The ins and outs of Central European unemployment

Flek, Vladislav; Hála, Martin; Mysíková, Martina

Baltic Journal of Economics

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rbec20

The ins and outs of Central European unemployment

Vladislav Flek, Martin Hála & Martina Mysíková

BALTIC JOURNAL OF ECONOMICS
2022, VOL. 22, NO. 1, 49–67
https://doi.org/10.1080/1406099X.2022.2083306

The ins and outs of Central European unemployment

Vladislav Flek, Martin Hála and Martina Mysíková

Department of Economics and Law, ŠKODA AUTO University, Mladá Boleslav, Czech Republic

ABSTRACT
We examine the role of unemployment inflows and outflows in contributing to unemployment cyclicality in Czechia and Poland, using data from the European Union Statistics on Income and Living Conditions, and a three-state model of unemployment variance decomposition. We find that the labour market fluidity is higher in Poland than in Czechia, with Polish workers moving in and out of unemployment more frequently than their Czech counterparts. For both countries, the upward unemployment dynamics was during 2008–2011 driven by counter-cyclical increases in the job-separation rate, rather than by pro-cyclical declines in the job-finding rate. The inflow-outflow split was nonetheless more balanced in Czechia. The two economies further diverged across 2015–2018: Czech unemployment declined prevailingly due to diminishing job separations, while in Poland it was mostly due to improving job-finding prospects. This signals a deeper insider-outsider fragmentation of the Czech labour market, even during the period of economic expansion.

ARTICLE HISTORY
Received 6 September 2021
Accepted 25 May 2022

KEYWORDS
Central Europe; labour market; unemployment variance decomposition; worker flows

1. Introduction

This study focusses on the less highlighted aspect of labour market dynamics in Central Europe – on the frequency of worker flows in and out of unemployment, and how these flows account for variation in unemployment. Though there has been a fair amount of evidence collected particularly for Western/Southern Europe and the US (see, among others, Elsby et al., 2009, 2011, 2013, 2015; Fujita & Ramey, 2009; Petrongolo & Pissarides, 2008; Shimer, 2012), we know relatively less about the inflow-outflow split to unemployment variation in Central European economies (Baranowska-Rataj & Magda, 2013; Flek et al., 2018; Strawinsky, 2009 are among the few exceptions known to us). Our study seeks to bridge this gap, assuming that identification of the labour-market-driven sources of unemployment variation is of policy interest. In the words of Elsby et al. (2011, p. 339), ' … policy that focused on encouraging outflows from unemployment may not be as relevant in an economy in which rises in unemployment were driven by changes in the rate of outflows from employment'.

CONTACT Vladislav Flek vladislav.flek@savs.cz Department of Economics and Law, ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic

We assess the contributions of variations in unemployment inflow and outflow rates to variations in Czech and Polish unemployment during 2008–2011 and 2015–2018, using data on economic activity from the European Union Statistics on Income and Living Conditions (EU-SILC), and a three-state model of unemployment variance decomposition borrowed from Elsby et al. (2011). The chosen time periods are characterised by contrasting unemployment trends, and are instructive in assessing the key drivers of unemployment cyclicality and the nature of labour market adjustments to macroeconomic fluctuations.

Specifically, we address the following research questions: Is rising unemployment associated decisively with (counter-cyclical) increases in the job-separation rate, with (pro-cyclical) declines in the job-finding rate, or with a relatively balanced contribution of the two? Do unemployment reductions occur mainly due to diminishing job-loss risks of insiders, or due to improving job-finding prospects of unemployed workers? How relevant are the contributions of flow rates involving economic inactivity? Is there any link between the 'ins' and 'outs' of unemployment and labour market regulatory frameworks? What can the results tell us about economic policies adopted to counteract rises in unemployment?

The 'retrospective' nature of our study is given by the fact that more recent developments do not yet display comparable degrees and lengths of cyclical swings in unemployment dynamics. This includes the pandemic crisis which has been accompanied by massive fiscal support aimed at preventing abrupt rises in unemployment, which would otherwise result from lockdowns and other measures that hindered normal economic activity. We believe that the novelty of our study lies in its longer-run view of labour market adjustment mechanisms, and how they respond to cyclical disturbances in two Central European economies, which remain almost completely unstudied in prior analyses. In addition, we apply in an innovative way the matched longitudinal monthly data of the EU-SILC database, as opposed to more frequently used quarterly data from the European Labour Force Survey.

In the next section, we discuss theoretical, methodological, institutional and empirical issues linked with unemployment variance decomposition. In particular, we address the economic importance and interpretation of unemployment variance decomposition over various business cycle stages, highlight various methodological approaches, explain reasons for our model choice, and refer to results in pre-existing literature. Then we explain why we utilise monthly data for the purposes of unemployment variance decomposition, describe our data processing procedures, and specify the model. Next, we report results which point to non-negligible differences in the sources of unemployment variation between the less protective/more fluid Polish labour market and the more protective/less fluid Czech labour market. Based on these results, the concluding section offers an implicit assessment of policies shaping the dynamics of both labour markets during the 'post-transition' stage of their development.

2. Literature overview

Mortensen and Pissarides (1999) popularised the idea that the strictness of employment protection legislation (EPL) matters in affecting the patterns of unemployment variation.[1] Strict EPL imposes explicit and implicit constraints on hiring/layoff decisions, and reduces worker turnover. Countries with more stringent EPL are thus likely to experience relatively low worker flows in and out of unemployment. This is frequently the case in the 'sclerotic' labour markets of continental Western and Southern Europe, which record much lower unemployment inflow and outflow rates than Anglo-Saxon and Nordic countries (see, for instance, Elsby et al., 2013; Garda, 2016 for empirical evidence). But this is obviously not to say that firms operating in less fluid and/or more protective national labour markets may not need to adjust the size of their workforce to product demand fluctuations. Lay-offs remain an option, particularly in recessions. However, as lay-offs are formally complicated and costly, a pro-cyclical variation (reduction) in unemployment *outflows* may decisively account for increasing unemployment. This leads to labour market segmentation (fragmentation) into insiders enjoying long job-tenures and outsiders suffering from prolonged unemployment spells.

Petrongolo and Pissarides (2008) apply a two-state model of steady-state unemployment variance decomposition in continuous time along the lines of Fujita and Ramey (2008),[2] and list France as a typical example, where the unemployment rate dynamics has been driven decisively (and in recessionary periods almost exclusively) by a pro-cyclical variation in the job-finding rate of unemployed workers since 1991. In contrast, studies which deal with the more liberal British labour market point to relatively high, or even decisive, importance of unemployment *inflows* in accounting to unemployment variation (Elsby et al., 2011; Petrongolo & Pissarides, 2008; Smith, 2011 represent prominent examples). The results obtained by Elsby et al. (2011) are perhaps most instructive: They apply a three-state model of logarithmic steady-state variance decomposition in discrete time, and point to an approximately 70:30 inflow-outflow split. Specifically, they find that, since 1975, the decisive contribution to unemployment variation in the UK has been a counter-cyclical variation (rise) in the job-separation rate during recessions.

The drivers of unemployment cyclicality have been examined by many other studies, and the results are evidently sensitive to data and model selections. Leaving aside the frequently controversial evidence collected for the highly fluid labour market in the US (see, for instance, Darby et al., 1986; Elsby et al., 2009; Fujita & Ramey, 2009; Shimer, 2012), Elsby et al. (2013) offer a contribution which includes the behaviour of European labour markets. Based on a two-state model in continuous time developed by Shimer (2012), they apply a new recursive formula for log changes in the non-steady-state unemployment rate, which enables them to decompose unemployment variation when unemployment deviates from its steady state. They conclude that variation in the job-finding rates of unemployed workers contributes decisively to unemployment variation in Anglo-Saxon and Nordic countries, while the labour markets of continental Western and Southern Europe display a balanced inflow-outflow split.

