eight industries listed in the table would stay employed in the same job ( $P_{ee}$ ), change from job to job ( $P_{eej}$ ), become unemployed ( $P_{eu}$ ), or move out-of-the-labor market ( $P_{eo}$ ) over a given year in any of the five years of our analysis.<sup>19</sup> The next two panels in Table 4 present similar transition flows for people who were, respectively, out-of-the labor force and unemployed at the beginning of the year.<sup>20</sup>

[Table 4 about here]

The figures in Table 4 identify which sectors are creating unemployment or moving people out of the labor market as well as which ones are experiencing more or less turnover. Since we are interested in trends for the 1994-1998 period, we have pooled the five annual cohorts into one data set rather than analyzing each year separately.<sup>21</sup>

From Table 4 it is clear that turnover among the employed is not correlated with the degree of overall job-creation or job-destruction in the industry. For example, the probability of staying employed if employed in 'other services' (a declining sector) is the same as the probability of staying employed in 'trade' (a growing sector) and these are the two lowest  $P_{ee}$ 's by industry. The industries with the highest turnover in employment are construction and trade: relatively fewer people who begin employment in these sectors tend to stay in the same job (low  $P_{ees}$ ); they are more likely to change jobs (high  $P_{eej}$ ) and become unemployed (high  $P_{eu}$ ). Those who are unemployed and have previously worked in either of these two industrial sectors are less likely to stay unemployed and more likely to find employment (low  $P_{uu}$  and higher than average  $P_{ue}$ ). Finally, those out-of-the labor

force who previously worked in either of these two sectors are less likely to stay out-of-the labor force (low  $P_{oo}$ ) and more likely to find a job (higher  $P_{oe}$ ) than people who had a job in other sectors.

In order to learn which sectors are more likely to be feeding the pool of unemployed, we compare the  $P_{eu}$  and  $P_{ou}$  of each sector to the overall probability for the labor force in the final row. There is a clear pattern that people who were previously employed in the construction, trade and other services sectors have the highest probability of becoming unemployed ( $P_{eu}$ ) over these five years. The principal sectors contributing to flows out of the labor force with disproportionately high  $P_{eo}$  and  $P_{uo}$  are agriculture and other services. Hence, the declining sectors are not the ones with the highest turnover, nor are they necessarily the ones that are pushing people into unemployment; rather they are pushing people out of the labor force.

#### ***4.3.2 Mobility across Sectors***

To what extent are people changing sectors when they change jobs? We address the question by comparing sector of previous job with sector of current job and we report in Table 5 the summary results of the large matrix.<sup>22</sup> The first striking finding is the degree to which sector of job is being changed. About one-half of the people who changed jobs, changed their sector of job. The second finding is that people who are unemployed or out-of-the labor force are more likely to change their sector of job than job-to-job changers. On average, 48 percent of the job-to-job movers changed sector, as compared to 56 percent of the unemployed and 54 percent of the individuals who found a new job after being out-of-the labor force.

[Table 5 about here]

Where did they tend to go? Judging by the proportions who flowed into a sector, those who were unemployed or out of the labor force had a higher probability of finding a job in other services, public administration or financial services than in any other sector. On the other hand, the employed were more likely to take a job in the transportation or financial service sectors than any other sector. Hence people who are not employed tend to be hired more by public administration and other services than by the other sectors.

Of the three sectors with the highest outflows, two (agriculture and other services) are declining industries and one (financial services) is a rapidly growing industry, which means outflows alone do not determine whether a sector is a declining or growing sector. (Inflows in the financial sector are also relatively high.) From Tables 4 and 5 it appears that, as they are growing and creating more employment over time, the transportation and financial service sectors have the highest turnover in terms of hiring and firing and having people move into and out of these sectors.

### **5. Determinants of Individual Transitions**

We next examine what type of a person is more likely to become unemployed or take a job in terms of his/her demographic characteristics and local demand conditions. As noted earlier, the univariate associations between the labor market transition probabilities and the sector of job may be misleading since they do not control for demographic composition and demand factors. We hence estimate multivariate models of exits from employment, unemployment and out of the labor force.

In carrying out the multivariate analysis, we estimate multinomial logit hazards

using five years of quarterly panel data for individual cohorts from the 1994-1998 Czech *Labor Force Surveys*. Our right-hand-side variables include static demographic characteristics (age, education (in years), and dummy variables for married men, married women, single men (the base) and single women)<sup>23</sup> and a time varying demand variable, the quarterly district vacancy rate.<sup>24</sup> In addition, in order to learn which sectors create more turnover, *ceteris paribus*, we include dummy variables for five industrial sectors.<sup>25</sup> We also include the log duration (in months) in the state to control for duration dependence and, to some extent, unobserved heterogeneity.<sup>26</sup> Finally, four annual dummy variables are included with 1994 as the base to allow for year-to-year changes in the base probabilities, due to national demand conditions or other annual shocks.

Appendix Table A1 provides the means of the variables in the first quarter of each year. The demographic characteristics differ for the people in each of the three labor market states: the unemployed tend to be younger and the people out of the labor force far older than the employed (whose mean age is 39 years). The employed are more educated (with an average of 12 years of education) than those in the other two states, who have on average of 11 years of education. Married people tend to be employed more than single people who tend to be unemployed (especially single men) or out of the labor force (especially single women). Unfortunately, about one-fifth of the unemployed and as many as three-quarters of those out-of-the labor force do not know the sector of their previous job.<sup>27</sup> When we exclude this group and adjust the proportions to add to 1.00, we are able compare the structure of the industrial sectors across the three groups. The data reveal the pattern identified in a different way in Table 4, namely that the unemployed

and those out-of-the labor force are more likely to have worked in agriculture than the employed. The unemployed people are less likely to have worked in the public sector and more likely to have worked in construction or trade compared to the proportion of employed in those sectors. Among the one quarter of those out-of the labor force that do know their sector, it is clear that they are more likely to have worked in agriculture or in manufacturing and less likely to have worked in the public sector than those who are currently employed. The average vacancy rate (over 78 districts and over five years) is 0.017 for the employed and out-of-the labor force, but it is lower (0.016) for the unemployed, indicating that the unemployed people are more concentrated in districts with lower unemployment rates.

