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Dynamics in Central Europe: A labor flow approach

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Unemployment Dynamics in Central Europe: A Labor Flow Approach

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Abstract:
We analyze labor market flows and unemployment in the Czech Republic (CR), Slovakia and Poland over the period 2004–2007. Relative involvement of working-age population in gross labor market flows is approximately five times lower in central Europe than in the U.S. /UK. Yet, compared to neighboring countries, the CR suffers more from unemployment rigidity, as evidenced most convincingly by a relatively weakernet flowof workers from unemployment to employment. This net flow alone would cut the unemployment rate in Poland more than twice as fast as in the CR. The CR lags behind in creating jobs forthe unemployed, particularly for men, individuals with primary education, and for the 55–65 age group.

Keywords: EU-SILC, labor market flows, longitudinal data, unemployment

JEL: E24, J60, J63, J64.

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Introduction

The period 2004–2007 in central Europe was marked by great economic expansion. While the countries entered the period at strikingly different unemployment rates, with Poland and Slovakia suffering from enormous unemployment, around 20 per cent, and the Czech Republic at relatively comfortable one-digit figures, in only four years the unemployment rates across the region converged remarkably and thus proved a relatively lower ability of the Czech labor market to respond to economic expansion by diminishing the unemployment rate.

Our key intention is to test the link between the observed cross-country differences in unemployment rate evolutions and thedegree of mobility prevailing on national labor markets. To measure the impact of labor mobility on unemployment rate dynamics in a comparative perspective we use a labor marketflow approach.

Movements of working-age population between various labor market states (i.e., between employment, unemployment and inactivity)are usually referred to in the literature as *gross labor market*or *workers flows*and serve as a commonly accepted proxy for labor mobility approximations.

These flows involve all relevant mobility channels, such as new entries into labor market, separations from employment, or exits from unemployment. We start our analysis with description of this concept, which includes literature overview and definition of a testable framework within which the link between unemployment rate dynamics and labor mobility can be revealed.

To our knowledge this is the first paper to attempt to use the matched longitudinal monthly data of the EU-SILC database for acomparative labor market flows analysis in Europe and thus, being relatively new, this approach requires more detailed technical description of data later in the text.

Afterwards we offer an introductory analysis common to any standard labor market flows research. This involves quantifying gross flows in countries covered by our analysis and establishing the probabilities for a working-age individual to move from one labor market status to another.

Then we proceed with an empirical examination of how labor market flows are linked with unemployment dynamics:We analyze their link with net changes in unemployment, and,subsequently, we demonstrate how they affect the evolution of unemployment rates in central European countries.

Finally, we deal with labor market flows decomposition of working-age population according to gender, education and age, and investigate the impact of labor mobility on unemployment ratesin each of these groups in the Czech Republic, Slovakia, and Poland.

1.Conceptual Remarks and Analytical Framework

There is a relatively long tradition in labor market flows research (see Abowd and Zellner 1985; Blanchard and Diamond 1990; or Burda and Wyplosz 1994 for some of the first analyses in the U.S./European context). Also central Europe is covered by similaranalyses (see e.g. Gora and Lehmann 1992; Bellman *et al.* 1995; Boeri 1996; Šorm and Terrel 2000; Večerník 2001; Gottvald 2005; Flek and Večerník (2007); or Cazes and Nesporova 2007).

Current research along these lines explores many specific directions, with the link between labor market flows and the dynamics of unemployment being one of the most influential ones (Shimer 2007; Petrongolo and Pissarides 2008). Gomez (2009); Silverstone and Bell (2010); or Dixon *et al*. (2011) are some of the most recent examples of research which sharesthis direction and methodological approach.

The essence of labor marker flows analysis is as follows: At any period$t$,each individual can be either employed(E_t), unemployed (U_t) or inactive(I_t).In the next period

$(t+1)$ the same individual can remain in an unchanged labor market status or change it. The former situation is characterized by continuing employment$(E_t \rightarrow E_{t+1})$,continuing unemployment $(U_t \rightarrow U_{t+1})$, or continuing inactivity $(I_t \rightarrow I_{t+1})$.In the later situation the individual statuscan become subject to change in the following sixways: $(E_t \rightarrow U_{t+1})$; $(E_t \rightarrow I_{t+1})$; $(U_t \rightarrow E_{t+1})$; $(U_t \rightarrow I_{t+1})$; $(I_t \rightarrow E_{t+1})$; and $(I_t \rightarrow U_{t+1})$.

Any period $(t+1)$ thus features a certain number(the sum of six possible gross flows) of individuals whose labor market status has changed since the initial period (t). Depending on the availability of data, this framework allows to calculate the average (monthly, quarterly) number of individuals involved in each gross labor market flow.Such results serve for labor mobility approximations both at national levels andinternationally.

Results obtained from gross labor market flows quantifications enable us also to display changes in aggregate labor market indicators (employment, unemployment and inactivity), as a consequence of workers' fluctuations betweenvarious labor market states. In this sense the link between unemployment rate dynamics and the micro mobility of workers expressed by gross labor market flows is of our primary interest:

Net change in unemployment(ΔU) can most intuitively be expressed as thefirst difference between the *stocks* of unemployed (U) at times $(t+1)$ and t. Another option is to make use of *flow* data and express (ΔU) as a balance of those gross labor market flowsthat influence the dynamics of unemployment (i.e., gross flows in and out from unemployment):

$$\Delta U = (U_{t+1} - U_t) = \left[\underbrace{(E_t \rightarrow U_{t+1}) + (I_t \rightarrow U_{t+1})}_{\text{IN}}\right] - \left[\underbrace{(U_t \rightarrow I_{t+1}) + (U_t \rightarrow E_{t+1})}_{\text{OUT}}\right]. (1)$$

Formula (1) can be rearranged in the following way:

$$\Delta U = (IN - OUT) = \left[\underbrace{(E_t \rightarrow U_{t+1}) - (U_t \rightarrow E_{t+1})}_{\text{net flow btw. } U \text{ and } E}\right] + \left[\underbrace{(I_t \rightarrow U_{t+1}) - (U_t \rightarrow I_{t+1})}_{\text{net flow btw. } U \text{ and } I}\right], (1.1)$$

where the difference $[(E_t \rightarrow U_{t+1}) - (U_t \rightarrow E_{t+1})]$ represents the *net* flow of workers between unemployment and employment, and $[(I_t \rightarrow U_{t+1}) - (U_t \rightarrow I_{t+1})]$ stands for the *net* flow between unemployment and inactivity.The contribution of these two net flows to the evolution of the unemployment rate can be formalized in the following steps:

$$\Delta\left(\frac{U}{LF}\right) = \frac{U_{t+1}}{LF_{t+1}} - \frac{U_t}{LF_t}. \quad (2)$$