Space for further research is even more open in the case of formerly centrally planned economies. The two economies of our research interest differ in size and structure, but are similar in their communist past, history of economic transition, GDP per capita, and relatively recent European Union entry. In formal institutional and policy terms, both countries maintain relatively ungenerous unemployment benefit replacement ratios, devote relatively low amounts of their GDP to expenditures on active labour market policies, record comparable average effective ages of labour market exit, and experience weakening union density (Fadejeva, 2019; Martin, 2014; OECD, 2020, 2022).

However, the strictness of Czech employment protection legislation is consistently among the highest in the OECD and European Union countries, while in Poland it is less stringent, being roughly comparable to those in Nordic countries. The extent of the tax wedge is also considerably higher in Czechia than in Poland, with the countries actually occupying different positions relative to the OECD average. The countries differ also in the share of temporary jobs in total employment, which is far higher in Poland (Fadejeva, 2019; Lewandowski & Magda, 2018; OECD, 2020).[3]

Business cycle fluctuations were more moderate in Poland than in Czechia during the global financial and economic crisis, and were not fully synchronised. While Poland actually avoided any absolute declines in real GDP, Czechia was hit more strongly, particularly in 2009. Yet, both economies faced a negative output gap opening in 2008. Negative figures prevailed until 2011, as did an increasing unemployment trend. The 2015–2018 period was in turn commonly characterised by the output gap remaining mostly in positive values, along with diminishing unemployment (CNB, 2012, 2019; Galuščák et al., 2021; IMF, 2011, 2022). With a degree of simplification, the 2008–2011 and 2015–2018 periods serve to represent two different business cycle stages with contrasting unemployment trends and output gap evolutions.

Which type of worker flows was decisive in contributing to unemployment fluctuations in Czechia and Poland, given the above highlighted institutional and cyclical characteristics? Were the contributions of ‘ins’ and ‘outs’ to variation in unemployment comparable across the countries studied, thus possibly displaying a common ‘liberal’ or ‘protective’ pattern, or did they differ remarkably? To our best knowledge, the existing evidence is rather scarce and would benefit from updated insights.

Strawinsky (2009) utilises two main approaches towards the no-log steady-state variance decomposition in continuous time. Applying a two-state model along the lines of Shimer (2007), he argues that the main driver of unemployment variation in Poland is variation in the job-finding rate of unemployed workers. However, when following the three-state approach of Petrongolo and Pissarides (2008), he finds that unemployment volatility is driven predominantly by variation in unemployment inflow rates.

Baranowska-Rataj and Magda (2013) follow the model of Elsby et al. (2013), and concentrate on Polish youth and prime-age groups using a gender breakdown. They find that the contributions of variations in the job-finding rates to variation in unemployment range between approximately 40 and 60 per cent (meaning that the contributions vary by age and gender), while the contributions of variations in the job-loss rates amount to some 50–60 per cent.

Flek et al. (2018) focus on various Czech and Polish age groups. The study applies a three-state model in continuous time developed by Smith (2011) and concludes that variations in the job-finding rates contribute decisively to variation in unemployment (except for Polish youth, where the contribution of variation in the job-separation rate dominates).

Given the relative lack of knowledge of the drivers of unemployment dynamics in Central European economies, we believe that the transition channels which involve economic inactivity should not be omitted, so we adopt a three-state model to demonstrate how unemployment evolves not only in response to variations in direct worker flows between unemployment and employment, but also to show the corresponding contributions of unemployment inflows and outflows via economic inactivity. We decompose variations in steady-state unemployment rates, and not in actual unemployment rates.

Variance decomposition of actual unemployment rates is analytically more feasible for two-state models (Elsby et al., 2013) than for a three-state model, which is explored in our analysis.

3. Data and model specification

3.1. Data selection and organisation

Most European studies devoted to worker flows between employment (*E*), unemployment (*U*) and inactivity (*I*) are based on quarterly data stemming from Labour Force Surveys (LFS).[4] Quarterly flow rates are more prone to time-aggregation bias than monthly rates, because they omit a higher number of multiple transitions (e.g. from unemployment to employment and back to employment) within the unit of observation. Controls for time-aggregation bias represent a research challenge in their own right, and these controls are typically missing when quarterly rates are used. Quarterly rates thus underestimate the degree of labour market fluidity, compared to monthly rates. On the other hand, if an individual experiences a transition once in a quarter, the quarterly data would simply register the change, while the monthly data would record one change and two unchanged statuses, i.e. a monthly average 1/3 flow rate. That is why, almost by definition, monthly rates differ from quarterly rates, and monthly rates are more accurate for our research purposes. EU-SILC datasets (as released in 2020 and 2021) are the only source available to us for calculation of monthly rates.

EU-SILC is an annual survey harmonised by Eurostat across European countries. Its longitudinal version is designed as a four-year rotational panel, in which approximately one quarter of respondents are replaced each year. The data involve retrospective, self-reported monthly information on each respondent's labour market status (employment, unemployment, inactivity). The longitudinal EU-SILC allows us to utilise four-year pure panels, and create matched chains of monthly flow rates over these periods, which refer to a constant number of the working-age population. This is the key condition for estimating the steady-state unemployment rate (and its variance decomposition) consistently, as stated explicitly below Formulas (1)– (3) in the following subsection. In contrast, the quarterly flow rates published by Eurostat stem from respondents' responses made just for two consecutive points of time, and do not satisfy the above noted condition for longer time periods.

Unlike the cross-sectional European Union Labour Force Survey (EU-LFS), the longitudinal version of EU-LFS is not yet routinely available for research purposes. This represents another key reason for adopting the longitudinal EU-SILC. We utilise two longitudinal EU-SILC datasets covering January 2008–January 2011 and March 2015–September 2018, as these two time periods are the most illustrative of the contrasting unemployment trends (see Figure 1). They include 37(43) monthly observations of the labour market status of each respondent, and are, in all cases, shorter than 48 months, which is the maximum length of observations one could extract from the panels.[5]

Because of methodological differences, the unemployment rates calculated from longitudinal EU-SILC are typically higher than those reported in Labour Force Surveys.[6] However, Figure A1 in the Appendix documents that their quarterly correlations are high, ranging between 0.75 and 0.95. As noted above, we limit our dataset to respondents

Figure 1. Monthly unemployment rates in Czechia (CZ) and Poland (PL). Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations.

Note: In per cent of workforce.

who remained in each selected sample over its full time horizon, so that the monthly labour market states of each respondent are continually matched, and their chains are of the maximum possible length.[7] For the respective time periods, the unweighted matched Czech samples contain 3,284 (2,600) individuals, while the Polish ones consist of 4,491 (3,944) individuals.[8] We apply longitudinal weights designed by Eurostat to account for non-response and attrition biases. As a result, the weighted matched samples are organised as pure panels, in which the total amount of working-age populations ($E + U + I$) remains constant over the chosen time periods. The respondents' ages range between 16 and 64 in the first year of observation, and between 19 and 67 in its fourth year.