The estimated coefficients and standard errors for the multinomial logits are presented according to the state of origin in the three panels of Table 6. Table 7 contains the ten transition probabilities (hazards) for people with specific characteristics. The base hazard is for a single man, 40 years of age, with 12 years of education (equivalent to vocational or academic high school), the average duration in the current state (90 months for the employed and 10 months for the unemployed), working (or having worked) in the agricultural sector in a district with the average vacancy rate and for the year 1994. Each subsequent row in Table 7 alters one of these characteristics in order to identify the marginal impact of a unit (or percentage) change in each variable.

### **5.1 Origin State is Employment**

The findings for the determinants of job-to-job mobility are reported in the first column of Table 6. They indicate that individuals with the following characteristics are

more likely to move from one job to another: younger, less educated, single men, people living in districts with higher vacancy rates, people with shorter job tenure, and whose job at origin is in the public sector.<sup>28</sup>

The probabilities that people with different characteristics make the job-to-job transition in any quarter (given they are employed in that quarter) are provided in the second column of Table 7. The base probability is 0.0083 and it rises to 0.0084 (i.e., by 1.1 percent) as age falls by one year, from 40 to 39. Hence, the probability that a 53-year-old man with the same base characteristics makes this transition is 0.0072, much lower than the base probability of 0.0083. The marginal impact of a year of education is larger than the marginal effect of a year of age, with an additional year of education lowering the hazard by 4.8 percent. The probability that a married man makes a job-to-job transition is thirty percent lower than that of a single man with the same other characteristics (0.0058 vs. 0.0083). The probability is a little higher for single women over married women; they are both about one half of those for single men. Job tenure has a large effect: a 10 percent increase in the mean number of months on the job reduces the base probability by 41 percent (from 0.0084 to 0.0049). Those working in the public sector have a  $P_{eej}$  of 0.0106, which is 28 percent higher than the probability for those working in agriculture or any other sector (since the other sector coefficients are not significant). A 10 percent increase in the average vacancy rate raises the probability by 1.2 percent. Finally, the job-to-job transition rate was lowest in 1994, the base year. It rose to about 2.3 times this base rate in 1995 and 1996 and then it receded to 1.9 times the 1994 rate in 1997 and 1.5 times this rate in 1998.<sup>29</sup>



The coefficients for the hazards from employment to unemployment are reported in column 2 of Table 6. They indicate that younger, less educated single men with short employment durations, working in the construction and trade sectors, and living in districts with relatively low vacancy rates are more likely to loose or quit their jobs and become unemployed than people with the opposite characteristics. The base hazard is 0.0061 in 1994 for a single man with the “base characteristics” (column 3 of Table 7). The coefficients on the annual dummies (and their corresponding hazards) indicate that the  $P_{eu}$ 's in 1995 and 1996 are 20-30 percent lower than those for 1994, 1997 and 1998. The hazard rises by 0.0001 points -- about 1.4 percent -- as age falls by one year and it rises by about 17.4 percent for one year less of education at the mean. The rate for married men is slightly more than one half the rate for single men, while the rate for women (married or single) is about three-quarters the rate for single men with the same characteristics. As average job tenure is increased by 10 percent, the  $P_{eu}$  falls by 2.4 percent. The hazards for people who had previously worked in construction and trade is 33 and 43 percent higher, respectively, than the hazard for people who and worked in any other sectors. The local vacancy rate plays a significant role; a 10 percent increase in the rate lowers the hazard by 2.4 percent.

The demographic characteristics of individuals with high  $P_{eu}$ 's are similar across the transition economies. In Table 8 we present findings from studies carried out in East Germany, Poland and Russia, showing that in these countries the younger, less educated, female, and single individuals tend to have higher  $P_{eu}$ 's

Who are the individuals leaving jobs to go out of the labor force? In Table 6, the

coefficients in the E to O column indicate that these are single men and both married and single women who are older, less educated, having shorter job tenure, and working in the agriculture, manufacturing or public sectors. The local vacancy rate does not affect the probability of leaving the labor force, but the  $P_{eo}$ 's vary with time, being higher in the earlier (1994-1996) than the later (1997-98) phase of the transition.

## **5.2 Origin State is Unemployment**

The estimated coefficients from the logits for exits out of unemployment to employment show that the hazards are higher for people with the following characteristics: younger, more educated, married men (higher than for married women or single men, who in turn have a higher probability than single women), and people with shorter unemployment spells. As seen in Table 7, the base hazard is 0.197 and it rises to 0.202 with a one-year decline in age from 40 to 39. Individuals with 11 years of education (one year less than the base) have a 0.181 probability of leaving unemployment for a job (8.5 percent lower than the base). Married men's hazards are 46 percent higher than single men's whereas married women's hazards are about 6 percent higher. Single women's hazards are about 11 percent lower than single men's hazards. Anyone who worked previously in the trade sector is more likely (43 percent higher probability) to find a job than those who worked in any other sector. The local vacancy rate, which proxies for demand conditions, plays a crucial role in determining these flows. A ten percent increase in the average vacancy rate of 0.016 increases the base hazard by 3.4 percent to 0.204. Finally, it is also clear from the coefficients on the annual dummies that the probability of exiting unemployment for a job was highest in 1994 and 1995 and declined

thereafter. In 1998 the hazard fell the most in any of the other years; it was 0.116 for the base person, a little more than half the base rate in 1994.

The demographic characteristics of the people with higher  $P_{ue}$ 's are similar in other transition economies as well. The findings from studies carried out in Bulgaria, East German Poland and Russia in Table 8 indicate that the younger, more educated, male and single individuals usually have higher  $P_{ue}$ 's.