Formula (2) defines a change in the unemployment rate between periods t and $(t+1)$. The labor force (LF) consists of the employed and the unemployed; changes in the labor force are represented by $\Delta LF = (LF_{t+1} - LF_t)$. From formulas (1) and (1.1) we can deduce that$U_{t+1} = (IN - OUT) + U_t$, and therefore formula (2) can be rearranged as follows:

$$\Delta\left(\frac{U}{LF}\right) = \frac{(IN - OUT)}{LF_{t+1}} + \frac{U_t}{LF_{t+1}} - \frac{U_t}{LF_t} = \frac{(IN - OUT)}{LF_{t+1}} + U_t\left(\frac{1}{LF_{t+1}} - \frac{1}{LF_t}\right). \quad (3)$$

Formula (3) expresses in percentage points which fraction of changes in the unemployment rate is due to the observed net change in unemployment$(IN - OUT)$, and which is due to theimpact of changes in labor force.[1]

From the term $(IN - OUT)$ in formulas(1.1) and (3) we can separate how the net flow of workers between unemployment and employment (*A*), and between unemployment and inactivity (*B*) affect changes in the unemployment rate: (4)

[1]If $\Delta LF = 0$ in formula (3), there is no contribution of changes in labor force to changes in the unemployment rate. Conversely, if $(IN - OUT) = 0$, then the number of unemployed persons remains constant over time, and the unemployment rate might develop solely due to a changing labor force. The term expressing the contribution of changing labor force to unemployment rate dynamics is derived somewhat differently by Dixon *et al*. (2011), as $[(\Delta LF/LF_t)U_t]/(LF_{t+1})$, but has the same implications.

$$\Delta\left(\frac{U}{LF}\right) = \underbrace{\frac{(E_t \rightarrow U_{t+1}) - (U_t \rightarrow E_{t+1})}{LF_{t+1}}}_{\text{A}}$$

$$+ \underbrace{\frac{(I_t \rightarrow U_{t+1}) - (U_t \rightarrow I_{t+1})}{LF_{t+1}}}_{\text{B}} + \underbrace{U_t\left(\frac{1}{LF_{t+1}} - \frac{1}{LF_t}\right)}_{\text{C}}.$$

Formula (4) provides a testable link between a change in the unemployment rate,"unemployment-related" mobility of workers(*A*; *B*), and changes in labor force (*C*). This formula can also be used for specific groups of workers. In such case we would obtain a testable link between mobility of certain groups of workers and the evolution of their specific unemployment rates.

In Europe labor flows analyses are conventionally based on *quarterly* Labour Force Surveys (LFSs).In the U.S.equivalentanalyses are typically based on *monthly* data from the Current Population Survey (CPS).[2]Thuspractically allcomparisons of labor mobility between Europe and the U.S. have systematically suffered from the different frequency/methodology of data collection.

Our results are based on longitudinal EU-SILC monthly data. As we argue later in the text, such approach lowers the potential biases which stem from the previous use of quarterly data for European labor market flows analyses.In addition longitudinal EU-SILC enablesmore meaningful comparisons of labor mobility between the U.S. and European countries.

It is plausible to use the U.S. as a reference country because the American labor market is believed to be more mobile (flexible) than those of European economies. Using the

[2]See Davis *et al.* (2006) for an overview of alternative data sources available in the U.S.

longitudinal EU-SILC we can test in a specific way the validity of this assumption and support/reject it by new quantifications for central European countries.

Unfortunately, the longitudinal EU-SILC database is not yet fully functioning in providing results for the whole European Union and thus the possibility to compare our results obtained for central European countries with the EU as a whole or some representative EU-member country is rather limited.

Western European labor markets which could serve for reference purposes, such as the German one, are not included in the longitudinal EU-SILC 2008. In other potentially illustrative cases (e.g., the UK) the specific construction of longitudinal weights eliminates too high a fraction of the original pre-weighting sample for the results to remain reliable.

Our approach also prevents direct comparison betweenresults obtained in our and in the previous research conducted for European countries. As noted earlier, European research has typically explored the LFS-based quarterly data. Moreover, the LFSs data available for research purposes typically lacked the longitudinal structure.[3]

Limited by the relatively short time span of the longitudinal EU-SILC dataset, our research could not exploresome advances in the contemporary labor market flows research, such as investigating labor market flows and unemployment dynamics over the different phases of the business cycle, to name but one.

2. The longitudinal EU-SILC database

The Statistics on Income and Living Conditions (EU-SILC) is an annual household panel survey where respondents state their monthly economic activity retrospectively for the

[3]The only exception available to us is the full longitudinal structure of quarterly LFS data for the UK, as used e.g., by Gomez (2009). That is why we also partly refer to the UK when interpreting our results for central European counties. One must admit, however, that cross-country comparisons of results based on monthly and quarterly data can be done only conditionally and must be viewed with necessary caution.

whole previous calendar year. Launched in 2005 in most European countries, EU-SILCis designed as a four-year rotational panel survey with approximately one quarter of households dropped and replaced with a new random sample every year.

The most recent longitudinal dataset EU-SILC 2008covers theperiod 1/2004–12/2007 and involves three rotational groups (the initial four-year sample plus two additional three- and two-year ones).The sample design allows us to follow the development inthe monthly labor market status (employed, unemployed, or inactive) of individuals from the initial rotational group who were surveyedfor 48 consecutive months, i.e.,for the maximumperiod.

We limit our four-year sample to working-age population, i.e., to those who are between 16 and 65 during the investigation. Finally, there is an additional attrition of approximately 20 per cent of respondents caused by refusals, non-contacts, untracked changes of residence,leaving the survey population, and deaths. This leaves us eventually with 5,071 individuals for the Czech Republic, 2,099 for Slovakia, and 5,441 for Poland.

These numbers are adjusted by longitudinal weights designed by Eurostat specifically for the four-year subsamples. The weights calibrate the final national samples which outlasted the surveyed 4-year period from the initial rotational groups. Our samples can thus be viewed as pure panels, rather than rotational ones, where all month-to-month labor market states of individuals are matched by definition.[4] This minimizes the *non-response* or *attrition bias*, which isotherwise present in typical rotational group samples.