Gross worker flows involve the numbers of individuals changing their labour market status in month $t+1$, compared to month t. $(E_t \rightarrow U_{t+1})$ represents flows from employment to unemployment, and so forth for $(E_t \rightarrow I_{t+1})$; $(U_t \rightarrow E_{t+1})$; $(U_t \rightarrow I_{t+1})$; $(I_t \rightarrow E_{t+1})$; $(I_t \rightarrow U_{t+1})$. Individuals remaining in their initial status are defined as $(E_t \rightarrow E_{t+1})$; $(U_t \rightarrow U_{t+1})$; $(I_t \rightarrow I_{t+1})$. Then, $\lambda_t^{UE} = \frac{(U_t \rightarrow E_{t+1})}{(U_t \rightarrow E_{t+1}) + (U_t \rightarrow U_{t+1}) + (U_t \rightarrow I_{t+1})} = \frac{(U_t \rightarrow E_{t+1})}{U_t}$ expresses an individual's probability of transitioning from unemployment in month t to employment in month $t+1$, and so forth for λ_t^{UI}; λ_t^{EU}; λ_t^{EI}; λ_t^{IE}; λ_t^{IU}. After multiplying by 100, the figures can be interpreted as flow transition rates, that is, as percentages of a given labour market stock (E; U; I) in month t, which are subject to a specific gross flow in month $t+1$. The monthly series of transition rates are seasonally adjusted by the X13 filter. We also calculate the average monthly transition rates. For instance, $\overline{\lambda^{UE}} = \frac{\overline{U_t \rightarrow E_{t+1}}}{\overline{U_t \rightarrow E_{t+1}} + \overline{U_t \rightarrow U_{t+1}} + \overline{U_t \rightarrow I_{t+1}}} \cdot 100$ stands for the average monthly job-finding rate of unemployed workers.

3.2. The model

Based on the arguments discussed earlier, we utilise monthly matched chains of flow transition rates in discrete time, presume the proximity of actual and steady-state unemployment rates, and distinguish two periods with opposite unemployment trends. In line with Elsby et al. (2011), we define the following stock-flow identity in expressing a change in the total number of unemployed persons:

$$\Delta U_{t+1} \equiv U_{t+1} - U_t = (\lambda_t^{EU} E_t + \lambda_t^{IU} I_t) - (\lambda_t^{UE} + \lambda_t^{UI}) U_t \quad (1)$$

We can analogously express a change in total employment:

$$\Delta E_{t+1} \equiv E_{t+1} - E_t = (\lambda_t^{UE} U_t + \lambda_t^{IE} I_t) - (\lambda_t^{EU} + \lambda_t^{EI}) E_t. \quad (2)$$

Finally, the following identity holds for a change in the total number of inactive individuals:

$$\Delta I_{t+1} \equiv I_{t+1} - I_t = (\lambda_t^{UI} U_t + \lambda_t^{EI} E_t) - (\lambda_t^{IU} + \lambda_t^{IE}) I_t \quad (3)$$

Formulas (1)–(3) involve three labour market stocks (states) and six flow transition rates, as defined above. Under a constant working-age population P ($P = U_t + E_t + I_t$), setting $\Delta U_{t+1} = \Delta E_{t+1} = 0$ implies $\Delta I_{t+1} = 0$. Then all three labour market stocks remain constant between months t and $t+1$, and the unemployment rate also remains constant. The corresponding value of the unemployment rate u_t^* (in per cent) is labelled as the steady-state unemployment rate. It can be expressed in terms of flow transition rates as follows:

$$u_t^* = \frac{s_t}{s_t + f_t}, \quad (4)$$

where $s_t = \lambda_t^{EU} + \lambda_t^{EI} \frac{\lambda_t^{IU}}{\lambda_t^{IU} + \lambda_t^{IE}}$, and $f_t = \lambda_t^{UE} + \lambda_t^{UI} \frac{\lambda_t^{IE}}{\lambda_t^{IU} + \lambda_t^{IE}}$.[9]

The unemployment inflow rate s_t in formula (4) consists of two terms: Interpretation of the first term (λ_t^{EU}) is evident, as it stands for the rate of direct inflows to unemployment from employment. When we refer to this rate later in the text, we label it the job-separation rate. The second component $\left(\lambda_t^{EI} \frac{\lambda_t^{IU}}{\lambda_t^{IU} + \lambda_t^{IE}}\right)$ represents the inflow rate to unemployment from employment via inactivity. The unemployment outflow rate f_t analogously splits into two components, with λ_t^{UE} representing the direct job-finding rate of unemployed workers, and the second one $\left(\lambda_t^{UI} \frac{\lambda_t^{IE}}{\lambda_t^{IU} + \lambda_t^{IE}}\right)$ defining the rate of outflow from unemployment to employment via inactivity.

Unemployment inflow and outflow rates do not necessarily remain constant over time, and the steady-state unemployment rate may vary accordingly. In terms of logarithmic decomposition:

$$\Delta \ln u_t^* \approx \alpha_t [\Delta \ln s_t - \Delta \ln f_t] \quad (5)$$

where $\Delta \ln u_t^* = \ln u_t^* - \ln u_{t-1}^*$, $\alpha_t = 1 - u_{t-1}^*$, $\Delta \ln s_t = \ln s_t - \ln s_{t-1}$, etc. We can approximate the log changes in unemployment inflow and outflow rates in formula (5) as follows:

$$\Delta \ln s_t \approx \omega_t^s \Delta \ln \lambda_t^{EU} + (1 - \omega_t^s) \Delta \ln \lambda_t^{EIU}, \text{ where } \omega_t^s = \frac{\lambda_t^{EU}}{s_t}, \text{ and } \lambda_t^{EIU} = \lambda_t^{EI} \frac{\lambda_t^{IU}}{\lambda_t^{IU} + \lambda_t^{IE}}, \quad (6)$$

$$\Delta \ln f_t \approx \omega_t^f \Delta \ln \lambda_t^{UE} + (1 - \omega_t^f) \Delta \ln \lambda_t^{UIE}, \text{ where } \omega_t^f = \frac{\lambda_t^{UE}}{f_t}, \text{ and } \lambda_t^{UIE} = \lambda_t^{UI} \frac{\lambda_t^{IE}}{\lambda_t^{IU} + \lambda_t^{IE}}. \quad (7)$$

Combining equations (5–7), we obtain the final approximation:

$$\Delta \ln u_t^* \approx \alpha_t[\omega_t^s \Delta \ln \lambda_t^{EU} + (1-\omega_t^s)\Delta \ln \lambda_t^{EIU} - \omega_t^f \Delta \ln \lambda_t^{UE} - (1-\omega_t^f)\Delta \ln \lambda_t^{UIE}]. \quad (8)$$

Formula (8) enables us to derive the following variance decomposition of log changes in the flow steady-state unemployment rate:

$$\mathrm{Var}(\Delta \ln u_t^*) \approx \mathrm{Cov}[\alpha_t \omega_t^s \Delta \ln \lambda_t^{EU}, \Delta \ln u_t^*] + \mathrm{Cov}[\alpha_t(1-\omega_t^s)\Delta \ln \lambda_t^{EIU}, \Delta \ln u_t^*] + \mathrm{Cov}[-\alpha_t \omega_t^f \Delta \ln \lambda_t^{UE}, \Delta \ln u_t^*] + \mathrm{Cov}[-a_t(1-\omega_t^f)\Delta \ln \lambda_t^{UIE}, \Delta \ln u_t^*]. \quad (9)$$

This decomposition implies natural summary measures of the contributions of the four components forming equation (4), to log changes in the flow steady-state unemployment rate:

$$\beta_{EU} = \frac{Cov[\alpha_t \omega_t^s \Delta \ln \lambda_t^{EU}, \Delta \ln u_t^*]}{Var(\Delta \ln u_t^*)}, \quad \beta_{EIU} = \frac{Cov[\alpha_t(1-\omega_t^s)\Delta \ln \lambda_t^{EIU}, \Delta \ln u_t^*]}{Var(\Delta \ln u_t^*)},$$

$$\beta_{UE} = \frac{Cov[-\alpha_t \omega_t^f \Delta \ln \lambda_t^{UE}, \Delta \ln u_t^*]}{Var(\Delta \ln u_t^*)}, \quad \beta_{UIE} = \frac{Cov[-\alpha_t(1-\omega_t^f)\Delta \ln \lambda_t^{UIE}, \Delta \ln u_t^*]}{Var(\Delta \ln u_t^*)}. \quad (10)$$

The decomposition in formula (8) holds only approximately, so the four 'betas' in formula (10) would also sum up to unity only approximately.[10] Their interpretation is as follows: If, for instance, $\beta_{EU} = 0.7$, then about 70 percent of the variation in log changes of the flow steady-state unemployment rate account for variability in log changes of the job-separation rate. We are not going to repeat such an exact specification throughout the text. We would say instead, somewhat inaccurately, that the (flow steady-state) unemployment rate varies predominantly due to variability in the job-separation rate. The interpretation of the remaining terms is analogous, and their estimated values are reported in Table 2 in the following section.

