IAAEU Discussion Paper Series in Economics
No. 02/2018

Labor reallocation and demographics

Joanna Tyrowicz, Lucas van der Velde

January 2018

Institute for Labour Law and Industrial Relations in the
European Union (IAAEU)
54296 Trier
www.iaaeu.de

Labor reallocation and demographics

Joanna Tyrowicz
FAME | GRAPE, IAAU
University of Warsaw, and IZA

Lucas van der Velde
Warsaw School of Economics
FAME | GRAPE

November 2017

Abstract

We explore data from all transition economies over nearly two decades, providing insights on the mechanisms behind labor force reallocation. We show that worker flows between jobs in different industries are rare relative to the demographic flows of youth entry and elderly exit. The same applies to the flows between state-owned enterprises and private firms. In fact, evidence suggest that changes in the demand for labor were accommodated mostly through demographic flows, with a smaller role left for job transitions. We also show that the speed of changing the ownership structure in the economy has driven exits to retirement, in particular the early exits.

JEL Codes: P2, P5, D2, J6
Key words: hirings, separations, transition, worker flows, unemployment, retirement

1 Introduction

In periods of large shifts in employment structure, such as those caused by technological and institutional changes, labor market interventions are considered vital for at least two reasons. First, to the extent that economic forces alone fail to synchronize the rate of job creation and job destruction, there is a need to mitigate the social cost of desynchronization *via* passive labor market policies. Second, changes in the production structure often imply changes in the demand for skills to be facilitated *via* active labor market policies. These two types of policies rely on the premise that the labor reallocation is broadly equivalent to flows of workers between jobs. Hence, these policies are typically prioritized in the context of economic shocks. The objective of our paper is to verify the actual role of worker flows in labor reallocation, relative to demographic flows, utilizing rich and heterogeneous evidence from transition countries.

Two types of approaches dominate the literature on labor reallocation: ownership as modeled by Aghion and Blanchard (1994), henceforth AB; and sectoral as analyzed by Caballero and Hammour (1996a, 1996b, 1998, 2000) henceforth CH. They both offer appealing predictions concerning the optimal speed of reallocation, either due to economic transition (AB) or other causes (CH). AB emphasizes synchronization of the state-driven job destruction in state-owned enterprises (SOEs) to the capacity of the private sector to create new jobs. CH models indicate that slowing down the restructuring forces reduces the job creation rate without benefits on the side of job destruction. In both approaches, workers are projected to flow from a declining sector to an emerging one, possibly with an unemployment spell. Due to the expected frictions caused by this process, economic policy should weigh the benefits of *laissez-faire* against the negative consequences of excessively high unemployment and / or excessively long unemployment spells.

Studies tested empirically the predictions of the AB and CH frameworks[1] as well as their premises.[2] Against this body of literature our paper offers two important novelties. First, unlike most of the earlier studies, we work with data on individual flows and characteristics for a comprehensive group of virtually all European transition economies over the entire transition period. Second, disposing of such high quality data we dissect actual individual flows into components attributable to transition (public vs private ownership), components attributable to restructuring (manufacturing vs service sector) and the demographic flows, i.e. labor market exit by the elderly and the labor market entry by the youth. Hence, we put the two theoretical workhorses – AB and CH – into competition with demographics to shed some light on the factors driving the change in employment structure.

We find that the actual change in the employment structure in the transition economies stems from demographic factors: entry of youth and early exits of the elderly. Worker flows are fairly rare and – if they occur at all – concentrate within the same segment of the economy, be it industry or form of ownership, preserving the original employment structure. Hence, the focus of our study is placed on the demographic flows, especially the labor market exits. Being risk averse, in the turbulent times of large structural change, workers may have a stronger preference certainty. Having experienced a termination of an employment contract, rather than

[1] AB received somewhat more attention in the context of economic transition from a centrally planned to a market based system (see Boeri and Terrell 2002, for an overview). Relevant studies include Konings et al. (1996), Bilsen and Konings (1998), Noorkoiv et al. (1998), Lehmann et al. (1999), Johnson et al. (2000), Sorm and Terrell (2000), Boeri and Terrell (2002), Earle and Sabrianova (2002), Svejnar (2002), Haltiwanger and Vodopivec (2002), Jurajda and Terrell (2003), Faggio and Konings (2003), Orazem et al. (2005), Jurajda and Terrell (2008)

[2] E.g. De Loecker and Konings (2006), Brown and Earle (2002, 2004, 2006), Siebertova and Senaj (2007), Brown and Earle (2008), Dimova (2008), Orazem and Vodopivec (2009).

seeking other employment, older workers may prefer accessing retirement or pre-retirement benefits. While these benefits may be lower than wages, with sufficiently convex preferences, lower income with certitude may provide welfare superior to a lottery of staying active in the labor market. We analyze if indeed individual uncertainty about future employment played an important part in early retirement decisions over the transition period. We find that the individual risk of losing a job plays a negligible role in the decision to retire. Since permanent labor exits are fiscally costly, reallocation *via* early labor market exits of older workers appears to be less efficient. Also, lower downward pressure on wages is likely if larger share of reallocation occurs *via* early labor market exits, constraining subsequent job creation.

Our paper is structured as follows. In the next section, we review the key assumptions and dynamics behind ownership change and sectoral reallocation models, our research focuses on the empirical literature. We then carefully describe data from the *Life in Transition Survey* (LiTS) in section 3, comparing the patterns emerging from this database to other sources in order to evaluate their reliability. We provide stylized facts about labor market flows in the process of large structural adjustment in section 4. We decompose worker flows into ownership, sectoral and demographics, analyze the emerging patterns, and discuss policy implications. Finally, in section 5 we deal with the main hypothesis of our study, analyzing the drivers of the timing of labor market exits. The concluding section discusses the policy recommendations that stem from our study.

2 Literature review

Caballero and Hammour (CH) propose a family of models of structural change, with impulses coming from cyclical factors (1991, 2005), technological innovation (1998) and intersectoral shift (1996a, 1996b, 2000). In these models, capital specificity generates quasi-rents (a surplus over the value of the match) which can be partially appropriated by workers, even though they are firm-specific, due to incompleteness of the employment contracts. With considerable adjustment costs, impulse to reallocate labor may yield excessive job destruction and insufficient job creation. Different institutional arrangements associated with employment contracts provide more or less bargaining power to workers, eventually producing a different scope of appropriation of the surplus. Even in a simplified version of the model, where all sectors have the same productivity, contract incompleteness produces a desynchronization of job creation and destruction, which eventually generates an inefficient equilibrium of excessive unemployment.

The economic transition from a centrally planned to a market economy serves as a context of this study of labor reallocation. In stylized terms, economic transition consists of the dissolution of presumably inefficient state-owned enterprises (SOEs) and the emergence of a new, more efficient, private sector. In the context of CH, transition was characterized by the existence two sectors which differ by productivity shocks, hence leading to a sudden increase in unemployment and slow job creation (Caballero and Hammour 1996a,b). Following Aghion and Blanchard (1994) approach, there is room for policy intervention: on the one hand, the government may control the speed of job destruction in the state-owned sector; and on the other hand, the (possibly transitory) unemployment spells between an 'old' job (in SOE) and a 'new' job in the private sector usually happen with state support. These unemployment benefits are financed *via* increased taxation.[3] Raising taxes to fund the safety nets pushes the (non-wage) cost of

[3]Both the 'non-employment' and the 'taxes' should be taken figuratively rather than literately. Safety nets may comprise also of pre-retirement benefits made available to individuals aged between e.g. 45 years old and the legal retirement age to discourage them from participating in the labor market and/or increase their support

labor up. The accumulating stock of jobless individuals pushes wage claims down, but the increasing tax wedge hampers vivid job creation, deepening the social costs of SOE-to-private sector reallocation. If the speed of job destruction is synchronized with the capacity of the emerging private sector to create new jobs, then employment is high and fiscal needs are small. A larger tax base will allow for lower taxation (hence, less distortion) – and in consequence, the economy may find an efficient equilibrium. Otherwise, an unstable equilibrium might emerge with low job creation, low employment and a relatively high number of transfer recipients (even if transfers themselves are necessarily modest).[4]

When it comes to testing the assumptions of AB and CH models, previous research reveals great country specificity. Faggio and Konings (2003) for a panel of countries and Siebertova and Senaj (2007) for Slovakia argue that firms' size was negatiely correlated with employment growth, suggesting that smaller firms (i.e. private *de novo*) tend to hire (relatively) more. However, this result is not robust to sample selection, nor cut-off point in the data (the minimum size of firms included in the survey). Konings et al. (2003) failed to find similar evidence in either manufacturing or services using Ukrainian data. Although De Loecker and Konings (2006) argue that that productivity increased more in private firms than in public firms in Slovenia, Orazem and Vodopivec (2009) show that the productivity growth in that country was in fact a universal pattern, unrelated to industry or ownership. By contrast, Dimova (2008) contests the assumptions of AB using data from Bulgaria: even though jobs and workers reallocated to more efficient industries, changes in market competition and import penetration had a much bigger bearing on factor productivity. Finally, Brown and Earle (2002, 2004, 2006, 2008) show that the processes in Russia and Ukraine are indicative of neither AB nor CH models being dominantly behind changes in firm productivity.

This body of empirical evidence is not comprehensive in four dimensions: country coverage, time coverage, labor market processes and underlying assumptions. In terms of countries, a majority of transition countries were never analyzed in the literature, see Table A.1 for a list of countries analyzed earlier. In terms of time, majority of the studies focused on mid 1990s, with only a handful of countries analyzed for early transition, see Table A.2. In terms of labor market processes, both AB and CH models neglect five potentially important flows: movement towards permanent non-employment and movements into job-seeking from non-employment; flows out of employment from the emerging sector as well as to employment in the disappearing sector; and direct job-to-job transitions from one sector to the other (see for example Haltiwanger and Vodopivec 2003, for the relative intensity of these flows).[5] Finally, in terms of the implicit assumptions in the models, AB and CH assume that workers are in fact homogeneous, i.e. they have the same probability of leaving the state/shrinking sector and finding a job in the emerging one, which is at odds with broader evidence provided by microlevel analysis.[6]

for the reforms (see models explicitly addressing the speed of transition and the political support Rodrik 1995, Roland 2002). Theoretically, 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 SOEs. Also, taxes should be viewed in a broad sense as they may encompass the opportunity costs of expanding productivity-enhancing infrastructure.

[4]Garibaldi and Brixiova (1998) offer the same implication in a search and matching model, though the transmission channel is different: unemployment benefits increase reservation wages of employees and decrease the value of a match, which discourages job creation.

[5]A theoretical extension to the AB model which comprises direct job-to-job flows has been offered by Tichit (2006), with the additional feature of job destructions occurring in the private sector. Castanheira and Roland (2000) propose that the state controls also capital flows in addition to worker flows, which mimics the so-called soft budget constraint.

[6]See Jurajda and Terrell (2003) in the case of the Czechia and Estonia as well as Schaffner (2011) for Germany and Turunen (2004) for Russia: there were persistent patterns of selectivity, see also Gimpelson et al. (2010). To address this point, Boeri (2000) as well as Balla et al. (2008) extend the original AB framework to comprise

Our paper aims to address all four of these dimensions: country, time, type of flows coverage as well as the heterogeneity in adjustment patterns. Thanks to unique data from the *Life in Transition Survey* collected by the European Bank for Reconstruction and Development, we are able to analyze worker flows in all transition countries over the entire transition period. Since these are rich individual data, we may analyze all types of flows, including demographic ones, and control for individual heterogeneity. Studying demographic flows – i.e. entries of the youth and exits of the elderly – is particularly desirable when analyzing the room for policy intervention and role of the state. Although early retirement schemes are similar to unemployment benefits from the household perspective, as they (at least partially) substitute for earned income, they differ substantially from the fiscal and labor market perspectives. Unemployment benefits are usually temporary, whereas retirement benefits are typically permanent, i.e. they imply higher fiscal expenditure per flow. Moreover, job-seekers with benefits exert pressure on wage claims to re-enter employment, but individuals who leave the labor force and enter early retirement schemes do so to a lesser extent or not at all.[7] Therefore, the distinction between temporary and permanent labor market entry/exit appears quantitatively important (see Boeri 1999).[8]

In general, the narrative from transition economies suggests that job destruction occurred in the SOEs that fell into bankruptcy or were privatized, mostly in manufacturing; while job creation was most intense in *de novo* private firms, especially in service sector. Previous analyses indicate also that the importance of these processes varied across time and countries (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). Mostly due to data shortages, not many studies were able to explicitly identify worker flows from "old" (state-owned, manufacturing) firms to a "new" (private, services) firms. Studies on the few analyzed countries show that employment grew rapidly in construction and trade while it dropped in manufacturing. We will verify how general these insights are, by quantifying the role of AB and CH flows in the process of labor reallocation in comparison to the labor flows induced by demographics: entries of youth and exits of elderly. We emphasize that an important part of the change in the employment structure was accommodate *via* a demographic shift, in line with insights from some earlier studies.

Subsequently, we address directly the demographic flows. We focus our attention on labor market exits to retirement, asking to what extent the decision to retire – especially to retire early – was affected by the individual labor market prospects. With large structural change, one may expect a relatively high hazard of separation and a relatively congested labor market when attempting to find new employment. Early and permanent labor market exits, suggest

worker heterogeneity.

[7] In many transition countries collecting pension contributions and having an employment contract were not mutually exclusive, though specific details of the legislation have changed over time. However, typically there were relatively tight earning caps, above which pension benefit payments were suspended. Also, at different points in time, workers receiving pension benefits were handicapped relative to younger workers, because they were excluded from some components of the social security contributions. So far, the literature lacks a systematic overview of these regulations, their changes and the effects of these changes.

[8] Consider the following: if 5 birth cohorts leave the labor market, e.g. the jobs in a declining sector and 5 birth cohorts enter the labor market, e.g. jobs in the growing sector, the overall change in the structure of employment will be approximately 12.5% in net terms and as much as 25% in gross terms without a single worker flow between the sectors. If roughly 10% of the active population is without a job and actively seeking one, arrival of a new young cohort constitutes already a 25% increase in the number of job seekers, *ceteris paribus*, while exit of an additional cohort improves the bargaining position of remaining workers, potentially reducing the size of the pool of job seekers. This issue is partially addressed theoretically by Bruno (2006), but empirical evidence on the importance of these flows for economic transition remains scarce.

that an insurance mechanism of the safety net implicit in retirement benefits may facilitate the adjustment in the employment structure, albeit at a considerable and lasting fiscal cost.

3 Data

We use data from the *Life in Transition Survey* (henceforth LiTS), launched by the European Bank for Reconstruction and Development in 2006. This database overcomes many of the limitations inherent to this literature. The database covers 27 countries from Europe and Central Asia between 1989 and 2006.[9] In this section, we describe the data properties and compare it to alternative sources of data on transition processes.

The LiTS 2006 database was conducted on a representative sample from the population: the sampling procedure reflects a variety of stratifications, including sub-national departments and cities. The questionnaire consists of two parts. The first one inquires about general characteristics of the household; whereas the second part asks individuals about values and attitudes, current employment and employment history. This second part of the questionnaire is of interest to our study and it was asked to a randomly selected individual in the household. This individual section contains a retrospective survey.

The LiTS database is extremely rich. In addition to basic socio-economic variables (age, gender, education, household size), respondents also provide a complete list of all previous jobs held between 1989 and 2006. For each job, workers report the starting and the ending year, as well as other relevant characteristics, such as industry and the form of ownership. This characterization of jobs permits a direct identification of worker flows, which is unique for such a long period of time and wide selection of countries. We refer to these flows as hirings and separations, because identification occurs on the worker and not on a firm level.[10] Two aspects of the estimation of flow measures deserve further discussion. First, flows are considered to be completed once the worker finds a new employment position. For example, if a worker leaves a SOE in 1991, and finds a position in a private firm only in 1995, then the flow is counted as having occurred in 1995.[11] While this definitional choice is relevant only for the transition mediated by long-term unemployment, it results in recording of some flows later.[12] Second, workers might hold more than one job at the same time. A worker may begin and end one job, while still employed on another: the shorter jobs is "nested". In such cases, entry to and exit from the "nested" job are not counted as flows. Multiple job holding is rare (under 3% of worker-years in our sample for those who are employed, of which roughly 70% are one year long spells) and thus is unlikely to drive any results.[13]

[9] The sample is missing Turkmenistan and Kosovo. While Mongolia and Turkey also participated in the survey, they were excluded from our sample.

[10] Clearly, taking 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). The strategy applied in Jurajda and Terrell (2003) to recover job destruction from worker data cannot be implemented in the LiTS, as the survey only asks about the nature (voluntary or not) of job termination, whereas their data had direct information on whether involuntary job termination was related to job destruction or simply terminating a contract with the given surveyed workers. This exemplary difference – and other related – in the type of data collected reduce the validity of applying definitions of "net" flows similar to those implemented in Jurajda and Terrell (2003) to the LiTS.

[11] If a subsequent employment spell is not observed in the data, the flow is classified as a flow to non-employment. If the previous employment status is missing, then the flow is classified as a flow from non-employment.

[12] Recording flows in the year of origin rather than the year of completion does not affect the stylized facts discussed in the next section (detailed results are available upon request).