By exclusively using the longest lasting initial rotational group and omitting use of the two other groups (the three- and two-year group), we lower considerably our pre-weighting sample size. Nonetheless, this decision is based on rational reasons:The corresponding

[4] This approach enables a 100% month-to-month match in Slovakia. However, the construction of longitudinal weights differs in Poland where the weighting procedure of a 4-year sample still includes some individuals who stopped participating in the survey in the second, third and/or fourth year. This causes only a 96.9% level of actual matching in a weighted 4-year Polish sample. A similar yet quantitatively less relevant problem applies to the Czech sample with the actual matching level of 99.8%.

longitudinal weights are constructed separately for each rotational group,and the total weighted sample of all three rotational groups thus corresponds to a triple the population.We suspect that interpretation of such results would be rather confusing.

EU-SILC provides monthly data on economic activity, which makes the data quite unique in this sense. Still it fails to capture short-term changes, such as unemployment lasting less than two weeks (so called *time aggregation bias*). In principle, the quarterly panel surveys face the same problem, which is in this case even more strikingsince their quarterly breakdown actually increases the time aggregation bias and disregards even longer-lastingstatus changes than the monthly data.

*Multiple transitions*between various labor market states are of similar nature. Whilequarterly data cannot account for multiple transitions (e.g., from employment to unemployment and back to employment) within less than one quarter of a year, which in their view leaves an individual employed over the whole period, monthly data would notice two changes in individual labor market status over the same period.

Using EU-SILC monthly data leads, almost by definition, to results different from those of quarterly surveys.Apart from the above noted arguments, consider additionally a respondent who in January declares him/herself an unemployedjob seeker. Due to the rigid labor market, s/he successfully finds a new job only in April of the same year.

The quarterly data would then recognize a status change of theindividual from unemployment to employment between the first and second quarterof a given year, i.e., a *quarterly*100 per cent labor market status change. Yet, had the economic activity been monitored on a monthly basis, the resulting *monthly*labor market status change for the same individual would be on average just 33 per centover the same period.

On the other hand, direct *job-to-job movements* cannot be analyzed by EU-SILC data. Respondents are asked whether they changed their jobs during the last year, yet neither the month nor the number of changes arerecorded. Research based on LFS data typically capturesboth gross flows and job-to-job movements of workers, thus leaving EU-SILC the only survey suffering from this specific omission.[5]

Introducing some of the existing arguments on why the quarterly longitudinal datasets might be more prone to biases than those based on monthly observations, we explained why national statistical institutions are often reluctant to publish or allow the selective use of these data for research purposes, and why most of the existing research, including cross-country comparisons, is based on national quarterly LFS data that lack the longitudinal structure.

Eurostat harmonizes the national LFSs and provides an integrated dataset EU-LFS. Although both EU-SILC and EU-LFS are designed as rotational panels and could serve as bases for longitudinal datasets, Eurostat does not make the international longitudinal datasets of EU-LSF available for research purposes.[6]This gives the EU-SILC another unique advantage for labor flows analysis, as it enables international comparisons based on longitudinal data.[7]

The most serious problem with both EU-SILC and LFS-based data (and even with the CPS) potentially consists in incorrectly reported data. It is commonly believed that due to this *response-error bias*labor market status changes are overestimated. For example,incorrectly recording one unemployment statuswithin a long period of actual employment would indicate two labor market status changes, instead of none at all.

[5]This omission might be significant in case of analyzing labour mobility *per se*. But our analysis is devoted especially to the link between labor market flows and unemployment, where the job-to-job-flows play no role.
[6]The attempt to use the harmonized EU-LFS for comparative labor flows analysis is reprezented by Cassado, Fernandez and Jimeno (2011). But, for the above mentioned reasons, this research is actually based on *cross-sectional* EU-LFS with a retrospective question on labour market status in previous year.
[7]For more details on EU-SILC methodology see e.g. Mysíková (2011) or European Commission (2007, 2010).

According to Abowd and Zellner (1985),gross flowsof workers between employment and unemployment in the U.S. are rather unaffected by this bias, while it remarkably influences gross flows from and to inactivity, and the total volume of gross labor market flows is therefore overestimated.

To cope with this bias, Abowd and Zellner (1985) apply re-interview data while others, such as Silverstone and Bell (2010), include supplementary questions (e.g.,about the duration of the respondents' employment, their job-search, or how longsince they received a paid job). Without this the bias remains unaccounted for.

So far all labor market flows research has been based on *monthly* or *quarterly* surveys. EU-SILC is an *annual* survey with respondents stating their monthly economic activity retrospectively for the whole previous calendar year. There is no reason to believe that respondents would enter incorrect information, such as claiming to have been unemployed for one month while actually they wereemployed the whole year.

But there is another realistic reservation: Respondents might not recallexactly when they changed their labor market status (for instance, when they found a job and moved from unemployment to employment). However, as we argue later in the text, this kind of potential error cannot substantially harm our analysis.