4. Results

First, we focus on developments in monthly unemployment inflow and outflow rates (λ^{EU}; λ^{IU}; λ^{UE}; λ^{UI}) in Czechia and Poland over 1/2008–1/2011 and 3/2015–9/2018. These rates account for changes in *total unemployment* as formalised in formula (1) in the previous section. Flow rates between employment and inactivity (λ^{EI}; λ^{IE}) are reported in the Appendix (Table A1; Figure A2). Next, we proceed, in line with formula (10), with variance decomposition of the flow steady-state *unemployment rate* for both countries and time periods.

4.1. Empirical analysis of flow transition rates

Table 1 reveals the differences between Czechia and Poland in average monthly unemployment inflow and outflow rates. The relative exposure of Polish workers to job-loss followed by unemployment ($\overline{\lambda^{EU}}$) is higher in both time periods analysed, as is the probability of Polish labour market entrants and re-entrants of becoming unemployed ($\overline{\lambda^{IU}}$). However, once unemployed, Polish workers experience better job-finding prospects ($\overline{\lambda^{UE}}$).[11]

Table 1. Average monthly unemployment inflow and outflow rates.

	Czechia			Poland		
	1/2008–1/2011	3/2015–9/2018	1998–2017*	1/2008–1/2011	3/2015–9/2018	1998–2017*
Unemployment inflow rates:						
from employment ($\overline{\lambda^{EU}}$)	0.49 (24.0)	0.24 (24.4)	0.79 (34.2)	0.63 (22.1)	0.33 (15.4)	1.01 (28.7)
from inactivity (λ^{IU})	0.29 (21.4)	0.21 (66.9)	0.60 (43.3)	0.35 (21.4)	0.39 (17.3)	1.14 (26.3)
Unemployment outflow rates:						
to employment ($\overline{\lambda^{UE}}$)	5.08 (16.3)	5.45 (23.5)	1.02 (17.6)	5.56 (16.6)	5.70 (17.1)	1.31 (22.1)
to inactivity (λ^{UI})	1.27 (27.6)	1.08 (32.7)	0.42 (61.9)	1.16 (23.9)	1.64 (12.1)	1.02 (28.4)

Note: In per cent of the respective labour market stock, as defined in Subsection 3.1.
*Results in per cent of the labour force, using quarterly LFS data. Coefficients of variation are reported in parentheses, and represent in all cases our own computations.
Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations; Galuščák et al. (2021).

Galuščák et al. (2021) compare the gross flow rates of Czech and Polish workers (in per cent of the labour force) over the period 1998–2017 by using quarterly data from Labour Force Surveys. Their results also point to relatively higher fluidity of the Polish labour market (see Table 1).

The above reported differences between Czechia and Poland are non-negligible, and appear to reflect the different degrees of strictness of employment protections in both countries.[12] But one has to note that the figures presented in Table 1 are actually common to 'sclerotic' labour markets: Elsby et al. (2013) report that the average monthly job-finding rate of unemployed workers ($\overline{\lambda^{UE}}$) exceeds 20 per cent in Anglo-Saxon and Nordic countries, while in continental Western and Southern Europe it falls below 10 per cent. In this context, Czechia and Poland outperform only Italy, and rank comparably with Portugal, Spain, and France. A relatively low degree of labour market fluidity is also apparent in the average monthly job-separation rate ($\overline{\lambda^{EU}}$), which ranges between 0.25 and 0.6 per cent in Czechia and Poland, as compared to 0.5–1 per cent in other continental European countries. In Anglo-Saxon and Nordic countries, this rate falls above 1.5 per cent (Elsby et al., 2013).

Figure 2 documents the evolutions of unemployment inflow and outflow rates over time. The Polish job-separation rate (λ_t^{EU}) evolved in an upward (counter-cyclical) direction during 1/2008–1/2011 (see the upper graph in the right column of Figure 2). An analogous, though slightly less straightforward, tendency also applies in Czechia, where this rate dramatically increased in the first thirteen months of observations, rising to about five times its initial value (see the upper graph in the left column). It continued fluctuating high above the initial level, and began rising yet again in October 2010, challenging its record highs from January 2009. Formula (1) demonstrates that acceleration in job separations leads, ceteris paribus, to increasing unemployment. It follows that, in both countries, increases in job-separation rates functioned as a likely robust driver of unemployment acceleration.

Coefficients of variation in Table 1 document that the job-finding rates of unemployed Czech and Polish workers varied relatively less than the job separation rates over 1/2008–1/2011. In addition, Figure 2 shows that evolutions of job-finding rates (λ_t^{UE}) lacked any clearly prevailing direction during that period, and were instead characterised by repeated upward and downward fluctuations. As a consequence, the overall impact of variations in