[13] Self-employed respondents indicate the years in which they run their own business, but do not report any

Given its retrospective nature, this database is subject to some 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. Better memory of more recent events is likely to reduce in relative terms the number of flows from the past, hence yielding a lower boundary on labor market flows estimates from early transition. In a recent analysis, Assaad et al. (2016) compare the validity of the retrospective data and show typically large events such as labor market entry, exit and changing jobs are well reported even in retrospective questionnaires. They also find that when the questions in the survey follow the chronological order of the events – as is the case of LiTS – then answers are consistent even with reference to distant events.

Second, data might suffer from survival bias. Since the survey was collected in 2006, it is likely that workers close to retirement in 1989 remain underrepresented for purely demographic reasons: a person entering labor market in 1989 had on average a 90% chance of surviving until the 2006 interview, whereas for a person above 45 years old in 1989, the probability of surviving till 2006 was slightly below 70%. The possible underrepresentation of older workers is likely to bias downward the number of exits to retirement captured in the survey.[14] In spite of this possible bias, sample in LiTS apears to be representative after weighing as shown in Table B.4.[15]

In addition to the difficulties inherent to retrospective data, LiTS does not follow the standard classification of labor market status promoted by the International Labour Organization. For individuals outside the education system, in the working age, who do not receive pension benefits, it is impossible to clearly delineate unemployment from inactivity. Hence, we use the term non-employment throughout the paper. Lack of a proper distinction among non-employed implies that the identification of entry and exit flows must rely on other variables. In particular, we combine information on age, education and labor market history. A worker is considered to enter the labor market if (s)he declared studying in $t-1$ and employment in t. Individuals are not considered entrants despite declaring studying if they were older than 25 at the time or if they held a job and studied in the same time. A worker is considered to leave the labor market if (s)he reported being officially retired in t or declared a movement to retirement from the previous job. In a number of cases, individuals declared to be officially retired and to have a job. In those cases, the flow to retirement occurs when the worker leaves the last job. Individuals in working age who report no wage employment are considered non-employed

An additional challenge refers to the identification of the ownership status of the firm. From theory, one would like to distinguish between *de novo* and privatized firms, yet such distinction

detailed information about this activity: in particular the industry and employment remain unknown. Given the focus of this paper on the worker flows, as suggested by AB and CH models, we abstract from the flows into and out of self-employment. Notably, less than 4% of individuals, who at any point in time were wage-employed, reported at least one spell of self-employment. Moreover, some of those workers were wage and self-employed in the same period, making self-employment akin to a secondary job.

[14] A simple calculation, where observations are weighted by the inverse probability of survival, shows that flows to retirement could be on average 40% higher than those observed in the sample. Data on mortality come from United Nations (1998) corresponding to the year 1991 (1992 if data from 1991 was missing); Azerbaijan, Georgia, Uzbekistan and the countries of the former Yugoslavia could not be included in the calculation due to data unavailability. Outward migration can be considered another form of survival bias. Yet, these migration flows are less of a concern because they do not reflect the flows described by the theory: these are neither AB nor CH flows. In fact, workers who migrate do not hold an employment in the country of origin nor are they unemployed, which would break the causal links discussed in the theory.

[15] A higher number of women in the sample results from the timing of the surveying and is fully compensated by the weights.

is not directly available in LiTS. Workers indicate whether the form of ownership is private or state-owned. In the former case, there are no specific questions on whether the firm was privatized or a *de novo* firm. However, individuals also report whether the employer (private or state-owned) existed prior to 1989. We use answers to these two questions to distinguish private *de novo* firms from currently private but previously state-owned enterprises. This is not an ideal identification as respondents (particularly young ones) may mistake a re-branded foreign-owned privatized firm with a new firm. Second, in some countries, such as Hungary, Czechia or Poland, the private sector existed even in the centrally-planned system; hence, not all firms active before 1989 were state-owned. Finally, even though the LiTS questionnaire asks workers to treat an employment spell in which a privatization occurred as two separate spells, the lack of firm identifiers makes it impossible to distinguish between privatization flows and flows from SOE to another privatized firm in the same industry.

To focus on the labor reallocation subsequent transition and productivity shocks, we exclude administrative services, public health and education (henceforth, public sector) from the sample. We also exclude agriculture from the analysis. Using retrospective individual data, we classify flows into eight types. First, following Aghion and Blanchard (1994) we identify a change from a SOE into a private sector employment, while keeping the industry constant – with or without a spell of non-employment. We call these flows OWNERSHIP flows. To distinguish worker flows from job flows, we separate flow from SOEs to *de novo* private firms (certainly a worker flow) from flows to firms identified as privatized. Second, in the spirit of Caballero and Hammour models, we define SECTORAL to identify flows from manufacturing to services, while working in the same form of ownership firm. In addition, some flows comprise both types of changes (SOE in manufacturing to a private firm in service), whereas others occur within the same industry and sector. We call the former OWNERSHIP & SECTORAL and the latter SAME. Finally, one could move in directions opposite to the ones predicted by both theories – i.e. from private firms to SOE or from service to manufacturing. If that is the case, we call these flows OPPOSITE. These six types of flows are complemented by outflows to inactivity (i.e. retirement) and entries from inactivity (i.e. youth entry). We also code the information on no changes in employment. See Appendix B.1 for a detailed treatment of the identification. In Appendix C.3 we discuss how these measures correlate with measures used in the literature on the optimal speed of transition, notably the decline of SOE employment (in levels or as a share of total employment).

3.1 LiTS in comparison to alternative sources of retrospective data

LiTS data conform the most comprehensive available data set from transition economies. Only for Russia there is a non-retrospective panel available – the Russian Longitudinal Monitoring Survey (RLMS) – and it starts only as of 1994 (years prior to 1994 are not comparable due to substantial changes in sampling methodology). RLMS lacks questions on industry until 2004, which prohibits its use for verifying hypotheses concerning changes in structure of employment during the first years of transition. Moreover, since industry coding of RLMS follows a national classification rather than NACE, with inconsistent crosswalks, flows cannot be directly compared to other transition economies.

Another large source of data – the Ukrainian Longitudinal Market Survey (ULMS)– similarly to LiTS, is retrospective. In fact, ULMS was collected for the first time just three years before LiTS, i.e. in 2003. The ULMS also differs from RLMS (and LiTS) on how labor market data from the early transition period are recovered. ULMS data are collected on a job basis,

asking characteristics of employments held at the time of relevant events, such as the Chernobyl disaster. Individuals are asked about their position in every year only as of 1999. By contrast, LiTS has coherent methodology for all the years in the sample.

We show comparisons of LiTS to RLMS and ULMS in Table B.1 in the Appendices. Even though the shares in employment for the service sector and in SOEs are not perfect, they are within a few percentage points, which is close given the substantial methodological differences between these surveys. Moreover, they also reflect the same time patterns. A higher share of SOEs in overall employment in LiTS may stem from differences in ownership identification between LiTS and RLMS.

Retrospective data on employment characteristics are also available for Czechia and Estonia. In both countries, retrospective surveys were administered once *circa* 1995. The micro-data are currently unavailable for further research to the best of our knowledge (see Jurajda and Terrell 2003, 2008, for analyses based on these samples). Moreover, the analyses were only presented graphically, which difficults a rigorous comparison between LiTS and these retrospective databases.[16]

For the more than twenty remaining transition economies, analyses comprised selected years, and often only macroeconomic aggregates, see Tables A.1-A.2 in the Appendices.

3.2 LiTS in comparison to other data

LiTS data reflect fairly well the structural characteristics of employment. Table B.2 in the Appendices compares the LiTS with the European Union Labour Force Survey (EU-LFS).[17] LiTS data overstate the importance of employment in the service sector, with a margin of difference that varies from negligible in Romania to a few percentage points; but, LiTS data typically replicate time trends. Also the share of manufacturing in employment implied by LiTS seems concordant with the LFS data, bearing no particular pattern of discrepancy.

Given the scarcity of data for early years of transition, we complement the overview of how reliable LiTS data are by comparing them to statistics reported in earlier literature. Previous studies typically focused on job destruction and job creation, which are not readily available in LiTS. Instead, we construct measures of hirings and separations. Relying on a large collection of estimates from the literature provided by Tyrowicz et al. (2017) we show that the correlation between measures derived from LiTS and from earlier literature is high and statistically significant. Results are reported in Table B.3 in the Appendices.

4 Stylized facts about worker flows in CEECs

We provide two stylized facts concerning worker flows during the transition from centrally planned to a market economy – patterns, which surface strongly despite substantial heterogeneity in the transition paths as well as different starting points of these economies. First, we show that flows at the heart of interest in the previous literature – from SOEs to private sector and

[16] Notwithstanding, some results appear comparable. Jurajda and Terrell (2003) report that in 1995, the new sector (de novo) comprised around 37 % of employment not in public sector in Czechia and around 42 % in Estonia. In the LiTS, the figures are 28% (with a 95% confidence interval from 23% to 33%) and 22% (17% - 28%), respectively. Two methodological decisions can help to explain these differences. First, Jurajda and Terrell (2003) identifies new sector based on firm size: small firms are considered new firms. Second, Jurajda and Terrell (2003) includes self-employment as new firms. For the reasons detailed in footnote **13**, we do not include self-employed in the analysis.

[17] EU-LFS lacks information on the ownership structure of the employer.

from manufacturing to services – have been but a minority of all worker flows. To this end we analyze the relative size of each type of flow in the 27 countries. Second, we show that even though the flows analyzed in the literature were relevant for overall labor reallocation, a vast part of the adjustment in the employment structure occurred *via* demographic flows, i.e. the entry of the youth and the exits of the elderly. To this end we analyze the contributions of various types of worker flows to the change in the employment structure.

The unit of observation is a flow, which implies that a single individual could be counted many times if (s)he changed jobs and / or labor market status multiple times within the 18 years of the observation window. In principle, and since the sampling procedure of LiTS guarantees a similar number of observations for each country, this indicator requires no scaling for international comparisons. However, the employment and activity rates differ between countries and across time, so Figure 1 presents this statistic scaled by the size of the workforce. All structural indicators are computed with the use of survey weights, relative to employment. The size of the flow, as portrayed in Figure 1 should be interpreted as an average annual probability of a given type of a flow for all adult workers at the risk of experiencing any change of labor market status.

The analysis of the structure of flows reveals that labor market entries and exits were by far the most numerous in all countries considered. Given the methodological constraints concerning the measurement of early retirement in LiTS, our estimates of the retirement flows should be considered a lower bound. Across all countries between industry reallocation is of minor importance, ownership flows are larger, but still remain substantially smaller than SAME and OPPOSITE flows.[18]

The patterns in Figure 1 could fail to reflect the importance of AB, CH and ABCH flows if intermediate flows are large, e.g. a worker fired from manufacturing SOE could search a new job in similar enterprises, and only eventually moves to private sector and/or services; alternatively one could think of an unstable emerging sector, where workers experienced many jobs before finding an appropriate match. Such transitions would be consistent with AB and/or CH models, but they would inflate the measures of SAME flows relative to AB, CH and ABCH in Figure 1. Finally, not all workers in our sample find employment in the last year of the observation, which implies that some transitions might be censored, i.e. we cannot observe the destination of all workers leaving SOE. To address this point, Figure 2 depicts flows between the first and the last status, i.e. those observed in 1989 and 2006. These flows are expressed as percentage of respondents who experienced at least one employment spell in the sample, and who were not employed in agriculture, construction or public sector. The conclusions remain similar: demographic flows dominate over other types of adjustment, whereas flows within industry and form of ownership quantitatively dominate worker reallocation between industries and ownership sectors.

We test formally to what extent the patterns in Figure 1 are driven by specific years and to what extent ownership and inter-sectoral theories are useful in explaining the reallocation of workers. In nearly all years ownership and industry flows are less numerous than demographic ones. This is visible in Figure 3, where we provide predictions for every year with country fixed effects[19] Figure 3 shows that OWNERSHIP flows were relatively small and of a similar size during the period. When compared to retirement, these flows were three times smaller, even

[18] Extending the definition of the state sector to comprise also public sector workers leads to qualitatively similar results: AB flows were still relatively unimportant in comparison to demographic flows. Detailed results available upon request.

[19] Full estimates reported in Tables C.1 and C.2 in the Appendix.

in more recent years. Similarly SECTORAL flows do not appear to be large enough to drive the reallocation needed from manufacturing to services. A way to think about the reported conditional time coefficients is that at a given point in time most of the analyzed countries are past the transition. Taking out the country-specificity, whichever "figurative" year of the transition end one considers, the estimates prior to that year give an indication for the size of the sectoral and ownership flows in the periods preceeding the "new normal". As is clear from Figure 3 demographic flows were dominant in the transition period, it is the periods of the "new normal" where the sectoral or ownership reallocations have an intensity similar to that of the demographics.

The dominant role of demographic roles displayed in Figure 3 is confirmed *via* formal tests on equality of means for the measures of labor market flows, see Table C.3 in the Appendix. Not only are AB and CH smaller than demographic flows, they are also smaller than worker flows *within* ownership sector and industry. The only type of labor market flow that did not dominate ownership, industry and the intersection of them is their complement, i.e. changes of employment which happened from services to manufacturing and from private firms to SOEs.

Figure 1 reveals also considerable heterogeneity across countries in the size of labor market flows. Latvia, a notable outlier in LiTS, has remained outside the radar of analysis.[20] Estonia and Czechia are generally characterized by substantially larger flows than other countries, which makes the comparative analysis by Jurajda and Terrell (2003, 2008) generalizable only to a certain limit. Focus on Slovenia was often motivated by how specific this country was (De Loecker and Konings 2006, Bojnec and Konings 1998), but its labor market flows are fairly typical. Russia on the other hand seems highly specific both in terms of the scope and in terms of the structure of the flows, which sheds some new light on the results of Brown and Earle (2002), Brown et al. (2006). Finally, countries with still a much larger state sector – Central Asia and partly also South Eastern Europe – observed almost no ownership flows. Uzbekistan and Kazakhstan stand out as exceptions to this rule.

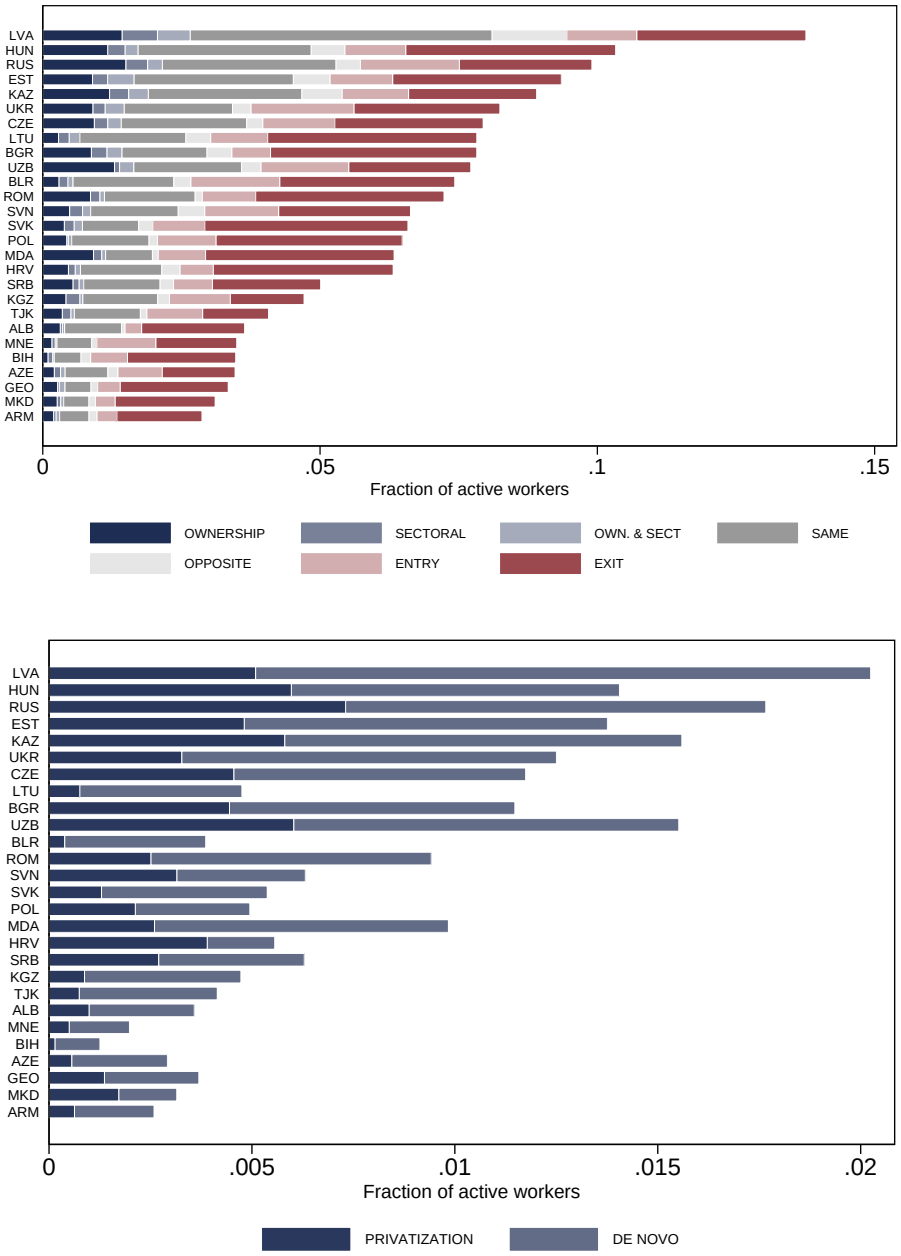
Demographic flows were not only universally large, they were also instrumental to the reallocation between SOE's and the private sector. Figure 4 displays the relative contribution of all analyzed flows to the change in the size of the state-owned and private sectors. While Figure 1 suggests that the flows across sectors were smaller than the flows into and out of the labor market, it remains possible that those inter-sectoral flows were responsible for a large part of the reallocation. This would be the case if the proportion of people exiting the labor market from private and state-owned companies were roughly the same; or whenever students entered in equal proportions to private and state-owned firms. To address this point, in Figure 4 we plot net of the gross flows from work in the state-owned and private sector and other labor market status, including entries, exits, and reallocation between state-owned and private sectors. Bars to the left indicate that the contribution of a given type of the flow to employment in a given industry / ownership sector was in net terms negative. For example, in the case of non-employment and SOE, a bar to the left indicates that more people left SOEs to become ultimately non-employed within the observation window than non-employed found employment in SOE.

