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JOANNA TYROWICZ
LUCAS VAN DER VELDE

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JOANNA TYROWICZ
Faculty of Economic Sciences
University of Warsaw
National Bank of Poland
e-mail: jtyrowicz@uw.edu.pl

LUCAS VAN DER VELDE
Faculty of Economic Sciences
University of Warsaw
e-mail: lvelde@wne.uw.edu.pl

Abstract

This paper employs a new rich source of data on worker reallocation in transition economies and provides a decomposition of the aggregate changes into those attributable to sectoral reallocation, those attributable to transition per se and those attributable to demographics. Aghion and Blanchard (1994) provide a theoretical framework that allows to conceptualize a reallocation from an (implicitly inefficient) public sector to a (more efficient) private sector, which is extremely useful in the analyses of economic transition. However, transition processes are not isolated from global trends such as a shift from industry to services, which is more explicitly tackled in the sectoral reallocation models of Caballero and Hammour (1996, 2001). Finally, there are also demographic processes, which exhibit in labor market exits by people with outdated or no longer necessary skills and in labor market entries by people with possibly better matched competences. The aggregate changes in transition economies are a combination of these three mechanisms. We thus test the validity of Aghion and Blanchard (1994) as well as Caballero and Hammour (1996, 2001) in the context of 26 transition economies over the period 1989-2006. We find that demographics and education can accommodate a fair share of shift from public to private and from manufacturing to services - as opposed to the actual worker flows between jobs. Whether or not this results in reduced employment at the end of the transition process stems not from the wage setting mechanism (such as collective bargaining, indexation, etc.) but rather seems to be related to the policies able to keep older cohorts in employment.

Keywords:
optimal speed of transition, reallocation, Aghion and Balnchard, Caballero and Hammour, demographic changes, transition economies, labour market.

JEL:
P31, P52, J21, J23,J11

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1 Introduction

In terms of labor utilization, many of the European and Central Asian countries underwent a significant transition over the past nearly three decades. This change consisted of two quite distinct economic processes. The first of them involved an ownership transformation associated with a decline in the public sector and a vivid growth in the private one. This implied the destruction of state owned incumbents and the emergence of private firms as well as privatizations, i.e. change of company ownership form without a change in company substance. The literature in this field focuses on the optimal speed of transition (OST). The second process comprises a more universal economic tendency of sectoral reallocation from manufacturing to services, which has, and still is, being observed in both transition and advanced market economies. This topic has been under scrutiny in a number of contexts ranging from Kuznets (1955) *via* Lilien (1982) to Kiyotaki and Lagos (2007).

In addition to these two fairly endogenous processes, transition countries also experienced a context of more exogenous demographic change; with (relatively more numerous cohorts of) older workers accustomed to work in public sector manufacturing firms retiring and (relatively less numerous cohorts of) young entering the labor markets. The exogenous process of generational exchange has been also largely influenced by policies. (In)Ability to access employment may have driven the labor market exit decisions by the elderly – but also fomented early exits. Educational policies as well as labor market institutions could have also affected the choices on whether to undertake education and, if so, which field of study.

From a theoretical perspective, the process of ownership and efficiency transformation was treated in Aghion and Blanchard (1994) model (henceforth AB), with its subsequent extensions. Entirely different theoretical foundations underlie the model of sectoral reallocation, as developed by Caballero and Hammour (1996a,b, 1998, 2000), henceforth CH. Finally, there is an important distinction between the job flows and worker flows (Haltiwanger and Vodopivec, 2003; Kiyotaki and Lagos, 2007). Both, AB and CH, approaches implicitly begin with job-level adjustments and translate them mechanically to worker-level adjustments, which has important direct and indirect drawbacks. Given that job flows are typically observed in net terms ($JobCreation - JobDestruction$) and not the gross terms ($JobCreation + JobDestruction$), these theories can hardly be tested directly in the empirical context. Most of the empirical studies relied on the available net job flows (and net worker flows), whereas gross job flows would be conceptually needed.

In addition, data on job and/or worker flows is scarce among former Soviet Block countries. For many of these countries it is close to impossible to obtain access to micro datasets as statistical offices claim privacy or other legal constraints. When available, the labor force surveys tend to be of low quality and, in general, of reduced comparability across countries. These difficulties have largely limited the range of countries analyzed so far in the literature and the generality of conclusions. Additional drawback follows from an excessive focus on the link between unemployment and net flows – as opposed to gross flows, including also youth labor market entry and elderly labor market exit.

In this paper we propose a decomposition of total worker flows into those attributable to transformation *per se*, those attributable to sectoral reallocation and those that result from demographic changes. This paper uses a new database of retrospective surveys in 29 European and Asian transition countries, developed by EBRD in the freely available Life in Transition Survey (LiTS). This survey had been compiled in two waves (2006 and 2010) and it covered every country from the former Soviet block except for Turkmenistan. This database is particularly rich, as it contains information on the household characteristics, on the respondent's personal and familiar background, and their ideas with respect to liberalization process. Individuals were asked to enumerate all the previous jobs and their characteristics. In other words, we can observe microeconomic worker flows, which were missing in most previous literature. Hence, our work aims to provide new evidence on the flows within and between industries from this database.

In addition to using a new data set, this paper offers also important novelties in terms of both research question and methodology. First, typically the literature in this field focused on testing the predictions of Aghion and Blanchard (1994) model in reference to transition economies, while the analysis of sectoral reallocation hypothesis has been usually limited to the context of industrialized countries. Second, the demographic side of reallocation, raised in numerous studies – e.g. Card and Lemieux (2001); Lemieux

(2006) as well as Boudarbat et al. (2010) – was generally overlooked, mostly due to focus on net job flows. Our results suggest that, though some of the flows indeed follow the trajectories prescribed by the literature on the optimal speed of transition, most of the adjustment occurred *via* alternative channels.

The paper is structured as follows. In the next section, we review the key assumptions and dynamics behind AB and CH models; however our focus will be set in the empiric on the OST literature with an emphasis on the methods used. We then carefully describe LiT data, comparing the patterns emerging from this data to other sources we managed to acquire in order to evaluate to what extent retrospective data on fairly small samples may be trusted. In the third section we decompose the flows into AB, CH and demographics, analyzing the time trends and countries which are special or stand out (and why they do). Finally, in section 4 we estimate a model of unemployment differentiation - as is standard in the literature - showing which flows explain most of the differentiation and when. The concluding sections emphasize the discrepancies between the earlier literature and our study as well as discuss policy recommendations.

2 Literature review

In principle the mechanics of the economic transition from a centrally planned to a market economy are simple: presumably inefficient public sector firms need to close and a vibrant, efficient new private sector needs to emerge. The flow of jobs may come either from privatization (same company changing ownership) or from a flow of workers (some jobs being destroyed and some others created, workers need to reallocate between them, possibly with a spell of unemployment between the two employments).

These simple mechanics are subject to a number of forces. The first of the forces comes from the fact that (possibly transitory) non-employment usually happens with state support, whereas the collapse of the public sector limits the options to raise the funds necessary to intensify social safety nets expenditure. This particular type of relationship was emphasized in the model by Aghion and Blanchard (1994), henceforth AB. The state raises funds to finance safety nets by taxing labor, which pushes the (non-wage) cost of labor up. If the fiscal gap grows too fast (i.e. taxes are levied too high), job creation lags behind job destruction. The accumulating non-employment pushes wage claims down, but the tax wedge prevents vivid job creation, deepening the social costs of public-to-private sector reallocation. If speed of job destruction is synchronized with the capacity of the emerging private sector to create new jobs, the non-employment pool is low, fiscal needs small, levied taxes are less distortionary, and an economy may find a fairly efficient equilibrium. Otherwise, an unstable high non-employment equilibrium emerges. Consequently, the relation between job creation and unemployment has an inverse U shape.[1] Clearly, both the 'non-employment' and the 'taxes' should be taken figuratively, not literately. Benefits may comprise also pre-retirement benefits made available to individuals aged between 40 and retirement age to discourage them from participating in the labor market, as has been frequently done. Also taxes should be viewed in a broad sense as they may encompass the opportunity costs of expanding productivity enhancing infrastructure instead of benefits.

The second force is associated with the extent to which labor is a specific input, as raised by Caballero and Hammour (1996a,b, 1998, 2000), henceforth CH. Ricardo Caballero and Mohamad L. Hammour developed a family of models for structural restructuring[2] with two particular features: capital specificity and incomplete contracts. Capital is specific to a given relation in the sense that if the relation is broken a part of the capital is lost. Training of employees is an example of capital-specificity. In the model, capital specificity leads to the generation of quasi-rents which can be partially appropriated by workers, even though they correspond to the firm. This operation is possible due to incomplete contracts. With considerable adjustment costs, impulse to reallocate labor may yield excessive job destruction and insufficient job creation due to the inherent incompleteness of the employment contract. Different characteristics and the institutional arrangements associated with an employment contract imply different scope of appropriation for the workers, which changes the bargaining balance between

[1] Garibaldi and Brixiova (1998) arrived to the same conclusion using a search and matching model, though the transmission channel was different: unemployment benefits increase the reservation wages of employees and decrease the value of a match, which discourages job creation.

[2] In a series of papers, they analyzed the cases of a restructuring impulse coming from cyclical factors (1991; 2005), technological innovation (1998) and intersectoral shift (1996a; 2000).

workers and employers. In a simple model, where all sectors have the same productivity, it produces a de-syncrhonization of job creation and destruction, which eventually generates "sclerosis" of the economy; in other words, workers remain in less productive positions. If two sectors differ by productivity (as in AB model), appropriation leads to sudden increases in unemployment and slow job creation.[3] In the limit, employers create little or no jobs at all, despite actual demand for the final product. Gradualism, the general recommendation from AB models, is not steered by this models, as it can only extend the transitional period, creating more unemployment. Instead, policies to expand the high-productivity sector should accompany the measures to slow down job destruction in the inefficient sector.

The third force arises from the fact that productivity is inherently embodied in humans, who tend to enter and exit labor market, when their skills (may) become outdated. Arrival of "new" workers - i.e. the entry of new cohorts with relatively fresh education but little or no professional experience - affects both the relative bargaining position of the unemployed (important in the AB model) and the ability to "appropriate" the rent from the employment contract (important in CH model). Given that at each point in time about 40 active cohorts coexist, the arrival of one additional may seem like a marginal change. However, if roughly 10% of the active population is without a job and actively seeking one, arrival of a new cohort constitutes already a 25% increase in the number of job seekers, *ceteris paribus*. The new cohort may also possibly dispose of currently more demanded skills, in comparison to an average job seeker. On the other hand, exit of an additional cohort improves the bargaining position of remaining workers, but also potentially reduces the size of the pool of job seekers whose skills are partially or fully outdated.

Thus, demographic processes - especially in interaction with changes to the educational policy and social security - may reinforce or flatten the forces from the AB and CH models. Only in AB the obstacles are uniquely associated with an economic transition from a centrally planned, state-owned economy to a market oriented, private one. Mechanics studied in CH models may be driven by transition, but also by standard processes of business cycles and technological innovation as well as a gradual shift from manufacturing to services in middle income and advanced economies.

Both of these forces have been put into empirical testing as well as re-worked theoretically in abundant literature. When it comes to empirics, we distinguish two main strands of the literature: the first evaluates the models' predictions to analyze transition processes (mostly) in Central and Eastern European Economies; the second tests the fit between the underlying model assumptions and the reality in these countries. Theoretical extensions on the other hand, respond to the diagnosed shortcomings present in those models. We review them below.

2.1 CEECs transition: testing the assumptions of the AB and CH models

Both AB and CH assume that workers are in fact fairly homogeneous and therefore they have the same probability of leaving the state/shrinking sector and finding a job in the emerging one. This assumption is at odds with broader evidence provided by microlevel analysis, such as Jurajda and Terrell (2003) in the case of the Czech Republic and Estonia and Schaffner (2011) for Germany. In fact, it seems that young male, urban residents, experienced less difficulties with job-to-job mobility. In contrast, Turunen (2004) indicates that in Russia, highly skilled workers were less likely to leave state sector. The likely explanation of these differences is the quality of the labor offered in the new private sector. As Turunen (2004) argues, the employment opportunities had a lower quality than the existing positions in the state sector. Taking the employers perspective, Gimpelson et al. (2010) show that most private companies in Russia suffered from a shortage of high skilled workers, and that the main reason for the disequilibrium was the high hiring costs.