Fewer people are leaving unemployment to go out of the labor force over time as indicated by the declining trend on the annual dummies. The estimated base hazard from unemployment to out of the labor force ( $P_{uo}$ ) is 0.063 in 1998 compared to 0.147 in 1994. Individuals who are older and more educated are more likely to leave than the younger and less educated. The probability that a 53 year old person leaves unemployment to go out of the labor force is 0.193 vs. 0.147 for someone 40 years in 1994. An additional year of education raises the probability by about 2.2 percent. Exits from unemployment to out-of-the labor force are not correlated with gender and marital status. Nor are they affected by demand conditions, as proxied by the vacancy rate. However, people who had previously worked in manufacturing construction or the public sector were less likely to leave the labor force than people who worked in any other sector.

### **5.3 Origin State is Out-of-the Labor Force**

The people most likely to find jobs from out-of-the labor force are the younger, more educated, men (single or married) as compared to women (especially married women). The  $P_{oe}$  for the base person is 0.069 and it rises by 5 percent as age falls by one year. It falls by 21 percent (to 0.055) as education is reduced by one year. Those who

had worked previously in construction sectors had the highest probability of re-entry to a job, followed by those who worked in agriculture or trade. Local demand conditions do not seem to play a role, but overall national demand conditions do seem to affect these transition probabilities. The probability of re-entry declined substantially during the 1997-1998 recession, as may be seen from the coefficients in Table 6 and the probabilities in Table 7.

Transitions from out-of-the labor force to unemployment are not as well defined as transitions between other labor market states.<sup>30</sup> They hinge on whether or not the person is “actively looking for a job” which is not always clearly defined in the respondent’s mind. The estimated coefficients from the multinomial logit indicate that the younger and more educated have higher  $P_{ou}$ ’s, which points to the school-leavers as a group. Those who had worked before in the public sector or who did not know their previous job’s sector had systematically lower probabilities than those who worked in all other sectors.<sup>31</sup> Local demand conditions as proxied by the district vacancy rates do not affect outflows from O to U, but overall national demand conditions do. Although relatively fewer people in this state found a job directly in 1997 and 1998 as compared to those in 1994-97, people in O were more likely to become unemployed and look for work in 1997 and 1998 as compared to people who were in that state in 1995 and 1996.

## 5. Summary and Conclusions

In this paper we provide a comparative analysis of the extent and direction of mobility in the Czech transitional labor market. We follow the movements of fifteen cohorts of working age individuals across the three labor market states of employment

(E), unemployment (U) and out-of-the labor force (O) during 1994-1998 using quarterly *Labor Force Surveys* of the Czech Republic. We first calculate overall and sector-specific gross probabilities of mobility and then estimate multinomial logits with the micro data. In assessing the functioning of the transitional labor market, we focus on three characteristics: i) how much restructuring has occurred in terms of sectoral shifts; ii) to what extent has the adjustment been carried out efficiently (i.e., with job-to-job rather than job-unemployment-job flows and with relatively short rather than long spells of unemployment); iii) which demographic groups are the winners and losers in the adjustment process; and iv) how does mobility in the Czech labor market compare with other transitional economies.

There has been a significant shift in the structure of employment by industrial sector. This restructuring occurred mostly during the 1989-93 period, although there have been continued shifts in the 1994-1998 period as well. The largest declines in employment were in the two largest sectors: agriculture and industry. The sectors creating employment most rapidly were the ones that had not been considered important under communism: financial services and trade and hotels and restaurants. Contrary to the expected withering away of the sizable state apparatus, public administration and defense were also continuing to create jobs throughout this period.

We show that the changes in the employment structure were brought about relatively efficiently: generally with shorter spells of unemployment compared to the other transitional economies and relying increasingly on job-to-job mobility and less on sending people out-of-the labor force. Whereas, the extent of job-to-job and

unemployment-employment mobility has been relatively high in the Czech Republic compared to the other transitional economies for which we have data (except Russia), it has not approached the high levels in the US.

From the analyses of labor market transitions by sector of job, we find that people previously employed in agriculture were less likely to change jobs, or find employment if previously unemployed and more likely to leave the labor force. The most interesting finding is that the highest turnover is actually in the growing (rather than declining) sectors of the economy: trade, construction and hotels and restaurants. People employed in those sectors are more likely to change jobs ( $P_{eej}$ ) and become unemployed ( $P_{eu}$  and  $P_{ou}$ ) but more likely to find a job if unemployed or out-of-the labor force ( $P_{ue}$  and  $P_{oe}$ ). However, once we control for demographic characteristics and demand conditions the above pattern holds for agriculture but not for the other sectors. Construction and trade no longer have significantly higher job-to-job mobility ( $P_{eej}$ ) although they do have much higher  $P_{eu}$ 's (30-40 percent higher) and lower  $P_{eo}$ 's (20-35 percent lower). Trade is the only sector with different (and higher)  $P_{ue}$ 's (40% higher) and only the public sector has significantly different (and higher)  $P_{eej}$

About one half of the people who change jobs (with or without a spell of joblessness) also change their sector of employment. The change in sector is occurring more among people who find a job out of unemployment or out-of-the labor force than among the job-to-job movers. The fast growing financial service sector is hiring people who are unemployed and out-of-the labor force at the same rate they are hiring people who are employed. We see this as evidence that the unemployed are not being scared by

the experience.

The labor market has shown a great deal of flexibility and responsiveness to changes in demand conditions both at the local and national level. We estimated an elasticity of 0.12 for the job-to-job hazard with respect to a change in the local vacancy rate. The probability that an employed person became unemployed ( $P_{eu}$ ) declined by 0.24 percent with a one percent increase in the local vacancy rate. The probability that an unemployed person found a job ( $P_{ue}$ ) increased by 0.34 for a one percent increase in the local vacancy rate. None of the other hazard rates (to and from out-of-the labor force) were affected significantly by the local demand conditions. However, all were affected by national conditions, as estimated with annual dummies in the logit model. For example, we find that the  $P_{eej}$  rose rapidly from 1994 to 1996 and then began to decline in 1997 and again in 1998 as GDP growth declined in those two years. Nevertheless, the  $P_{eej}$  in 1998 was still higher than the  $P_{eej}$  in 1994. Conversely, the  $P_{eu}$ 's declined in 1995 and 1996 but then grew again in 1997 and 1998. Similarly, the  $P_{ue}$ 's declined as the economy worsened and were much lower in 1998 than in 1994, indicating that the duration of unemployment spells began to grow in that year.