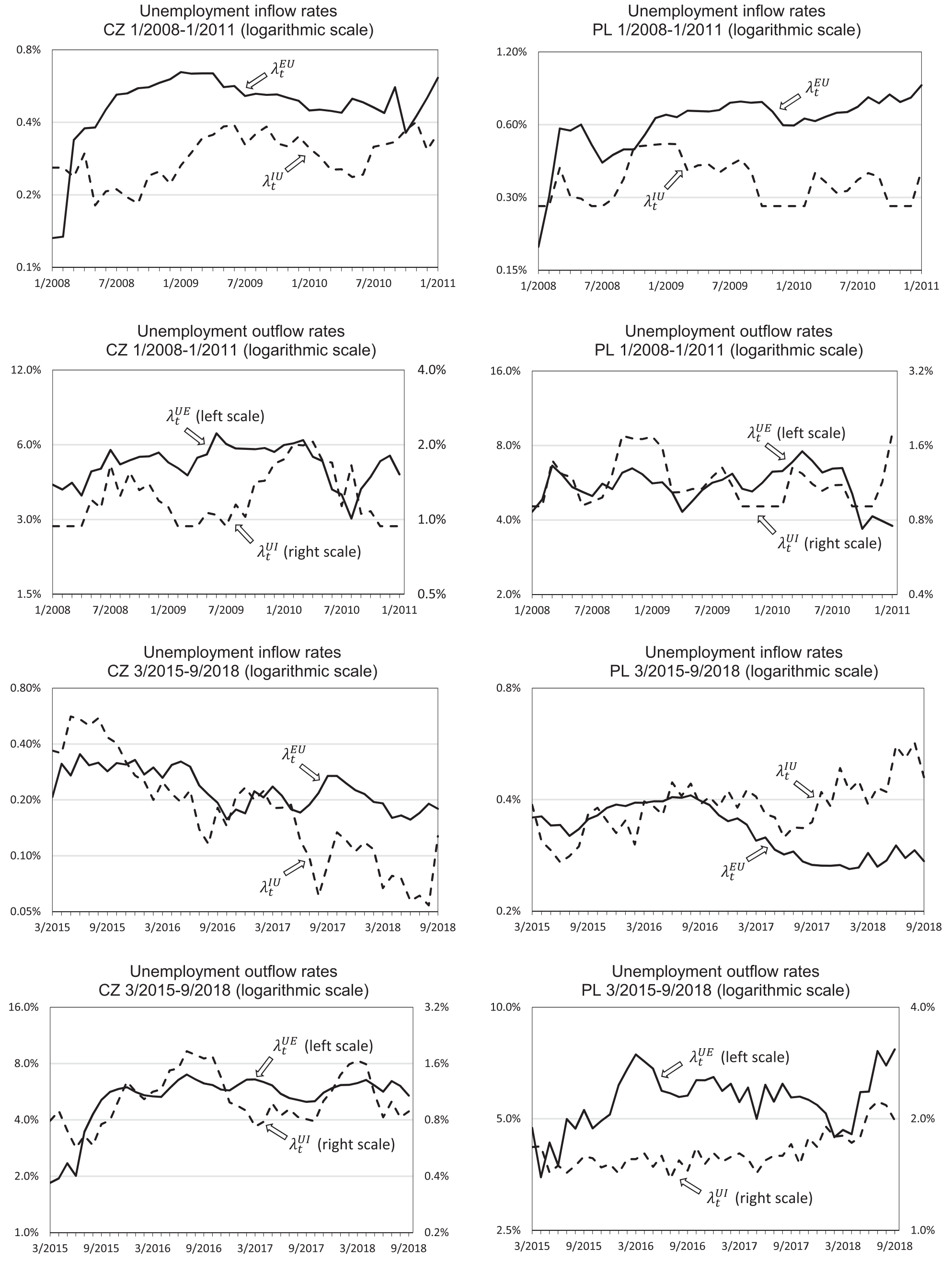

Figure 2. Unemployment inflows and outflows in Czechia (CZ) and Poland (PL). Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations.

Note: Monthly unemployment inflow rates include the job-separation rate (λ_t^{EU}) and the inflow rate from inactivity (λ_t^{IU}). Monthly unemployment outflow rates consist of the job-finding rate of unemployed workers (λ_t^{UE}) and the outflow rate to inactivity (λ_t^{UI}).

national job-finding rates on rising unemployment is likely to be relatively less straightforward and/or robust than in the case of job-separation rates.

Variations in unemployment inflow and outflow rates which involve economic inactivity (λ_t^{IU}; λ_t^{UI}) also lacked any dominant evolutionary pattern across 1/2008–1/2011, except for the Czech inflow rate to unemployment from inactivity (λ_t^{IU}). After initial up- and downward fluctuations, Czech labour market entrants and re-entrants faced higher (and mostly increasing) probability of becoming unemployed, which evidently contributed positively to the observed rises in unemployment.

Figure 2 also displays observations for 3/2015–9/2018 (see the four bottom graphs). The Czech unemployment inflow rates (λ_t^{EU}; λ_t^{IU}) are both characterised by a downward (counter-cyclical) tendency, thus commonly contributing to the observed reduction in unemployment. But, in Poland, the impact of declines in the job-separation rate on unemployment reduction was partly offset by increases in the unemployment inflow rate from inactivity (λ_t^{IU}).

The countries simultaneously experienced (pro-cyclical) increases in the unemployment outflow rates (λ_t^{UE}; λ_t^{UI}), which also contributed to declines in unemployment. Unlike the previously analysed period, these rates display more straightforward tendencies (cyclical sensitivity) in their evolution. This concerns particularly the job-finding rate of unemployed workers (λ_t^{UE}). It follows that identifying qualitatively the key drivers of unemployment dynamics during 3/2015–9/2018 is less intuitive than for the period of 1/2008–1/2011. In any case, these drivers need to be identified more formally, using a model of (steady-state) unemployment variance decomposition.

4.2. Decomposition of unemployment rate variation

Table 2 reports that the main contribution to unemployment rate variation in Czechia and Poland during 1/2008–1/2011 was the variation in unemployment inflow rates (β_{IN}). In Poland, it accounted for 70 per cent of the fluctuations in the unemployment rate, while in Czechia the inflow-outflow split to unemployment rate variation was relatively more balanced (55:45).[13] Contributions of 'ins' to unemployment variation were dominated in both countries by (counter-cyclical) variation in the job-separation rate (β_{EU}).

Table 2. Variance decomposition of steady-state unemployment rates.

		Of which			Of which	
	Contribution of inflow rate (β_{IN})	job-separation rate (β_{EU})	via inactivity (β_{EIU})	Contribution of outflow rate (β_{OUT})	job-finding rate (β_{UE})	via inactivity (β_{UIE})
Czechia						
1/2008-1/2011	56.6	47.0	9.6	46.6	39.6	7.0
3/2015-9/2018	54.9	49.4	5.5	45.1	39.3	5.8
Poland						
1/2008-1/2011	70.5	66.5	4.0	30.9	32.0	−1.1
3/2015-9/2018	45.3	37.5	7.8	55.1	50.7	4.4
1995-2008*	59.5	–	–	40.5	–	–

Note: In per cent, using the log decomposition described in the text. The decomposition refers to monthly changes in steady-state unemployment rate throughout the samples.
*Results for contributions of inflow and outflow rates, based on quarterly LFS data (involve contributions of inactivity-related flow rates).
Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations; Strawinski (2009).

But the contribution of inflows to unemployment from employment via inactivity (β_{EIU}) was also non-negligible, particularly in Czechia, where it accounted for almost 10 per cent of variation in the unemployment rate.[14]

This does not mean that variations in unemployment outflow rates (β_{OUT}) were irrelevant in contributing to unemployment rate variation. This applies particularly to the contribution of the job-finding rate of unemployed workers (β_{UE}), the variation in which accounted for some 40 per cent of the unemployment rate variation in Czechia, and 30 per cent in Poland. Yet, though undeniably relevant, variations in unemployment outflows represented only a minor driver of unemployment fluctuations across 1/2008–1/2011.

In Czechia, the estimated percentages each 'beta' contributed to unemployment variation during 3/2015–9/2018 remained very similar to those occurring during 1/2008–1/2011. The inflow-outflow split to unemployment rate variation thus appears to be relatively stable in Czechia, with (counter-cyclical) variation in the job-separation rate (β_{EU}) constantly playing a more important role than variation in the job-finding rate (β_{UE}). Poland experienced a different story over 3/2015–9/2018, with a (pro-cyclical) variation in the job-finding rate of unemployed workers (β_{UE}) being the main driver of unemployment fluctuations.

5. Discussion and conclusion

The first key message stemming from our results is that the labour market fluidity is on average higher in Poland than in Czechia, with Polish workers tending to flow in and out of unemployment relatively more frequently than their Czech counterparts. Specifically, Czech insiders experience a lower risk of job-loss, while Polish workers face better job-finding prospects once unemployed. This suggests that the insider-outsider fragmentation is relatively deeper within the less fluid and more protective Czech labour market.

Second, the analysis of developments in unemployment inflow and outflow rates over time reveals the presence of counter-cyclical increases in the Czech and Polish job-separation rates during the 2008–2011 period. In contrast, the evolutions of national job-finding rates were relatively less straightforward. This points to a likely decisive role of unemployment inflows in affecting the upward unemployment dynamics in both countries vis-à-vis the negative output gap. Conversely, the lack of persistent and more profound pro-cyclical declines in the job-finding rates of unemployed workers apparently prevented the two economies from experiencing even higher increases in unemployment. The main drivers of unemployment reductions during the expansionary period of 2015–2018 are more difficult to assess, since both the 'ins' and 'outs' display cyclical sensitivity in their evolutions.

These findings stem from our descriptive analysis of worker flows in and out of unemployment, and offer qualitative insights into the key drivers of evolutions in total unemployment. We examined the plausibility of these findings more formally, using a variance decomposition approach. Specifically, we decomposed variations in (steady-state) unemployment rates into parts which can be attributed to variations in job separations, job finding, and unemployment inflows and outflows via inactivity. This provides a third group of messages.

The results confirm that the main contribution to the upward unemployment rate dynamics in Czechia and Poland across 2008–2011 was variation in unemployment inflow rates. The Polish (Czech) inflow-outflow split to unemployment rate variation was approximately 70:30 (55:45), and the contributions of 'ins' to unemployment cyclicality were dominated by job-separation rates: A counter-cyclical variation in the job-separation rate contributed to unemployment rate variation by approximately 65 per cent in Poland and 45 per cent in Czechia.