Figures 4 and 5 suggest that placing a strong focus on worker flows across industries and sectors, mediated by non-employment, might have been misguided. Although in most cases we observe separations from SOEs throughout the period, they continued to attract some labor market entrants.[21] However, flows to retirement from SOEs were on average twice the size

[20] Eamets (2004) is the only study on Latvia.

[21] A prominent example is Russia, where SOEs employment grew in eleven out of the sixteen years under

Figure 1: The structure of flows



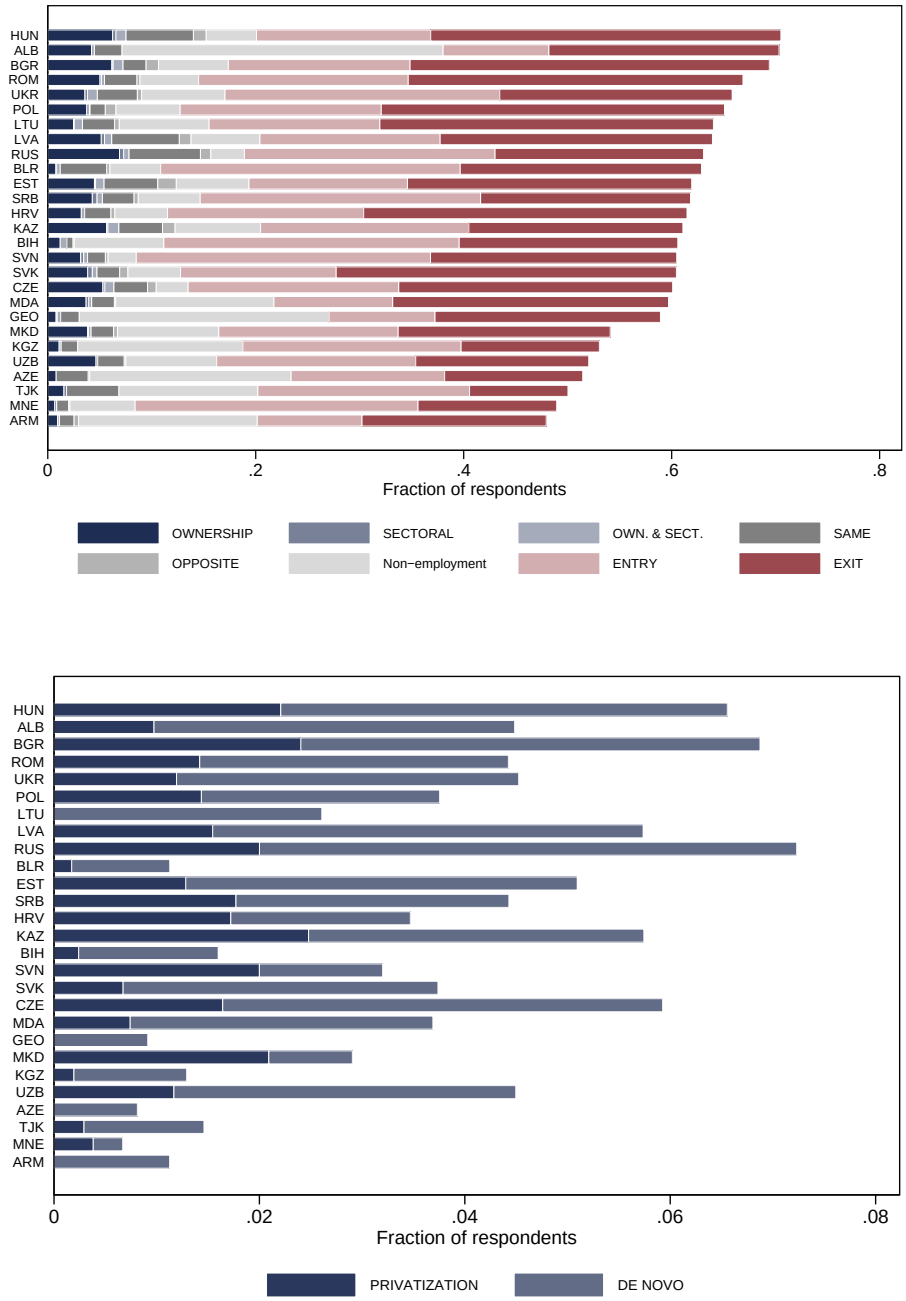
Notes: Average flows per year for each country. Estimation covers all years in the sample (1989-2006), weighted by survey weights, expressed in relation to the number of workers in each period who were not employed in agriculture nor the public sector. All flows are displayed in the upper panel and a decomposition of OWNERSHIP flows into privatizations and worker flows is shown in the bottom panel. Countries are sorted from the highest to the lowest number of flows. Computations of the structure of flows for sub-periods are displayed in Figure C.1 in the Appendix.

of flows to the private sector, whereas flows to retirement from the private sector were often negligible.

A similar analysis across industries reveals the equally paramount role of retirement flows

analysis (consistent with Boeri 2000, who indicates that Russian state-owned sector was reduced at a much slower pace than other countries).

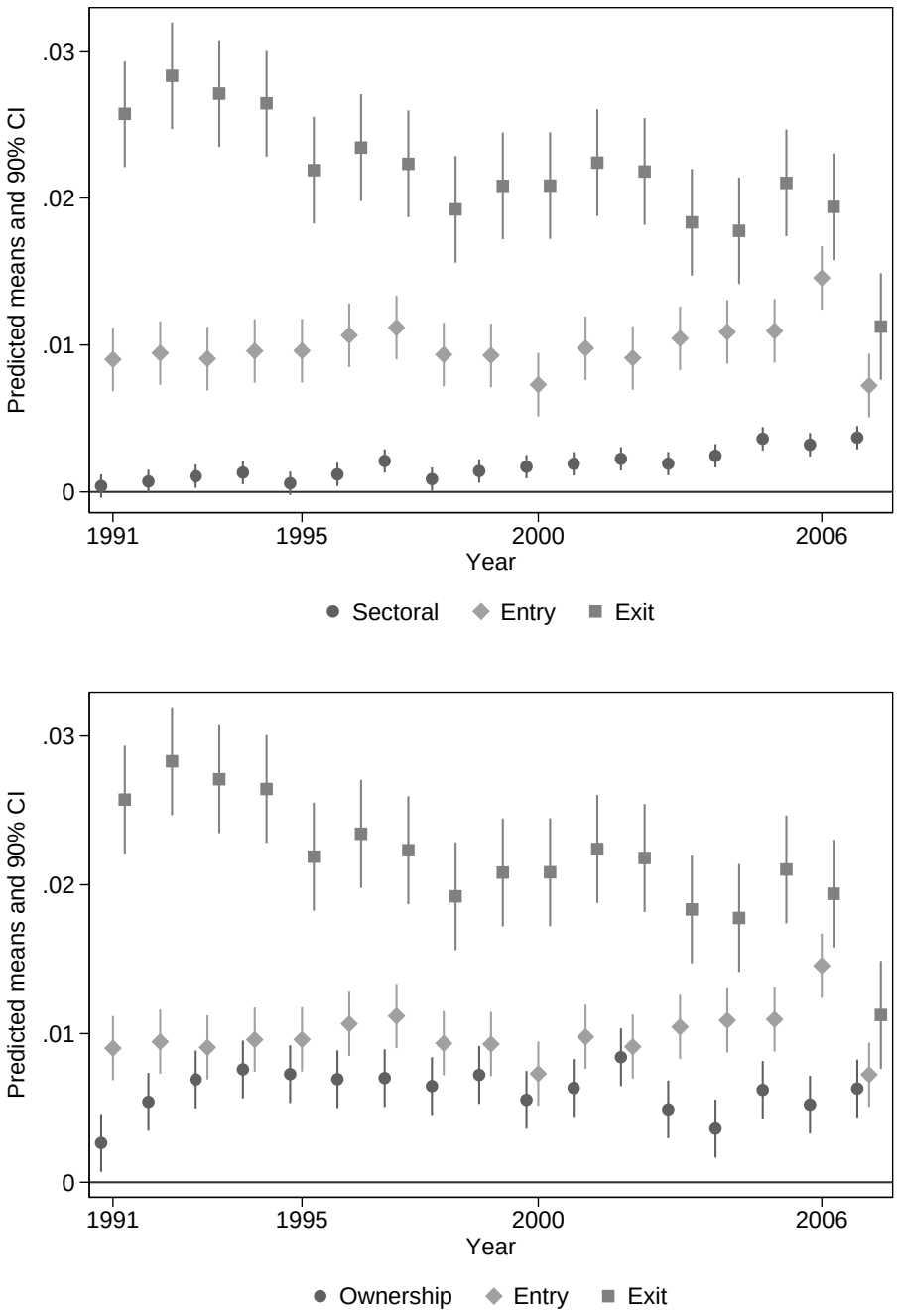
Figure 2: The structure of completed flows



Notes: Completed flows refer to changes between the first and the last observed status. Average flows for each country, covering all years in the sample (1989-2006), weighted by survey weights, expressed in relation to the number of respondents not working in agriculture nor the public sector. All flows are displayed in the upper panel and a decomposition of OWNERSHIP flows into privatizations and de novo flows is displayed in the bottom panel. Countries are ordered from the highest to the lowest number of flows. Computations of the structure of completed flows for sub-periods are displayed in Figure C.1 in the Appendix.

and youth labor market entry. In Figure 5 we demonstrate the contributions of the respective type of gross worker flows to the net change in employment for the manufacturing and service

Figure 3: Predicted yearly labor market flows



Notes: Predictions of yearly flows from a model that also includes country fixed effects. OWNERSHIP stands for ownership change (a flow from a SOE to the private sector); SECTORAL stands for a sector change from manufacturing to services; ENTRY stands for youth labor market entry and EXIT stands for permanent labor market exit. All these measures comprise cases mediated by non-employment spells within the observational window. Point estimates behind the predictions are reported in Tables C.1 and C.2.

sector. While the scale of adjustments in net terms is substantially smaller than in Figure 4, the majority of overall decline in manufacturing comes from exits to retirement, whereas the increase in the service sector comes mostly from the youth labor market entry and partially also entry from non-employment. Only in few selected countries did the massive layoffs (outflows

to the non-employment) matter quantitatively, whereas in many countries the manufacturing sector actually hired more non-employed individuals than it dismissed (permanent flows to non-employment within the observational window). The flows from manufacturing to the service sector were negligible and played a minuscule role in overall structural adjustment in both manufacturing and service sector. Notably, Figures 4 and 5 reveal interesting cross country differences. Belarus emerges as an outlier in both figures, consistent with the intuition that the transition period was different in that country.

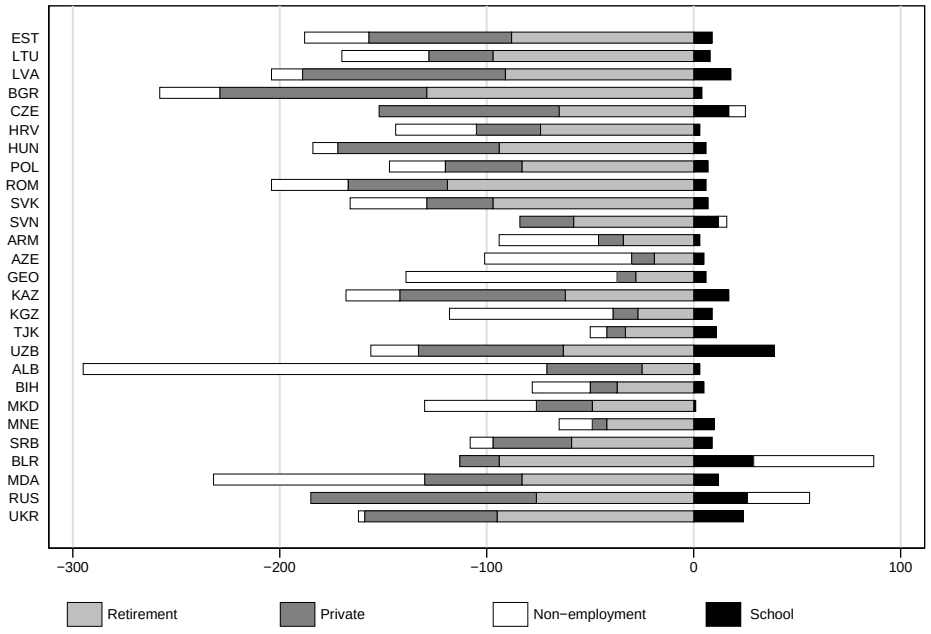
In order to analyze time heterogeneity, we split Figures 4 and 5 in two subperiods, which together represent most of the sample. These figures are presented in Appendix D and show that the importance of ENTRY in accommodating structural change is constant across subperiods. Taking as an example the change in ownership structure, in both periods, the private sector attracted a majority of entrants and the differences only increased over time, with the exception of Uzbekistan. By contrast, the role of retirement appears to be particularly important at the onset of transition; in later periods, flows to retirement from the public and private sector became more similar. This suggests that after an initial stage of rapid adjustment *via* early retirement, entry and direct OWNERSHIP flows gained relative importance.

Industry of employment is defined fairly broadly in LiTS. For example, if a hairdresser became a barista, job change is classified as a within industry flow, despite such a transition naturally involving considerable frictions and a need to re-skill. Given these interpretation limitations, our results do not undermine the validity of focusing on labor market policies *per se*. However, given how universally small flows between declining manufacturing and SOEs sector and growing service and private sector were, one has to recognize that the need for active policies aimed at facilitating intersectoral flows has been somewhat overstated. Admittedly, the industry definition used in this study is not very detailed. However, data capture fairly well the change in employment structure observed in aggregate terms in the analyzed countries (recall the fit between LiTS data and other representative data, discussed in section 3.2 and related appendices).

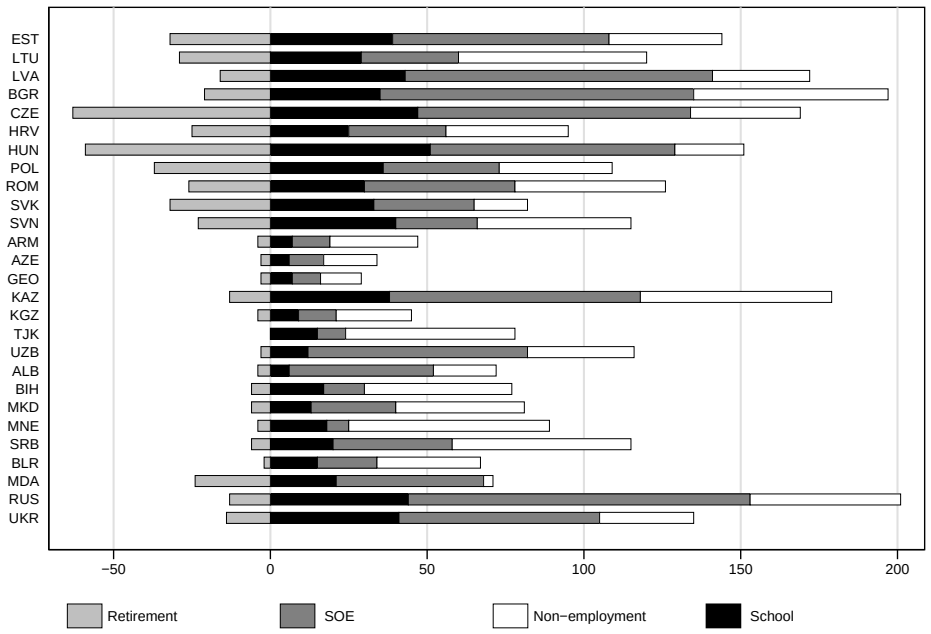
Summarizing the analysis of these stylized facts, we find compelling evidence that theories on ownership flows and inter-industry flows appear insufficient to explain adjustments in the employment structure in the transition economies. The majority of the gross worker flows occurred within industry and sector of ownership, whereas the majority of the net reallocation occurred via the exit of the retirees and the entry of youth. Large flows to retirement are to some extent analogue to the flows-to-benefits as proposed by the AB model, with the distinction that they were one-way and more costly in terms of public finances. The prevalence of these flows lead to a persistent increase in non-wage costs of employment. If they are excessive and desynchronized, the costs of supporting the retirees can hinder job creation, following the mechanics suggested by the AB model.[22] The retirees, however, are unlikely to mitigate the wage pressure from the workers and young entrants as have the unemployed in the AB model. Consequently, the mechanism of fostering job creation through moderating wage expectations is not likely to counteract the negative impact of rising non-wage employment costs on job creation, effectively eliminating the equilibrium mechanism of the AB model.