Extensions of the original AB model which overcome this shortcoming of were offered by Balla et al. (2008); Boeri (2000). Balla proposed a framework to model (massive) reallocation of heterogeneous workers. They show in a numerical exercises that, in AB model, higher employment subsidies actually lower the pace of restructuring when compared to unemployment or non-employment benefits. They may thus yield superior welfare outcomes (especially to low productivity workers), compared to unemployment benefits necessarily accompanying swift job destruction in the public sector. Boeri's insights

[3] A consequence of sclerosis is that if appropriation is close to complete, no transition will occur at all, even if it would be socially optimal to do so Caballero and Hammour (1996a). Unlike AB model, the reallocation is a private process, i.e. the state cannot directly decide on the flow of people to unemployment.

on worker heterogeneity point to the effect of types on re-employment probabilities and the role of unemployment benefits.

Both AB and CH models neglect four potentially important flows of workers: the movement towards permanent non-employment and movements into job-seeking from non-employment; flows out of employment from the *private/emerging* sector as well as to employment in the *public/disappearing* sector; and direct job-to-job transitions from one sector to the other. The addition of these flows would be desirable if we consider, for example, the role played by early retirement schemes. Although these schemes are similar to unemployment benefits from the fiscal perspective (they are a social safety net that need to be financed *via* taxation) they are very different when it comes to labor market effects. The job-seekers with benefits are able to minimize the extent to which their household needs to reduce consumption, but they still exert pressure on wage reductions in order to re-enter employment. Individuals who leave the labor force due to early retirement schemes no longer affect wage expectations. Indeed, Boeri (1999) shows that the flows towards inactivity and between jobs were more numerous than the transitions mediated by unemployment.

This point has been theoretically addressed by Papapanagos and Sanfey (1997) and by Bruno (2006). In the former, migration mitigates the unemployment rate, and hence the fiscal burden. The main prediction from this model is that the inclusion of this escape valve results in a faster pace of restructuring, even if it does not lead to a faster pace of job creation. Bruno (2006) extends the original AB model to comprise the resident out-of-the-labor-force category. Employees in the public sector decide whether to become unemployed or exit the labor market. Both options are costly for the state, which has to pay unemployment benefits and build a safety net for inactive people. Like in Aghion and Blanchard (1994), the state maintains a balanced budget, and the subsidies are financed *via* taxes on wages, which *ceteris paribus* reduce job creation in the private sector; however, the increase in the dependency ratio (the number of people inactive per worker) leads to higher – not lower – wage pressure. The state must then decide on the levels of unemployment and inactivity by setting adequately their corresponding benefits. The optimal decision implies a division of the transition process in two stages. During the first, the out of the labor force category rises and the optimal speed of transition is exogenous. Once the inactive population reaches a critical level, the optimal speed of transition depends on the unemployment rate. The most important prediction of this model is that unlike the AB model suggests, the optimal speed of transition has two paces: fast until the level of inactive is reached and then it slows down.

An extension which comprises direct job-to-job flows has been also offered by Tichit (2006), with the additional feature of job destructions occurring in the private sector. This extension shows that the original conclusions of AB model remain essentially unaffected even if the role of unemployment in the economy changes. In fact, in Tichit (2006), the risk of loosing a job in the public sector speeds up voluntary reallocation to the private sector. This mechanism applies as long as job destruction remains higher in the public sector, even if the private sector offers lower wages.

Also, AB model itself has no institutional features and no mechanics for these features to change in response to alterations in the bargaining power of the workers, the *de novo* private employer and the government/state sector. Namely, the speed of job destruction in the public sector is not likely to be exogenous - it may respond to social and political impulses, in addition to the economic ones. These features are absent in the AB framework, but somehow reflected in the CH framework, where the extent of appropriability is allowed to change over time, altering the subsequent equilibria. On the empirical side, the role of labor market institutions on the transition process is still not clear, though it seems to be of small significance, Boeri and Terrell (2002). Notwithstanding, models explicitly addressing the two processes – the speed of transition and the political support – have been developed by Rodrik (1995) and Roland (2002). These models emphasize that the need to redistribute in exchange for political support is likely to affect the fiscal side of the transition and the rate of job destruction in the public sector. As a side effect, the state had also to assume the costs of supporting inefficient, overmanned firms longer with its budgetary implications.

Finally, several papers studied the role of job reallocation in productivity growth and the relative importance of within industry against across industries effects.[4] The evidence so far is inconclusive

[4]We leave aside an extension by Castanheira and Roland (2000), who propose that the state controls also capital flows in addition to worker flows. This is close to the idea that the state is actually in charge of the privatization process as well as actual bankruptcy (which bears some resemblance to the so-called soft budget constraint). In this model, the changes

and country specific. De Loecker and Konings (2006) measured factor productivity in Slovenia between 1995 and 2000 and decomposed the changes into their possible causes. They showed that productivity increased more in private firms than in public firms, and that the main drivers of the increment were downsizing (job destruction) in privatized and vivid productivity growth in newly created firms; however, Orazem and Vodopivec (2009) shows that the overall productivity growth was a universal pattern, unrelated to industry or ownership. Dimova (2008) also contests the claim on transition-driven productivity with data from Bulgaria: even though jobs and workers clearly reallocated to more efficient industries, the impact of this process on factor productivity was overshadowed by industry specific changes, such as market competition and import penetration. In a series of articles (Brown and Earle, 2002, 2004, 2006, 2008) the authors show that employment gradually concentrates in more efficient firms in the context of Russia and Ukraine; but, in their setting workers moving within the same industry/sector from low to highly productive firms have a greater impact on overall productivity when the dispersion between firms is higher. Given how dispersed the state sector was prior to the transition – ranging from nation-wide large scale manufacturing enterprises to small, local groceries – these findings are not indicative of either AB or CH models being at work.

2.2 CEECs transition: testing the predictions of AB and CH models

In general, common sense suggests that job destruction occurred in privatized and falling into bankruptcy public sector, mostly manufacturing, whereas job creation was most intense in *de novo* private firms, mostly in service sector. However, the data seems to suggest that the proportions between these processes were different across time and countries, see Boeri (2000). These general tendencies were confirmed in Baltic and Central European countries, whereas Russia, Ukraine and Southern Europe provide much weaker or sometimes even contradictory evidence, Acquisti and Lehmann (2000). On the other hand, mostly due to data shortages, not many studies were able to explicitly identify the flow of workers from "old" (state-owned, manufacturing) sector to a "new" (private, services) one. Studies show that employment grew rapidly in construction and trade and dropped in manufacturing, but these are net changes, rather than the gross flows suggested by both AB and CH models (Faggio and Konings, 2003; Jurajda and Terrell, 2008).

Since unemployment grew substantially in transforming CEECs, clearly job destruction had to exceed job creation, at least during the early stages of the transition. CEE countries were however fairly diversified in the scale and in the duration of this disequilibrium. Describing some stylized facts concerning this dispersion, Haltiwanger et al. (2003) emphasize specifically the difference between CEECs and former Soviet republics. In principle, the net changes were initially much faster in CEECs and the explanations of why it would be so remain inconclusive, cfr. Boeri and Terrell (2002); Earle and Sabrianova (2002); Lehmann et al. (1999); Svejnar (2002). With the exception of Czech Republic, Estonia and Slovenia, little is known about the synchronization of job destruction and job creation processes (Sorm and Terrell, 2000a; Jurajda and Terrell, 2003; Haltiwanger and Vodopivec, 2003; Orazem et al., 2005).

Three main stylized facts seem to emerge from the empirical literature on OST. First, the patterns of job creation and job destruction changed as the transition rolled out. Haltiwanger and Vodopivec (2002) show that in Estonia initially job destruction exceeded 10% with job creation lagging, but as of 1995 they were fairly at par , making gross reallocation rates in Estonia close to those observed in the US. Gradual synchronization of job destruction and creation was also confirmed for a number of other countries by Faggio and Konings (2003) and by Jurajda and Terrell (2008), but in these studies time period covered makes it likely that cyclicality of of job flows caused this result. Second, determinants of worker flows also changed with the progress of the transition. In the first stage they were predominantly a consequence of job terminations, whereas in later stages wage differences appear to encourage worker flows (Konings et al., 1996; Bilsen and Konings, 1998). Noorkoiv et al. (1998) analyzed the effects of flows on wages. They showed that flows were rapid whereas compensation schemes did not seem to differ for shrinking state-owned manufacturing sector from expanding private service sector. Third, the literature suggests that institutional environment conducive to private property and entrepreneurship

in capital allocation determine the demand for labor in each sector, which in turn determines the pace of reallocation. Though appealing on numerous accounts, this model ignores the budget constraint and lacks taxes on firms. In addition, it assumes perfect labor mobility and no unemployment, which is outside of this paper's scope of interest.

seems to speed up the job creation. This finding is implicit in some of the aforementioned studies, and addressed explicitly by Johnson et al. (2000) and Boeri and Terrell (2002).

With these stylized facts emerging from the literature, the added value of yet another study is far from obvious. However, the literature still has some gaps that this study aims to fill. First, the studies are concentrated on few, selected transition countries - for the reasons of data availability. Most studies concern Czech Republic, Estonia and Slovenia, i.e. fairly small, relatively well educated and service oriented economies.[5] For Russia and Ukraine representative data sets are typically not available, so most available studies rely on other sources. Second, majority of the studies uses net, instead of gross, flows. It does not have to be a problem if reallocation between existing firms and within sectors is of minor importance, as seems to be the case of Slovenia (De Loecker and Konings, 2006). However, if flows within industry or between state-owned firms are of relevance, net measures are not able to tell much about the nature of the jobs and workers reallocations. Finally, most of the tests and studies were largely indirect. For example, using firm level data (Brown and Earle, 2004) show that after the reforms more productive firms tend to grow more than the average firm. Faggio and Konings (2003) for a panel of countries and Siebertová and Senaj (2007) for Slovakia argue that firms' size has a negative correlation with the growth in employment, which seems to suggest that smaller (i.e. private *de novo*) firms tend to hire (relatively) more. But this test is fairly weak and subject to the cut-off point in the data (the minimum size of firms are still included in the survey). For Ukraine, Konings et al. (2003) finds no such result in either manufacturing or services.

Our objective in this paper is then threefold. First, thanks to the new and comprehensive retrospective survey by the EBRD – Life in Transition Survey – we are able to address the processes of workers reallocation and gross flows in virtually all European transition economies over the entire transition period. Second, disposing of such high quality data we are able to dissect worker flows into components attributable to AB model, components attributable to CH model and other flows, for which theoretical foundation has no link to economic transition or restructuring (such as demographic and within industry/ownership flows). Third, we intend to put into test the conclusions of the earlier literature on factors driving worker flows and the synchronization between job creation and job destruction. Finally, similar to some earlier work – e.g. Earle (2012) – we can include individual-level factors, such as education, education, experience or age, but on top of this we can also tell to what extent privatization results in worker flows (employment reduction pushes workers out of current employment to seek another job) and to what extent it only implies job flows (public sector employment becomes private sector one, but no change in actual employment contract happens).

To this end we formulate the following testable hypotheses. **First**, we argue that only a minority of the flows that occurred in transition had characteristics inherent to either AB or CH models, i.e. workers changed jobs without changing industry or the sector of employment, moving usually within state-owned manufacturing jobs or within private service jobs (H1).This leads to the **second** hypothesis, that demographic trends, and not worker flows, explain the majority of the shift in net employment from public to private sector (H2). **Third**, we hypothesize that given the transition context, AB type of adjustment exhibits stronger relation with unemployment dynamics than the CH type of adjustment (H3). This would be a distinctive feature of transition CEECs, when compared to other EU Member States, calling for different forms of policy intervention. **Fourth**, we argue that countries differ substantially in how they responded to demographic trends in accommodating the transition-driven adjustments. The arrival of new, better educated cohort and the (possibly premature) exit of older cohorts with (at least partially) obsolete skills could have been quantitatively more important than the flows mediated by a period of unemployment. Since there is no information on wages in our dataset, we cannot directly test the predictions of AB or CH models on wages. However, with the use of wage and labor efficiency dynamics (combined into a unit labor cost indicator) we can test the hypothesis that countries with more exits and less arrivals were subject to more wage pressure *ceteris paribus* (H4). Institutional factors that determine worker's bargaining power should have a negative impact on different types of flows, but the effect should be larger in productivity enhancing sectors (CH flows).

[5] Detailed list of studies and periods covered is available in Table 7 in Appendix A.

3 Data and stylized facts about worker flows in CEECs

We employ the data coming from the "Life in Transition Survey" (or LiTS), launched by the EBRD in 2005 which overcomes many of the limitations inherent to this literature, as discussed in the previous section. The survey was conducted in 2006 and 2010 in 29 countries, including most of the European transition economies; missing only Turkmenistan from the former USSR and Kosovo. We focus on the European transition economies.[6] In this section we describe the data properties and move along to some of the stylized facts emerging from this new dataset.