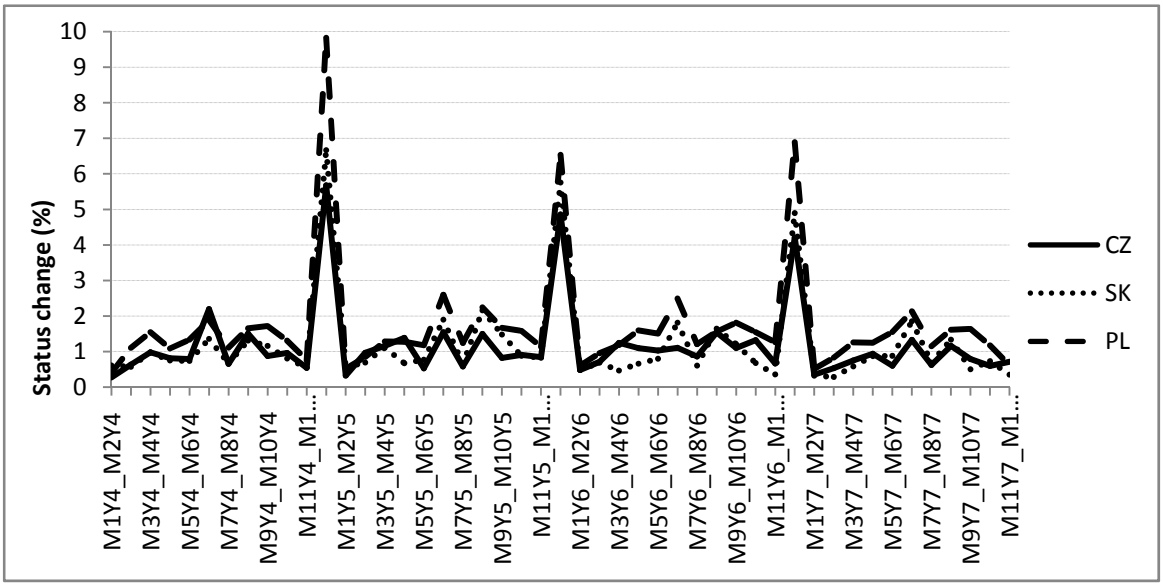
As noted earlier, there are three situations reflecting an unchanged individual's labor market status: continuing employment ($E_t \rightarrow E_{t+1}$); continuing unemployment ($U_t \rightarrow U_{t+1}$); or continuing inactivity($I_t \rightarrow I_{t+1}$). In addition, six possible labor market status changes are reflected by the corresponding six gross labor market flows:($E_t \rightarrow U_{t+1}$); ($E_t \rightarrow I_{t+1}$); ($U_t \rightarrow E_{t+1}$); ($U_t \rightarrow I_{t+1}$); ($I_t \rightarrow E_{t+1}$); and ($I_t \rightarrow U_{t+1}$).

Figure 1 shows the frequency of the six month-to-month labor market status changes relative to the total of nine possible month-to-month situations. The three major peaks in

Figure 1 indicate that most changes occur between December and January.[8] The timing of status changes seems to be influenced by typical decisions of both workers and employers:

Employees tend to retire towards the end of the year, which is also the time when a large portion of quits and layoffs occurs. In addition, some less significant peaks of labor market status changes can typically be observed in June–July and August–September, due to seasonal jobs and labor market status changes of students.

Figure 1: *Labor market status changes* (in per cent of total month-to-month states)



Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

The reported rise of labor market status changes in January compared to December might be to some extent given also by incorrect retrospective answers by respondents. For example,an unemployed respondent finds a jobin March but, to ease the interview or simply because s/he does not remember exactly,claims to have found it back in January.

Although the precise month of the labor market status change can be unclear, it does not affect the results of analyzing*average* monthly gross labor market flows: declaring that

[8]Labor flows in all three countries display strong common seasonal patterns. If we analyzed these flows in time series, we would apply seasonal adjustments, as does most of the existing research. Since we limit ourselves on cross-country comparisons, we believe that the use of raw monthly gross flows averaged over the whole investigated period can be justified.

changes occurred between December and January although they actually occurred between February and March does not influencemonthly averages for the whole period.

3. Gross Labor Market Flows in a Comparative Perspective

Based on 47 month-to-month observations in each country,we calculate the average monthlynumber of individuals involved in gross labor market flows (see Figures 1A-3A in Appendix).But for the sake of comparability we start our analysis with percentage shares of working-age populationinvolved in gross labor market flows, rather than with the absolute working-age-population numbers. These results are summarized in Table 1.

Table 1:*Gross Labor Market Flows in Central Europe* (monthly averages, 2004–2007)

	$(E_t \rightarrow U_{t+1})$	$(E_t \rightarrow I_{t+1})$	$(U_t \rightarrow E_{t+1})$	$(U_t \rightarrow I_{t+1})$	$(I_t \rightarrow E_{t+1})$	$(I_t \rightarrow U_{t+1})$
CR	0.24	0.23	0.32	0.09	0.18	0.11
Slovakia	0.26	0.16	0.38	0.08	0.19	0.12
Poland	0.34	0.30	0.49	0.15	0.33	0.14

Notes: In per cent of working-age population (16–65); weighted matched sample.
Source: EU-SILC LONGITUDINALUDB 2008, version3 of August 2011; own calculations.

On average monthly gross labor market flows in the CR involve 1.17per cent of working-age population. For other countries covered by our analysis, the respective figures are 1.19per cent for Slovakia and 1.75per cent for Poland (row totals from Table 1). Three specific features of these results are worth commenting on.

First, our results indicate a considerably lower degree of mobility on central European labor markets compared to the U.S./UK.In the U.S. the monthly gross flows involve on average between 5% and 7% of working-age population, depending on the analyzed period and author.[9]The quarterly results for the UK are similar, as evidenced by Gomez (2009).

[9]These results do not involve job-to-job flows (see Gomez 2009 for an overview). Note that the results for the U.S. refer to averages derived from one or even two decades of monthly observations, while our data cover just a four-year period 2004–2007. When we refer to the UK, one has additionally to consider the quarterly structure of the UK data which might generate over/underestimated results.

Second, all three analyzed central European labor markets appear to display rather modest differences in relative involvement of working-age population in average monthly gross labor market flows: The respective difference between the Polish and Czech labor market, or in other words between the most "mobile" and the most "rigid" labor market, amounts to just aroundhalf a percentage point (1.74% – 1.17%).

Third, similar patterns of labor mobility are manifested in structural terms across all central European countries: Average monthly gross flows between employment and unemployment ($E_t \rightarrow U_{t+1}$; $U_t \rightarrow E_{t+1}$) represent in sum more than one half of total gross labor market flows in all central European countries analyzed in Table 1. The overall labor market dynamics in central Europe is therefore determined by these two flows.

Furthermore, Table 1 reports that in all countries the most robust gross flow is the one from unemployment to employment ($U_t \rightarrow E_{t+1}$), which is with equal uniformity followed by gross flow in opposite direction ($E_t \rightarrow U_{t+1}$). But, as far as the two abovementioned gross flows are concerned, and especially the one from unemployment to employment, the CR has the lowest values: While in the CR it involves on average some 0.3 per cent of working-age population per month, in Slovakia and Poland the respective figures are 0.4 and 0.5 per cent.

Our main finding here is that similar mobility patterns prevail across all central European labor markets. However, the CR appears to have a slightly more rigid mobility channels between unemployment and employment in relative terms. Yet, we still have to ask later in the text about the relevance of this finding in explaining the observed cross-country differences in unemployment rate dynamics.

Results in Table 1 also indicate existing structural dissimilarity between central European and UK/U.S. patterns of labor mobility. In the U.S. and in the UK gross flows between employment and unemployment (in both directions) account,according to Gomez

(2009), for only about one third of total monthly/quarterly gross flows, with the gross flows between employment and inactivity (and *vice versa*) as the relatively most relevant ones.