[22] In the Appendix C.3 we discuss the correlations between the unemployment rate and the flow measures derived in LiTS data. We show that data lend support to the AB model in as far as non-employment is concerned – higher labor market flows due to the change of ownership are associated with higher non-employment rates. We also show that demographic flows – ENTRY and EXIT – have no explanatory power for the variation in non-employment rate.

Figure 4: Net contributions of gross worker flows to the changes in between state-owned and private sectors employment (total for 1989-2006)



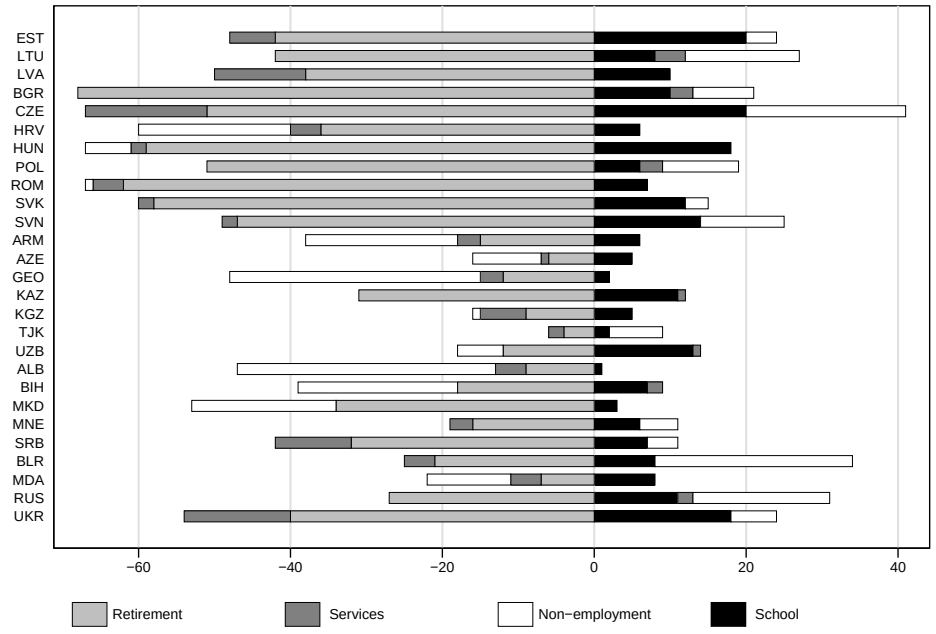
(a) SOEs



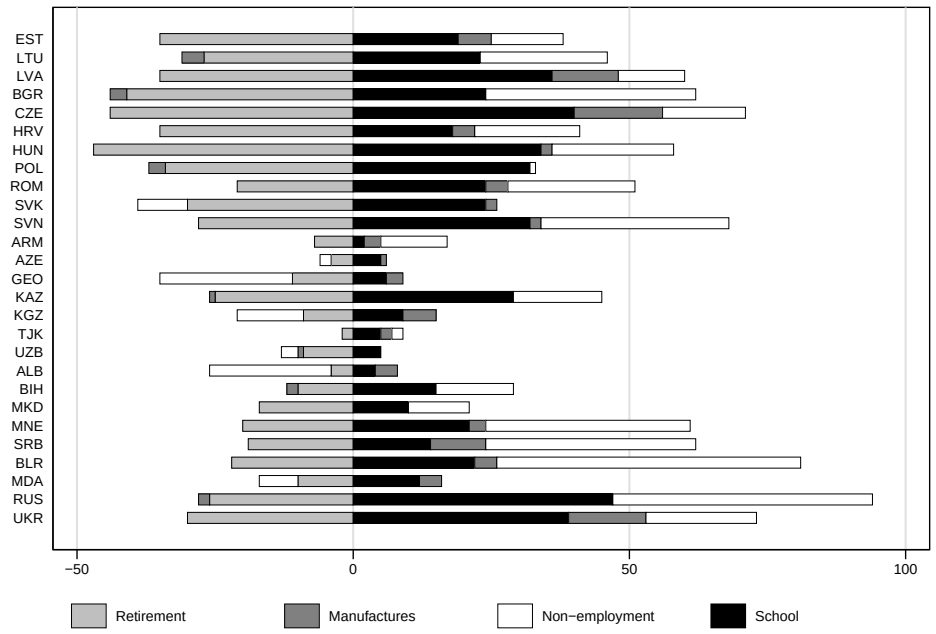
(b) private firms

Notes: Count of net flows between firms with different ownership structure and other employment and non-employment status. Net worker flows between two sectors, i and j, in the period t to$t+n$ are defined as $Net_{i\to j;t,t+n} = \sum_t^{t+n} flows_{i\to j} - \sum_t^{t+n} flows_{j\to i}$. Flows split by sub-periods are available in Figure C.3 in the Appendices. Each country-level sample comprises 1000 individuals. To maintain scales comparable for large and small countries, we abstract from population weights in obtaining the count measures.

Figure 5: Net contribution of the gross worker flows to the changes in manufacturing and services employment (total for 1989-2006)



(a) manufacturing



(b) service sector

Notes: Count of net flows between firms in manufacturing and services, and other employment and non-employment status. Net worker flows between two sectors, i and j, in the period t to$t+n$ are defined as $Net_{i\to j;t,t+n} = \sum_t^{t+n} flows_{i\to j} - \sum_t^{t+n} flows_{j\to i}$. Flows split by sub-periods are available in Figure C.5 in the Appendices. Each country-level sample comprises 1000 individuals. To maintain scales comparable for large and small countries, we abstract from population weights in obtaining the count measures.

5 Results

The stylized facts discussed in the previous section suggest the paramount importance of demographic flows in explaining the structural change in employment in transition economies. Yet, the remaining question to be asked concerns the extent to which the decision to retire – especially to retire early – was driven by the individual risk of separation. In manufacturing SOEs, the individually perceived hazard of becoming non-employed should be higher in light of AB and CH. We test our main hypothesis using a survival model of retirement, conditional on individual characteristics and labor market conditions, controlling for country specificity.

We estimate survival models where movement to retirement represent the failure. In our main specification, individuals become at risk when they turn 45 years old. Our dependent variable is the time elapsed between the year of the 45th birthday and the year of retirement. We estimate an accelerated time failure model. Since the early labor market exits due to transition were not likely to occur *before* transition itself, we reestimate our specification for two sub-samples of workers: younger than 45 in 1989 (that is the individuals that become at risk during transition) and older than 45 year old in 1989. Since in our sample, a majority of respondents retired before the statutory retirement age, we do not distinguish early retirement from retirement *per se*.[23] We estimate the following model:

$$\text{time until labor market exit}_{i,t} = S[\alpha\ job_{i,t} + \gamma\ individual\ risk_{i,t} + \beta X_i + \xi\ market_{i,t} + \epsilon_{i,t}]$$

where i denotes individual at risk, t denotes time and S stands for the survival distribution function. We denote by $job_{i,t}$ the work-place related characteristics, i.e. industry and sector of employment. Given insights from theoretical models, as well as earlier empirical findings, we expect to find that more job creation, especially in the private sector and the service sector is conducive to easier transition from declining firms, thus reducing incentives to retire early. By the same token, high job destruction – especially in the sector and ownership characteristics for an individual – work as push factors. We account for individual labor market prospects by estimating the relevant risk of separation by the $individual\ risk_{i,t}$ measure. The risk of separation is computed as the number of separations in firms of a given ownership and industry with respect to total employment of the same ownership in the same industry. In models with within-subject variation, risk of separation is a time varying measure, computed for each year. In models with between subject-variation, individual risk of separation is computed in the period when the individual becomes at risk. We denote by X_i the individual characteristics of the worker. In parallel to the analysis in previous sections, the sample for the survival analysis is restricted to wage employees, who were not working in agriculture, nor in the public sector at the time they became at risk.[24]

Our preferred specification relies on a model exploiting between-subject variation. We record the sector and industry of employment when an individual becomes at risk of retirement, controlling for individual characteristics such as gender, education or place of residence. We complement this setup with indicators of employment structure and labor market situation at

[23] The prevalence of early retirement in transition countries was already noted in Fox (1994). Often, early retirement schemes were occupation specific and varied over time. Since LiTS does not present information on previous occupations at the level of disaggregation used in legislation, we cannot explicitly address this issue. Appendix D.1 provides a comparison of the statutory retirement age (from Cottarelli et al. 1998) and average retirement age estimated from LiTS.

[24] In theory, workers could move to the public sector afterwards and, those periods are not excluded from the sample based on the aforementioned criteria. These flows, however, are not numerous and most of individual observations correspond to workers in complementary sectors.

the moment when the individual becomes at risk, that is on the year of the 45th birthday or in 1989 for individuals that were already older. We also include, for robustness, an analogous estimation for the model of within-subject variation, that is for time varying covariates. In this specification, risk of separation, entry and labor market status vary over time for each individual. In principle, also job-related characteristics may vary over time, if worker changed sector or industry of employment prior to retirement. To account for country specificity, we include country fixed effects, as well as the private and service sector employment shares in 1989. Table D.1 in the Appendix displays the descriptive statistics for the sample.

If individual retirement decision was driven by individual labor market outlooks, one would expect substantial explanatory power from the risk measure, as it captures an unconditional risk of losing employment. One should also expect relevance of job-related characteristics. By contrast, there should be relatively less explanatory power in variables describing the labor market situation in a given year or in 1989. Based on the stylized facts, there appears to be little role for the youth entry, as young workers entered in different types of firms than those left by exiting elderly workers. We test for this contention by computing the accumulated inflow of youth in to sector/ownership of the individual.[25] Finally, some individual-level characteristics typically do not vary over time, e.g. education; hence, these coefficients capture between-subject variation.

We use parametric survival models with a generalized gamma distribution. Data favour this parametrization over popular alternatives.[26] In principle, generalized gamma estimation allows a great degree of flexibility, as it estimates two ancillary parameters to determine the shape of the survival function. As a possible downside, results of this model can only be expressed in an accelerated time failure metric. Unlike proportional hazard metrics, where the interest often lies in modeling the exit rate, the accelerated time failure focuses on the employment period, i.e. the time until retirement.[27]

Results are reported in Table 1. The coefficients can be understood as elasticities on spell duration: e.g. on average women retire roughly 4 years earlier than men, whereas individuals with a tertiary degree on average almost 4 years later than those with at most primary or vocational education. Within-subject specifications are reported in columns marked with the letter "W".

The main result of the estimations is that individual risk of losing a job provides no or very little explanatory power. In specification (2), this variable has an insignificant estimator

[25] We take the accumulated inflow until retirement year + 2. The choice of 2 additional years is based on the fact that until then only a negligible number of individuals retires, but it still allows having a non-zero entry measure for the early cohorts.

[26] Non-parametric proportional hazard models and models based on Weibull distributions are rejected by the diagnostic tests.

[27] The (log) likelihood function to be maximized takes the form:

$$lnL(\theta) = \sum_{i=1}^{N} (\delta_i * lnf(t_i|x_i, \theta) + (1 - \delta_i) * ln(S(t_i|x_i, \theta))$$

where $f(t_i|x_i, \theta)$ is the density function of the generalized gamma distribution, and $S(t_i|x_i, \theta)$ is one minus the cumulative distribution function. The exact functions depend on the value of the ancillary parameters estimated in the first step of the maximization process. The relevant case corresponds to a positive of the shape parameter below one. The cumulative and density function then correspond to an incomplete gamma. The specification also includes an indicator function (δ_i) that takes the value of 1 if the observation is not censored, that is for individuals that retired during the observation period. In order to allow covariates to vary over time, we divide the spell into sub-periods, each of them lasting one year. The contribution of each sub-period to the likelihood function is the same as that of censored observations (e.g. $S(t_i|x_i, \theta)$). In the period when an individual retires, the contribution is given by the first term of the previous equation.

and the model is no better than the baseline specification from column (1). If individual risk of separation was a strong predictor of decision to retire, the model in column (2) should trump the parsimonious specification which accounts only for individual and job-related characteristics in column (1) in terms of (log) likelihood. We do not find this information gain. The risk measure becomes statistically significant in a specification allowing for within-subject variation and only once we account for youth labor market entry to jobs of the same industry and sector as that held by an individual at risk (column 3W). However, the estimated elasticity on spell duration is low. We compare it to a placebo specification, in which the risk measure for each individual takes the average value of risk in a given type of position in all countries, but the one in which the individual lives (column 4P). In other words, the placebo risk measure captures an irrelevant risk (and possibly some time-specific shocks, if they were common for a given country and the average of all others). The estimated spell elasticity on the placebo risk measure of roughly 1.5 months is statistically similar to the actual risk of losing the job, which hints that the decision to retire was not driven to a large extent by job prospects. However, it appears to be consistently driven by ownership structure of the firm: individuals from SOEs on average retire 2-4 years earlier than individuals employed in private sector. This may be related to special early retirement arrangements introduced by the government for several industries (dominated by SOEs, e.g. mining and quarrying). However, it could also be related to privatizations: in some cases investors were explicitly forbid to fire workers, but were allowed to offer generous severance packages to those who quit voluntarily. Having access to early retirement benefits, some workers could be encouraged to leave the labor market early despite relatively favorable individual outlooks, if incentivized by such a bonus. We partially confirm this intuition by splitting the sample into workers close to retirement in earlier transition (aged 45 or above in 1989) and younger birth cohorts. Indeed, the marginal effect is higher for the older cohorts (column 4O) than for the younger ones (column 4Y). It also appears that the more vivid the job creation in the private *de novo* sector, the longer the employment duration – the coefficient implies 4-7 months on average. The large positive coefficient for the *de novo* firms is high and robust, whereas the coefficient for the privatized firms appears negative, corroborating the intuition suggested by Fox (1997): privatized firms were often incentivized by the government to preserve headcount, hence co-fund early retirement schemes as a form of redundancy program. New firms, in the absence of these incentives, might be more likely to reduce headcount by actually firing workers.

Table 1: Survival models of permanently leaving the labor market - marginal effects

	Duration	(1)	(1 W)	(2)	(3)	(3 W)	(4)	(4 W)	(4 P)	(4 Y)	(4 O)
Job related characteristics	Manufacturing	-1.077***	-1.456***	-1.130***	-1.908***	-1.203***	-0.992***	-1.256***	-1.610**	-1.415***	-0.739**
		(0.338)	(0.334)	(0.344)	(0.373)	(0.338)	(0.351)	(0.342)	(0.649)	(0.377)	(0.321)
	SOEs	-2.412***	-4.280***	-2.692***	-4.375***	-3.515***	-0.258	-3.715***	-2.466***	-0.093	-2.189***
		(0.455)	(0.401)	(0.532)	(0.637)	(0.414)	(0.580)	(0.459)	(0.854)	(0.577)	(0.679)
Same ownership and sector	Risk of separation			0.027	0.037	-0.134***	-0.085***	-0.120***	-0.102***	-0.043*	-0.106***
				(0.025)	(0.028)	(0.020)	(0.031)	(0.021)	(0.029)	(0.024)	(0.039)
	Entry of youth				-0.385***	-0.176	-0.242***	-0.168	0.028	-0.111***	-0.159***
					(0.027)	(0.132)	(0.023)	(0.133)	(0.021)	(0.021)	(0.022)
Individual characteristics	Female	-3.968***	-4.173***	-3.999***	-4.306***	-4.112***	-4.213***	-4.116***	-3.966***	-1.247***	-2.598***
		(0.356)	(0.359)	(0.359)	(0.382)	(0.360)	(0.361)	(0.362)	(0.345)	(0.414)	(0.312)
	Secondary education	-0.002	-0.371	-0.028	-0.234	-0.190	-1.765***	-0.153	-1.639***	-1.083**	-0.981***
		(0.371)	(0.368)	(0.374)	(0.394)	(0.369)	(0.391)	(0.376)	(0.374)	(0.443)	(0.326)
	Tertiary education	3.875***	3.530***	3.869***	3.645***	3.718***	0.638	3.802***	0.742	0.490	0.342
		(0.657)	(0.667)	(0.662)	(0.694)	(0.673)	(0.640)	(0.685)	(0.612)	(0.693)	(0.536)
	Married	-0.894**	-1.202***	-0.921**	-1.116***	-1.053***	-1.906***	-0.992***	-1.816***	-0.359	-1.085***
		(0.358)	(0.361)	(0.361)	(0.379)	(0.362)	(0.358)	(0.367)	(0.343)	(0.379)	(0.303)
	Urban	0.265	0.643*	0.264	0.273	0.557	0.900**	0.581	0.857**	0.271	0.969***
		(0.364)	(0.354)	(0.366)	(0.386)	(0.358)	(0.357)	(0.360)	(0.342)	(0.376)	(0.320)
Labour market structure	% privatized at risk						-0.167***	-0.155***	-0.184***	0.140**	-0.060*
							(0.037)	(0.049)	(0.036)	(0.062)	(0.033)
	% de novo at risk						0.303***	-0.009	0.313***	0.535***	0.267***
							(0.022)	(0.072)	(0.021)	(0.040)	(0.019)
	% manufacturing at risk						-0.256***	0.051*	-0.256***	-0.044	-0.321***
							(0.067)	(0.030)	(0.064)	(0.096)	(0.061)
No of unique individuals		3,182	3,182	3,182	3,182	3,182	3,182	3,182	3,182	1,916	1,266
No of observations		3,182	26,913	3,182	3,182	26,913	3,182	26,913	3,182	1,916	1,266
Log-likelihood		-1,522	-1,609	-1,521	-1,397	-1,583	-900.5	-1,578	-	-	-
P-value relative to baseline				0.278	0.000	0.000	0.000	0.000	-	-	-

Notes: Individuals become at risk when they turn 45 years old. Sample restricted to exits from employment. Labor market structure variables computed in 1989 or in a year when an individual becomes at risk (whichever comes earlier). Risk of separation computed for the same industry and sector as a given individual. Youth entry computed as cumulated youth entry in the same industry and sector until the year a given individual becomes at risk of retiring +2, relative to total employment in a job characteristic for a given individual (ownership and industry). P-value reports the results of a likelihood ratio test against the model presented in column (1) for columns (2) and (3), and against column (1 W) for columns (2 W) and (3 W). Columns denoted by (W) allow within-subject variation. Column denoted by (P) shows result of the placebo test (risk measure for all countries but the one in which individual lives in a given year). Column (4Y) reports results for the cohorts who were under 46 years of age in 1989. Column (4O) reports results for cohorts aged 45 or above in 1989. The specification with 3,182 individuals at risk includes 1,489 retirements (failures). Robust standard errors reported in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels.