3.1 Data

The LiTS database contains individual retrospective surveys on a representative sample from the population (in each country 1000 individuals was effectively interviewed). Only the 2006 survey provides retrospective data, and therefore is our main source.

The LiTS database is extremely rich. In addition to basic socio-economic variables (age, gender, education) it also provides the total number of jobs [7] held by workers in each year. This characteristic permits the direct identification of the net flows. While taking up a new job is not necessarily *job* creation (the position may be assumed after someone whose contract was terminated or the previous worker retired) and separation is not necessarily *job* destruction (the position may be immediately filled by someone else), *worker flows* are identified in gross terms in LiTS database, which is unique for such a long period of time and wide selection of countries. Henceforth, for the purposes of brevity, we refer to separations and hirings, because identification occurs on the worker and not on a firm level. For individuals with multiple contemporaneous jobs, we identify the main occupation by the lowest ISCO code (which corresponds to the highest skill level). Unfortunately, the LiTs lacks information on wages, size of the employer and hours work within each jobs, which limits our possibilities in the analysis.

Given its retrospective nature, this database is subject to some well-known limitations. First, the interviewee might not perfectly remember all the positions held since the onset of the transition process. People might recall better the jobs they had in the recent years, which might inflate job reallocation close to 2006 (the year of the retrospective survey) relatively to the earlier ones. Second, since the sample is representative for 2006 in each country, it is likely that older workers in early transition were underrepresented for purely demographic reasons.

The data from LiTS has also some definitional shortcomings. First, the data does not permit direct identification of unemployment, because individuals report the employment status, but not the labor force status. Consequently, some are not in employment because of age (e.g. schooling or retirement), others because of unemployment and yet others because of plain inactivity. The first group we identify based on age and previous/next status: previous pupils/students or future retirees need not be counted as unemployed in these periods. Students are included in the inactive category only before they achieved their highest degree and as long as they are under 25 years old and they have not worked in the past. Retirees are those who self-reported either to be officially retired in a year or have declared to move to retirement from the previous job. In a small number of cases, people kept working after being officially retired. In those cases, we consider them to be retired after they left their last job.

Unfortunately, the inactive remain indiscernible from the job seekers in the survey. To correct for this shortcoming, we constructed a definition of the labor force status. In addition to the status of the pupil/student and the retiree, we also construct the definition of an inactive person. This category comprises individuals who do not report working in any of the years of the survey. Consequently, the unemployed are those individuals who were in the working age, who did not have a job in a given period, but did work in at least one year of the sample. Even after these refinements unemployment rates in the LiTS remained higher than the official statistics, see Figure 4 in Appendix B.[8]

Using the retrospective microeconomic data we divide the flows into seven types. First, following Aghion and Blanchard (1994) we identify a change from a public sector employment into a private sector

[6] Although data is available, we do not include in the estimations Mongolia and Turkey.

[7] In some – quite numerous – cases, the same individual worked in two different parallel positions for several years, which was typically ignored in earlier literature. Multiple contemporaneous jobs are a topic requiring further analysis, but beyond the scope of this paper.

[8] A regression of one on the other returns a coefficient of 0.301 (s.e. 0.068) with the inclusion of country and year dummies.

employment – with or without a spell of unemployment. We call these flows AB flows, while keeping the industry constant. Second, in a similar spirit, we follow the literature by Caballero and Hammour to identify a flow from industry to services, while working in the same sector. We call these flows CH flows. In addition, there are flows which comprise both types of changes (public industry to private service) and flows within each industry/sector. We call the former ABCH and the latter SAME. Finally, one could move in directions opposite to the ones predicted by both theories – i.e. from private to public or from service to industry. If that is the case, we call these flows NONE. These five types of flows are complemented by outflows to inactivity (i.e. predominantly retirement) and entries from inactivity (i.e. predominantly youth entry). We also code the information on no changes in employment.

The second definitional shortcoming of the LiTS data is that there is no direct information on whether 'currently' private employer was a formerly a state-owned enterprise that got privatized or is it a *de novo* private firm. The responders are asked, though, if the particular employer existed at all prior to 1989, which we use as identification of SOE. This identification is clearly only an approximation for two reasons. First, it is likely that – especially young – responders may misidentify re-branded foreign-owned privatized firm as a one that did not exist in that country prior to 1989. Second, in some countries, such as Hungary, the private sector began to emerge before the collapse of the Soviet Union. Yet, the risk of misclassification does not seem substantial.

In addition to the unemployment, LiTS data reflect fairly well the structural characteristics of employment. Table 8 in the appendix compares the results from the LiTS with the European Labor Force Survey (EU-LFS) for all the countries included in both surveys. Given that the EU-LFS lacks information on the ownership structure of the firm, we used the Structure of Earnings Survey (SES) to fill in this variable (SES is available biennially only since 2002). Despite the good match, there are some differences that we should bear in mind when analyzing the results. First, the LiTS overestimates the importance of employment in the service sector, with a margin of difference that varies from a small 1% in Romania to almost doubling its size in the case of Lithuania. The estimations of industry share in employment seem to be closer to those from the LFS, with no particular sign in the distortion. Except for Hungary and Romania, the differences are smaller than 10%. In the case of the share of the private sector in employment, we observe that the estimates from LiTS tend to be smaller, with important differences between countries. Also, for Latvia and Poland, data from the LiTS show a smaller fall in the share of industry in employment than data from the EU-LFS. In the case of Romania, LiTS implies higher share of population employed in services than confirmed otherwise. These results may emerge from the differences in coverage between the two surveys.

In Table 9 in Appendix B we describe age, gender and education in our sample. The fairly universal process of aging is well reflected in the sample despite its retrospective design. On the other hand, there are also striking differences in the demography of the labor force across the analyzed countries, with Estonia having the oldest working population and Central Asian countries having the youngest labor force. On the other hand, the latter group of countries aged at a fastest rate. Although women are overrepresented in our sample (one of the features associated with the data collection method), we observe a decrease in female participation rates in the majority of the covered countries, though in some cases the differences are not large. In concordance with other data sources, educational attainment has improved radically during the transition period, even in the countries with high educational attainment already before the introduction of the market economy. The improvement in the overall education is also a consequence of retiring older cohorts, which tended to be relatively less educated. We can observe that the pace of change varied across countries. In some of them (such as Bulgaria, Croatia, Hungary, Poland, Slovakia and Central Asian countries), the decline in the number of workers with only low education levels is gradual; while in Caucasian and Baltic countries, the decline is abrupt, which may suggest that the role of the demographic processes in labor market flows could be of importance. In addition, table 9 conveys also information on GDP per capita, unemployment, the minimum wages and the unadjusted labor share in GDP. As expected we observe the increase in unemployment rates in all countries, with a larger variation between countries than within them, which indicates the relevance of cross country comparisons.

We complement this rich data with macro-level characteristics of these countries from two additional sources: the World Development Indicators (WDI) and the LABORSTA, compiled by the World Bank and the International Labour Organization, respectively. We use the data on labor share and output

to compile aggregate measures of unit labor cost. We also compare the measures of unemployment rate derived from our micro data set with the official registered unemployment indicators in WDI. In most cases, these macroeconomic variables are available only for some of the countries and only for some periods (e.g. we cannot observe the unemployment rate or the ULC in Montenegro before its independence.

3.2 Stylized facts about worker flows in CEECs

We first analyze the time dynamics of the labor market flows in the transition economies [9]. Table 1 reports the time effects from a set of regressions where total flows of each type are correlated with time and country dummies, as well as some additional controls such as GDP, unemployment rate, etc. The reported time effects show the overall trend for each of the flows across time (baseline is 1990). AB flows were relatively more important in early years of transition, whereas the CH flows gradually gain momentum towards the end of the analyzed period. That would be consistent with AB driving most of the reallocations related to transition and CH driving most of the reallocations related to plugging into the global value chains. Yet, analysis reveals that there is an inverted U-shaped pattern spiking in mid 1990s for ABCH flows (individuals changing both industry and sector), whereas the real increase in flows over time occurred for the SAME flows (i.e. individuals changing a job within a sector and industry). These last flows were on average six times larger in mid 2000s than they were in early 1990s.

Table 1: Time dynamics of the labor market flows

Flow/year	AB	CH	ABCH	SAME	To U	ENTRY	EXIT
1990	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1991	1.000*	0.111	0.148	0.667	-0.815	0.556	1.296
1992	1.593***	0.333	0.667***	2.037***	0.481	0.370	0.111
1993	1.926***	0.407*	0.815***	2.074***	-3.556*	-0.074	-0.148
1994	1.556**	0.185	0.519**	2.148***	-5.333**	-0.000	-1.630*
1995	1.444**	0.296	0.222	3.148***	-6.037***	0.148	-1.148
1996	1.778***	0.778***	0.778***	3.852***	-2.333	0.444	-1.259
1997	1.074*	0.185	0.556**	3.074***	-5.185**	-0.037	-2.407**
1998	1.778***	0.333	0.407*	2.667***	-7.333***	0.037	-2.111**
1999	0.593	0.407*	0.333	3.148***	-6.704***	-0.481	-2.111**
2000	1.222**	0.407*	0.519**	4.370***	-6.556***	0.185	-1.519
2001	1.630***	0.741***	0.481**	4.333***	-4.778**	0.185	-2.296**
2002	0.593	0.481**	0.333	2.889***	-6.481***	0.556	-2.963***
2003	0.148	0.667***	0.333	4.333***	-7.185***	0.667	-2.519***
2004	0.889	0.889***	0.259	5.296***	-5.037**	1.000*	-1.889*
2005	0.852	1.000***	0.185	4.630***	-1.593	2.185***	-2.000**
2006	0.741	1.296***	0.259	6.148***	-1.074	-0.370	-4.370***
Observations	459	459	459	459	459	459	459
R^2	0.674	0.582	0.542	0.898	0.810	0.796	0.844

Notes: The table shows the effects of time on different variables in a fixed effects estimator. The asterisks denote the conventional significance levels. Dependent variables represent specific flows of workers (total in country, year): ownership change, from public to private (AB); an industry change from manufacture and agriculture to services (CH); from public industry to private services (ABCH); within the same sector and industry (SAME) and in the opposite directions (NONE). The models did not include a constant, but a full set of dummy variables for the different countries The analysis complemented by labor market entries (ENTRY) and retirement (EXIT). As a robustness check other variables were added, such as unemployment rate, GDP per capita, and lagged values of the dependent variables. The results were consistent, with only slight changes in the adjusted R^2

In addition to the theory-driven flows we also explore the demographic component. The entries to the labor market were not in general significantly different across years (the spike in 2005 comes from the fact that in this year the first survey was collected, thus capturing most youth at all). The gradual

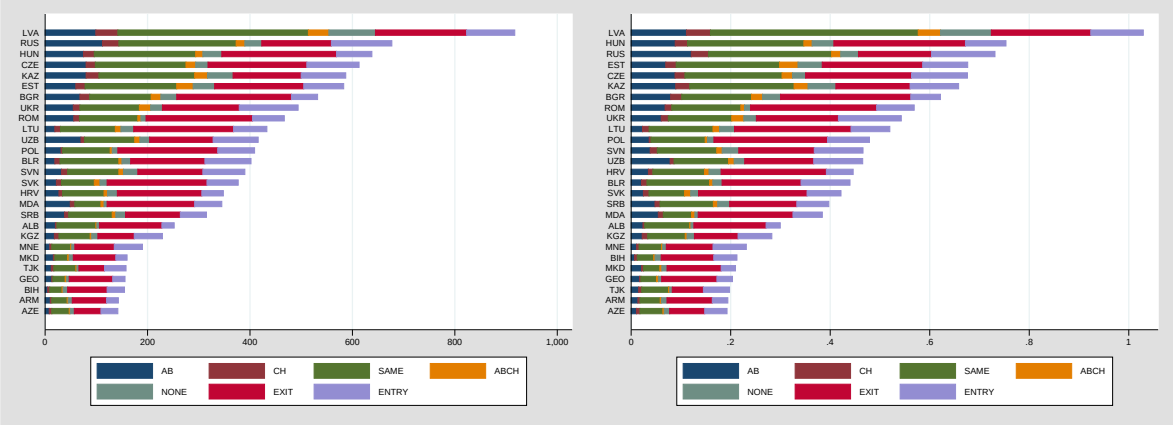
[9] The years of the flows correspond to the year at the end of the period, i.e. flows in 1990 correspond to the differences between 1990 and 1989

aging of the post-war baby boom should be reflected in gradually intensifying labor market exits to retirement. Yet, we observe the opposite - EXIT flow has the largest intensity in early transition years and a gradually decreasing pace since late 1990s. This seems to suggest that the flows driven by labor market and institutional features (early retirement schemes to reduce unemployment) quantitatively dominated purely demographic trends (post-war baby boomers should be retiring as of mid 2000s).