Figures 1A-3A in Appendix also involve transition probabilities (hazard rates), i.e., rates at which each individual is faced with a "hazard" of changing theirlabor market status next month.[10]Analogously to the analysis of gross labor market flows, the results concerning such hazard rates in central European labor markets are highly similar, and at the same time remarkably different from those obtained for the U.S. or the UK.

In central Europe the probability that an unemployed will become employed next month ranges between 4.6per cent and 5.0per cent.[11]Yet, this probability in the U.S. and the UK is much higher (Fallick and Fleischman 2004 established its average monthly value for the U.S. in 1996–2003 at 28.3 per cent; Gomez 2009 reported that its quarterly average value in 1996–2007in UK was 27.8per cent). This leaves central European unemployed with a striking one-in-five chance of receiving a job compared to their U.S. (or UK) counterparts.[12]

The probability of losing job and entering the pool of unemployed next month ranges between 0.4per cent and 0.6per cent in central Europe. This is again much less than in the UK and the U.S., where in both cases this probability reaches 1.3 per cent(Fallick and Fleischman 2004; Gomez 2009).It follows that the risk of losing a job and becoming unemployed is two or even three times lower in central Europe than in the U.S. or UK.

[10]These probabilities can formally be expressed as first-order Markov transitions where the individual finds him/herself in a new (or initial) labor market status at time $(t+1)$, depending on his/her labor market status at time t. For instance, $UE = (U_t \rightarrow E_{t+1})/U_t$ indicates the individual probability to exit unemployment (U_t), and move to employment (E_{t+1}).All possible transitions of this sort form a 3x3 matrix where the diagonal terms represent unchanged labor market states over time (*EE, UU, II*). Each row also involves two off-diagonal terms indicating possible status transitions (*EU, EI; UE, UI; IE; IU*). In a fully rigid labor market the off-diagonal terms would equal zero. Conversely, in a totally fluid labor market with 100% transitions between states, the diagonal terms would be zero. See, e.g., Silverstone and Bell (2010); or Gottvald (2005) for more detail.

[11] See Figures 1A-3A in Appendix.

[12]To further interpret this result: For every 100 currently unemployed persons in the US, on average 28 would become employed next month. In central Europe the same prospect concerns as a maximum 5 individuals in every 100 unemployed.

4.Labor Market Flows and Unemployment

In Table 2 net changes in unemployment (ΔU) are presented as the balance between thetwo "unemployment-related" net flows. In CR a net decline in unemployment totals on average some 3,500 persons every month, in Slovakia and Poland 2,900 and 34,300 respectively.

Table 2: *Net Changes in Unemployment* (monthly averages, 2004–2007)

	Av. monthly net change in unemployment	Net av. monthly flows btw. unemployment and employment	Net av. monthly flows btw. unemployment and inactivity
	ΔU	$[(E_t \rightarrow U_{t+1}) - (U_t \rightarrow E_{t+1})]$	$[(I_t \rightarrow U_{t+1}) - (U_t \rightarrow I_{t+1})]$
CR	−3,576	−4,811	1,235
Slovakia	−2,913	−4,398	1,485
Poland	−34,267	−32,231	−2,036

Notes: Number of people (16–65); weighted matched sample. Negative values represent net flows from unemployment to employment (2nd column), and from unemployment to inactivity (3rd column).
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

Table 2 demonstratesin second column that the net flow from unemployment to employment is the key factor behind the country-specific net declines in unemployment. In fact in CR and Slovakia it is the only factor cutting down the total number of unemployed.

This is caused by net flows from inactivity to unemployment in the CR and Slovakia: The rightmost column in Table 2 shows that, in both these countries, more people move every month from inactivity to unemployment($I_t \rightarrow U_{t+1}$)than in the opposite direction($U_t \rightarrow I_{t+1}$). This net flow alone would therefore amount to an average monthly increase in the total number of unemployed by some 1,200 persons in the CR and 1,500 in Slovakia.

Poland is the only country experiencing a net flow from unemployment to inactivity,which diminishes total unemployment on average by some 2,000 persons every month (see third column in Table 2). This structural specificity isanother, albeit partial, factor to be considered when explaining later in the text why the downward unemployment rate flexibility is higher in Poland than in other central European countries.

These results can be considered as quantitative evidence of the crucial impact the workers moving from unemployment to employment have on net changes in unemployment in central European economies.Nonetheless,country-specific absolute figures on net changes in unemployment are rather hard to compare internationally.

When relying solely on such figures, it would remain somewhat unclear which country performs "better" in terms of reducing the unemployment rate, and precisely how did the corresponding gross (net) flows contribute to these reductions.That is why the links between labor market flows and the rate of unemploymenthave to be quantified in a manner enabling meaningful international comparisons.

The three components on the RHS in formula (4) are calculated in Table 3 and specify, in percentage points,the factors behind the monthly average changes in the unemployment rate. The term *A*, if negative, announces the impact of a net flow of workers from unemployment to employment on cutting the unemployment rate.

Negative*B*, on the other hand, marks the impact of a net flow from unemployment to inactivity on declines in the unemployment rate. Finally, the term *C* indicates the impact of changes in labor force on the unemployment rate: If negative, it indicates adecline in the unemployment rate caused solely by increasing labor force.

Table 3: *Changes in the Unemployment Rate*(monthly averages, 2004–2007)

	Av. monthly change in the unemployment rate	Contribution of net av. monthly flowsbetweenunemployment andemployment	Contribution of net av. monthly flows betweenunemployment and inactivity	Contribution of av. monthlychange in labor force
		A	*B*	*C*
CR	−0.0737	−0.1030	0.0264	0.0028
Slovakia	−0.1228	−0.1686	0.0569	−0.0111
Poland	−0.2469	−0.2275	−0.0144	−0.0050

Notes: In percentage points; weighted matched sample.
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

Table 3 shows that the steepest decline in the unemployment rateis witnessed in Poland with a monthly average of 0.25 percentagepoints. Slovakia scores twice as worse with its mere 0.12 percentage points and the CR three and a half times as worse with only 0.07 percentage points.[13]

The *common* decisive factor causing national rates of unemployment to decline is a net flow from unemployment to employment (see negative values in column *A*in Table 3). The contribution of factors (*B*+*C*) is much less relevant if not negligible. We also see that country-specific *differences* in the downward dynamics of the unemployment rate emerge decisively due to different strengthsof net flowsof workers from unemployment to employment (*A*):

In Poland, net flow of workers from unemployment to employment (*A*) alone cuts the monthly unemployment rate on average by some 0.23 percentage points, while in the CR the same net flow causes the unemployment rate todecline on average only by 0.10 percentage points per month. Thus the net flow of workers from unemployment to employment alone would diminish the unemployment rate in Poland more than twice as fast as in the CR.