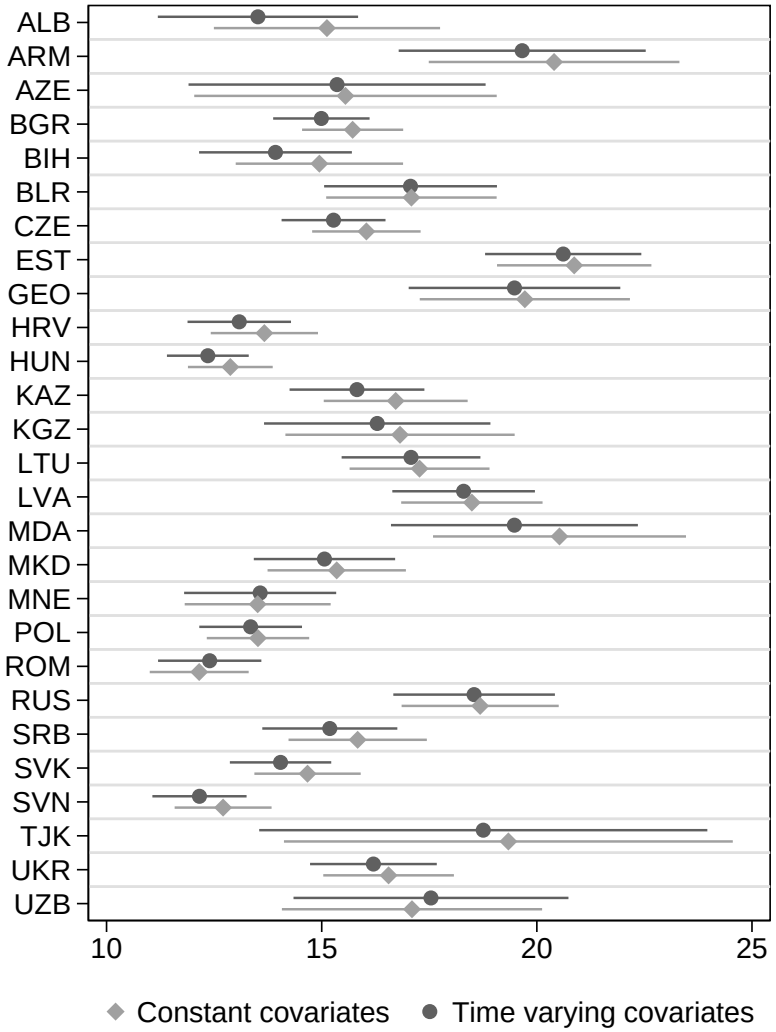
There is weak correlation between the intensity of youth entries and the intensity of elderly exits. Partially, this confirms the "lump of labor" fallacy in the following sense: typically young workers do not take over the jobs that are vacated by the retiring workers. Still, in some cases the skills of the younger workers may be more complementary with the capital used. In consequence, the availability of workers with the adequate skills may foster the decision to modernize capital and make some of the older workers redundant. This result would be consistent with our interpretation of the stylized facts: young workers entered different jobs than those that were vacated by the elderly workers.

We explore also the heterogeneity of retirement patterns across countries. To this end we obtain predictions of employment duration at the median individual characteristics. We base these predictions from specifications (1) and (1 B) of Table 1, as these specifications do not require an arbitrary choice on which labor market structural characteristics to apply. We report country median predictions with confidence intervals in Figure 6. This form of presenting the estimation results has several advantages. First, we can clearly see that findings discussed in Table 1 are fairly general and only few countries stand out in terms of median prediction. On the one end, we find Estonia, with long working careers, whereas Hungary, Poland, Croatia, Slovenia, and Romania are all characterized by statistically early labor market exits. Second, it appears that in some countries the retirement patterns are much more heterogeneous than in others. Central Asia countries – Armenia, Azerbaijan, Tajikistan and Uzbekistan, as well as to a lesser extent Georgia and Tajikistan – are characterized by much wider confidence intervals at the median. This signifies social delineations not captured by education, family structure, gender and urban or rural location. Since we exclude individuals working in agriculture and in the public sector, the identified wide dispersion cannot be explained away by these sectors. Clearly, this is a phenomenon requiring further research. Finally, while heterogeneity between some countries appears to be relatively large in economic terms, the groupings of the countries do not seem to conform to the typologies recognized by earlier literature. For example, while Central Asia countries are in general characterized by wide dispersion, the largest of them, Kazakhstan, has dispersion at par with Central European countries. Also, among the transition leaders (the Baltic States and the Visegrad countries), some are characterized by early permanent labor market exits and some by long working duration.[28]

Overall, the results indicate that although the individually perceived risk of being jobless might play a role in early retirement decisions, actual household and individual decision to provide labor were to a large extent driven by general economic conditions and firm characteristics rather than individual job market prospects. The informational gain from adding economic conditions to the model is substantial, particularly in the case of the employment structure at the time the individual becomes at risk. Possibly, many of the retirement decisions were taken in the *expectation* of redundancies in manufacturing or privatized firms rather than in response to actual individual hazards of unemployment. While we are unable to attribute this effect to demand driven (individual willingness to retire) and policy pushed (availability of early retirement schemes), findings from the survival model corroborate the relevance of the permanent labor market exits to the process of employment restructuring.

[28]We tested the correlation between the predicted median working time durations and country level characteristics: GDP *per capita* (level and growth rate and accumulated growth), labor share, tax wedge (only available for the last two years in the sample), speed of transition, FDI inflow and EBRD reform index. With 26 observations, one is limited by the degrees of freedom, hence we run them one at a time, but no strong patterns emerge. Significant correlations were typically rather weak, below $\mid 0.3 \mid$.

Figure 6: Country heterogeneity: predicted median duration



Note: Predicted median durations in each country and their 95% confidence intervals. Estimates correspond to columns (1) and (1 W) of Table 1.

6 Conclusions

In terms of labor utilization, transition countries in Europe and Central Asia underwent a significant structural change over the past three decades. This change was attributed to two quite distinct economic processes. The first one involved an ownership change associated with a decline in employment in state-owned enterprises and a growth of private employment. From a theoretical perspective, the process of ownership and efficiency transformation was treated in the Aghion and Blanchard (1994) model, as well as in its subsequent extensions. Due to data limitations, much of the earlier literature in this field focuses on the optimal speed of transition, analyzing unemployment rates and synchronization between job creations and job destructions in a relatively narrow group of countries (Boeri and Terrell 2002). The second process is universal in a sense that it comprises ever-present inter-sectoral reallocation, 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) with a

comprehensive treatment of labor reallocation developed by Caballero and Hammour (1996a,b, 1998, 2000). Both, the AB and CH approaches implicitly begin with job-level adjustments and equate them to worker-level adjustments. Such approach has important implications. For example, employment in manufacturing can decline either through the destruction of these firms and the emergence of new jobs in service sector (pure worker flows); or through relatively more intensive exits of older workers from manufacturing and relatively more intensive entry of youth to service sector. While they could lead to the same net change in employment, the different nature of these flows generates different types of labor market frictions and requires different policy instruments.

Our objective in this paper was to provide new insights about the role of the flows from inactivity (entry of youth) and to inactivity (exit, possibly early, of the older cohorts) in both sector of ownership and industry reallocation processes. We contribute to the literature in several ways. First, we provide evidence from comparable worker-level data on gross flows for 27 transition countries over the entire post-1989 period. Second, building on earlier studies and exploiting the richness of the data, we combine ownership and structural reallocation processes in one coherent empirical framework. The novelty of our study lies in putting the magnitude of the worker flows previewed by Aghion & Blanchard as well as Caballero & Hammour in the context of the demographic processes. Finally, we shed some light on the link between the risk of becoming jobless and the decision to retire prior to the statutory eligibility age.

We provide evidence that retirement and youth labor market entry had a sizable contribution to the change of the employment structure, both in terms of industry and in terms of ownership. Though some of the flows follow the trajectories prescribed by the literature on the optimal speed of transition, most of the adjustment occurred *via* alternative channels. Overall, our findings emphasize the salient role of permanent labor market exits and entries rather than worker flows in modeling labor market reallocation in the course of large structural change. 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 an employment contract (important in CH models). While ownership change was inherent to transition economies of Central and Eastern Europe and Central Asia, the change in the industrial composition occurs all over the world in response to technological, openness and other shocks. Evidence from transition economies suggests that the policies cushioning unemployment targeted the quantitatively less important channel of labor market adjustment, implicitly positing the existence of processes that in reality occurred seldom or not at all. Admittedly, our definition of inter-industry reallocation is rather extreme, as many changes of occupations not covered in our analysis may still necessitate substantial adjustment in human capital. It is thus likely that the labor market policies were insufficient in scale to effectively facilitate the worker reallocation in the ways previewed by Aghion & Blanchard as well as Caballero & Hammour models. However, most transition countries adjusted substantially labor market structure in terms of ownership and industry composition in a relatively short period of time.

In terms of retirement decisions, our results suggest that although the individually perceived risk of losing a job could have some bearing on workers' retirement decisions, this effect does not seem to be large. In fact, it appears that a chunk of the early labor market exits may be explained by the overall labor market conditions rather than individual job prospects. This result seems to suggest that a substantial number of workers in transition countries may have considered retirement benefits as safety nets in the expectation of becoming non-employed and not solely after redundancy. These early exits have relieved the downward pressure on wages

by the job-seekers and permanently increased the non-wage employment costs, hence hindering the job creation. Such mechanics were previewed by neither AB nor CH models, hinting an important channel for explaining the speed, scale and scope of labor reallocation. Importantly, these processes can be largely influenced by policy intervention. For example, eligibility rules for the early retirement schemes may affect the rate of labor market exits, in as much as taxation to support such schemes could create wedge reducing job creation, in a spirit similar to the AB framework.

Like many other works in the field, our research suffers from some limitations related to data availability. Even though the LiTS proves to be a unique source of information on workers flows, it lacks information on wages, which prevents us from explicitly analyzing the wage pressure channel. Thus we cannot test if the movements to early retirement effectively reduce the wage pressure. Neither can we test that flows to retirement increase the non-labor costs of hiring new employees (the tax-wedge channel), thus hindering further the job growth of new firms, *ceteris paribus*.

Last, one more avenue for further analysis concerns agriculture. While in many of the transition economies, industrialization has taken place, some of them had in early 1990s, and still have, a considerable share of labor force engaged in agricultural activities. Despite most of the labor economics models of transition leaving the agricultural sector outside the scope of the analysis, for a noticeable fraction of countries undergoing large structural change in terms of ownership and sector composition – the sector may remain an important outside option, thus affecting the final equilibrium.

Acknowledgements

Authors would like to thank Saul Estrin, Roberta Gatti, Karsten Staehr, Tomasz Mickiewicz, Jan Rutkowski and two anonymous referees for their insightful suggestions. The paper benefited greatly from the comments of the participants of IZA/World Bank (2015), EEA (2015), Scottish Economic Society (2015), EACES (2014), WIEM (2016), ECEE (2016), UoW, WSE, UCL and GRAPE seminars. The support of National Center for Science (grant #2012/05/E/HS4/01506) is gratefully acknowledged. Usual disclaimer applies.

References

Acquisti, A. and Lehmann, H.: 2000, Job creation and job destruction in the Russian Federation, *Trinity Economic Paper Series 2000/1*, Trinity College Dublin.

Aghion, P. and Blanchard, O. J.: 1994, On the speed of transition in Central Europe, *NBER Macroeconomics Annual 1994, Volume 9*, pp. 283–330.

Assaad, R. A., Krafft, C. and Yassin, S.: 2016, Comparing retrospective and panel data collection methods to assess labor market dynamics, *Discussion Papers 11052*, Institute for Study of Labor (IZA).

Balla, K., Köllö, J. and Simonovits, A.: 2008, Transition with heterogeneous labor, *Structural Change and Economic Dynamics* **19**(3), 203–220.

Bilsen, V. and Konings, J.: 1998, Job creation, job destruction, and growth of newly established, privatized, and state-owned enterprises in transition economies: Survey evidence from Bulgaria, Hungary, and Romania, *Journal of Comparative Economics* **26**(3), 429–445.

Boeri, T.: 1999, Optimal speed of transition 10 years after, *CEPR Discussion Papers 2384*, C.E.P.R. Discussion Papers.

Boeri, T.: 2000, *Structural change, welfare systems, and labour reallocation: lessons from the transition of formerly planned economies*, Oxford University Press.

Boeri, T. and Terrell, K.: 2002, Institutional determinants of labor reallocation in transition, *Journal of Economic Perspectives* **16**(1), 51–76.

Bojnec, S. and Konings, J.: 1998, Job creation, job destruction and labour demand in Slovenia, *Technical report*, LICOS Discussion Paper.

Brown, J. D. and Earle, J. S.: 2002, Gross job flows in Russian industry before and after reforms: Has destruction become more creative?, *Journal of Comparative Economics* **30**(1), 96–133.

Brown, J. D. and Earle, J. S.: 2004, Economic reforms and productivity-enhancing reallocation in the post-Soviet transition, *IZA Discussion Papers 1044*, Institute for the Study of Labor (IZA).

Brown, J. D. and Earle, J. S.: 2006, Job reallocation and productivity growth in the Ukrainian transition, *Comparative Economic Studies* **48**(2), 229–251.

Brown, J. D. and Earle, J. S.: 2008, Understanding the contributions of reallocation to productivity growth: lessons from a comparative firm-level analysis, *IZA Discussion Papers 3683*, Institute for the Study of Labor (IZA).

Brown, J. D., Earle, J. S. and Telegdy, A.: 2006, The productivity effects of privatization: Longitudinal estimates from Hungary, Romania, Russia, and Ukraine, *Journal of Political Economy* **114**(1), pp. 61–99.

Bruno, R. L.: 2006, Optimal speed of transition under shrinking labor force and uncertainty, *Economics of Transition* **14**(1), 69–100.

Burke, F. and Walsh, P. P.: 2012, Regional earning disparities and the speed of transition: evidence from Poland 1994–1997, *IZA Journal of Labor & Development* **1**(1), 1–19.

Caballero, R. J. and Hammour, M. L.: 1991, The cleansing effect of recessions, *NBER Working Paper 3922*, National Bureau of Economic Research.

Caballero, R. J. and Hammour, M. L.: 1996a, On the ills of adjustment, *Journal of Development Economics* **51**(1), 161–192.

Caballero, R. J. and Hammour, M. L.: 1996b, On the timing and efficiency of creative destruction, *Quarterly Journal of Economics* **111**(3), 805–852.

Caballero, R. J. and Hammour, M. L.: 1998, Jobless growth: appropriability, factor substitution, and unemployment, *Carnegie-Rochester Conference Series on Public Policy*, Vol. 48, pp. 51–94.

Caballero, R. J. and Hammour, M. L.: 2000, Creative destruction and development: Institutions, crises, and restructuring, *NBER Working Paper 7849*, National Bureau of Economic Research.

Caballero, R. J. and Hammour, M. L.: 2005, The cost of recessions revisited: A reverse-liquidationist view, *Review of Economic Studies* **72**(2), 313–341.

Castanheira, M. and Roland, G.: 2000, The optimal speed of transition: A general equilibrium analysis, *International Economic Review* **41**(1), 219–239.