This analysis of the timing of flows suggests that the apparent discrepancy in the literature may actually stem from the differences in periods covered, see Table 7. Our analysis shows in Table 1 that AB flows were characteristic for the first decade of the transition whereas CH flows intensified once majority of the ownership change was already passed. Depending on which period was captured in the study, the pure chance of "catching" AB flows increased.

Table 1 describes the time trends, but remains silent about the absolute and, more importantly, relative size of these flows. This dimension is covered by Figure 1, where we show the total over time by each country. Since by the design of LiT survey, each country sample consists of 1000 individuals, these numbers can be compared directly *ceterum censeo* the differences in the labor force participation. Thus, to be on the safe side, we also provide the size of the flows rescaled by the number of people in the labor force (averaged over the available period of 18 years). Across all countries CH flows are of minor importance, AB flows and ABCH are relatively much larger, but still remain substantially smaller than SAME flows and NONE.[10] Flows to retirement and from school are systematically the largest, with the exception of Latvia. In general it seems that the SAME flows were quantitatively most important, covering between 30% and as much as 60% of the total flows within the country. AB flows were quantitatively larger in some countries, but, in general, these were economies which experienced a higher number flows. CH flows are never "large". The two flows are also reflected in with ABCH flows, which were in most cases as negligible as the two separately. Majority of inside labor market flows occurred in transition countries within industry and sector, but these are always quantitatively dominated by entry (of youth) and exit (of retirees).

Figure 1: The composition of labor market flows in the analyzed economies



Note: number of flows (total over analyzed sample) in the left and divided by the number of workers in the right. Data come from 2006 wave of the Life in Transition Survey

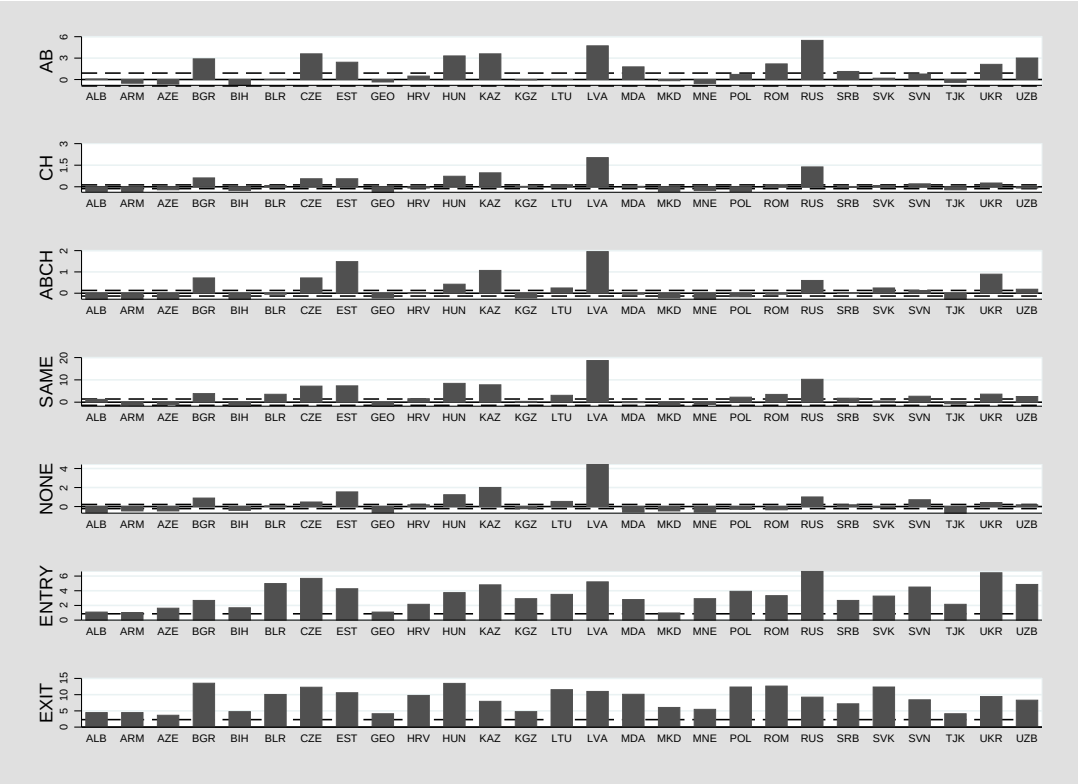
Figure 1 seems to suggest that conceptualizations by Aghion and Blanchard (1994) as well as Caballero and Hammour (1996a; 1996b; 1998; 2000) can have only a minor role in explaining the labor market phenomena observed in transition economies. Our data also indicates that the restriction placed on flows by a large part of the literature following Aghion and Blanchard (1994) are misguiding. During the entire period, we observe that there was some job creation in the public sector (partially reflected in the SAME flow) and also job destruction in the private sector. On the other hand, large flows to retirement are an analogue of the flows to-benefits as proposed by AB model, with the distinction that they were one-way (did not return to employment) and were more costly in terms of public finances.

Another interesting insight comes from the cross-country comparison depicted in Figure 2 which

[10] Countries with still much larger state sector – Central Asia and partly also South Eastern Europe – observed almost no AB flows, but Uzbekistan and Kazakhstan clearly stand out.

allows us to put in context the results from previous studies. For example, Estonia and Czech Republic are both outliers in terms of labor market mobility, which makes the comparative analysis by Jurajda and Terrell (2003) generalizable only to a certain limit. On the other hand, focus on Slovenia by De Loecker and Konings (2006); Bojnec and Konings (1998) was always justified by how specific this country was in its transition path, which finds little confirmation in labor market flows data. Russia on the other hand seems relatively specific and – much to a surprise – a country with massive flows, which was never confirmed in studies by Brown and Earle (2002) or comparative analysis by Brown et al. (2006). The fact that literature is missing on the analysis for Central Asian countries leaves much of the no-flows beyond the scope of the analysis. Finally Latvia, a notable outlier in LiTS, has remained outside the radar of analysis.[11]

Figure 2: Country specificity in labor market flows



Note: country effects from a regression of flows against time (point estimates). The dashed red lines show the 5% significance level threshold. Data come from 2006 wave of LiTS.

Figures 1 and 2 also provide some additional puzzles. Although in most cases, we observe that the public sector did reduce its size throughout the period, in specific years there was an actual net increase in employment in the public sector (i.e. graduates hirings and NONE flows exceeded a sum of AB and ABCH flows). Prominent examples are Belarus and Russia: in the former public sector employment grew in twelve of the sixteen years under analysis, while in the latter – only in eleven cases [12]. Data on net public employment also allows to analyze when did transition begin. Particularly, we observe that in Central Asia (Kazakhstan, Uzbekistan and Kyrgyzstan) the process started later, as the number of workers employed in the public sector continued to grow until mid-1990.

When it comes to the private sector we encounter important differences between the type of company, whether privatized or *de novo*. As expected, net job creation in privatized companies tended to be only slightly positive for most of the period (77% of the time-country cases), and in many cases close to zero.

[11] Eamets (2004) is a noteworthy exception. The article provides a comparative analysis for the Baltic States using LFS data, finds substantially higher unemployment outflow in Latvia, but argues that this development was coupled with large exits to inactivity, which he points to worker discouragement.

[12] This is consistent with the evidence presented in Boeri (2000), who indicates that Russian public sector was reduced at a much slower pace than other countries.

With respect to *de novo* firms, who are usually small and subject to much greater volatility in their employment patterns, both job creation and destruction were high.[13]

With respect to the timing of transition, we can observe that direct job-to-job flows predominated, Figure 5 in the appendix. This has a few consequences worth mentioning. First, it casts a shadow of doubt on the true importance of unemployment benefits as drivers of the separations from state employment. Second, it also implies that in spite of the disorganization associated with transition, synchronization between job creation and destruction existed and was mitigated by other channels as well – mainly entries form school and exits to retirement. This trend can also imply that people tend to retire early, which is consistent with the fall in participation rate in most countries.

These stylized facts shed some new light on the patterns of labor market flows in countries undergoing a transition from a centrally planned to a market economy. They also help to address the first hypothesis of this paper. Namely, we formulated that only a minority of flows is consistent with either of the theories: AB or CH. Data confirm that in fact a majority of flows occurred within sector and industry, whereas it seems that majority of the reallocation was mediated by the flow of jobs rather than workers and by labor market exits of the elderly and entries of the youth. In the results section we move to formally test the remaining three hypothesis of this paper.

4 Results

In this section we provide empirical evidence testing the four main hypotheses formulated in this paper. First, we test for the relative importance of various labor market flows in transition countries (H1). The tentative evidence from Figure 1 and 5 suggest that AB and CH flows were not nearly as important on aggregate as other flows. Yet there is some time specificity, so a more formal test is required to uncover if and to what extent AB and CH theories have explanatory power for the vast variation across time and countries. We de-trend and remove the country specificity form the measures of labor market flows and provide statistical evidence if and which of these flows was of larger magnitude.

Second, we ask if the predictions of AB and CH models concerning unemployment are supported by the data. In principle, if AB mechanics were predominantly at work, the link between CH flows and unemployment should be relatively weaker, especially in the first years of the transition (H3). Here too we propose a set of linear regressions modelling the flows to employment, with special emphasis on where the flows are from (public/private and manufacturing/services) and where they are to (likewise).

Third, we formally address the relative importance of job flows and worker flows. Many of the public sector jobs were destroyed necessitating a reallocation to a private sector, but also many of them were transformed directly to private sector *via* privatization. In addition, the change in public sector employment could be a result of elder workers leaving jobs and youth assuming positions elsewhere in the economy. If AB was the dominant mechanism at work, it should be flows from public sector jobs to private sector ones that lead in importance over privatizations (jobs reallocation) and demographics (youth entries and elderly exits). These considerations fall into H2. To test that empirically, we formulate additionally a set of models for changes to a private sector job and for changes from a public sector job.

Finally, for H4, we propose to use a competing hazard model of survival analysis. We want to test the hypothesis that countries with more elderly exits and less youth arrivals were subject to more wage pressure *ceteris paribus*. Yet, wage pressure and flows tend to be extremely closely correlated in the business cycle. Thus, we explore the panel dimension of our data most extensively formulating a model of contract duration. Contract breach can in principle happen because of three reasons: (i) job destruction consistent with AB and CH explanations, (ii) better wage offer elsewhere (inconsistent with AB or CH) and (iii) labor market exit. We keep option (i) as baseline and formulate competing hazards for AB and CH type of flows with no unemployment spells. We include unit labor cost in the model. Economies/periods where wage pressure was driven by AB or CH phenomena should observe a stronger link between contract survival and the unit labor costs. Likewise for the competing hazard associated with the retirement. We also include period-specific labor market entries rate as one of the key controls.

[13] Yet, in levels, job creation and destruction in the public sector were greater than in the *de novo* firms.

4.1 Which flows were more important during the transition?

We answer this question and test H1 by comparing the relative size of the flows. Given strong heterogeneity of flows across countries and time periods, instead of using the raw values of flows, we use the residuals from a simple regression of each flow against a set of time and country dummies (without a constant). This allows removing any specific variation, extracting the overall trends. We include a series of pairwise tests for the equality of means in Table 2. The top row and the most left column report the mean values of $constant_j + constant_t + \hat{\epsilon_{j,t}}$ where j denotes country, t denotes time period and $\hat{\epsilon_{j,t}}$ denotes residuals from a regression against the country and period dummies. The numbers reported as means report an average number of flows of each type in each country and each period. Figuratively speaking, net of period and country effects, about 7.7 workers leave to retirement per year, which should be related to approximately 500 workers, yielding app. 1.5% of the labor force. The remaining cells show the t-statistic of pairwise comparison tests of mean equality.

Table 2: The adjusted size of each type of flows

		NONE	EXIT	ENTRY	SAME
	Means	1.18	7.69	3.53	5.88
AB	2.30	-17.76***	40.16***	18.89***	22.67***
CH	0.66	17.97***	45.61***	44.62***	27.84***
ABCH	0.60	16.88***	46.80***	43.94***	27.33***

Notes: $t-statistics$ reported, ***, ** and * denote significance at 10%, 5% and 1% significance levels. Test on residuals from regressing each type of flow (per country per year) on country and period dummies.