If so, real wages were apparently not flexible enough to balance the emerging strong pressure on employment reductions. Analogously, one may argue that the demand management policies applied should have been more counter-cyclically oriented, to counteract dramatic increases in layoffs. The decisive role of job separations in affecting the upward unemployment rate dynamics over 2008–2011 also suggests that Czech and Polish employers did not appear to be strongly constrained by employment protection legislation in adjusting the size of their workforce via layoffs of workers who subsequently become unemployed. However, this effect is considerably more robust for the less protective and more fluid Polish labour market.

During 2008–2011, variations in job-finding rates were in both countries relatively more moderate than variations in job-separation rates. In Section 2 we referred to institutional arrangements that have framed labour market functioning in Czechia and Poland. This included the discussion on Czech and Polish unemployment benefits in the OECD context. We noted that these benefits are relatively ungenerous in both countries. One may assume that less generous benefits encourage active job searches, which indeed appears to be the case: The declining prospects of Czech and Polish unemployed workers finding a job were relatively moderate, and did not function as the main driver of increasing unemployment.

Finally, we establish that a counter-cyclical variation in the job-separation rate functioned as the main driver of unemployment rate variation in Czechia during 2015–2018. In direct contrast, a pro-cyclical variation in the job-finding rate played the main role in Poland. Czech unemployment rate was thus declining mainly due to diminishing unemployment risks of incumbent workers, while in Poland it was declining predominantly due to improving job-finding prospects of unemployed workers. This signals a deeper insider-outsider fragmentation of the Czech labour market, even during the period of economic expansion.

In general, the less protective and more fluid Polish labour market displays more 'liberal' patterns in the drivers of unemployment dynamics than the more protective and less fluid Czech labour market. Our results thus appear to be in line with theoretical arguments proposing that countries which differ in the strictness of employment protection legislation would experience the different degrees of labour market fluidity, and would also differ in the key drivers of unemployment variation.

The Czech example simultaneously demonstrates that those 'post-transition' economies with stricter employment protection legislation, lower labour market fluidity and deeper insider-outsider fragmentation may maintain relatively low unemployment rates, even in a long-run. However, we also showed that the job-finding probability of a Czech unemployed worker is persistently lower, compared to a Polish unemployed worker. Apart from our own findings, we referred to pre-existing evidence, which suggests that this particularly concerns some vulnerable groups of unemployed workers. This signals that a country with a low level of unemployment may nonetheless face problems which complicate further declines in structural unemployment, and preserve long unemployment spells among outsiders.

Notes

1. Given the complexity of links between institutional arrangements and labour market outcomes, empirical literature is frequently inconclusive or offers ambiguous results. Yet, the recent studies addressing these links in the context of OECD countries tend to maintain that strict EPL moderates the response of unemployment to external shocks and vice versa (Abbritti & Weber, 2018; see also Feldmann, 2009; Haltiwanger et al., 2014 for additional empirical evidence). Studies dealing explicitly with 'post-transition' countries report, in many cases, analogous results. They also suggest that stricter EPL is associated with higher informal employment, longer unemployment spells and increases in unemployment, particularly among vulnerable groups. Furthermore, the interactions of EPL with other labour market regulations and policies matter in 'post-transition' economies: For instance, active labour market policies appear to be particularly efficient in interaction with relaxed EPL, low tax wedges, and low unionisation (see, among others, Feldmann, 2005; Fialová & Schneider, 2009; Lehmann & Muravyev, 2012; Fadejeva, 2019 for more empirical findings and discussion).
2. The steady-state unemployment rate is a theoretical construct of equilibrium type. There are two basic approaches towards its modelling: The two-state model involves only the flow rates from unemployment to employment and vice versa. The three-state model considers economic inactivity as a third labour market status, and involves the corresponding flow rates (see Subsection 3.2 for detail). For the purposes of unemployment variance decomposition, the steady-state unemployment rate serves as a *proxy* for the statistical (actual) unemployment rate. This concerns particularly the three-state model. To the best of our knowledge, variance decomposition of the statistical unemployment rate based on a three-state approach has not yet been developed in a form enabling its routine use in applied research.
3. Fadejeva (2019) combines various LABREF and OECD indicators and shows that Czechia and Poland have done relatively little since 2008 in terms of altering their labour market regulations and policies. While this is true in comparison with most of the remaining European Union member-states, it is particularly remarkable when comparing the frequency of reform measures with those of Belgium, Greece, and Spain.
4. In addition, Eurostat regularly publishes quarterly labour market flow rates based on LFS (https://ec.europa.eu/eurostat/web/experimental-statistics/labour-market-transitions).
5. Unemployment variance decomposition makes the most sense when applied to a clear trend in unemployment rate evolution. That is why we drop some disposable observations on the beginning and/or end of our samples.
6. Definition of unemployment is stricter in LFS, where the official definition of International Labour Organization applies: Unemployed people must be currently available for work, must be actively seeking work, and could not have worked even an hour during the reference week. In contrast, economic activity is self-defined in EU-SILC, therefore, violating any of these conditions does not prevent EU-SILC respondents to consider themselves unemployed. As a consequence, the pool of unemployed may be relatively larger in EU-SILC than in LFS.
7. Overlapping panels would clearly increase the number of observations, but would not satisfy these conditions.
8. It would be natural to include Slovakia/Hungary as 'post-transition' economies from the same region, but the longitudinal EU-SILC 2019 is not yet available for Slovakia. Hungarian sets are too small to utilise in our analysis.
9. Formula (4) also applies in its general form to a two-state model, where $s_t = \lambda_t^{EU}$ and $f_t = \lambda_t^{UE}$. Setting $\Delta U_{t+1} = s_t E_t - f_t U_t$ and $\Delta U_{t+1} = 0$, yields step by step the following equations: $s_t E_t + s_t U_t - s_t U_t - f_t U_t = 0 \Rightarrow s_t(E_t + U_t) - (s_t + f_t)U_t = 0 \Rightarrow s_t = \dfrac{U_t(s_t + f_t)}{E_t + U_t}$ $\Rightarrow \dfrac{U_t}{E_t + U_t} = \dfrac{s_t}{s_t + f_t} \Rightarrow u_t^* = \dfrac{s_t}{s_t + f_t}$.
10. Some results, which are actually close to zero, may bear a negative sign. This applies particularly to β_{EIU} and/or β_{UIE}. Such seemingly counter-intuitive results are rather exceptional (see, for instance, Elsby et al., 2011), but may nonetheless occur due to a weak negative correlation

between the series of logarithmic differences of the steady state unemployment rate ($\Delta \ln u_t^*$) and the series of terms $\alpha_t(1-\omega_t^s)\Delta \ln \lambda_t^{EIU}$ and/or $\alpha_t(\omega_t^f - 1)\Delta \ln \lambda_t^{UIE}$.

11. Relatively better job-finding prospects, compared to Czechia, apply particularly to the least qualified and older Polish unemployed workers (Flek & Mysíková, 2015).
12. In Section 2 we note that formal employment protection legislation (EPL) is more relaxed in Poland, compared to Czechia. At the same time, results in Table 1 suggest that the labour market fluidity is higher in Poland than in Czechia. That is why we suggest (for these two countries) that higher labour market fluidity appears to be consistent with more relaxed formal EPL and vice versa. In contrast, Eamets and Masso (2005) refer to Baltic countries and argue that the relatively high effective fluidity of their labour markets does not stem from relaxed formal EPL, but rather from problems with enforcement of formally strict employment protections.
13. According to Strawinski (2009), the inflow-outflow split in Poland is 60:40 (see Table 2). This result differs somewhat from ours, not least because it refers to the different time period and involves more business cycle stages. Alternative results for the Czech aggregate unemployment variance decomposition are not known to us.
14. In sum, β_{EIU} and β_{UIE} contribute to unemployment variation by 3–17 per cent, depending on the country and time period analysed (see Table 2). Galuščák et al. (2021) apply a net-flow approach towards investigating unemployment cyclicality in Czechia and Poland. They also conclude that the role of inactivity-related (net) flows in explaining the cyclical properties of unemployment rates is rather small. In contrast, Elsby et al. (2015) report for the US that the participation margin accounts for around one-third of unemployment fluctuations.