Christev, A., Kupets, O. and Lehmann, H.: 2008, Trade liberalization and employment effects in Ukraine, *Comparative Economic Studies* **50**(2), 318–340.

Cottarelli, M. C., Cubeddu, M. L. M. and Cangiano, M. M.: 1998, *Pension Developments and Reforms in Transition Economies*, number 98-151, International Monetary Fund.

De Loecker, J. and Konings, J.: 2006, Job reallocation and productivity growth in a post-socialist economy: Evidence from Slovenian manufacturing, *European Journal of Political Economy* **22**(2), 388–408.

Dimova, R.: 2008, The impact of labour reallocation and competitive pressure on TFP growth: firm-level evidence from crisis and transition ridden Bulgaria, *International Review of Applied Economics* **22**(3), 321–338.

Dong, X. and Xu, L. C.: 2009, Labor restructuring in China: Towards a functioning labor market, *Journal of Comparative Economics* **37**(2), 287–305.

Dries, L. and Swinnen, J. F.: 2002, Institutional reform and labor reallocation during transition: Theory evidence from Polish agriculture, *World Development* **30**(3), 457–474.

Eamets, R.: 2004, Labour market flows and adjustment to macroeconomic shocks in the Baltic States, *Post-Communist Economies* **16**(1), 47–71.

Earle, J. S.: 2012, Industrial decline and labor reallocation in a transforming economy: Romania in early transition, *IZA Journal of Labor & Development* **1**(1), 1–18.

Earle, J. and Sabrianova, K.: 2002, How late to pay?: Understanding wage arrears in Russia, *Journal of Labour Economics* **20**, 661–707.

Faggio, G. and Konings, J.: 2003, Job creation, job destruction and employment growth in transition countries in the 90s, *Economic Systems* **27**(2), 129–154.

Flek, V.: 1999, Employment structure and unemployment in the Czech Republic, *Prague Economic Papers 3*, University of Economics, Prague.

Fox, L.: 1997, Pension Reform in the Post-Communist Transition Economies, *in* J. M. Nelson, C. Tilly and L. Walker (eds), *Transforming Post-Communist Political Economies*, National Academy Press, Washington, D.C.

Fox, M. L.: 1994, *Old-Age Security in Transitional Economies*, Vol. 1257, World Bank Publications.

Garibaldi, P. and Brixiova, Z.: 1998, Labor market institutions and unemployment dynamics in transition economies, *IMF Staff Papers* **45**(2).

Gimpelson, V., Kapeliushnikov, R. and Lukiyanova, A.: 2010, Stuck between surplus and shortage: demand for skills in Russian industry, *Labour* **24**(3), 311–332.

Gottvald, J.: 2001, Czech labour market flows from 1993 to 2000, *Prague Economic Papers* **2001**(2).

Haltiwanger, J. C. and Vodopivec, M.: 2002, Gross worker and job flows in a transition economy: an analysis of Estonia, *Labour Economics* **9**(5), 601–630.

Haltiwanger, J. and Vodopivec, M.: 2003, Worker flows, job flows and firm wage policies, *Economics of Transition* **11**(2), 253–290.

Johnson, S., McMillan, J. and Woodruff, C.: 2000, Entrepreneurs and the ordering of institutional reform: Poland, Slovakia, Romania, Russia and Ukraine compared, *Economics of Transition* **8**(1), 1–36.

Jurajda, S. and Terrell, K.: 2003, Job growth in early transition: Comparing two paths, *Economics of Transition* **11**(2), 291–320.

Jurajda, S. and Terrell, K.: 2008, Job reallocation in two cases of massive adjustment in Eastern Europe, *World Development* **36**(11), 2144–2169.

Kiyotaki, N. and Lagos, R.: 2007, A model of job and worker flows, *Journal of Political Economy* **115**(5), 770–819.

Konings, J., Kupets, O. and Lehmann, H.: 2003, Gross job flows in Ukraine, *Economics of Transition* **11**(2), 321–356.

Konings, J., Lehmann, H. and Schaffer, M. E.: 1996, Job creation and job destruction in a transition economy: Ownership, firm size, and gross job flows in Polish manufacturing 1988-1991, *Labour Economics* **3**(3), 299–317.

Kuznets, S.: 1955, Economic growth and income inequality, *American Economic Review* **45**(1), 1–28.

Lehmann, H., Wadsworth, J. and Acquisti, A.: 1999, Grime and Punishment: Job Insecurity and Wage Arrears in the Russian Federation, *Journal of Comparative Economics* **27**(4), 595–617.

Lilien, D. M.: 1982, Sectoral shifts and cyclical unemployment, *Journal of Political Economy* **90**(4), 777–93.

Masso, J. and Heshmati, A.: 2004, The optimality and overuse of labour in Estonian manufacturing enterprises, *Economics of Transition* **12**(4), 683–720.

Noorkoiv, R., Orazem, P. F., Puur, A. and Vodopivec, M.: 1998, Employment and wage dynamics in Estonia, 1989-95, *The Economics of Transition* **6**(2), 481–503.

Orazem, P. F. and Vodopivec, M.: 2009, Do market pressures induce economic efficiency? The case of Slovenian manufacturing, 1994-2001, *Southern Economic Journal* **76**(2), 553–576.

Orazem, P. F., Vodopivec, M. and Wu, R.: 2005, Worker displacement during the transition: Experience from Slovenia, *The Economics of Transition* **13**(2), 311–340.

Rodrik, D.: 1995, The dynamics of political support for reform in economies in transition , *Journal of the Japanese and International Economies* **9**(4), 403 – 425.

Roland, G.: 2002, The political economy of transition, *Journal of Economic Perspectives* **16**(1), 29–50.

Rutkowski, J.: 2001, *Job Creation and Job Destruction in Poland (1993-1999)*.

Rutkowski, J.: 2003a, Does strict employment protection discourage job creation? Evidence from Croatia, *World Bank Research Papers*, The World Bank, Washington, DC.

Rutkowski, J.: 2003b, Rapid Labor Reallocation with a Stagnant Unemployment Pool: Puzzle of the Labor Market in Lithuania, *World Bank Research Papers*, The World Bank, Washington, DC.

Rutkowski, J.: 2003c, Why is unemployment so high in Bulgaria?, *World Bank Research Papers*, The World Bank, Washington, DC.

Schaffner, S.: 2011, Heterogeneity in the cyclical sensitivity of job-to-job flows, *Zeitschrift fur ArbeitsmarktForschung* **43**(4), 263–275.

Siebertova, Z. and Senaj, M.: 2007, Job creation and destruction: evidence from the Slovak Republic 2000–2004, *Ekonomicky Casopis* (02), 107–124.

Sorm, V. and Terrell, K.: 2000, Sectoral restructuring and labor mobility: A comparative look at the Czech Republic, *Journal of Comparative Economics* **28**(3), 431–455.

Svejnar, J.: 2002, Transition economies: Performance and challenges, *Journal of Economic Perspectives* **16**(1), 3–28.

Tichit, A.: 2006, The optimal speed of transition revisited, *European Journal of Political Economy* **22**(2), 349 – 369.

Turunen, J.: 2004, Leaving state sector employment in Russia, *Economics of Transition* **12**(1), 129–152.

Tyrowicz, J., van der Velde, L. and Svejnar, J.: 2017, Effects of labor reallocation on productivity and inequality: Insights from studies on transition, *Journal of Economic Surveys* **31**, 712–732.

United Nations: 1998, *Demographic Yearbook*, 48 edn, Publishing division United Nations, New York, USA.

Vodopivec, M.: 2002, Worker reallocation during Estonia's transition to market, *International Journal of Manpower* **23**(1), 77–97.

Walsh, P. P.: 2003, The cyclical pattern of regional unemployment flows in Poland, *Economic Systems* **27**(2), 155–169.

Warzynski, F.: 2003, The causes and consequences of sector-level job flows in Poland, *Economics of Transition* **11**(2), 357–381.

A The coverage of countries and years available in the literature

Table A.1: Coverage of countries and periods in the previous literature

Paper	Country	Period studied
Rutkowski (2003a)	Croatia	2001
Rutkowski (2003c)	Bulgaria	2000
Brown and Earle (2006)	Ukraine	1992-2000
Haltiwanger and Vodopivec (2003)	Estonia	1989-1994
Orazem et al. (2005)	Slovenia	1991-1992
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 (2012)	Romania	1994-1995
Faggio and Konings (2003)	Romania	1995-1997
Flek (1999)	Czechia	1993-1996
Gottvald (2001)	Czechia	1993-2001
Sorm and Terrell (2000)	Czechia	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
Siebertova and Senaj (2007)	Slovakia	2000-2004
Schaffner (2011)	East Germany	1992-2001
Dries and Swinnen (2002)	Poland	1990-1997
Rutkowski (2001)	Poland	1993-1999
Walsh (2003)	Poland	1994-1996
Warzynski (2003)	Poland	1996-1999
Burke and Walsh (2012)	Poland	1994-1997
Jurajda and Terrell (2003)	Czechia, Estonia	1989-1995
Jurajda and Terrell (2008)	Czechia, Estonia	1989-1995
Faggio and Konings (2003)	Bulgaria, Estonia, Slovenia, Poland	1994-1997
Brown et al. (2006)	Hungary, Romania, Russia, Ukraine	1992-2002

Note: this list follows a recent quantitative overview of the literature (see Tyrowicz et al. 2017).

Table A.2: Coverage of countries – overview

Year	N	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
Albania																	
Armenia																	
Azerbeijan																	
Bulgaria	1						+	+	+	+							
Belarus																	
Croatia																	
Czechia	2				+	+	+	+	+								
Estonia	2				+	+	+	+	+	+	+	+	+	+			
Georgia																	
Hungary	2					+	+	+									
Kazakhstan																	
Kyrgistan																	
Latvia																	
Lithuania																	
Macedonia																	
Moldova																	
Montenegro																	
Poland	3						+	+	+	+	+	+	+				
Romania	1							+	+	+							
Russia	2		+	+	+	+	+	+	+	+	+	+	+				+
Slovenia	2			+	+	+	+	+	+								
Slovakia	1						+	+	+	+			+	+	+	+	+
Serbia																	
Tajikistan																	
Ukraine	3				+	+	+	+	+	+	+	+	+				
Uzbekistan																	

Note: N denotes a number of papers available for a given country, for the list of studies, consult Table A.1.

B Data characteristics

B.1 Adapting LiTS data

- Workers provide information about the form of ownership: public or private. In the latter case, there are no specific questions on whether the firm was privatized or a *de novo* firm. However, individuals report whether the employer (private or SOE) existed prior to the transition. We use answers to these two questions to identify previously state owned enterprises (SOEs). This is not an ideal identification as young responders may mistake a re-branded foreign-owned privatized firm as a new firm. Second, in some countries, such as Hungary, Czechia or Poland, the private sector existed even in the centrally planned system, hence not all firms active before 1989 were state-owned.

- Flows are counted as complete when worker finds a new employment. Thus, a workers leaving SOEs in 1990, but joining private sector in 1995, will be considered as an AB flow in 1995.

- By construction, it is possible to recover worker flows from SOE to privately owned firms as changes of job identifiers. However, absent additional changes, such as sector or occupation, it is impossible to distinguish privatization and flows from a SOE to another privatized SOE.

- Given how data was collected, that is lacking information on the month of transition, it is not surprising that individuals held more than one job in the same year; these might be flows and not contemporaneous employment. Approximately 2.5% of individuals in our sample held more than one job in more than two consecutive years. In those few cases, we define as the main job the one with the lower ISCO code, i.e. the code that corresponds to the higher skill level.

- Beyond the youth entry and elderly exit, the definitions of the inactive individuals remain directly indiscernible from the unemployed individuals. To address this issue we classify as unemployed those individuals who are in the working age and report have worked at least one year in the age brackets 18-65. Non-employment rate computed this way is higher than the unemployment rate from the official statistics, also because in many countries eligibility criteria for registration were stricter. Our measure of non-employment comprises also parents in paternity leave. Despite these differences, our measure of non-employment correlates well with the registered unemployment rates (a coefficient of 0.601 with a standard error of 0.068).

LiTS lacks information on wages, size of the employer and hours worked within each jobs.

Table B.1: The match between LiTS data and the available longitudinal surveys

Country	Year	LMS, % in employment		LiTS, % in employment	
		Services	SOEs	Services	SOEs
Ukraine	1991	0.16	0.61	0.24	0.59
Ukraine	1996	0.17	0.47	0.27	0.43
Ukraine	2001	0.19	0.30	0.31	0.30
Russia	1994	-	0.71*	0.25	0.79
Russia	1999	-	0.70*	0.27	0.67
Russia	2004	0.34	0.57*	0.31	0.61

* For Russia public sector employment cannot be distinguished from SOEs (due to lack of information on industry in RLMS before 2004). LiTS figures computed accordingly.
Notes: Ukrainian Longitudinal Monitoring Survey (ULMS), Russian Longitudinal Monitoring Survey (RLMS) and LiTS.

Table B.2: The match between LiTS data and the European Union Labour Force Survey

Country	Year	Services		Manufacturing	
		LFS	LiTS	LFS	LiTS
Czechia	1997	0.31	0.31	0.32	0.27
	2002	0.31	0.32	0.33	0.24
Slovenia	1997	0.28	0.30	0.34	0.30
	2002	0.30	0.31	0.32	0.28
Estonia	1997	0.31	0.23	0.28	0.25
	2002	0.33	0.23	0.26	0.25
Hungary	1997	0.30	0.33	0.29	0.21
	2002	0.31	0.36	0.29	0.18
Romania	1997	0.15	0.25	0.24	0.29
	2002	0.15	0.27	0.23	0.26
Latvia	1998	0.24	0.25	0.18	0.17
	2002	0.29	0.29	0.19	0.16
Lithuania	1998	0.26	0.22	0.22	0.19
	2002	0.26	0.22	0.20	0.18
Bulgaria	2000	0.30	0.27	0.27	0.28
	2002	0.32	0.29	0.28	0.27
Poland	2000	0.26	0.26	0.23	0.25
	2002	0.27	0.24	0.22	0.26

Notes: Data on services and industry was taken from the EU-LFS. In all cases, we display the earliest available year and 2002.

Table B.3: Correlation between JC and JD measures from LiTS and earlier literature

	JC	p-val	JD	p-val
Pairwise correlation	0.449	0.001	0.328	0.018
OLS - no controls	0.524	0.001	0.641	0.018
OLS - country dummies	0.345	0.003	0.580	0.074
OLS - year dummies	0.443	0.025	0.765	0.012
OLS - country and year dummies	0.226	0.153	1.057	0.005

Notes: Table adapted from Table D.1 in Tyrowicz et al. (2017). The dependent variable is the median of job creation (destruction) in the literature for each country year and the independent variable hirings (separations) from LiTS data.

Table B.4: Sample characteristics

Country	Age			Female			Basic education			Higher education			GDP per capita			Unemployment		
	1989	1995	2005	1989	1995	2005	1989	1995	2005	1989	1995	2005	1991	1994	2005	1991	1996	2005
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
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
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
Czechia	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
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
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
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
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
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
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
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
Bosnia and Herz.	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
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
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
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			
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
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
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
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
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
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
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
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
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
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
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

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. Data without survey weights provided by LiTS (consult Table B.5 for weighed statistics). 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).