The results are consistent with Figure 1. In general flows suggested by the two theories – AB, CH and the two combined – are trumped by both demographic trends and are also trumped by changes of jobs *within* the sector and industry. The only type of labor market flow that is not dominating AB, CH and the two combined is their complement, i.e. changes of employment which happened from service to industry and from private to public sector. Given the small size of both private and service sectors in majority of these countries at the brink of transition, this is more than self explanatory. Yet, NONE flows are much bigger than ABCH flows combined (and also bigger than CH alone). While the theory of optimal speed of transition by Aghion and Blanchard (1994) or optimal reallocation by Caballero and Hammour capture only a minority of labor market flows in transition economies, the mechanics of link between flows and unemployment can still fit these theories well. We move to testing that empirically in the following subsections.

4.2 Which flows explain the phenomenon of unemployment better?

The predictions of the AB and CH theories concern mostly unemployment. The timing and the dynamics of the unemployment rate differed across the transition countries substantially. When business cycle effects are removed and when the sample starts at the verge of transition, if AB and CH theories had explanatory power, unemployment rate should be positively linked to these flows. Table 3 reports the estimates of correlations between the flows and the unemployment rate (with fixed effects for country and period). Following both AB and CH theories we include the non-linearities.

As covered in section 3.1 and in Figure 4, the definitions of the unemployment rate based on LiT survey and on the official statistics are not identical. LiTS data report lower unemployment rates, whereas The World Bank data do not cover the first transition years.[14]. Thus, we rely more in the measure of the unemployment rate computed within our sample, but as a robustness check include also the measures of the unemployment rate from The World Bank (which start *circa* 1993 and are not available for all countries). As a way to control the sample composition effects, we re-estimate the relationship with the unemployment rate computed on LiTS data with the observations restricted to data available from The World Bank.

[14] As a matter of fact early 1990s data are missing in any source for a large share of transition countries

Table 3: The link between the unemployment rates and flows

	AB	CH	SAME	ABCH	NONE	EXIT	ENTRY
	Unemployment definition from LiTS						
$flow^2$	0.057***	0.089	0.009	0.220*	0.026	0.006	0.037*
	(0.017)	(0.090)	(0.006)	(0.118)	(0.055)	(0.007)	(0.022)
$flow$	-0.789***	-0.688	-0.533***	-1.067**	-0.595*	-0.060	-0.762***
	(0.221)	(0.436)	(0.154)	(0.486)	(0.349)	(0.162)	(0.247)
N	486	486	486	486	486	486	486
R^2	0.888	0.885	0.890	0.886	0.886	0.885	0.889
$\bar{flow} * \hat{\beta}$	-1.51		-3.13	-0.56	-0.70		-2.23
	Unemployment definition from The World Bank						
$flow^2$	0.040**	0.011	-0.001	-0.063	-0.015	0.003	-0.014
	(0.019)	(0.055)	(0.005)	(0.104)	(0.038)	(0.007)	(0.016)
$flow$	-0.269	-0.411	-0.130	0.188	0.184	0.014	0.124
	(0.205)	(0.303)	(0.131)	(0.396)	(0.262)	(0.159)	(0.206)
N	236	236	236	236	236	236	236
R^2	0.816	0.814	0.817	0.810	0.810	0.813	0.810
	Unemployment definition from LiTS restricted The World Bank availability						
$flow^2$	0.038**	-0.016	-0.006	0.099	-0.013	0.001	0.002
	(0.016)	(0.048)	(0.004)	(0.088)	(0.032)	(0.006)	(0.014)
$flow$	-0.350**	0.190	0.066	-0.356	0.044	0.053	-0.118
	(0.174)	(0.260)	(0.112)	(0.336)	(0.223)	(0.135)	(0.174)
N	236	236	236	236	236	236	236
R^2	0.967	0.966	0.967	0.966	0.966	0.967	0.967

Notes: Standard errors reported in parentheses, ***, ** and * denote significance at 10%, 5% and 1% significance levels. Flow definitions are the same as in the case of Table 1. All regressions include period and country fixed effects. For the computation in $\bar{flow} * \hat{\beta}$ we extract the country and period fixed effects, i.e. a coefficient on a squared applied to a square of means as reported in Table 2 plus the coefficient on the linear term times the same mean value, insignificant coefficients treated as zeros.

Regardless of the unemployment rate definition, data lend support to the AB model – higher labor market flows of the AB type are associated with higher unemployment rates. Similarly universal is the result that CH flows are not related to the unemployment rate, but the strong result from the AB flows is visible also in the ABCH flows. Indeed, the CH flows have the same signs as the AB flows but are estimated with much less precision. Controlling for country and period fixed effects reveals that a larger number of SAME flows is associated with a lower unemployment rate. One potential explanation is that these reallocations improved the way labor was utilized, reducing the need for excessive job destruction. A similar reasoning can explain why NONE flows also exhibit negative link to the unemployment rate, but that effect is susceptible to country/year effects, because the estimates are much smaller (and insignificant) in the restricted sample. Also higher labor market entries worked to increase the unemployment rate in early transition. Yet, the coefficient on the nonlinear term is substantially reduced when we move to The World Bank definition of the unemployment as well as the restricted sample.

For our preferred definition of the unemployment – bearing in mind its caveats, as discussed above – we also compute the contribution to the actual unemployment rate. The biggest contribution to reducing the unemployment rate comes from the SAME flows, which stems from their large importance and fairly large point estimator for the linear term. Despite a positive nonlinear term, AB flows in total contribute to reducing unemployment *within* the sample. One explanation for this finding may be that the flows we identify were actually successful transitions from public to private sector, whereas the increase in the unemployment rate should be observed with a growing number of unsuccessful transitions. Also youth labor market entries exhibit a negative contribution to the unemployment rate within sample.

The lack of correlation between the CH flows and the unemployment rates does not necessarily imply that the CH model was not applicable to transition economies. First, it could be that these channels operated as previewed by the model, but were not the dominant forces, so their effect on the unemployment rate could be indiscernible from other processes. This explanation is corroborated by

Figure 1 and Table 2. Second, it is also possible that the cyclical shocks – as used in CH model – happened with different strengths and at different points in time in the analyzed countries. If that indeed were the case, the time and country fixed effects would in fact inflate the standard errors on the estimates of CH flows in the unemployment rates regression.

Taking into consideration the possible criticisms concerning the methodology, we also explore the relation from a different angle. We exploit the panel dimension of our data to estimate probability of finding a loosing a job from any labor market status. We employ linear probability models with fixed effects for countries and years. We include controls to help to identify the flows suggested by AB and CH theories as well as the other we discussed above. We also distinguish explicitly between privatized and *de novo* firms, to help addressing H2. Since each flow has two dimensions (industry and ownership), the interpretation of the results depends on the reference levels. Given that we are interested to observe the actual effects of AB and CH flows, the reference levels need to be public or privatized for the ownership and manufacturing for industry. This allows also to look explicitly at additional types of flows which include staying within the same industry as well as changing the type of employer. Additionally, we tested the role of labor market segmentation by including the re-incidence of unemployment as an independent variable. We used the panel dimension of the data to construct a count variable which measures the number of times each individual became unemployed during their work life. Table 4 reports the estimates from the regressions.

Table 4: Movements to employment

	N⇒ E	U⇒ E	E⇒ E
AB	0.968***	0.870***	0.920***
	(415.606)	(59.151)	(214.500)
CH	0.650***	0.662***	0.594***
	(281.813)	(18.648)	(66.944)
Same sector - Public	0.883***	0.882***	0.916***
	(616.295)	(106.321)	(293.973)
Same industry - Manufacturing	0.102***	0.348***	0.479***
	(81.215)	(23.762)	(109.083)
ABCH	-0.623***	-0.593***	-0.534***
	(-154.898)	(-9.061)	(-30.601)
Same sector - de novo		0.854***	0.892***
		(57.601)	(228.873)
Foreign	-0.004**	-0.028	-0.069***
	(-2.026)	(-0.480)	(-3.487)
Reincidence of unemployment (count)		-0.207***	-0.004***
		(-64.783)	(-4.163)
Female	-0.003***	0.002	-0.003***
	(-2.887)	(0.447)	(-3.110)
Age (in tens)	0.002***	0.200***	-0.012***
	(3.642)	(30.178)	(-5.705)
Age 2 (in thous)	-0.004***	-0.294***	0.008***
	(-8.645)	(-35.490)	(3.163)
Urban	0.001	0.000	0.001
	(0.910)	(0.059)	(0.656)
Secondary education	0.003***	0.049***	-0.001
	(5.487)	(10.337)	(-0.810)
Tertiary education	0.015***	0.133***	-0.004**
	(14.253)	(20.173)	(-2.005)
Observations	196,744	65,193	133,619
Number of id	15,132	9,968	13,107
R^2 between	0.825	0.276	0.641
R^2 within	0.834	0.314	0.641

Notes: panel random effects estimation of a linear probability model with standard errors clustered at individuals, specifications comprise fixed effects for country and year. $T - statistics$ reported in parentheses, ***, ** and * denote significance at 1%, 5% and 10% significance levels. Constant included, not reported.

AB flows and CH flows are statistically significant and come in with an expected sign: if one leaves public sector, it is more likely that new employment is found in *de novo* private firms; if one leaves manufacturing – a new job is more likely to be in the service sector. It also seems that the AB flows explain labor mobility better than CH flows. However, youth entries are more likely to private firms in general – be it *de novo* or privatized. In addition, youth entry is less likely for manufacturing than for service. These results suggest that part of the change in employment structure is better explained by demographics than direct worker flows.

Moreover, if workers in the transition countries were changing jobs – with or without the unemployment spell – they were more likely to stay within public sector and were just as likely to stay within manufacturing. Since flows *within* sector and industry cannot explain reallocation, they are simply indicative or the large role of worker flows, i.e. low importance of privatizations for the overall change in employment composition. Influx of labor market entrants was predominantly geared towards the emerging private sector, which contributed to the shift away from the public employment.

Re-incidence of unemployment enters both job finding and job-to-job flows equations with a negative sign. This suggests that higher unemployment rate in countries with faster destruction in early transition could be due to the mechanism of human capital depletion and discouragement at individual level - not only the mechanics of the AB and CH models.

The analysis confirms earlier findings concerning individual characteristics. Females are less likely to enter labor market and to change jobs – but, they are just as likely to find a new one once fired. Age reduces propensity to change jobs and shortens the unemployment spells. More educated individuals are more likely to find a job and less likely to leave the current one. Urban environment creates better opportunities for the labor market entry, but in principle cities and rural areas do not differ that much in job finding mechanisms or job-to-job flows (they may differ in educational and age composition, though, which would translate to different aggregate flows).

4.3 Were worker flows or job flows more relevant for reducing public sector?

In the analysis depicted in Table 4 the job flows – i.e. privatizations – are the reference value for flows from public $\Rightarrow$ *de novo* (as captured by AB dummy) and for flows public $\Rightarrow$ public. Since both coefficients are positive and large, it means that job flows were less likely than the remaining two options. One minor caveat for this analysis comes from the definition of the variables. Individuals report in the LiT survey whether the company in which they currently hold a job existed prior to the transition (1989), which we rely on to proxy state owned enterprises. That information is reported for all jobs held in the period analyzed in the survey . Thus, the identification of job flows as opposed to worker flows is indirect. We classify as privatizations (i.e. job flows) the cases when the individuals reported working in a state owned company as a previous job and working in a privatized company as a current job. We classify as worker flows the cases when the individuals reported working in a SOE as a previous job and a private *de novo* company as a current job. [15]

The results also show that a fair share of flows in the transition countries occurred between the private *de novo* firms, and between public sector employers – same relative probability as for the AB flows. In general job flows of that character are likely to occur in any functioning labor market due to reasons unrelated to AB or CH models. Examples include changing a job for a promotion or a raise (as in a standard search & matching framework) as well as terminating a contract with a worker not suited for a job. Both may have no link to job destruction or job creation and are associated with regular churning. However, if AB and CH mechanisms were at work we would observe that contract breach is influenced by the firing rate, hiring rate and wage pressure as well as labor market exit and entry rates. This is our approach to testing H4, which we discuss in the subsequent section.