Acknowledgements

The datasets of the European Union Statistics on Income and Living Conditions (EU-SILC LT UDB 2012 – version of 2020-03; EU-SILC LT UDB 2019 – version of 2021-09) were made available to the authors on the basis of the Research project proposal No. 242/2016-EU-SILC, granted to ŠKODA AUTO University by the European Commission, Eurostat. The authors thank Aleš Bulíř and Kamila Fialová for discussion on earlier versions of this study, and two anonymous referees for their helpful suggestions and comments on the submitted version. The responsibility for all results and conclusions drawn from the data lies entirely with the authors.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Vladislav Flek is Associate Professor at SKODA AUTO University. He obtained Ph.D. in Economics in 1992 from the Czechoslovak Academy of Sciences. From 1997 to 2020 cooperated with Charles University in Prague as Associate Professor in Labour Economics. Between 1992 and 2007 he worked in the Czech National Bank as an economic research coordinator and an advisor to the Bank Board. Afterwards he moved to the Ministry of Finance as Head of the Organizational Committee for Euro Adoption, a post he held until 2011. Research Fellow at the Catholic University of Leuven - LICOS (1992), Stanford University - GSB (1995-1996), and University of Oxford - Pembroke College (1996).

Martin Hála is Research Fellow at SKODA AUTO University. He received his Ph.D. in Statistics at the Charles University in Prague, Faculty of Mathematics and Physics. He teaches at the University of New York in Prague, the Czech Technical University, and the Metropolitan University, Prague.

Martina Mysíková is Research Fellow at SKODA AUTO University. She obtained PhD. in Economics from the Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague.

Since 2008, she has been affiliated with the Institute of Sociology of the Czech Academy of Sciences. She worked in the Czech Statistical Office (2004-2008) and participated in the methodology and coordination of the international household survey Statistics on Income and Living Conditions (EU-SILC).

ORCID

Vladislav Flek http://orcid.org/0000-0002-3132-3983
Martin Hála http://orcid.org/0000-0003-4535-0330
Martina Mysíková http://orcid.org/0000-0002-6340-4753

References

Abbritti, M., & Weber, M. (2018). Reassessing the role of labor market institutions for the business cycle. *International Journal of Central Banking*, *14*(1), 1–34.

Baranowska-Rataj, A., & Magda, I. (2013). Decomposition of trends in youth unemployment – the role of job accessions and separations in countries with different employment protection regimes. Working Paper No. 26, Institute of Statistics and Demography, Warsaw School of Economics, Warsaw.

CNB (2012). *Inflation Report 1/2012*. Czech National Bank.

CNB (2019). *Inflation Report 1/2019*. Czech National Bank.

Darby, M., Haltiwanger, J. C., & Plant, M. W. (1986). *The ins and outs of unemployment: The ins win*. NBER Working Paper No. 1997. National Bureau of Economic Research, Cambridge, MA.

Eamets, R., & Masso, J. (2005). The paradox of the Baltic states: Labour market flexibility but protected workers? *European Journal of Industrial Relations*, *11*(1), 71–90. https://doi.org/10.1177/0959680105050403

Elsby, M. W. L., Hobijn, B., & Sahin, A. (2013). Unemployment dynamics in the OECD. *Review of Economics and Statistics*, *95*(2), 530–548. https://doi.org/10.1162/REST_a_00277

Elsby, M. W. L., Hobijn, B., & Sahin, A. (2015). On the importance of the participation margin for labor market fluctuations. *Journal of Monetary Economics*, *72*(May), 64–82. https://doi.org/10.1016/j.jmoneco.2015.01.004

Elsby, M. W. L., Michaels, R., & Solon, G. (2009). The ins and outs of cyclical unemployment. *American Economic Journal: Macroeconomics*, *1*(1), 84–110. https://doi.org/10.1257/mac.1.1.84

Elsby, M. W. L., Smith, J. C., & Wadsworth, J. (2011). The role of worker flows in the dynamics and distribution of UK unemployment. *Oxford Review of Economic Policy*, *27*(2), 338–363. https://doi.org/10.1093/oxrep/grr014

Fadejeva, L. (2019). *Labour market reforms in the European Union: An overview*. On-line report (Macroeconomics), Latvijas Banka, Riga. Accessed December 18, 2021. https://www.macroeconomics.lv/labour-market-reforms-european-union-overview

Feldmann, H. (2005). Labour market institutions and labour market performance in transition countries. *Post-Communist Economies*, *17*(1), 47–82. https://doi.org/10.1080/14631370500052720

Feldmann, H. (2009). The unemployment effects of labor regulation around the world. *Journal of Comparative Economics*, *37*(1), 76–90. https://doi.org/10.1016/j.jce.2008.10.001

Fialová, K., & Schneider, O. (2009). Labor market institutions and their effect on labor market performance in the new EU member countries. *Eastern European Economics*, *47*(3), 57–83. https://doi.org/10.2753/EEE0012-8775470303

Flek, V., Hála, M., & Mysíková, M. (2018). Unemployment and age-based labour market segmentation. *Politická ekonomie*, *66*(6), 709–731. https://doi.org/10.18267/j.polek.1227

Flek, V., & Mysíková, M. (2015). Unemployment dynamics in Central Europe: A labour flow approach. *Prague Economic Papers*, *24*(1), 73–87. https://doi.org/10.18267/j.pep.501

Fujita, S., & Ramey, G. (2008). *The cyclicality of separation and job finding rates.* Working Paper No. 07-19. Federal Reserve Bank of Philadelphia.

Fujita, S., & Ramey, G. (2009). The cyclicality of separation and job finding rates. *International Economic Review*, *50*(2), 415–430. https://doi.org/10.1111/j.1468-2354.2009.00535.x
Galuščák, K., Šolc, J., & Strzelecki, P. (2021). Labour market flows over the business cycle: The role of the participation margin. *Eastern European Economics*, *59*(5), 449–471. https://doi.org/10.1080/00128775.2021.1958688
Garda, P. (2016). *The ins and outs of employment in 25 OECD countries*. OECD Economics Department Working Papers No. 1350, Organisation for Economic Co-operation and Development, Paris.
Haltiwanger, J. S., Scarpetta, S., & Schweiger, H. (2014). Cross country differences in job reallocation: The role of industry, firm size and regulations. *Labour Economics*, *26*(C), 11–25. https://doi.org/10.1016/j.labeco.2013.10.001
IMF (2011). *Republic of Poland: Selected Issues. IMF Country Report No. 11/167*, International Monetary Fund, Washington, DC.
IMF (2022). *Republic of Poland: Selected Issues. IMF Country Report No. 22/59*, International Monetary Fund, Washington, DC.
Lehmann, H., & Muravyev, A. (2012). Labour market institutions and labour market performance: What can we learn from transition countries? *Economics of Transition*, *20*(2), 235–269. https://doi.org/10.1111/j.1468-0351.2012.00435.x
Lewandowski, P., & Magda, I. (2018). *The labor market in Poland, 2000–2016*. IZA World of Labor, Issue 426, Institute for the Study of Labor (IZA), Bonn.
Martin, J. M. (2014). *Activation and active labour market policies in OECD countries: Stylized facts and evidence on their effectiveness*. IZA Policy Paper No. 84, Institute for the Study of Labor (IZA), Bonn.
Mortensen, D. T., & Pissarides, C. A. (1999). Job reallocation, employment fluctuations and unemployment. In J. B. Taylor & M. D. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1, pp. 1171–1228). Elsevier.
OECD (2020). *Employment outlook 2020. Organisation for economic co-operation and development*. OECD Publishing.
OECD (2022). *Pensions at a glance*. Organisation for Economic Co-operation and Development. Accessed February 23, 2022. https://stats.oecd.org/Index.aspx?QueryId = 69218
Petrongolo, B., & Pissarides, C. (2008). The ins and outs of European unemployment. *American Economic Review*, *98*(2), 256–262. https://doi.org/10.1257/aer.98.2.256
Shimer, R. (2007). *Reassessing the ins and outs of unemployment*. NBER Working Paper No. 13421, National Bureau of Economic Research, Cambridge, MA.
Shimer, R. (2012). Reassessing the ins and outs of unemployment. *Review of Economic Dynamics*, *15*(2), 127–148. https://doi.org/10.1016/j.red.2012.02.001
Smith, J. C. (2011). The ins and outs of UK unemployment. *Economic Journal*, *121*(552), 402–444. https://doi.org/10.1111/j.1468-0297.2011.02428.x
Strawinsky, P. (2009). Ins and outs of Polish unemployment. *Central European Journal of Economic Modelling and Econometrics*, *1*(3), 243–259.