Table B.5: Description of the LiTS

Country	Age (1989)		Age (2005)		Female (1989)		Female (2005)		Basic education		Higher education	
	LiTS	Eurostat	LiTS	Eurostat	LiTS	Eurostat	LiTS	Eurostat	1989	2005	1989	2005
Estonia	33.88	35.34	49.88	48.04	0.55	0.53	0.55	0.55	0.25	0.19	0.14	0.21
Latvia	32.82	35.81	48.82	48.07	0.55	0.54	0.55	0.56	0.27	0.22	0.12	0.21
Lithuania	32.38	34.44	48.38	47.77	0.54	0.53	0.54	0.55	0.32	0.25	0.12	0.18
Czechia	30.79	35.54	46.79	47.16	0.52	0.51	0.52	0.52	0.17	0.1	0.08	0.15
Hungary	32.84	36.6	48.84	47.55	0.53	0.52	0.53	0.53	0.34	0.3	0.09	0.14
Poland	30.15	33.29	46.15	46.07	0.52	0.51	0.52	0.53	0.31	0.25	0.07	0.15
Slovakia	30.28	32.79	46.28	45.28	0.52	0.51	0.52	0.52	0.24	0.14	0.09	0.16
Albania	27.91		43.91	43.48	0.51		0.51	0.51	0.62	0.53	0.06	0.09
Bulgaria	33.41	36.48	49.41	48.66	0.52	0.51	0.52	0.52	0.33	0.27	0.14	0.22
Moldova	30.46		46.46		0.53		0.53		0.4	0.36	0.18	0.28
Romania	30.73	33.84	46.73	46.39	0.52	0.51	0.52	0.52	0.41	0.31	0.1	0.17
Bosnia and Herz.	27.57		43.57		0.52		0.52		0.4	0.3	0.06	0.12
Croatia	33.26		49.26	48.67	0.52		0.52	0.53	0.32	0.29	0.12	0.18
Macedonia	28.79		44.79	44.93	0.51		0.51	0.5	0.36	0.27	0.1	0.16
Montenegro	26.93		42.93		0.51		0.51		0.33	0.23	0.1	0.18
Serbia	29.48		45.48	48.51	0.51		0.51	0.52	0.32	0.25	0.09	0.16
Slovenia	30.39	34.95	46.39	47.42	0.52	0.51	0.52	0.52	0.39	0.22	0.1	0.2
Armenia	28.7		44.7		0.55		0.55		0.24	0.11	0.17	0.24
Azerbaijan	24.24		40.24		0.53		0.53		0.33	0.16	0.15	0.26
Georgia	30.79		46.79		0.54		0.54		0.19	0.08	0.22	0.33
Kazakhstan	26.78		42.78		0.53		0.53		0.25	0.11	0.12	0.2
Kyrgyzstan	24.46		40.46		0.52		0.52		0.3	0.12	0.1	0.21
Tajikistan	21.98		37.98		0.51		0.51		0.39	0.2	0.06	0.13
Uzbekistan	23.04		39.04		0.51		0.51		0.28	0.07	0.07	0.13
Belarus	28.22		44.22		0.54		0.54		0.19	0.11	0.14	0.29
Russia	28.43		44.43		0.54		0.54		0.22	0.13	0.15	0.26
Ukraine	28.83		44.83		0.55		0.55		0.18	0.1	0.12	0.27

Notes: Average age and percentage of female population in the LiTS sample with survey weights and in general population (Eurostat). Age corresponds to the average age, while female and education level is expressed as a percentage of active population. Unlike Table B.4, this table presents descriptive statistics for the entire LiTS sample

C Stylized facts

Table C.1: Time patterns of the gross worker flows (I)

	TO NON-EMPLOYMENT			ENTRY			EXIT		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1991	0.048***	0.058***	0.016	0.009***	0.009	0.036**	0.026***	-0.009	0.030
	(0.006)	(0.019)	(0.023)	(0.001)	(0.007)	(0.014)	(0.003)	(0.011)	(0.018)
1992	0.050***	0.056***	0.010	0.009***	0.009	0.034**	0.028***	-0.014	-0.004
	(0.006)	(0.020)	(0.020)	(0.001)	(0.007)	(0.013)	(0.003)	(0.011)	(0.016)
1993	0.058***	0.054***	0.013	0.009***	0.010	0.039***	0.027***	-0.012	-0.009
	(0.006)	(0.020)	(0.020)	(0.001)	(0.007)	(0.012)	(0.003)	(0.012)	(0.015)
1994	0.050***	0.052**	0.013	0.010***	0.008	0.035***	0.026***	-0.016	-0.012
	(0.006)	(0.020)	(0.019)	(0.001)	(0.007)	(0.012)	(0.003)	(0.012)	(0.015)
1995	0.040***	0.056***	0.009	0.010***	0.010	0.036***	0.022***	-0.012	-0.006
	(0.006)	(0.020)	(0.019)	(0.001)	(0.008)	(0.012)	(0.003)	(0.012)	(0.015)
1996	0.038***	0.070***	0.017	0.011***	0.010	0.041***	0.023***	-0.015	-0.012
	(0.006)	(0.021)	(0.019)	(0.001)	(0.008)	(0.012)	(0.003)	(0.012)	(0.015)
1997	0.050***	0.055***	0.027	0.011***	0.008	0.036***	0.022***	-0.018	-0.013
	(0.006)	(0.021)	(0.019)	(0.001)	(0.008)	(0.012)	(0.003)	(0.012)	(0.015)
1998	0.041***	0.054**	0.013	0.009***	0.008	0.045***	0.019***	-0.016	-0.018
	(0.006)	(0.021)	(0.021)	(0.001)	(0.008)	(0.013)	(0.003)	(0.012)	(0.016)
1999	0.036***	0.054**	0.018	0.009***	0.006	0.032**	0.021***	-0.017	-0.016
	(0.006)	(0.021)	(0.021)	(0.001)	(0.008)	(0.013)	(0.003)	(0.012)	(0.016)
2000	0.034***	0.058***	0.027	0.007***	0.009	0.034**	0.021***	-0.013	-0.002
	(0.006)	(0.021)	(0.020)	(0.001)	(0.008)	(0.012)	(0.003)	(0.012)	(0.015)
2001	0.037***	0.061***	0.025	0.010***	0.008	0.036**	0.022***	-0.015	-0.001
	(0.006)	(0.021)	(0.022)	(0.001)	(0.008)	(0.013)	(0.003)	(0.012)	(0.017)
2002	0.042***	0.053**	0.007	0.009***	0.009	0.038***	0.022***	-0.018	-0.004
	(0.006)	(0.021)	(0.022)	(0.001)	(0.008)	(0.013)	(0.003)	(0.012)	(0.017)
2003	0.036***	0.056***	0.013	0.010***	0.009	0.040***	0.018***	-0.018	0.006
	(0.006)	(0.020)	(0.022)	(0.001)	(0.008)	(0.013)	(0.003)	(0.012)	(0.017)
2004	0.035***	0.062***	0.021	0.011***	0.009	0.028***	0.018***	-0.014	0.007
	(0.006)	(0.020)	(0.012)	(0.001)	(0.007)	(0.008)	(0.003)	(0.012)	(0.010)
2005	0.041***	0.064***		0.011***	0.013*		0.021***	-0.014	
	(0.006)	(0.020)		(0.001)	(0.007)		(0.003)	(0.011)	
2006	0.048***	0.067***		0.015***	0.005		0.019***	-0.021**	
	(0.006)	(0.019)		(0.001)	(0.007)		(0.003)	(0.011)	
Lagged dependent		0.446***			0.032			0.085	
		(0.048)			(0.052)			(0.052)	
GDP pc change		-0.045***			0.005			-0.019**	
		(0.013)			(0.005)			(0.008)	
Unemployment (%)		-0.014			-0.007			0.050***	
		(0.030)			(0.011)			(0.018)	
N	459	395	48	459	395	48	459	395	48
R^2	0.824	0.885	0.923	0.721	0.741	0.859	0.818	0.834	0.949
$F-test$		0.00			0.61			0.00	

Notes: Year effects, relative to 1990, all estimations include country fixed effects. Specifications denoted by (1) report year effects with country fixed effects. In column (2) we report the same estimates, but controlling for economic outlook in the country. The results of the $F-test$ report the p-value for the joint significance of a test for all additional controls in columns denoted by (2). Specifications denoted (3) include the countries and years reported in the earlier studies (for comparison purposes). *,**,*** indicate significance at the 10%, 5% and 1% level respectively.

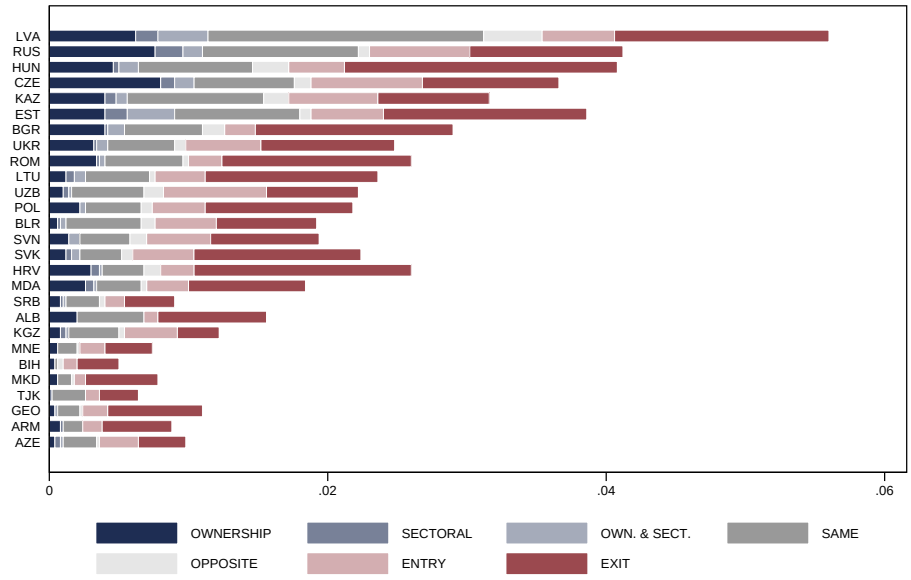
Table C.2: Time patterns of the gross worker flows (II)

	OWNERSHIP			SECTORAL			OWNERSHIP & SECTORAL			SAME			OPPOSITE		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1991	0.003**	0.004	-0.007	0.000	0.000	0.001	0.001	0.000	0.002	0.006***	0.025***	0.016	0.001	-0.001	-0.003
	(0.001)	(0.006)	(0.012)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.006)	(0.002)	(0.008)	(0.010)	(0.001)	(0.004)	(0.005)
1992	0.005***	0.006	0.003	0.001	0.001	0.001	0.001	0.001	-0.000	0.009***	0.029***	0.015*	0.002**	-0.000	0.002
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1993	0.007***	0.006	-0.004	0.001**	0.001	0.001	0.002***	0.002	0.002	0.011***	0.031***	0.015*	0.002***	-0.001	0.001
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1994	0.008***	0.005	0.002	0.001**	0.000	0.001	0.002***	0.002	-0.000	0.014***	0.031***	0.023***	0.002**	-0.001	0.006
	(0.001)	(0.007)	(0.010)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1995	0.007***	0.005	-0.000	0.001	0.001	0.001	0.002***	0.001	-0.000	0.013***	0.035***	0.029***	0.002***	-0.001	0.003
	(0.001)	(0.007)	(0.010)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1996	0.007***	0.006	0.002	0.001**	0.002	0.003	0.001*	0.003	0.002	0.016***	0.038***	0.031***	0.003***	-0.001	0.003
	(0.001)	(0.007)	(0.010)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1997	0.007***	0.006	0.003	0.002***	0.001	0.002	0.003***	0.003	0.003	0.018***	0.035***	0.028***	0.003***	-0.001	0.003
	(0.001)	(0.007)	(0.010)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
1998	0.006***	0.006	0.004	0.001*	0.002	0.008***	0.002***	0.002	0.002	0.016***	0.036***	0.022**	0.003***	0.000	0.002
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.009)	(0.001)	(0.004)	(0.004)
1999	0.007***	0.004	-0.002	0.001***	0.002	0.001	0.002***	0.001	0.004	0.016***	0.035***	0.030***	0.004***	-0.001	0.003
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.010)	(0.009)	(0.001)	(0.004)	(0.004)
2000	0.006***	0.005	0.006	0.002***	0.002	0.002	0.002***	0.002	-0.000	0.015***	0.039***	0.029***	0.003***	0.002	0.004
	(0.001)	(0.007)	(0.010)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.008)	(0.001)	(0.004)	(0.004)
2001	0.006***	0.007	-0.001	0.002***	0.002	0.004	0.002***	0.001	0.001	0.020***	0.040***	0.034***	0.005***	0.001	0.002
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.009)	(0.001)	(0.004)	(0.005)
2002	0.008***	0.004	0.002	0.002***	0.002	0.004	0.001***	0.002	-0.002	0.019***	0.037***	0.034***	0.004***	0.000	0.002
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.009)	(0.001)	(0.004)	(0.005)
2003	0.005***	0.003	0.001	0.002***	0.002	0.001	0.002***	0.001	-0.002	0.017***	0.039***	0.034***	0.004***	0.001	0.003
	(0.001)	(0.007)	(0.011)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.009)	(0.009)	(0.001)	(0.004)	(0.005)
2004	0.004***	0.005	0.005	0.002***	0.004	0.001	0.001**	0.001	0.000	0.020***	0.043***	0.025***	0.004***	0.000	0.006**
	(0.001)	(0.007)	(0.007)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.009)	(0.005)	(0.001)	(0.004)	(0.003)
2005	0.006***	0.004		0.004***	0.003		0.001**	0.001		0.024***	0.040***		0.003***	0.003	
	(0.001)	(0.007)		(0.001)	(0.003)		(0.001)	(0.003)		(0.002)	(0.009)		(0.001)	(0.004)	
2006	0.005***	0.006		0.003***	0.004		0.001**	0.001		0.020***	0.044***		0.006***	0.002	
	(0.001)	(0.006)		(0.001)	(0.003)		(0.001)	(0.003)		(0.002)	(0.009)		(0.001)	(0.004)	
Lagged dependent		0.149***			0.043			-0.061			-0.066			-0.065	
		(0.056)			(0.055)			(0.055)			(0.058)			(0.056)	
GDP pc change		-0.001			-0.001			0.000			-0.005			0.004	
		(0.004)			(0.002)			(0.002)			(0.006)			(0.002)	
Unemployment (%)		-0.001			-0.001			-0.002			-0.018			0.002	
		(0.011)			(0.004)			(0.004)			(0.014)			(0.006)	
N	459	395	48	459	395	48	459	395	48	459	395	48	459	395	48
R^2	0.597	0.612	0.774	0.487	0.508	0.809	0.434	0.447	0.669	0.865	0.870	0.953	0.618	0.650	0.741
F-test		0.07			0.69			0.71			0.23			0.27	

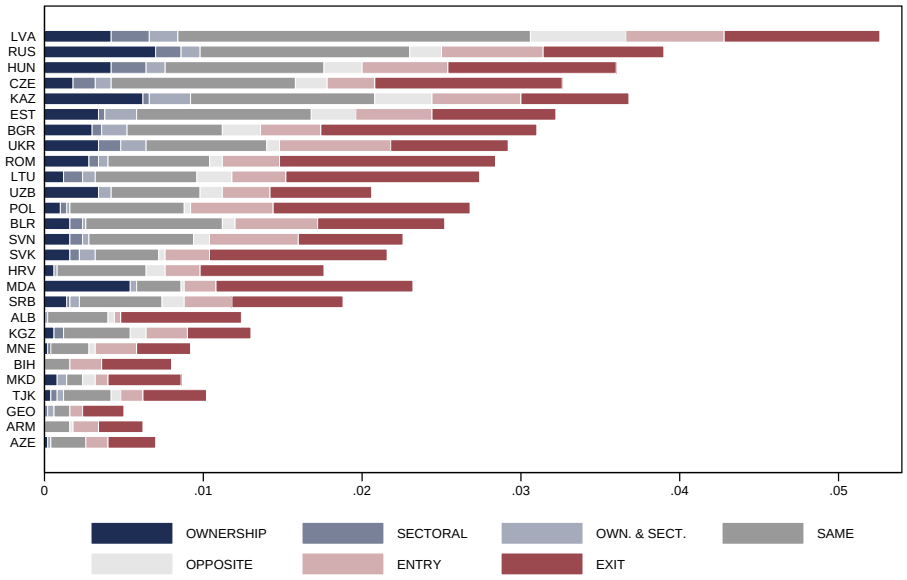
Notes: Year effects, relative to 1990, all estimations include country fixed effects. Specifications denoted by (1) report year effects with country fixed effects. In column (2) we report the same estimates, but controlling for economic outlook in the country. The results of the $F-test$ report the p-value for the joint significance of a test for all additional controls in columns denoted by (2). Specifications denoted (3) include the countries and years reported in the earlier studies (for comparison purposes). *,**,*** indicate significance at the 10%, 5% and 1% level respectively.

C.1 Structure of flows: time heterogeneity

Figure C.1: The structure of flows split by time periods



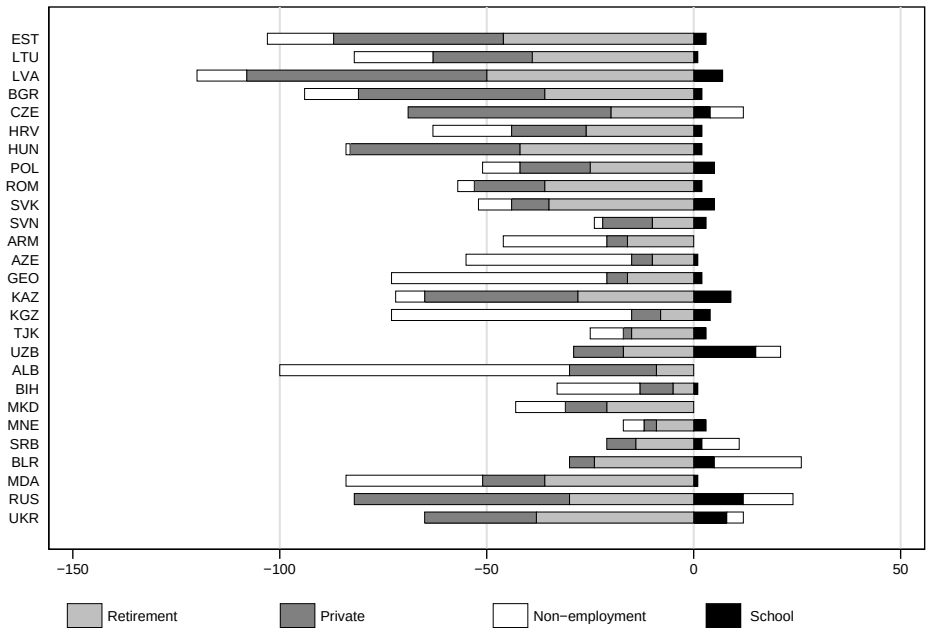
(a) 1991 - 1995



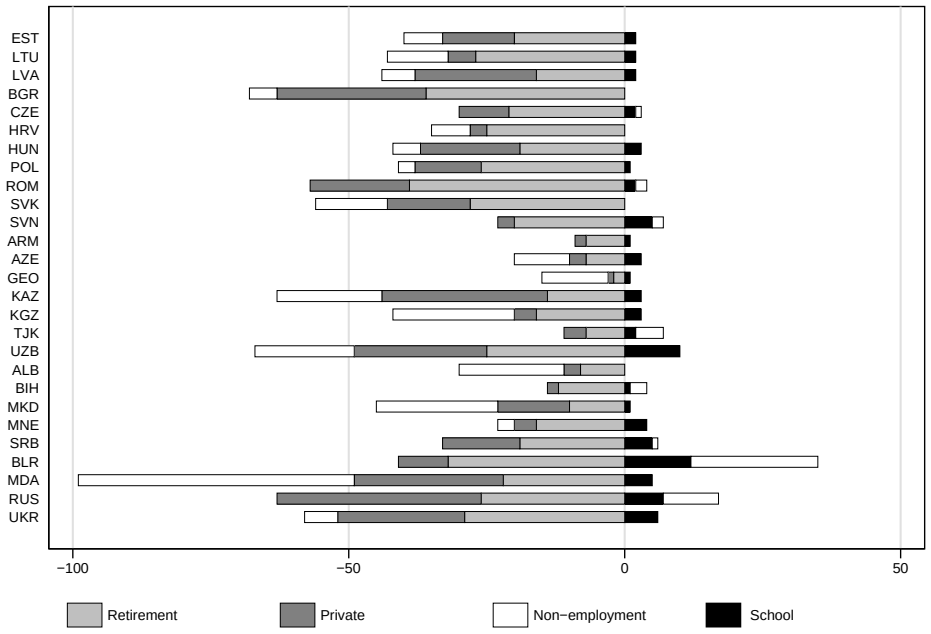
(b) 1996 - 2001

Notes: Figure analogous to Figure 1. Figure displays the average value of the ratio of flows to total active workers in LiTS split in two subperiods.