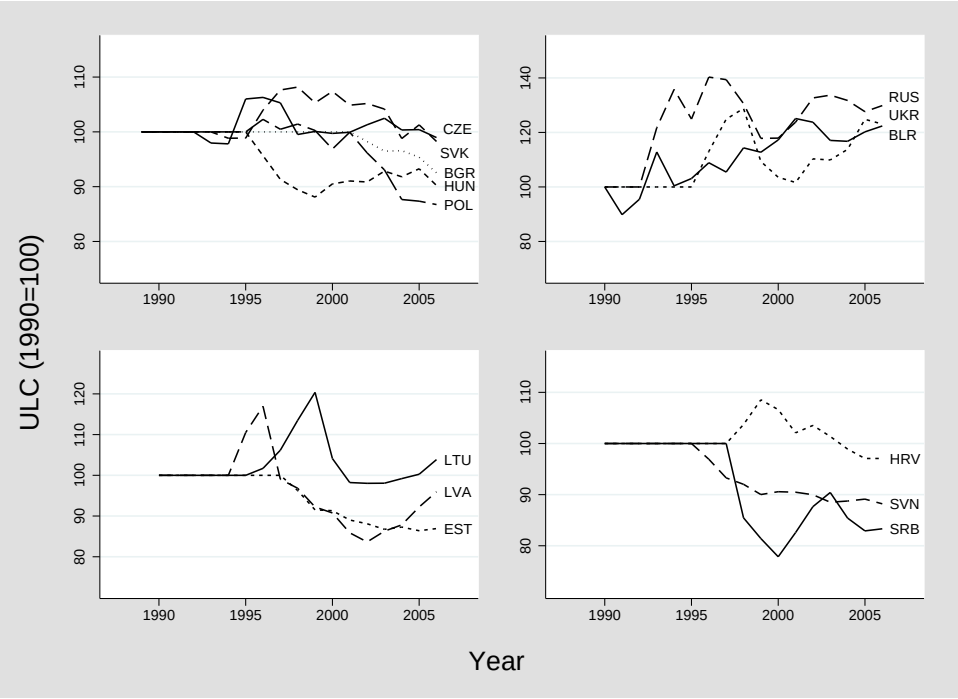
4.4 Were demographic trends reinforcing the wage pressure?

In both AB and CH models, the role played by wages in job creation and destruction, invokes actually wage pressure, i.e wage growth in excess of productivity growth. We approach this concept by introducing unit labor cost into our models, using as inputs data available from ILO and The World Bank.

[15] In some cases, respondents were not sure about the existence of the company in the past. In that case, the firm was considering as existing, and thus the estimates can be considered a lower bound.

Using labor share and GDP per worker indicators we compute the payroll and we use GDP as output measure. Payroll growth in excess of output growth signifies periods of wage pressure. Figure 3 depicts the outcome measures for grouping of selected countries. Unfortunately, this measure is not available for the first five years of transition for the majority of the countries.

Figure 3: Unemployment rate comparison



We model contract breach as a survival model, as they allow to measure the impact of personal and environmental characteristics in a time-to-event framework. At the moment of contract breach, we are able to identify the sector and the industry in addition to worker characteristics. We explore this dimension using a standard Cox (1972) proportional hazard model. This method allows to estimate the effect of covariates without specifying the baseline hazard functions, which provides additional flexibility as we can specify different references for different countries. However, this comes with a price, as the coefficients should be interpreted as increases in the hazard with respect to an unspecified base level, which corresponds to the situation when all covariates equal zero.

In a second stage, we use the panel dimension to differentiate between contract breaches to employment to private/public sector as well as manufacturing/service, for which we use a competing risk model as proposed by Fine and Gray (1999). In this setup, individual observations can "die" of several mutually exclusive causes: they can either go to private or public firms, but not to both at the same time. Thus, a key feature of these models is that the occurrence of one type of event prevents others from happening. Here lies the main distinction between a competing risk approach and the standard Cox (1972) approach, as the second assumes(for the calculus of the individual likelihood) that the event will occur sometime in the future. So, while in a Cox model the probability of occurrence as $t \to \infty$ is always one, and all observations without a failure time are considered as censored; in competing risks model, the probability as $t \to \infty$ equals the occurrence of the event in the population. Therefore, we would use the Cox (1972) approach to model the separation rate , as all individuals at some point leave their job; and the competing risks models based on Fine and Gray (1999), when we want to model the different flows, in other words where do they go after employment.

All time events are assumed to occur at the end of the period. This simplification results from data constraints, as we do not observe when exactly the subject moved. Because only a fraction of the individuals worked since 1989, we use a model which allows for delayed entry, i.e. initially idle individuals become at risk only when they obtain their first employment. In Table 6 we present the results from the survival regressions, which models the event of changing the first job. In the first group, we model the probability of any change from the employment status, in other words a contract breach.

Given that it encompasses all possible types of "death", we employ a proportional Cox model to obtain the results. In the other two groups, we focus on specific flows: AB and CH. Therefore, we employ the methodology suggested by Fine and Gray (1999). In addition, we include a proxy for wage pressure: the dynamics of the unit labor cost (third column in each group). Given the fact that this variable is available only as of 1995 [16], we isolate the sample selection effects by comparing these estimates to the estimates without ULC but for the same observations.

The results from the Cox decomposition indicate that unlike it was suggested by the theory, but consistent with previous empirical findings, individual characteristics had a significant impact on the occurrence of a contract breach. More educated workers stayed longer in their first jobs. Additional analysis where education level was interacted with the sector, indicate that the effect was driven mainly by the public sector. These results are consistent with the evidence presented in Turunen (2004) for Russia. The effect of the education level is also visible in the type of occupation they had in their previous employment. Workers who worked in high skilled occupations were less likely to experience a contract breach, though the effects were not constant in different periods. [17].

The sector and industry of the firm also affected contract duration. As expected, given the transition process, workers from public firms were exposed to a higher risk. This result might be partially driven by the fact that we restricted the analysis to the first employment, which for over half of the sample was the public sector. On the other hand, we observe that once in the private sector, the dynamics of privatized and *de novo* firms did not differ significantly. Services appears to be the more volatile, as would be expected from an emerging sector. This is also consistent with the fact that this sector tends to hire relatively less educated workers. [18]

Finally, we include some variables controlling for the macroeconomic conditions: the unemployment rate and its square in the previous period [19] and a proxy measure for the wage pressure (ULC dynamics). In all cases, the unemployment rate presented an inverse U-shaped pattern, which is consistent with our *a priori* expectations. However, the coefficients from the ULC variable seem to indicate that the mediating mechanism was not the wage pressure. The lack of significance of the ULC coefficients is not a by-product of restricting the sample to the period where data was available, as the rest of the coefficients are largely similar to the ones obtained for the whole sample.

As an alternative measure of wage pressure we also include the size of the movements in and out of the labor market [20]. These flows represent the size of the population entering and leaving the labor force, from school and to retirement respectively. We observe that the entrance of younger cohorts is associated with higher contract breach, much more than the exit breach reduces labor reallocation. The phenomenon of younger cohorts entering an unstable market and generating more transitions is self explanatory; less obvious is the effect of the movements towards retirement. Previous theory leads us to expect that previous flows to retirement increase the wage pressure (both through the need of financing pension schemes and the reduction in the pool of unemployed population), leading to higher contract breach. However, our results suggest that the movements to retirement did not affect the general hazard rates. A possible explanation is that retiring from the market increased the

[16] ULC information was not available for Albania, Montenegro and Uzbekistan, which therefore were excluded from the sample.

[17] We can also observe that contract breach was not gender neutral. Women were more likely to experience a contract breach throughout the period, but specially in the early years, as indicated by the time interaction

[18] As expected, the effects of different industries were not constant over time. Interactions of time dummies (not reported below) with the types of industries revealed that the risk was higher after 1993 for services, as before their size was negligible, and 1995 for construction and manufacturing.

[19] We use unemployment rate constructed from the LiTS, therefore we could not use data from the same period as it would have been mechanically correlated with contract breach.

[20] We use previous year data for the same reason as in the case of the unemployment rate

Table 5: Duration models for the first employment

	Contract breach			CH			AB to *de novo*		
VARIABLES	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Unemployment rate	7.359***	8.868***	8.850***	3.119	8.749***	9.035***	0.050	8.643***	8.435***
	(5.932)	(4.187)	(4.174)	(1.305)	(2.799)	(2.902)	(0.028)	(3.497)	(3.398)
Unemployment rate 2	-9.543***	-12.319***	-12.305***	-9.449**	-18.142***	-18.396***	-3.643	-16.328***	-16.145***
	(-6.046)	(-4.351)	(-4.345)	(-2.377)	(-3.475)	(-3.524)	(-1.299)	(-3.988)	(-3.941)
Entry	2.377***	3.714***	3.727***	12.004***	9.049***	8.737***	8.932***	5.950***	6.219***
	(2.859)	(3.390)	(3.396)	(9.099)	(5.006)	(4.686)	(7.783)	(3.511)	(3.659)
Exit	2.542	2.929	2.950	9.536***	0.692	0.676	12.099***	7.500**	7.472**
	(1.486)	(1.294)	(1.302)	(2.684)	(0.150)	(0.145)	(4.513)	(2.043)	(2.051)
ULC dynamics			-0.062			0.878			-0.601
			(-0.185)			(1.302)			(-1.078)
Female	0.314***	0.303***	0.303***	-0.357***	-0.258**	-0.259**	-0.358***	-0.233**	-0.232**
	(10.783)	(8.733)	(8.734)	(-3.667)	(-2.373)	(-2.381)	(-4.487)	(-2.544)	(-2.539)
Age	-0.070***	-0.072***	-0.072***	-0.009	-0.010	-0.010	-0.012	-0.029	-0.029
	(-9.136)	(-7.549)	(-7.549)	(-0.379)	(-0.410)	(-0.392)	(-0.533)	(-1.178)	(-1.195)
Age^2	0.001***	0.001***	0.001***	0.000	0.000	0.000	0.000	0.000	0.000
	(7.639)	(6.361)	(6.361)	(0.037)	(0.300)	(0.281)	(0.261)	(0.942)	(0.958)
Secondary education	-0.238***	-0.227***	-0.227***	0.233	0.099	0.096	0.163	0.105	0.107
	(-5.326)	(-4.069)	(-4.069)	(1.340)	(0.516)	(0.500)	(1.119)	(0.609)	(0.620)
Tertiary education	-0.428***	-0.433***	-0.433***	0.134	-0.199	-0.202	0.167	0.076	0.078
	(-7.391)	(-6.130)	(-6.130)	(0.637)	(-0.847)	(-0.861)	(0.961)	(0.372)	(0.386)
Urban	-0.032	-0.035	-0.035	0.656***	0.659***	0.661***	0.632***	0.596***	0.593***
	(-1.091)	(-0.992)	(-0.991)	(5.844)	(5.190)	(5.204)	(6.834)	(5.585)	(5.566)
Public	0.515***	0.472***	0.472***	0.357***	0.350**	0.346**	2.724***	2.915***	2.917***
	(12.871)	(10.235)	(10.236)	(2.678)	(2.338)	(2.311)	(11.363)	(10.705)	(10.711)
De novo	0.067	0.049	0.049	0.095	-0.002	-0.001	0.440	0.487	0.486
	(1.323)	(0.886)	(0.885)	(0.580)	(-0.009)	(-0.004)	(1.395)	(1.403)	(1.399)
Manufacturing	0.435***	0.455***	0.455***	0.325***	0.189	0.190	0.605***	0.523***	0.522***
	(11.368)	(9.743)	(9.742)	(2.613)	(1.343)	(1.351)	(5.754)	(4.263)	(4.262)
Construction	0.470***	0.457***	0.457***	0.438***	0.193	0.190	0.945***	0.832***	0.834***
	(8.249)	(6.632)	(6.632)	(2.603)	(0.963)	(0.953)	(6.689)	(4.961)	(4.975)
Services	0.495***	0.527***	0.527***	-0.208	-0.282*	-0.283*	0.688***	0.754***	0.756***
	(12.892)	(11.508)	(11.507)	(-1.428)	(-1.731)	(-1.743)	(6.418)	(6.320)	(6.331)
High skill jobs	-0.370***	-0.340***	-0.340***	-0.180	-0.208	-0.210	-0.103	-0.144	-0.143
	(-10.027)	(-7.794)	(-7.794)	(-1.443)	(-1.526)	(-1.542)	(-1.023)	(-1.284)	(-1.272)
Observations	93,587	69,706	69,706	93,587	69,706	69,706	93,587	69,706	69,706
Log-Likelihood 0	-29713	-19664	-19664	-4295	-3293	.	-6042	.	-4452
Log-Likelihood 0	-29208	-19992	-19992	.	.	-3292	.	-4452	.

Notes: duration models for contract breach and competing risk models for CH and AB (to *de novo* firms) flows. Foreach group, the first column presents the results for the whole sample; the second, those from the sample for which there is data on the change in ULC; and the third, for the inclusion of this variable. All specifications include different baseline hazard functions for each state. $T-statistics$ reported in parentheses, ***, ** and * denote significance at 10%, 5% and 1% significance levels.