5. Unemployment Rates and Labor Market Flows of Specific Population Groups

Between 2004 and 2007 the male unemployment ratein the CRwas declining on average by some 0.06 percentage points per month, female by 0.09 percentage points, i.e. Czech female unemployment rate is by one third more downward flexible than the male one(see Table 4).

[13]Note that unemployment response to economic recovery in the U.S. between June 2003 and March 2007 was weaker than in central Europe in 2004–2007. According to Dixon *et al*. (2011), average monthly decline in the U.S. unemployment rate represented just -0.056 percentage points per month.This was almost exclusively (i.e., by -0.054 percentage points) due to the term($IN - OUT$). Of which the contribution of the net flow from unemployment to employment (*A*) accounted to -0.158 percentage points, and the contribution of the net flow from inactivity to unemployment (*B*) represented 0.104 percentage points. A relatively higher net inflow into unemployment from inactivity (*B*) is thus the main factor explaining lower downward unemployment flexibility in the US than in central European countries.

Table 4: *Changes in the Unemployment Rate: Gender Decomposition* (2004–2007)

		Average monthly change in the unemployment rate	*A*	*B*	*C*
CR	Male	–0.0610	–0.0726	0.0136	–0.0020
	Female	–0.0865	–0.1403	0.0422	0.0116
Slovakia	Male	–0.1747	–0.2050	0.0406	–0.0104
	Female	–0.0650	–0.1281	0.0751	–0.0120
Poland	Male	–0.2591	–0.2734	0.0305	–0.0163
	Female	–0.2320	–0.1784	–0.0626	0.0089

Notes: In percentage points; weighted matched sample.
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

Column *A* inTable 4 demonstrates that this observation is mainly due to a relatively stronger female net flow from unemployment to employment compared to male. Such result differs both from Slovakia and Poland. In both these countries unemployment rates of men are declining more rapidly than those of womenwhich is due to relatively stronger male net flows from unemployment to employment compared to female.

The CR is the only country with a net flow of least qualified workers from employment to unemployment (see column *A* in Table 5). Thus, even at times of historically the strongest economic expansion there were more primary education workers who lost their jobs and became unemployed than those who moved from unemployment to employment.

Table 5: *Changes in the Unemployment Rate: Educational Decomposition* (2004–2007)

		Average monthly change in the unemployment rate	*A*	*B*	*C*
CR	Primary	–0.0607	0.0050	–0.1542	0.0885
	Secondary	–0.0825	–0.1240	0.0390	0.0025
	Tertiary	0.0015	–0.0400	0.0434	–0.0020
Slovakia	Primary	–0.3518	–0.3724	–0.1256	0.1462
	Secondary	–0.1182	–0.1521	0.0411	–0.0072
	Tertiary	–0.0260	–0.1918	0.1755	–0.0097
Poland	Primary	–0.4177	–0.2613	–0.2445	0.0881
	Secondary	–0.2691	–0.2494	–0.0172	–0.0025
	Tertiary	–0.0146	–0.1273	0.1246	–0.0119

Notes and Source: See Table 4.

The net flow (*A*) alone would be responsible for an average *increase*by 0.005 percentage points per month in the unemployment rate of the least qualified Czech workers. The results for Slovakia and Poland in this respect are quite opposite, with net flows of

primary education workers from unemployment to employment, which then alone contributes to average monthly*declines* intheir specific unemployment rates by 0.26 percentage points in Poland, and by 0.37 percentage points in Slovakia.

Table 6: *Changes in the Unemployment Rate: Age Decomposition* (2004–2007)

		Average. monthly change in the unemployment rate	*A*	*B*	*C*
CR	19-24	–0.3080	–0.8128	0.9244	–0.4196
	25-54	–0.0934	–0.1054	0.0138	–0.0018
	55-65	0.0013	0.1303	–0.2056	0.0765
Slovakia	19-24	–0.5075	–1.0607	1.1378	–0.5845
	25-54	–0.1118	–0.1147	0.0095	–0.0066
	55-65	–0.1723	–0.0630	–0.1766	0.0673
Poland	19-24	–0.7046	–0.8556	0.8925	–0.7416
	25-54	–0.2444	–0.1945	–0.0517	0.0019
	55-65	–0.2148	–0.1406	–0.2092	0.1350

Notes and Source: See Table 4.

Another striking cross-country difference concerns the population group aged between 55 and 65: In the CR, the net flow of this category of workers is from employment to unemployment, and this net flow alone would contribute to an *increase* inthe specific monthly unemployment rate of this group on average by 0.13 percentage points(see column *A* in Table 6). In contrast, Poland (Slovakia)witnessesa net flow (*A*) of elderly workers from unemployment to employment, whichalone would contribute to a monthly average *decrease* in their specific unemployment rate by 0.06 percentage points (0.14 percentage points).

Concluding Remarks

A relatively modest share of working-age population (between 1–2 per cent) appears to be involved in average monthly gross flows in central European labor markets. This indicator of overall labor mobility is approximately five times lower than one in the U.S. or in the UK.

In addition the fairly low degree of mobility in central European labor markets is confirmed by the analysis of transition probabilities (hazard rates). Here the differences in

comparison with the U.S./UKare again of a similar magnitude, above all with respect to the hazard rate of moving from unemployment to employment and *vice versa*.

The analysis of net changes in unemployment confirms the decisive role the unemployment-employment mobility channel (i.e., of the net flow of workers from unemployment to employment)played in the dynamics of unemployment in central Europe: In the Czech Republic and Slovakia this labor mobility channel alone is fully responsible for cutting down the number of unemployed.

The net flow of workers from unemployment to employment further needs to be taken into account when analyzing the factors behind changes in the unemployment rate. In fact, this net flow is decisive for unemployment rate evolutions in all central European countries. It also explainsthe majorityof cross-country differences in unemployment rate dynamics. For instance, this net flow alone would diminish the unemployment rate in Poland more than twice as fast as in the Czech Republic.