Finally, the multinomial logit analysis enables us to answer the questions about who, in terms of demographic characteristics, is more likely to leave employment, change jobs, exit unemployment etc. We find that younger people seem to be experiencing the most mobility and the more positive directions in mobility. The younger are more likely to change jobs; they are more likely to lose their job and become unemployed although they are less likely to leave a job to go (be pushed) out of the labor force. Once

unemployed, the younger are more likely to find a job and less likely to leave the labor force. Once out of the labor force, the younger are more likely to find a job or be seeking work (become unemployed). People with less education do not fare as well as those with more education. The less educated are less likely to stay employed, more likely to change jobs (which is positive) but more likely to lose their job to unemployment or out-of-the labor force and more likely to stay unemployed or out-of-the labor force. In terms of gender and marital status, we find that married men are most likely to keep their jobs (although the differences in the probabilities are small), single men are most likely to change jobs (with women's probabilities about one half of theirs). However, single men are also most likely to become unemployed. Married men are most likely to leave unemployment for a job. Men (single and married) are more likely to enter/return to the labor force than women.

Overall, the Czech labor market has demonstrated a great degree flexibility in that there has been significant movement into the newly created finance and trade sectors, as well as into the growing tourist and construction sectors, and considerable outflow from the over-staffed agricultural and industrial sectors.<sup>32</sup> There have been relatively small flows out of employment and a relatively small proportion of the employed have been changing jobs, but the high degree of turnover in the pool of unemployed has been signaling the workings of a vigorous labor market. We hence conclude that the Czech labor market has been flexible. The existing problems of inadequate restructuring appear to have their origins outside of the labor market – the legal framework, corporate governance and functioning of the capital markets.



## Footnotes

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- <sup>1</sup> For a flow analysis of an early transition economy, see Bellman et al. (1995)
- <sup>2</sup> This question is important for understanding if unemployment is stigmatizing individuals and hence having longer-term effects.
- <sup>3</sup> Prices in some sectors, such as utilities and housing, are still subsidized and only slowly being liberalized.
- <sup>4</sup> These are data collected by the Czech Statistical Office from firms; unfortunately, the *Labor Force Survey* does not have data on type of ownership.
- <sup>5</sup> Macroeconomic statistics are taken from the EBRD *Transition Report* 1998 and 1999 update.
- <sup>6</sup> GDP growth slowed down as the currency became overvalued and export growth had stopped in the previous year. The trade deficit had grown to over 10 percent of GDP, prompting the abandoning of a fixed exchange rate and a depreciation of the crown by 10 percent in May 1997. The country was then hit by a natural disaster in July (flooding in the western portion of the country) and soon thereafter the Prime Minister was embroiled in a scandal which forced him and the government to resign in December 1997.
- <sup>7</sup> The quarters are as follows: 1Q = November-January; 2Q = February - April; 3Q = May-July; 4Q= August-October.
- <sup>8</sup> The first sample in 2Q93 was smaller, only two-thirds, of the others. The CSO did this in order to introduce a new cohort in 3Q93 and hence allow them to carry out the

rotation scheme.

- <sup>9</sup> This analytical approach has been used, among others, by Marston (1976) with U.S. data, and in the transitional economies by Bellmann, et al. (1995), Lehman and Wadsworth (1999) and by Foley (1997).
- <sup>10</sup> Ham, Svejnar and Terrell (1998, 1999) and Terrell and Sorm (1999) confirmed this for earlier years as well with registry data for 1991-1994.
- <sup>11</sup> Our estimates of round tripping – the number of people who left and returned to the original state within the year, as a percent of those in the state at the beginning of the year -- are as follows: are 0.9% for the employed 3.5% for the unemployed and 0.6% for those out of the labor force (averages for the five years).
- <sup>12</sup> Had the studies for the Czech Republic and the other countries used the same methodology, the difference in their respective  $P_{ee}$ 's would have been even greater.
- <sup>13</sup> The 1990-91 data are from the registry of the Ministry of Labor as the LFS data were not yet available in the early 1990s.
- <sup>14</sup> In both Russia and the Czech Republic the  $P_{uu}$ 's rose and the  $P_{ue}$ 's fell over the period analyzed.
- <sup>15</sup> Given that these are quarterly observations, and what we observe is that someone changed jobs from one quarter to the next, it is possible that some of these individuals passed through a very short spell of unemployment between the two quarters. We are unable to check what percent might have experienced unemployment because the variable for duration of unemployment is coded in a grouped form 1-3 months, 3-6 months, etc.
- <sup>16</sup> The Russian finding is particularly interesting in view of the dismal aggregate

economic performance in Russia. It suggests that the Russian labor market may be a relatively flexible part of the otherwise malfunctioning economy.

<sup>17</sup> Since the majority of this group is pensioners, it appears that people in the US tend to want to work more and/or are give greater opportunity to work in retirement than their counterparts in the CEE and NIS economies.

<sup>18</sup> We would also like to examine mobility between public enterprises and private firms, however this information does not exist in the Czech Labor Force Survey.

<sup>19</sup> In Tables 4 and 5 we have aggregated some of the sectors shown in Table 1. Moreover, since the sectors have abbreviated names, we want to clarify that in all three tables: '*Agriculture*' also includes forestry and mining; '*Industry*' includes manufacturing and utilities; '*Construction*' is the simply construction. In Tables 4 and 5 '*Trade*' includes wholesale and retail trade and hotels and restaurants; '*Transport*' includes storage and communication, telecommunication and postal services; '*Financial services*' includes banking, insurance and real estate; '*Public administration*' includes public administration, defense, education, judicial services, health and social work; '*other service activities*' includes recreation and cultural services, and all other services (as in Table 2).