Table 6: Duration models for the first employment

	Contract breach			CH			AB to *de novo*		
VARIABLES	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Unemployment rate	0.547	0.735	0.731	9.961**	17.315**	17.879**	2.482	12.669**	12.483**
	(0.312)	(0.282)	(0.279)	(2.108)	(2.465)	(2.533)	(0.689)	(2.391)	(2.355)
Unemployment rate^2	-2.985	-4.022	-4.018	-11.163**	-22.765**	-23.423**	-1.668	-13.965**	-13.775**
	(-1.488)	(-1.257)	(-1.252)	(-2.052)	(-2.448)	(-2.505)	(-0.407)	(-2.016)	(-1.986)
Exit rate	4.684**	4.222*	4.223*	3.168	-0.944	-1.062	0.296	-0.383	-0.339
	(2.358)	(1.719)	(1.719)	(0.622)	(-0.158)	(-0.177)	(0.073)	(-0.080)	(-0.071)
Entry rate	-1.112	-0.073	-0.072	4.433	2.425	2.365	-0.345	-0.910	-0.866
	(-0.943)	(-0.051)	(-0.050)	(1.641)	(0.694)	(0.675)	(-0.130)	(-0.278)	(-0.264)
ULC Dynamics			-0.006			0.588			-0.212
			(-0.015)			(0.642)			(-0.283)
Female	0.078	0.070	0.070	-0.386***	-0.309***	-0.309***	-0.379***	-0.286***	-0.286***
	(1.240)	(1.078)	(1.078)	(-3.888)	(-2.788)	(-2.794)	(-4.622)	(-3.053)	(-3.051)
Secondary Education	-0.182***	-0.175***	-0.175***	0.160	0.036	0.036	0.072	0.029	0.029
	(-3.893)	(-3.026)	(-3.026)	(0.907)	(0.186)	(0.185)	(0.495)	(0.167)	(0.168)
Tertiary education	-0.421***	-0.443***	-0.443***	0.011	-0.281	-0.281	0.101	0.028	0.028
	(-7.014)	(-6.088)	(-6.088)	(0.052)	(-1.186)	(-1.186)	(0.576)	(0.137)	(0.139)
High skill job	-0.401***	-0.358***	-0.358***	-0.269**	-0.289**	-0.289**	-0.192*	-0.234**	-0.234**
	(-9.750)	(-7.169)	(-7.169)	(-2.210)	(-2.153)	(-2.152)	(-1.933)	(-2.099)	(-2.100)
Urban	-0.036	-0.029	-0.029	0.542***	0.590***	0.591***	0.493***	0.509***	0.508***
	(-1.178)	(-0.786)	(-0.786)	(4.775)	(4.637)	(4.641)	(5.267)	(4.752)	(4.749)
Public	0.429***	0.256***	0.256***	0.624***	0.533***	0.533***	3.070***	3.136***	3.135***
	(8.360)	(3.894)	(3.894)	(4.345)	(3.338)	(3.339)	(12.501)	(11.286)	(11.284)
De Novo	0.042	0.013	0.013	-0.106	-0.125	-0.125	0.225	0.340	0.340
	(0.816)	(0.237)	(0.237)	(-0.636)	(-0.707)	(-0.707)	(0.711)	(0.978)	(0.978)
Manufacture	0.345***	0.293***	0.293***	0.463***	0.315**	0.315**	0.783***	0.680***	0.679***
	(7.472)	(4.867)	(4.867)	(3.620)	(2.185)	(2.186)	(7.263)	(5.465)	(5.463)
Construction	0.397***	0.335***	0.335***	0.505***	0.256	0.255	1.071***	0.904***	0.904***
	(5.734)	(3.822)	(3.821)	(2.863)	(1.243)	(1.242)	(7.322)	(5.235)	(5.235)
Services	0.341***	0.273***	0.273***	-0.113	-0.196	-0.196	0.811***	0.865***	0.865***
	(6.530)	(4.021)	(4.021)	(-0.756)	(-1.183)	(-1.180)	(7.522)	(7.233)	(7.231)
Observations	92,000	68,926	68,926	92,000	68,926	68,926	92,000	68,926	68,926
Log-Likelihood 0	-28034	-18742	-18742	.	-3200	.	.	-4303	-4303
Log-Likelihood 0	-27534	-19084	-19084	-4126	.	-3200	-5771	.	.

Notes: duration models for contract breach and competing risk models for CH and AB (to *de novo* firms) flows. Foreach group, the first column presents the results for the whole sample; the second, those from the sample for which there is data on the change in ULC; and the third, for the inclusion of this variable. Cox models include different hazard baselines for each state, while in the competitive risk models we include dummies to model the effects of different countries. We also include interaction of time with workers' and firms' characteristics to ensure the fulfilling of the proportional hazard assumptions, these variables were not needed in the case of competing risks models and therefore they were not included. $T-statistics$ reported in parentheses, ***, ** and * denote significance at 10%, 5% and 1% significance levels.

In Table 6 we explore also the sub-hazard ratios for AB and CH flows – these flows were not quantitatively the largest, but could have driven the rest of the adjustment by affecting substantially the stability of the first contract. It does not seem that AB or CH are anything like the other flows. We observe that personal characteristics had a different impact, which underscores the importance of including them in the models. For example, while female workers experienced a higher risk of moving, their were less likely to perform either AB or CH flows. Similarly, we observe that neither age, nor education level were significant for the job-to-job transitions, which implies that the effect on the overall probability of contract breach was due mostly to the decrease in the likelihood of moving towards unemployment. Furthermore, urban flows were much more likely to follow AB or CH adjustments – the opposite has to hold for the reminder.[21] We can thus surely identify those who lost out on a transition: low educated, rural female workers were more likely to experience transitions towards unemployment.

With respect to the firm characteristics we observe that workers from the public sector were more likely to experience a movement towards service industry, not necessarily in the same sector. Again, this results might have been partly due to most of first jobs being the public sector. In both AB and CH, the unemployment variables were significant, with a similar interpretation than in the case of the contract breach, though in the case of CH we also encounter that the change in the ULC was marginally significant. The positive sign indicates that large changes in the ULC initiate a process of industrial restructuring.

Neither the entry nor the exit rate has a significant coefficient, in any of the subhazards estimations. These results suggest that the mechanisms considered relevant for reallocation were not working during the period and point to the need of looking for alternative explanations.

Even though this explanation seems plausible, we should bear in mind that the effect might vary across countries, an issue that we explore in graph 6 in the appendix. The graph compares the values of the coefficients for entry and exit from the first models (green lines), with those obtained using the same specification in each countries.[22] The red line in the graph shows the lower bound of the confidence interval [23]. Though most of the estimates fall within the expected range, countries appear to have different reaction to the changes in the entry rates. Thus, in Central European countries, the entrance of new workers appears to have actually reduced the hazard rate, making contracts more stable. The non-significance of the exit rates in explaining contract breach was further ratified with the country level comparisons.

5 Conclusions

AB and CH models may well be adapted to fit the case of CEECs transition, but it is AB model that has been more frequently applied empirically. Both these models offer appealing yet conforming predictions concerning the optimal speed of reallocation – be it due to economic transition (AB) or any other cause (CH). AB emphasizes synchronization of the state-driven job destruction to the capacity of the private sector to create new jobs. CH model indicates that slowing down the restructuring forces leads only to a reduction in the job creation rate without any benefits in job destruction.

The empirical research into optimal speed of transition and labor reallocation in the transition economies is vast, yet inconclusive. Some papers focus on testing the assumptions of the reallocation models, whereas others attempted testing the predictions. In either case, the results are mixed, whereas country and period selection fairly scarce. In this paper we aimed to shed some more light on the mechanics of the labor reallocation in the transition economies. We employ a new and rich data from the Life in Transition Survey by the EBRD and ask explicitly how much of reallocation in transition countries can be explained by AB theory, how much of it by CH theories and how much should be attributed to flows (and processes) missing in these theories. LiTS offers individual and comparable information of the labor market trajectories in almost all transition economies for periods as early as 1989. We can analyze gross flows and the impact of the individual characteristics, thus closing an important gap in the existing literature.

[21] An analysis on the subhazard rates for movements towards unemployment, not reported, confirms these intuitions.

[22] A direct comparison of the coefficients is possible due to the lack of assumptions of the Cox model with respect to the country baseline hazard ratio

[23] The upper bound was omitted from the graph as it was much higher than the rest of the estimates.

Our results suggest that there is still much to be conceptualized about labor reallocation mechanisms in transition countries. First, the most numerous flows were those connected to the demographic transition, that is with the entry of new cohorts and the exit of older ones. This generational exchange has fostered reallocation from public to private and from manufacturing to services more effectively than job-to-job flows, even those mediated by the unemployment. More importantly, given that we cannot observe early retirement (or discouraged workers) properly in LiTS, our estimates of this flow should be considered a lower bound. The policy implications from this finding may be twofold. First, that the policies cushioning transition were mostly ineffective, thus reducing the role of the typical labor market adjustment in favor of demographics adjustments. Second, instruments encouraging early retirement – quite popular in those countries – coupled with the educational boom for the youth effectively did "all the work", as opposed to direct labor market policies. This came at the expense of high social security expenditures and relatively lowered labor market participation. Importantly, we were not able to find any significant relation between the total flows to the retirement and the unemployment rate, thus it was rather employment than unemployment which was affected by policies encouraging early retirement.

When it comes to job-to-job flows – whether mediated by unemployment or not – our results also indicate that the AB or CH models cannot capture a large part of adjustments. Only a small part of total flows can be classified as AB, CH or ABCH. Our analysis also demonstrates that the transition was not simultaneous. During the early stages, flows from the public to private sector where more significant that changes between industries. Since the early 2000's the importance of this flows appears to be reversed. However, most of the flows were not AB nor CH, but rather changes within the same industry and/or sector. Private firms did not behave in the same fashion; in particular, *de novo* firms experienced greater job reallocation than privatized ones, service sector firms are characterized by more flows than manufacturing. It also appears that non-market services (which is often ignored in theory) offered the higher stability. Poorly educated females in rural areas were more likely to become unemployed than anything else. Re-incidence of unemployment makes one less employable and – also – less prone to change jobs in the future. Both results highlight the importance to introduce worker heterogeneity in macroeconomic models of unemployment in transition countries. All results undermine the role of the wage pressure as the channel influencing the processes of labor reallocation in transition economies. These results should be approached with caution, since adequate measures of wage pressure are only available as of mid 1990s, which limits the generalizability of our findings.

Our analysis helps to reconcile the possibly contradictory results from earlier empirical literature - we show that both period and country selection largely affects the results, because transition economies were highly heterogeneous in the scope and size of labor reallocation. Yet, when analyzing the microeconomic mechanisms, country and time effects aside, the emerging picture is far from obvious and thus fairly important in terms of policy recommendations. Namely, focus on preserving employment could prove more effective than focus on reducing unemployment. Namely, demographics and education can accommodate a fair share of shift from public to private and from manufacturing to services – as opposed to the actual worker flows between jobs. Whether or not this results in reduced employment at the end of the transition process stems not from the wage setting mechanism (such as collective bargaining, indexation, etc.) but rather seems to be related to the policies able to keep older cohorts in employment.