Our results indicate that the Czech Republic is lagging behind in creating enough job opportunities for unemployed men, and even more so for unemployed least qualified and elderly individuals. Only in this country more primary education/elderly workers had lost their jobs and entered the pool of unemployed compared to the amount of those who had left unemployment and moved into employment.

These results might trigger a response in active labor market policy, the system of benefit provision, and measures against illegal work in the CR. At least to a certain extent all these policy areas appear to be responsible for rather gloomy employment prospects of the least qualified and elderly Czech unemployed.

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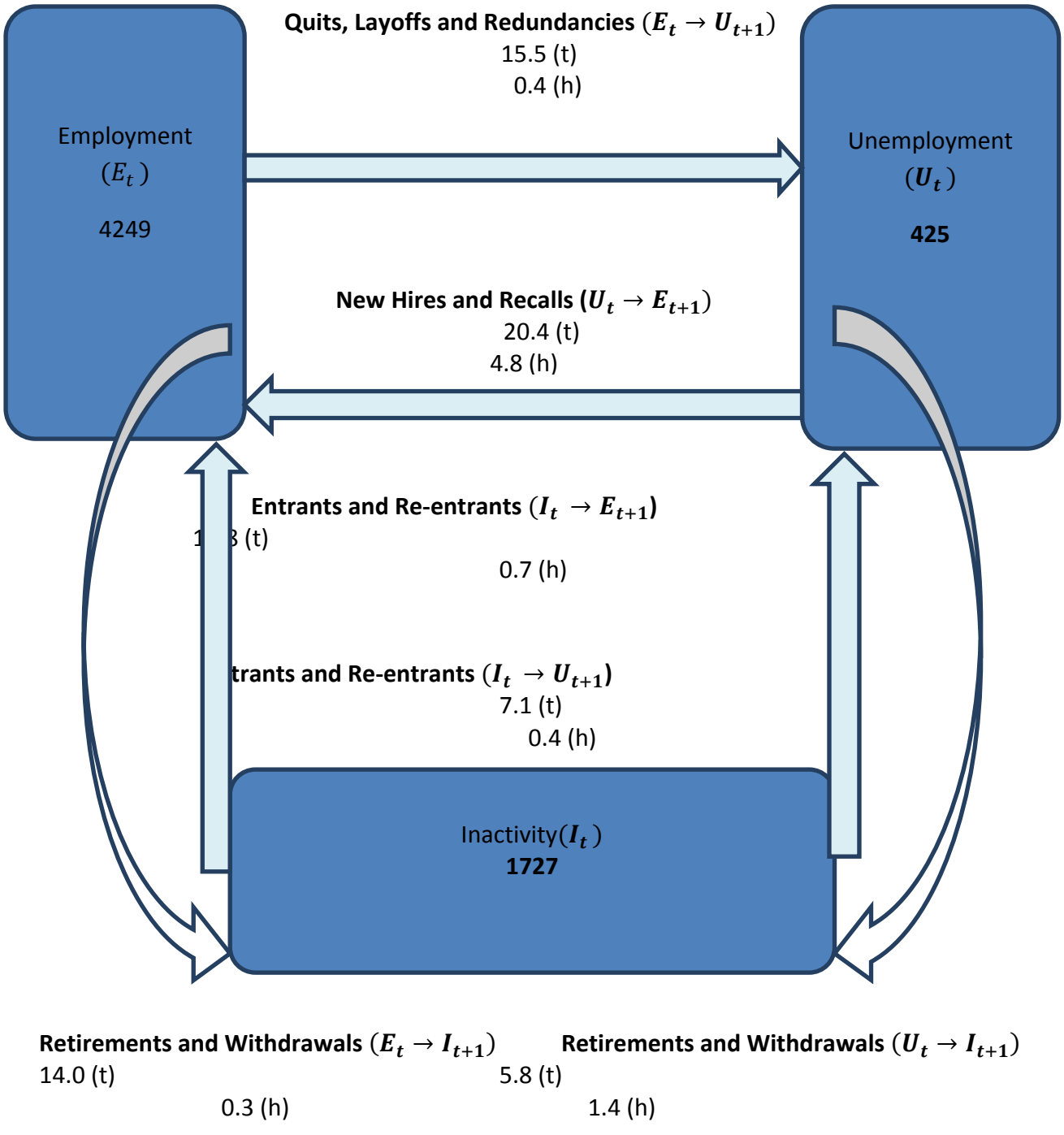
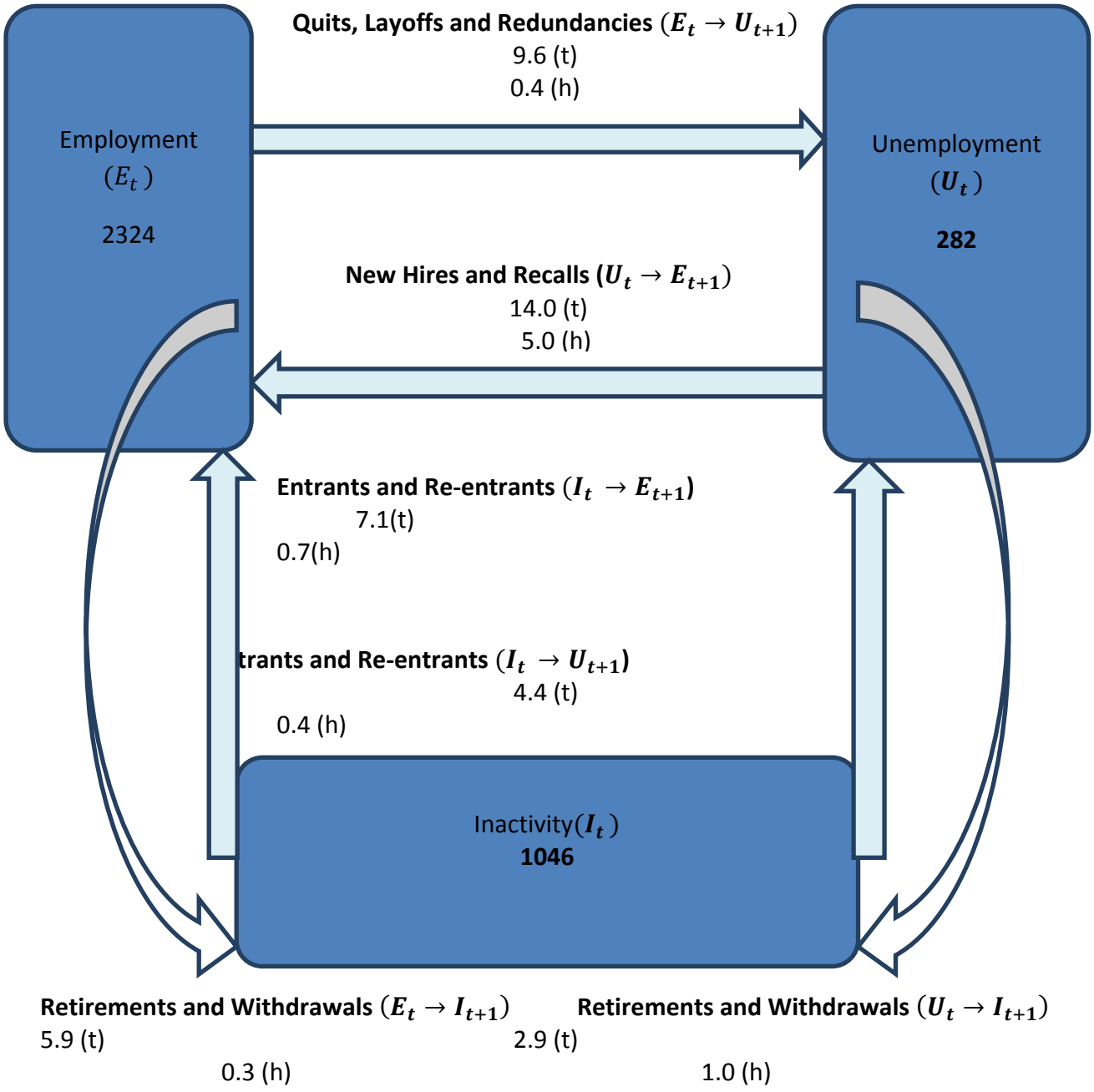
Appendix