<sup>20</sup> In panels B and C of Table 4 the "sector of job" refers to the industrial sector of the individual's job prior to being unemployed or out-of-the labor force. Hence, there is more time variation for these observations than in the first panel, where the observation for job sector refers to the first quarter of the year for everyone. Moreover, the dispersion in the dates that these jobs were last held is likely to be

wider for those out-of-the labor force as compared to the unemployed (who probably left a job less than one year prior to our observation). We do not know the date that someone left the labor force, hence we cannot determine the degree of variation.

<sup>21</sup> The annual tables are available from the authors upon request. We found that rarely did the relative magnitudes of the ten annual transition probabilities by industry vary from the five-year average.

<sup>22</sup> The tables is derived from the diagonal and the final row and column of a matrix of sector at origin and sector at destination. We did not find any significant pattern in the flows from one sector or group of sectors to another and hence do not present this larger matrix. These tables may be obtained from the authors upon request.

<sup>23</sup> The category 'single' includes widowed and divorced people as well as those who never married.

<sup>24</sup> The district vacancy rate is defined as the number of vacancies divided by the labor force in the district.

<sup>25</sup> The industrial sectors are the same as those used in Tables 4 and 5 (defined in footnote 14) except that two sectors have been further aggregated: '*Trade*' includes 'transport' and 'financial services', in addition to trade, hotels and restaurants. The '*public sector*' now includes, 'other services' in addition to 'public administration.'

<sup>26</sup> The probability that one exits a labor market state for another may be dependent on how long someone is in the original state. For example, negative duration dependence implies that the longer one is in a state that less likely he/she is to leave that state. This may be due to unobserved heterogeneity, if as is often believed to be

the case for the unemployed, those who are unemployed for longer spells are less motivated, or have other characteristics that make them less favorable to employers.

<sup>27</sup> Of the unemployed that do not know their previous sector, 61 percent are new entrants to the labor force. However, among the population out-of-the labor force only 32 percent of those that do not know the sector of previous job had never worked before.

<sup>28</sup> These findings are somewhat similar to those of Lehmann and Wadsworth (1999) for Poland and Russia 1994-1996.

<sup>29</sup> The chi square test indicates that the difference between the 1997 and 1998 coefficients is significant at the 1 percent confidence level.

<sup>30</sup> See Flinn and Heckman (1983).

<sup>31</sup> Over three quarters of those out-of-the labor force had worked before, and of these about two-thirds did not know their previous sector.

<sup>32</sup> A potentially negative aspect is that many of those in agriculture left the labor market and those that were seeking a job were not able to find employment as easily.







Table 3: Transition Probabilities for Six Transition Economies and the US										
Country	Reference Year	Pee*	Peu	Peo	Puu	Pue	Puo	Poo	Poe	Pou
Czech Republic	1Q1994-4Q1994	0.948	0.020	0.032	0.319	0.507	0.176	0.936	0.046	0.018
Czech Republic	1Q1995-4Q1995	0.957	0.015	0.028	0.382	0.471	0.167	0.938	0.051	0.011
Czech Republic	1Q1996-4Q1996	0.959	0.013	0.028	0.422	0.435	0.142	0.948	0.042	0.010
Czech Republic	1Q1997-4Q1997	0.958	0.019	0.024	0.448	0.429	0.124	0.944	0.041	0.016
Czech Republic	1Q1998-4Q1998	0.950	0.023	0.028	0.535	0.366	0.099	0.942	0.036	0.022
<b>Other Transitional Economies</b>										
Bulgaria (1)	3/1994 - 3/1995	0.849	0.059	0.092	0.433	0.323	0.244	0.864	0.092	0.044
E. Germany (2)	11/1990 - 11/1991	0.836	0.093	0.071	0.373	0.350	0.277	0.799	0.160	0.041
Poland(3)	1992-1993	0.884	0.040	0.076	0.481	0.361	0.158	0.860	0.095	0.045
Poland(3)	1993-1994	0.897	0.040	0.063	0.487	0.354	0.159	0.883	0.074	0.043
Russia(4)	1992-1993	0.910	0.032	0.058	0.323	0.520	0.157	0.899	0.087	0.014
Russia(4)	1995-1996	0.881	0.056	0.062	0.459	0.395	0.145	0.891	0.076	0.034
Slovakia (1)	1Q1994-4Q1994	0.932	0.023	0.045	0.685	0.237	0.078	0.965	0.018	0.017
United States (1)	1992-1993	0.919	0.028	0.053	0.053	0.659	0.288	0.796	0.043	0.161
Czech Republic probabilities based on authors' calculations using panel data from the Czech quarterly Labor Force Surveys.										
Sources:										
(1) Boeri, 1998.										
(2) Ballmann et al., 1995.										
(3) Gora and Lehmann, 1995.										
(4) Foley, 1997.										
Includes job-to-job flows as well as those that remained on the same job.										

Table 4: Transition Probabilities by Industrial Sector of Previous or Current Job, 1994-1998										
Sector of Current or previous job	Panel A			Panel B				Panel C		
	Pee	Peej	Peu	Pec	Puu	Pue	Puc	Poc	Poe	Pou
agriculture	0.923	0.032	0.013	0.031	0.457	0.366	0.177	0.917	0.065	0.018
industry	0.916	0.040	0.017	0.027	0.443	0.431	0.127	0.926	0.055	0.019
construction	0.902	0.058	0.022	0.018	0.407	0.504	0.089	0.836	0.127	0.038
trade	0.888	0.056	0.027	0.029	0.348	0.541	0.111	0.867	0.097	0.036
transport	0.937	0.028	0.014	0.022	0.447	0.404	0.149	0.925	0.057	0.017
financial serv.	0.917	0.044	0.014	0.025	0.324	0.441	0.235	0.857	0.109	0.034
pub.adm.	0.910	0.047	0.012	0.031	0.433	0.442	0.125	0.897	0.081	0.022
other services	0.888	0.057	0.022	0.034	0.469	0.383	0.148	0.894	0.086	0.021
Total	0.910	0.045	0.018	0.028	0.431	0.433	0.136	0.942	0.043	0.015