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A The coverage of countries and years available in the literature

Table 7: Previously published studies

Paper	Country	Period studied
Rutkowski (2003c)	Bulgaria	2000
Rutkowski (2003a)	Croatia	2001
Brown and Earle (2006)	Ukraine	1992-2000
Christev et al. (2008)	Ukraine	1993-1999
Konings et al. (2003)	Ukraine	1996-2000
De Loecker and Konings (2006)	Slovenia	1994-2000
Bojnec and Konings (1998)	Slovenia	1991-1996
Dong and Xu (2009)	China	1988-2002
Earle (1997)	Romania	1994-1995
Faggio and Konings (2003)	Romania	1995-1997
Flek (1999)	Czech Republic	1993-1996
Gottvald (2001)	Czech Republic	1993-2001
Sorm and Terrell (2000b)	Czech Republic	1994-1998
Turunen (2004)	Russia	1992-1996
Brown and Earle (2002)	Russia	1997-1999
Gimpelson et al. (2010)	Russia	2004
Masso and Heshmati (2004)	Estonia	1992-2001
Vodopivec (2002)	Estonia	1994
Rutkowski (2003b)	Lithuania	1998-1999
Siebertová and Senaj (2007)	Slovakia	2000-2004
Schaffner (2011)	East Germany	1992-2001
Dries and Swinnen (2002)	Poland	1990-1997
Rutkowski (2002)	Poland	1993-1999
Walsh (2003)	Poland	1994-1996
Warzynski (2003)	Poland	1996-1999
Burke and Walsh (2012)	Poland	1994-1997
Jurajda and Terrell (2003)	Czech Republic, Estonia	1989-1995
Faggio and Konings (2003)	Bulgaria, Estonia, Slovenia, Poland	1994-1997
Brown et al. (2006)	Hungary, Romania, Russia, Ukraine	1992-2002

B Data characteristics

Figure 4: Unemployment rate comparison

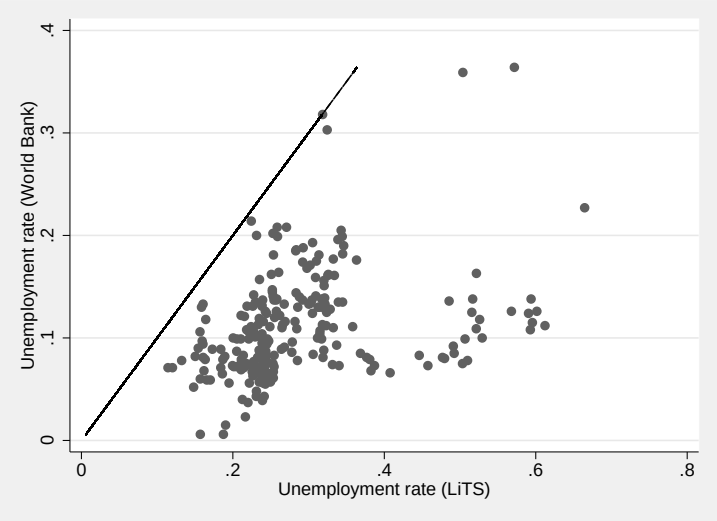


Table 8: The match between LiTS data and other sources

Country	Year	Services (LFS)	Industry (LFS)	Private (SES)	Services (LiTS)	Industry (LiTS)	Private (LiTS)
Bulgaria	2000	51.8	39.6		57.2	36.0	48.7
	2002	54.9	38.3	55.9	60.0	34.4	53.5
Czech Republic	1997	56.1	33.3		60.8	33.5	59.5
	2002	58.0	32.1	59.8	65.5	30.4	63.3
Estonia	1997	53.1	33.1		58.4	30.6	52.7
	2002	56.0	32.9	91.8	59.8	30.9	62.2
Hungary	1997	55.6	34.7		65.4	27.2	52.6
	2002	56.1	36.3	22.9	68.7	26.8	61.9
Latvia	1998	47.4	30.1		67.1	23.6	51.2
	2002	49.0	27.7	88.0	67.1	24.4	59.7
Lithuania	1998	27.0	28.3		61.5	29.5	36.5
	2002	29.0	26.3	51.3	63.4	29.1	44.2
Poland	2000	46.1	40.1		59.6	34.6	50.0
	2002	51.5	37.8	47.1	59.0	34.3	53.4
Romania	1997	48.4	22.8		54.1	39.7	44.2
	2002	58.0	24.7	65.3	58.8	36.1	54.8
Slovakia	1998	50.2	29.2		62.6	30.1	39.7
	2002	52.7	27.7	63.0	65.6	28.6	45.9
Slovenia	1997	51.8	41.8		62.3	34.7	43.9
	2002	53.2	41.3		64.3	33.3	52.4

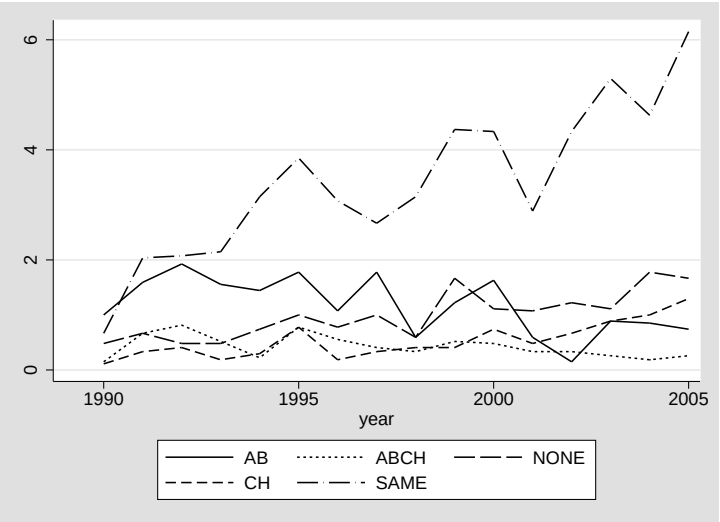
Notes: Data on services and industry was taken from the EU LFS. In all cases, we display the earliest available year and 2002. Data on the ownership of the companies was taken from the SES 2002. Firms are considered private if private individuals own at least 50% of the company's shares. In the LiTS, respondents indicated the ownership of the firm.

Table 9: Sample characteristics

Country	Age			Female			Basic education			Higher education			GDP per capita			Unemployment			Min. Wages		Wage share	
	1989	1995	2005	1989	1995	2005	1989	1995	2005	1989	1995	2005	1991	1994	2005	1991	1996	2005	1995	2004	1995	2004
Estonia	40,4	43,4	46,2	64,5	63,2	60,4	17,1	16,5	12,8	20,7	21,5	26,2			208,5	14	23,5	23,4				44,3
Latvia	38,3	41,0	43,4	60,3	59,2	55,8	18,9	18,4	14,7	16,0	16,7	22,1	143,6	99,5	210,9	24,4	25,6	24,5	0	37,9	44,0	39,5
Lithuania	39,5	42,3	44,4	65,7	64,0	62,0	23,5	21,6	13,3	17,3	17,2	23,0	159,4	96,1	192,2	26,4	27,9	24,1	37,4	12,6		44,3
Czech Republic	36,7	39,1	42,7	56,5	56,1	57,2	11,5	10,2	7,9	11,7	11,8	16,8	92,1	94,1	135	16,9	18,4	22,4	0	1,2	43,0	42,7
Hungary	36,6	37,0	41,0	58,5	57,2	58,5	29,4	24,1	19,2	11,7	13,5	16,8	98,9	98,4	145,2	25,3	25	24			54,6	53,9
Poland	36,0	39,3	42,8	63,1	63,4	62,9	24,6	22,2	16,6	11,0	13,5	17,4	84,3	93,6	153,2	20,3	22,9	29,5	44,1	36,3	39,8	36,2
Slovakia	36,8	38,4	41,6	59,0	59,0	60,6	14,8	12,7	8,4	12,1	13,1	18,0	100,1	94,8	149,5	23	23,6	27,6		41,1	39,9	36,8
Albania	34,1	38,7	44,2	51,7	51,4	51,8	48,3	47,3	43,6	9,8	11,0	13,3	77,8	87,6	178,2	18,8	24,7	21,1	53,1	52,9		
Bulgaria	38,7	40,8	43,6	57,7	55,7	54,6	27,6	24,8	20,6	21,7	23,9	26,4	101,8	96,8	143,5	31,5	29	27,4	0	21		34,7
Moldova	36,8	40,4	45,4	54,2	53,6	53,2	36,4	34,0	27,7	24,9	25,9	32,2	207,8	100,9	127,8	17,3	16	16,3	0	7,3	50,6	48,6
Romania	36,3	37,1	39,7	48,2	48,5	48,5	28,2	20,2	13,4	13,2	15,5	22,2	95,7	93,1	129,8	19,2	15,4	18,1	27,2	34,2	39,6	41,2
Bosnia and Herc.	34,3	35,8	37,6	48,4	52,2	52,0	21,6	16,8	11,0	12,8	13,1	16,7		79,7	392,3	28,3	32,8	36,6	0	20,2		
Croatia	37,9	39,6	41,7	48,9	51,2	50,8	21,8	17,6	14,3	20,2	21,1	23,3			154,5	22,3	23,4	28,5	0	32,6		50,8
Macedonia	34,5	37,0	42,1	40,1	38,8	38,2	15,5	14,4	12,7	18,8	19,4	22,2	116,8	101	117,8	37,2	41,1	45,4		4		40,7
Serbia	34,6	36,6	39,8	53,3	53,8	51,8	21,1	17,4	12,8	14,9	15,7	18,5	185,1	94,3	150,8					0		48,4
Slovenia	34,6	36,6	38,7	55,7	55,4	53,2	23,3	18,4	11,0	18,0	20,8	26,2	93,8	96,5	146,9	17,2	19,9	21,6		41,6	55,7	51,1
Armenia	35,7	39,4	42,6	59,2	58,7	57,7	6,5	6,0	3,3	30,4	31,4	35,2	153,5	91,6	244,2	25,1	28	34,9	6,7	29,9		
Azerbaijan	31,9	35,5	40,9	62,2	61,4	60,5	10,8	10,5	6,0	31,5	34,4	39,7	250,7	114,7	242,5	11,1	11,1	13,2	8,8	20,1	22,6	24,9
Georgia	37,9	41,1	44,4	58,2	57,7	59,1	4,9	4,7	1,8	33,1	35,4	42,2	273,4	94,9	205,2	17,2	15,9	18,5	0	12,8		16,7
Kazakhstan	34,5	35,7	39,6	58,2	54,8	52,7	12,5	9,3	4,9	19,9	20,8	24,0	139,4	107	193,3	16,6	20,8	16,2	5,5	23,3	37,3	33,3
Kyrgyzstan	32,6	35,5	41,0	57,5	57,6	57,5	10,6	8,1	5,2	18,8	22,2	29,3	185,7	106,8	139,7	15,2	15,2	14,3	33,1	23,7	37,8	24,3
Tajikistan	30,4	34,1	38,3	53,8	53,7	54,5	20,8	18,5	14,6	12,8	13,1	14,8	260,9	115,8	135,8	16,3	16,1	16	10,9	11,3	0,0	13,5
Uzbekistan	31,0	33,1	37,8	58,4	58,1	60,0	7,9	5,4	3,7	12,0	13,8	13,9	133,4	102,7	136,9	16,1	16,3	16,4	0	12,3		
Belarus	35,1	36,8	39,0	55,3	55,0	53,9	10,9	9,2	4,7	24,1	25,9	35,5	151,3	111,2	205,8	21,8	23,8	25,2	7,9	36,9	47,4	51,6
Ukraine	36,1	38,5	40,3	60,8	59,3	58,4	10,2	8,4	2,6	18,9	21,7	30,4	189	113	143,2	20	21	19,4	0,8	40,2	48,7	50,3
Russia	35,0	37,2	39,7	67,1	65,6	65,2	10,5	7,1	3,7	23,1	25,6	30,5	152,4	104,2	151	23	22,7	19,7	38,1	2,1		

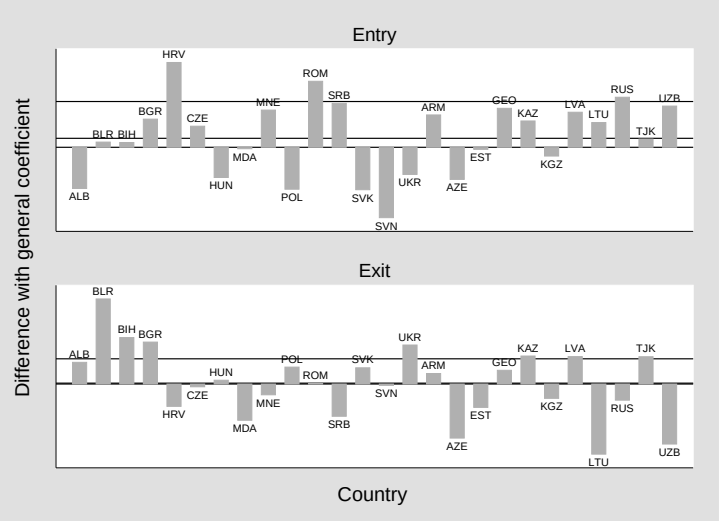
Notes: Age, female and the education variables are expressed with respect to active population. Age corresponds to the average age, while female and education level is expressed as a percentage of active population. GDP and GDP per capita were taken from the WDI database. In both cases 1995=100. Unemployment rate was built on data from the WDI (employment to population ratio, labor force to population). Min. wages expresses the value of minimum wages as a percentage of average wages. Wage share is the unadjusted share of wages on GDP. All variables are expressed in percentage points. In Tajikistan, minimum wage data corresponds to 1996 (instead of 1995) and 2004.

Figure 5: Job-to-job flows (averaged over countries)



Note: This graph presents the values of the coefficients of different flows on time and country dummies. It is the equivalent of the results presented in table 1.

Figure 6: Entry and Exit effects on different countries



Note: This graph presents the values of the coefficients of entry and exit rates on contract breach presented for each country separately. The green line represents the value of the coefficient for the full sample, and the red line the lower bound of the confidence interval. The upper bound was omitted as it lay outside the graphic area. The specification corresponds to the one presented in 6 column 1.

Faculty of Economic Sciences
University of Warsaw
44/50 Długa St.
00-241 Warsaw
www.wne.uw.edu.pl