Figure 1A: *Gross Labor Market Flows in the Czech Republic*
(monthly averages, 2004–2007)



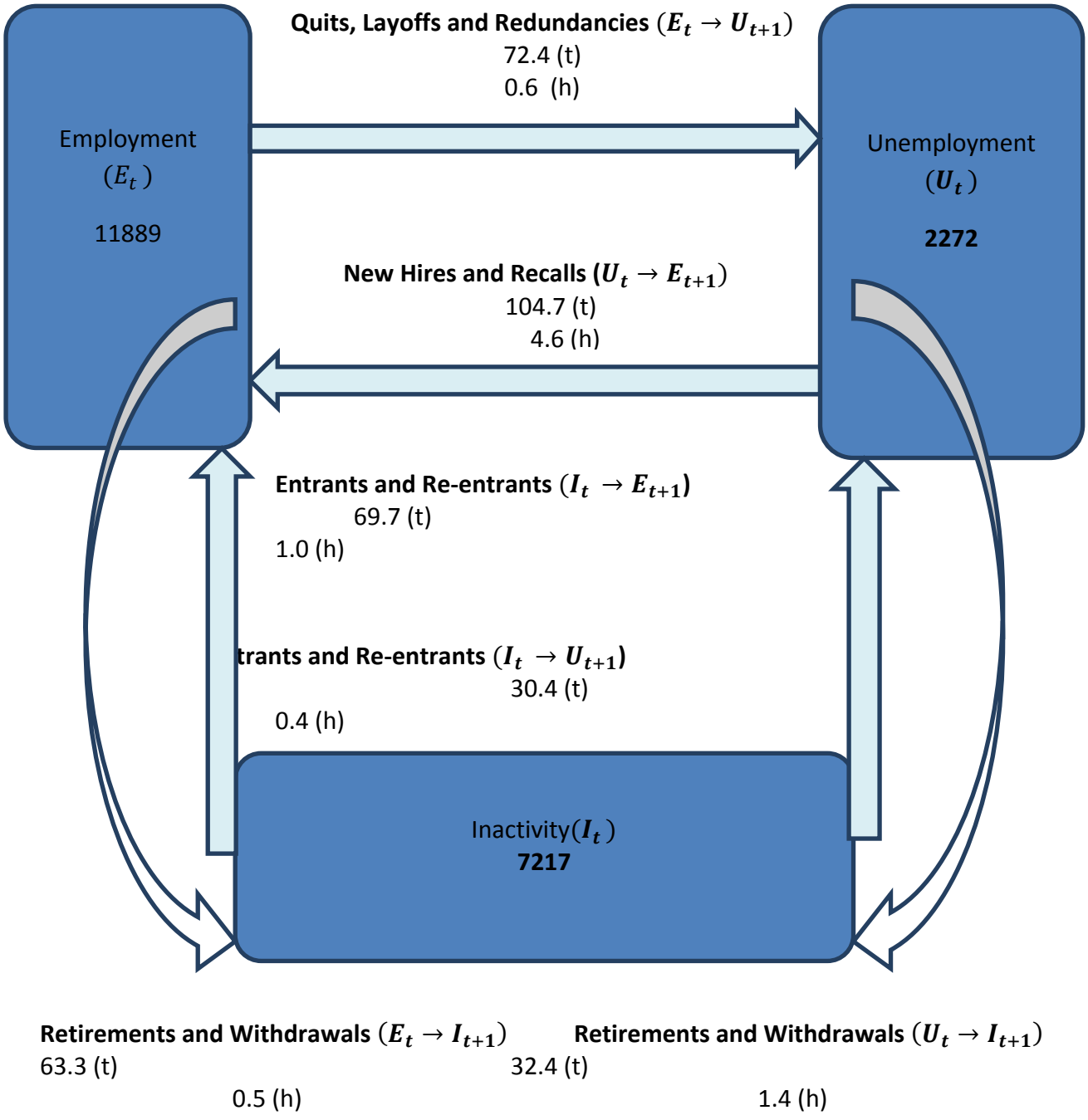
Notes: Number of people (16–65)in thousands (t); hazard rate of changing labor market status in per cent (h).
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

Figure 2A: *Gross Labor Market Flows in Slovakia* (monthly averages, 2004–2007)



Notes: Number of people (16–65) in thousands (t); hazard rate of changing labor market status in per cent (h).
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

Figure 3A: *Gross Labor Market Flows in Poland* (monthly averages, 2004–2007)



Notes: Total number of people in thousands (t); hazard rate of changing labor market status in per cent (h).
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

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