From Sector of Previous Job to Sector of Current Job for those who Changed/Found a Job,					
composite data for 1994-1998					
Employed who changed jobs					
Sector	stayed	flowed out	flowed in	net flows	
agriculture	0.3722	0.6278	0.5167	-0.1111	
industry	0.5399	0.4601	0.4803	0.0203	
construction	0.4912	0.5088	0.4912	-0.0176	
trade	0.5489	0.4511	0.4666	0.0154	
transport	0.4058	0.5942	0.8986	0.3043	
financial serv.	0.3529	0.6471	0.7794	0.1324	
pub.adm.	0.6210	0.3790	0.3703	-0.0086	
other services	0.3492	0.6508	0.4762	-0.1746	
<b>Total</b>	<b>0.5222</b>	<b>0.4778</b>	<b>0.4778</b>	<b>0.0000</b>	
Unemployed who found a job					
Sector	stayed	flowed out	flowed in	net flows	
agriculture	0.3176	0.6824	0.3882	-0.2941	
industry	0.4712	0.5288	0.4712	-0.0576	
construction	0.4701	0.5299	0.5299	0.0000	
trade	0.5104	0.4896	0.4549	-0.0347	
transport	0.1136	0.8864	0.9545	0.0682	
financial serv.	0.1333	0.8667	1.0667	0.2000	
pub.adm.	0.4348	0.5652	0.7971	0.2319	
other services	0.1935	0.8065	1.2581	0.4516	
<b>Total</b>	<b>0.4360</b>	<b>0.5641</b>	<b>0.5641</b>	<b>0.0000</b>	
Out-of-the Labor Force who Found a Job					
Sector	stayed	flowed out	flowed in	net flows	
agriculture	0.6222	0.3778	0.2778	-0.1000	
industry	0.4891	0.5109	0.3424	-0.1685	
construction	0.5781	0.4219	0.3594	-0.0625	
trade	0.5906	0.4094	0.4882	0.0787	
transport	0.2000	0.8000	0.5333	-0.2667	
financial serv.	0.3846	0.6154	0.9231	0.3077	
pub.adm.	0.5833	0.4167	0.6667	0.2500	
other services	0.3200	0.6800	1.0000	0.3200	
<b>Total</b>	<b>0.4710</b>	<b>0.5290</b>	<b>0.5290</b>	<b>0.0000</b>	

**Table 6: Multinomial Logit Model of Exits from Employment (E),  
Unemployment (U) and Out-of-the Labor Force (O), 1994 to 1998**  
(standard errors in parentheses)

	Job to Job	E to U	E to O	U to E	U to O	O to E	O to U
Constant	-3.016 <sup>a</sup> (0.152)	-1.770 <sup>a</sup> (0.254)	-5.343 <sup>a</sup> (0.192)	-2.004 <sup>a</sup> (0.253)	-3.780 <sup>a</sup> (0.372)	-3.398 <sup>a</sup> (0.181)	-3.843 <sup>a</sup> (0.326)
Age	-0.010 <sup>a</sup> (0.002)	-0.014 <sup>a</sup> (0.003)	0.063 <sup>a</sup> (0.002)	-0.024 <sup>a</sup> (0.003)	0.020 <sup>a</sup> (0.004)	-0.055 <sup>a</sup> (0.002)	-0.078 <sup>a</sup> (0.004)
Education (yrs.)	-0.050 <sup>a</sup> (0.009)	-0.163 <sup>a</sup> (0.017)	-0.094 <sup>a</sup> (0.011)	0.130 <sup>a</sup> (0.017)	0.119 <sup>a</sup> (0.026)	0.251 <sup>a</sup> (0.010)	0.246 <sup>a</sup> (0.017)
Marital status <sup>1</sup>							
Married men	-0.372 <sup>a</sup> (0.053)	-0.589 <sup>a</sup> (0.089)	-0.770 <sup>a</sup> (0.080)	0.517 <sup>a</sup> (0.106)	0.094 (0.171)	-0.081 (0.103)	-0.034 (0.221)
Married women	-0.668 <sup>a</sup> (0.056)	-0.311 <sup>a</sup> (0.085)	-0.119 (0.075)	0.089 (0.093)	0.083 (0.145)	-0.525 <sup>a</sup> (0.082)	-0.012 (0.141)
Single women	-0.456 <sup>a</sup> (0.062)	-0.238 <sup>a</sup> (0.095)	-0.040 (0.090)	-0.169 <sup>a</sup> (0.097)	-0.147 (0.162)	-0.201 <sup>a</sup> (0.061)	0.246 <sup>a</sup> (0.097)
Duration (in current state)	-0.010 <sup>a</sup> (0.0004)	-0.006 <sup>a</sup> (0.0005)	-0.004 <sup>a</sup> (0.0003)	-0.024 <sup>a</sup> (0.003)	-0.007 <sup>a</sup> (0.003)	--	--
Sector of job (current or previous) <sup>2</sup>							
Manufacturing	0.064 (0.079)	0.138 (0.122)	-0.131 (0.084)	0.1388 (0.136)	-0.3387 (0.186)	-0.357 <sup>a</sup> (0.132)	-0.256 (0.241)
Construction	0.107 (0.090)	0.288 <sup>a</sup> (0.142)	-0.438 <sup>a</sup> (0.124)	0.210 (0.157)	-0.723 <sup>a</sup> (0.252)	0.359 <sup>b</sup> (0.172)	0.498 (0.314)
Trade	0.130 (0.081)	0.361 <sup>a</sup> (0.124)	-0.221 <sup>b</sup> (0.091)	0.431 <sup>a</sup> (0.139)	-0.320 (0.200)	-0.217 (0.138)	-0.379 (0.249)
Public Sector	0.250 <sup>a</sup> (0.080)	0.049 (0.127)	-0.052 (0.086)	-0.005 (0.145)	-0.528 <sup>a</sup> (0.205)	-0.418 <sup>a</sup> (0.139)	-0.632 <sup>b</sup> (0.259)
Sector unknown	--	--	--	-0.212 (0.152)	0.103 (0.197)	-1.383 <sup>a</sup> (0.120)	-1.442 <sup>a</sup> (0.225)
Local Vacancy rate	6.756 <sup>b</sup> (2.752)	-13.617 <sup>a</sup> (4.859)	4.452 (3.590)	28.000 <sup>a</sup> (5.044)	7.907 (8.526)	0.692 (3.677)	-1.808 (6.354)
Annual Dummies (1994 = base)							
Y95	0.882 <sup>a</sup> (0.069)	-0.218 <sup>b</sup> (0.099)	-0.095 (0.075)	-0.106 (0.107)	-0.209 (0.163)	0.067 (0.077)	-0.547 <sup>a</sup> (0.143)
Y96	0.855 <sup>a</sup> (0.069)	-0.337 <sup>a</sup> (0.101)	-0.106 (0.074)	-0.264 <sup>a</sup> (0.113)	-0.403 <sup>b</sup> (0.171)	-0.076 (0.080)	-0.557 <sup>a</sup> (0.143)
Y97	0.627 <sup>a</sup> (0.071)	-0.034 (0.091)	-0.274 <sup>a</sup> (0.076)	-0.181 <sup>a</sup> (0.104)	-0.585 <sup>a</sup> (0.184)	-0.157 <sup>b</sup> (0.079)	-0.178 (0.126)
Y98	0.389 <sup>a</sup> (0.077)	0.097 (0.092)	-0.136 <sup>a</sup> (0.078)	-0.760 <sup>a</sup> (0.107)	-1.068 <sup>a</sup> (0.177)	-0.286 <sup>a</sup> (0.084)	0.200 <sup>a</sup> (0.123)
No. of observations		190174		6501		120141	
Log likelihood		-30821		-4447		-1122	
SOURCE: annual panels constructed from 1994 -1998 quarterly Czech Labor Force Survey.							
<sup>1</sup> Single men are the base.							
<sup>2</sup> Agricultural Sector is the base.							
<sup>a</sup> Significant at the 1% level; <sup>b</sup> Significant at the 5% level; <sup>c</sup> Significant at the 10% level.							