Appendix

Table A1. Average monthly flow transition rates between employment and inactivity

	Czechia		Poland	
	1/2008–1/2011	3/2015–9/2018	1/2008–1/2011	3/2015–9/2018
From employment to inactivity (λ^{EI})	0.35 (9.1)	0.28 (21.2)	0.48 (13.2)	0.52 (15.4)
From inactivity to employment (λ^{IE})	0.53 (20.5)	0.66 (26.3)	0.89 (19.1)	0.88 (17.3)

Note: In per cent of the respective labour market stock, as defined in Subsection 3.1. Coefficients of variation are reported in parentheses.
Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations.

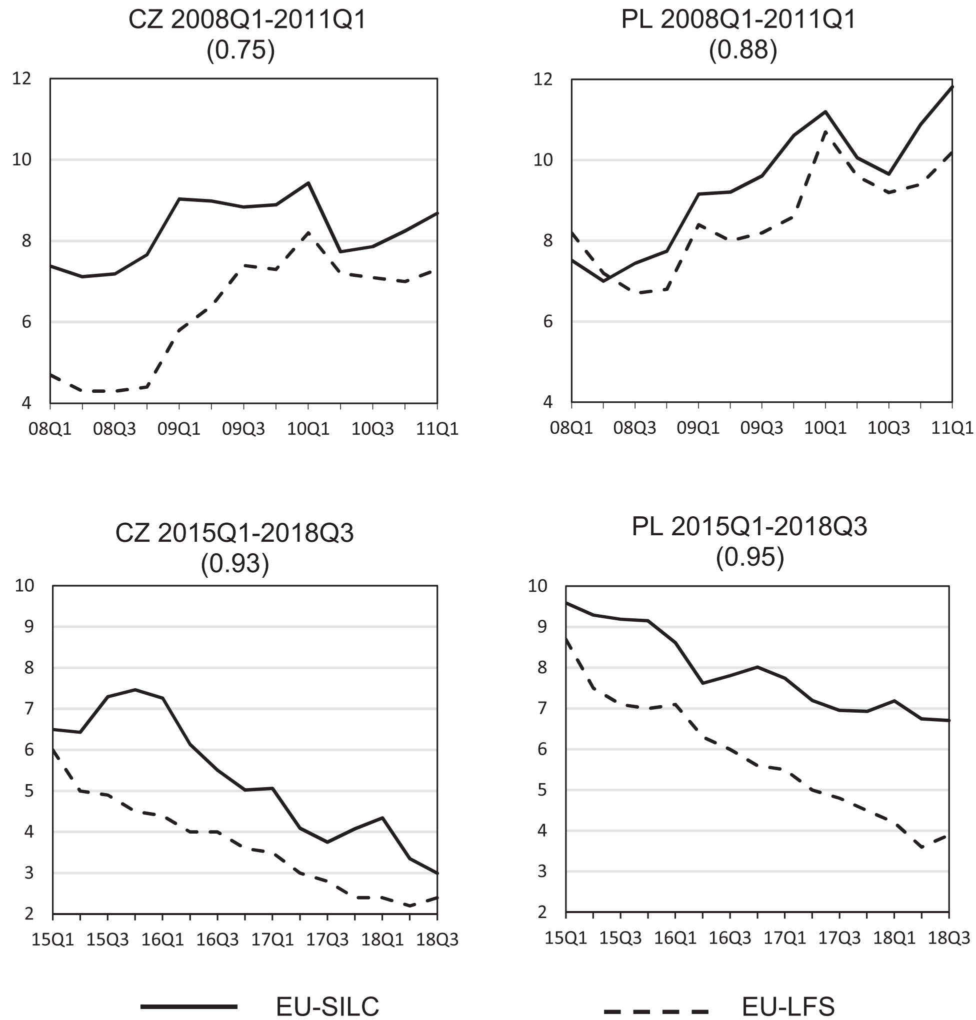

Figure A1. Quarterly unemployment rates in Czechia (CZ) and Poland (PL). Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); EU-LFS (Eurostat database, variable lfsq_urgan); authors' computations.

Note: In per cent of the workforce; EU-SILC unemployment rates are averaged from monthly data. Correlation coefficients between both unemployment rates are reported in parentheses.

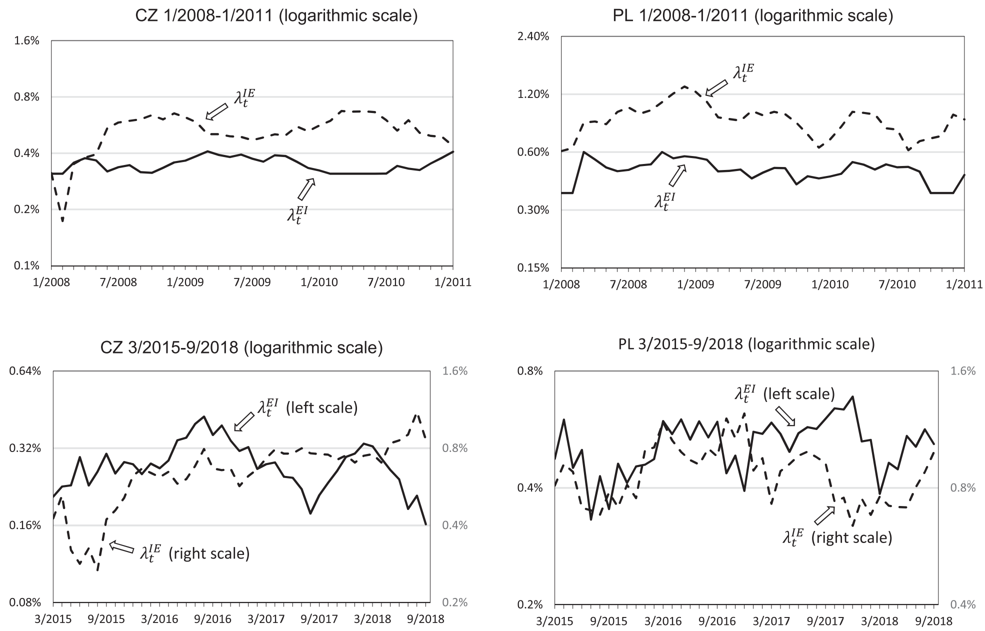

Figure A2. Monthly flow transition rates from employment to inactivity (λ_t^{EI}), and from inactivity to employment (λ_t^{IE}) in Czechia (CZ) and Poland (PL). Source: Longitudinal EU-SILC 2012 and 2019 (2020-03 and 2021-09 versions); authors' computations.