Table 7: Quarterly Hazard Rate from Employment (E), (U) and Out-of-the Labor Force (O), 1994 to 1998										
	Panel A			Panel B			Panel C			
	Pe <sub>e</sub>	Pe <sub>ej</sub>	Pe <sub>eu</sub>	Pe <sub>oo</sub>	Pu <sub>u</sub>	Pu <sub>e</sub>	Pu <sub>o</sub>	Po <sub>o</sub>	Po <sub>e</sub>	Po <sub>u</sub>
Base Hazard <sup>1</sup>	0.9718	0.0083	0.0061	0.0138	0.6553	0.1973	0.1473	0.9148	0.0688	0.0165
Age = 39	0.9725	0.0084	0.0062	0.0129	0.6541	0.2017	0.1442	0.9100	0.0723	0.0177
Age = 33	0.9754	0.0089	0.0068	0.0089	0.6445	0.2295	0.1260	0.8759	0.0969	0.0272
Age = 53	0.9569	0.0072	0.0050	0.0309	0.6615	0.1459	0.1926	0.9586	0.0351	0.0063
Education 11 yrs.	0.9690	0.0087	0.0072	0.0151	0.6831	0.1806	0.1363	0.9324	0.0545	0.0131
Married men	0.9843	0.0058	0.0034	0.0065	0.5708	0.2883	0.1409	0.9202	0.0638	0.0160
Married women	0.9789	0.0043	0.0045	0.0123	0.6356	0.2092	0.1552	0.9414	0.0418	0.0168
Single women	0.9777	0.0049	0.0046	0.0128	0.6904	0.1756	0.1340	0.9221	0.0567	0.0212
Duration (in current state)										
Increased by 10%	0.9777	0.0049	0.0046	0.0128	0.6591	0.1937	0.1472	-	-	-
Job (current or previous) in:										
Manufacturing	0.9720	0.0088	0.0070	0.0121	0.6639	0.2297	0.1064	0.9376	0.0493	0.0131
Construction	0.9737	0.0092	0.0082	0.0089	0.6754	0.2509	0.0737	0.8793	0.0947	0.0261
Trade	0.9708	0.0094	0.0088	0.0110	0.6147	0.2849	0.1004	0.9321	0.0564	0.0115
Public Sector	0.9699	0.0106	0.0064	0.0130	0.6982	0.2092	0.0926	0.9442	0.0467	0.0090
Vacancy rate										
Increased by 10%	0.9717	0.0084	0.0060	0.0139	0.6483	0.2041	0.1476	0.9147	0.0688	0.0164
Y95	0.9629	0.0198	0.0049	0.0124	0.6881	0.1863	0.1256	0.9167	0.0737	0.0096
Y96	0.9640	0.0193	0.0043	0.0123	0.7238	0.1674	0.1088	0.9259	0.0645	0.0096
Y97	0.9682	0.0155	0.0059	0.0104	0.7264	0.1826	0.0910	0.9265	0.0595	0.0140
Y98	0.9691	0.0122	0.0067	0.0120	0.8210	0.1156	0.0634	0.9272	0.0524	0.0204
SOURCE: Based on multinomial logit estimates in Table 6.										
<sup>1</sup> Base Hazard is for a single man, aged 40 (avg. for E=39, avg. for O = 53, avg. for U = 34), 12 years of education (avg. for E=12, avg. for U = 11, avg. for O = 11), working (or having worked) in the agricultural sector, with average duration in the state (avg. for E=90, avg. for O = n.a., avg. for U= 10), living in a district with average vacancy rate (0.017) in 1994.										

Table 8: Demographic Characteristics of Mobility into and out of Unemployment							
	Bulgaria (1)		E. Germany (2)		Poland(3)	Russia(4)	Russia(5)
<i>Probability of Leaving: a job for Unemp. (Peu)</i>	men	women	men	women	all	all	all
<i>is higher for the:</i>							
Younger	n.a.	n.a.	yes <sup>b1</sup>	yes	yes	yes	yes
Less educated	n.a.	n.a.	no <sup>b2</sup>	no <sup>b2</sup>	yes	yes <sup>c1</sup>	yes <sup>c1</sup>
Women	n.a.	n.a.		yes <sup>b3</sup>	yes	no	no
Single	n.a.	n.a.	yes	n.s.	yes	yes <sup>a2</sup>	n.s.
<i>Unemp. for a Job (Pue)</i>							
<i>is higher for the:</i>							
Younger	n.s.	n.s.	yes	n.s.	no	yes	n.s.
More educated	yes <sup>a</sup>	yes <sup>a</sup>	n.s.	yes	yes	n.s.	yes
Men				yes <sup>b4</sup>	yes	no	no
Married	n.s.	n.s.	yes	n.s.	n.s.	yes <sup>c3</sup>	yes <sup>c3</sup>
Note: 'n.s.' means not significant; 'n.a.' means not available.							
Findings are based on logit analysis and, except where noted, data from national <i>Labor Force Survey</i> data.							
<i>Sources:</i>							
1) Jones & Kato, 1997: refers to 1994-95.							
2) Bellmann et al., 1995: refers to 1990-91.							
3) King & Adamchik, 1999: refers to 1995-96, non-agricul. workers, educn. dummies							
4) Foley, 1997: refers to 1992-3 RSLMS data; Age in yrs.; 5 Educn. dummies.							
5) Foley, 1997: refers to 1995-6 RSLMS data; Age in yrs.; 5 Educn. dummies.							
<i>Notes:</i>							
<sup>a</sup> Anyone with more than a basic compulsory education.							
<sup>b1</sup> People less than 25 years of age are as likely to leave as the middle aged group (25-40); both groups are more likely to leave than the older group.							
<sup>b2</sup> More educated are more likely to leave.							
<sup>b3</sup> The base probability of one is higher than the base for the other.							
<sup>b4</sup> Less educated include primary school, apprenticeship and vocational school (coeff. not significantly diff. from each other), the technical and university levels were significantly different from elementary and from each other.							
<sup>c1</sup> Not in general. However, the interaction term for married women shows they tend to exit from e to u at a higher rate than single men in 1992-93. The coefficient on this interaction term was not significant in 1995-96.							
<sup>c2</sup> Married men are more likely to leave than single men and married women are less likely to leave than single men.							



<b>Table A1:</b>			
<b>Means of the Variables in the Multinomial Logit</b>			
	<b>E</b>	<b>U</b>	<b>O</b>
<b>Age</b>	39.185	34.399	53.335
<b>Education</b>	12.130	11.074	10.644
<b>Married men</b>	0.388	0.179	0.215
<b>Married women</b>	0.339	0.337	0.280
<b>Single women</b>	0.125	0.225	0.332
<b>Single men (base)</b>	0.149	0.259	0.173
<b>Duration (in current state)</b>	89.783	10.210	n.a.
<b>Agriculture</b>	0.085	0.084	0.036
<b>Manufacturing</b>	0.313	0.254	0.088
<b>Construction</b>	0.087	0.097	0.013
<b>Trade</b>	0.217	0.221	0.042
<b>Public Sector</b>	0.291	0.167	0.053
<b>Don't Know Sector</b>	0.006	0.177	0.768
<b>Proportion deleting Don't Know</b>			
<b>Agriculture</b>	0.085	0.102	0.156
<b>Manufacturing</b>	0.315	0.309	0.378
<b>Construction</b>	0.088	0.117	0.055
<b>Trade</b>	0.219	0.269	0.180
<b>Public Sector</b>	0.293	0.203	0.230
<b>Adj. total (excl. don't know)</b>	1.000	1.000	1.000
<b>Never Worked Before</b>			
<b>Vacancy rate</b>	0.017	0.016	0.017
<b>Y94</b>	0.182	0.164	0.167
<b>Y95</b>	0.197	0.184	0.192
<b>Y96</b>	0.209	0.169	0.210
<b>Y97</b>	0.212	0.207	0.213
<b>Y98</b>	0.200	0.276	0.218
<b>No. of Observations</b>	66705	2781	41214

Chart 2:  
Annual Flows Across the Three Labor Market States  
in the Czech Republic

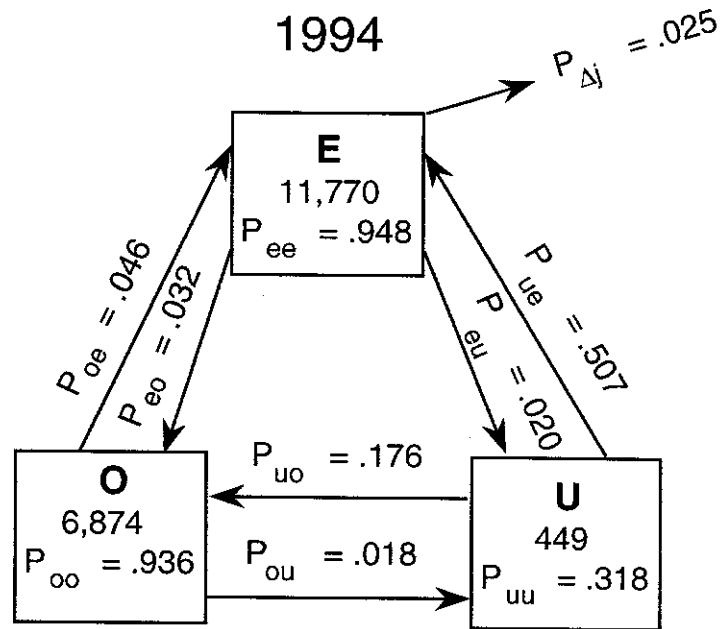


Chart 2 Contd.:  
Annual flows for the Czech  
Republic