Figure C.2: Net contribution of the gross worker flows to the changes in the public and private sector employment



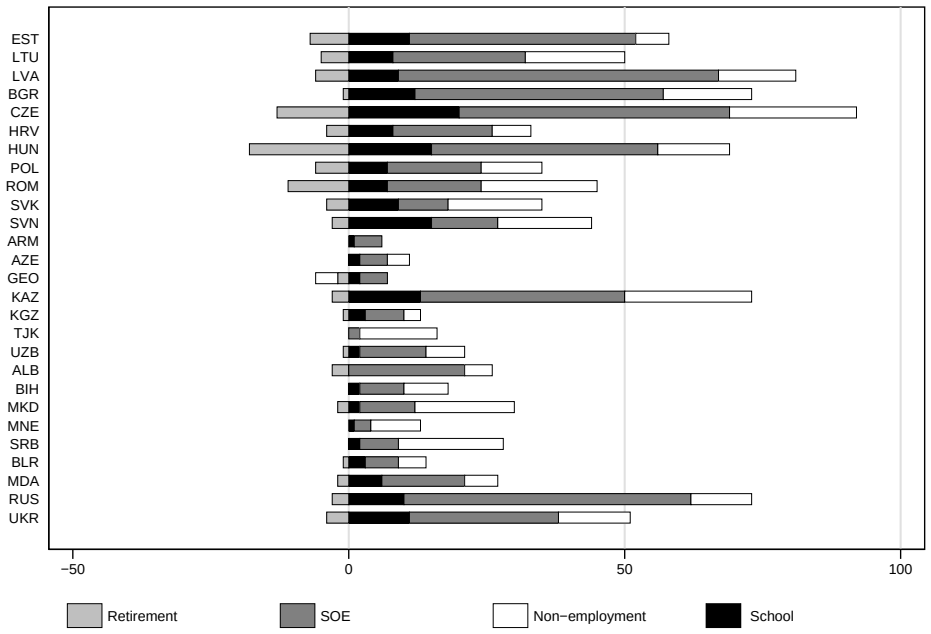
(a) SOEs (1991-1995)



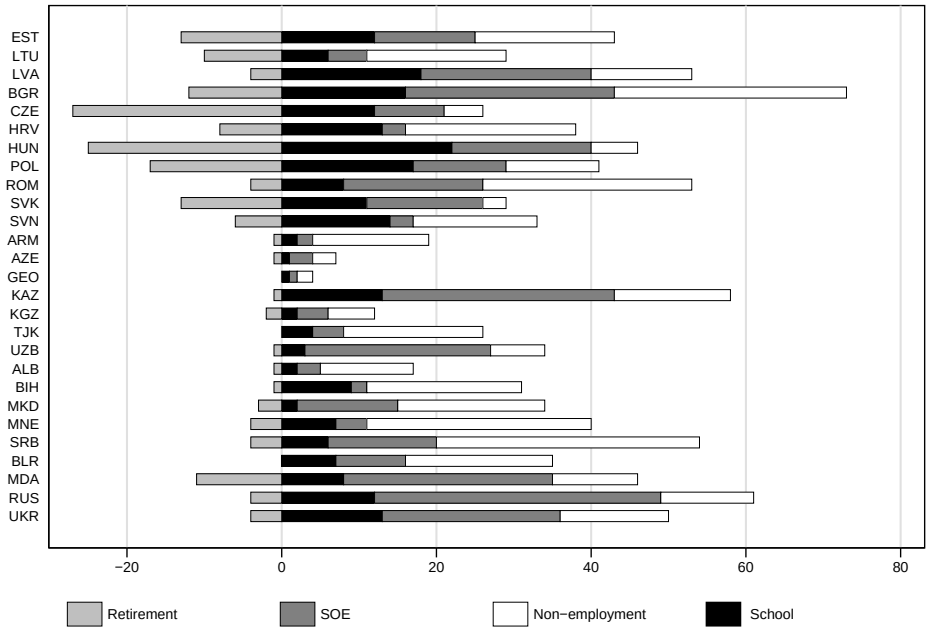
(b) SOEs (1996-2001)

Notes: Figure analogous to Figure 4, see note under Figure 4 for definitions.

Figure C.3: Net contribution of the gross worker flows to the changes in the public and private sector employment - continued



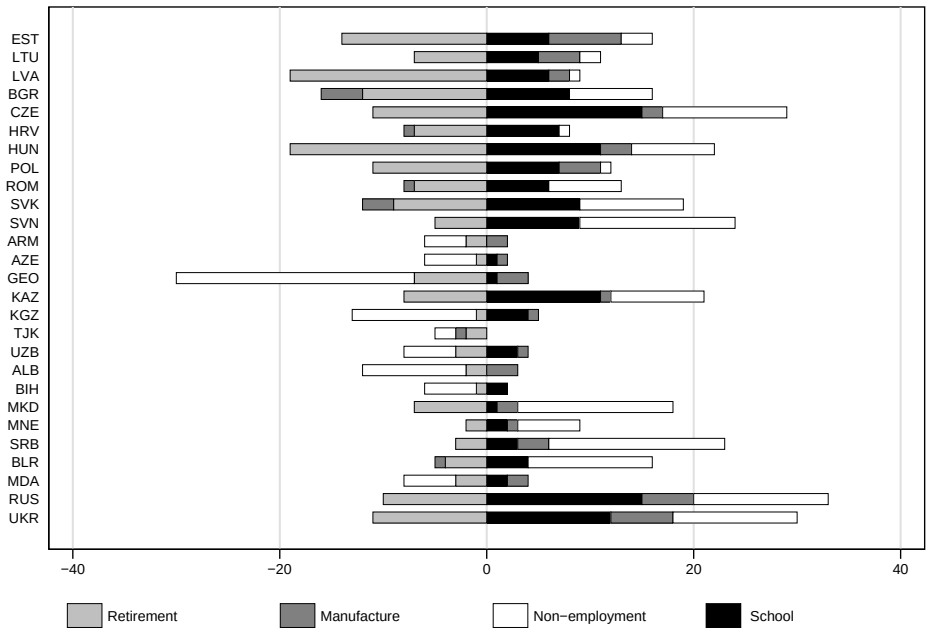
(a) Private (1991-1995)



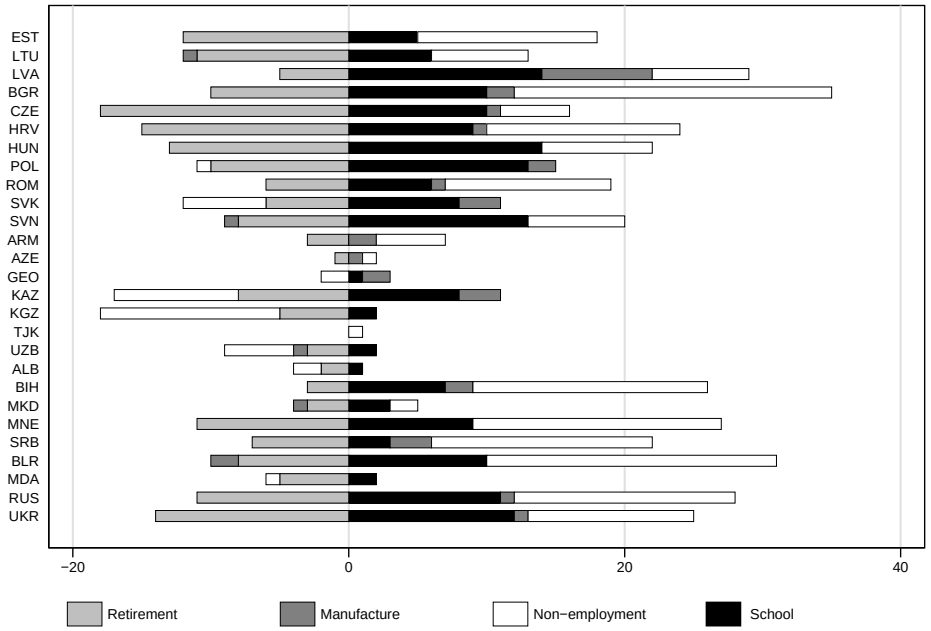
(b) Private (1996-2001)

Notes: Figure analogous to Figure 4. Figure displays the total net number of flows in LiTS split in two subperiods, see note under Figure 4 for definitions.

Figure C.4: Net contribution of the gross worker flows to the changes in industrial composition



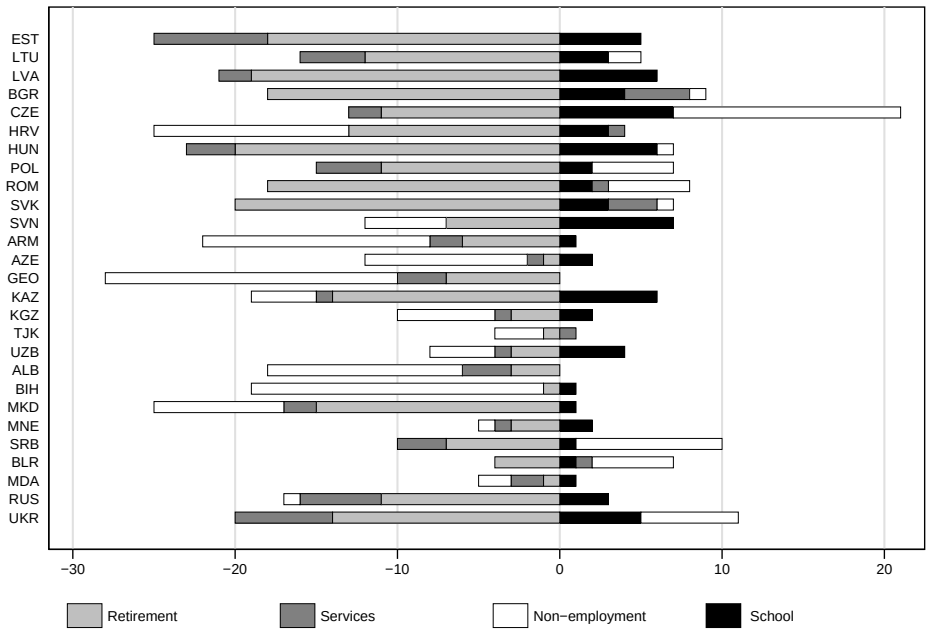
(a) Service (1991-1995)



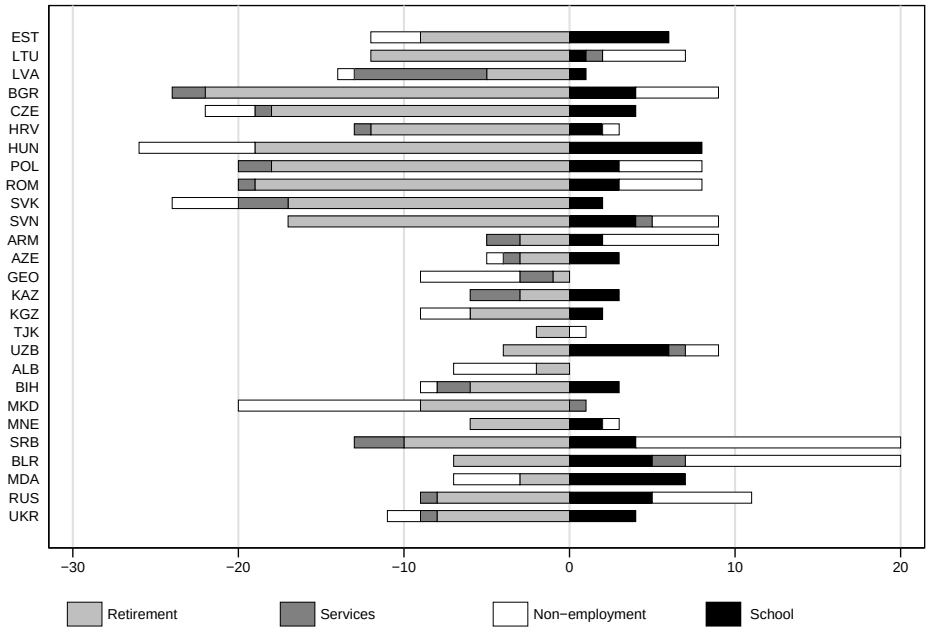
(b) Service (1996-2001)

Notes: Figure analogous to Figure 5. Figure displays the total net number of flows in LiTS split in two subperiods, see note under Figure 5 for definitions.

Figure C.5: Net contribution of the gross worker flows to the changes in industrial composition, continued



(a) Manufacturing (1991-1995)



(b) Manufacturing (1996-2001)

Notes: Figure analogous to Figure 5. Figure displays the total net number of flows in LiTS split in two subperiods, see note under Figure 5 for definitions.

C.2 The relative size of flows

To formally test in a robust way that ownership and sectoral flows were smaller than the others, we test equality of means in the distributions, where the measures of means are computed for each country and each year. The results are reported in Table C.3. The numbers reported as means describe an average fraction of flows (relative to total employment) for each type of the flow in each country and each period. For example, a value of 0.051 indicates that on average 5.1% of employed workers moved to retirement *per annum*. The remaining cells show the p-values of pairwise comparison tests of mean equality in each pair of flow types. The number of observations in each cell of this table is 459 (17 years × 27 countries).

Table C.3: The adjusted size of each type of flows

		EXIT	ENTRY	SAME	OPPOSITE
		All countries			
	Mean	0.0507	0.0194	0.0316	0.0061
OWNERSHIP	0.0123	0.0000	0.0000	0.0000	0.0000
SECTORAL	0.0034	0.0000	0.0000	0.0000	0.0000
O. and S.	0.0032	0.0000	0.0000	0.0000	0.0000
		Countries and years covered in the literature			
	Mean	0.0542	0.0206	0.0284	0.0045
OWNERSHIP	0.0133	0.0000	0.0000	0.0000	0.0000
SECTORAL	0.0023	0.0000	0.0000	0.0000	0.0000
O. and S.	0.0044	0.0000	0.0000	0.0000	0.9400

Notes: P-values for a tests of equality of means in size of flows presented in Table. Flows are measured as percentage of the working population in the start period. For countries and years analyzed in the literature, see Table A.2.

C.3 Flows, unemployment and the speed of transition

The speed of transition in the AB theory has been operationalized in the earlier literature by the SOE employment (in levels and in share) and changes thereof. Table C.4 presents the correlation between flow measures in LiTS and the conventional measure of SOE employment. Speed of transition is measured as changes in employment in SOE firms, both in absolute terms and as a share of total employment not in agriculture or in the public sector. Two measures of change are displayed: year to year changes and cumulative (since 1989). One should expect strong and negative correlation with OWNERSHIP as well as OWNERSHIP&SECTORAL flows. By the same token, also OPPOSITE flow should be correlated, with a positive sign. These predictions are strongly confirmed by the data. The correlations for ENTRY and EXIT flows are not determined by the AB model.

Earlier studies analyze the link between the labor market flows and the unemployment, finding confirmation for the role of the synchronization in determining unemployment in few of the selected analyzed countries. Table C.5 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 test for non-linear relations. As a robustness check, we use the unemployment rate provided by The World Bank. Since this data does not cover early transition years and some countries, we also show a specification with the same countries and years as The World Bank data, but using LiTS as a source. Regardless of the unemployment rate definition, data lends support to the AB model – higher labor market flows due to change of ownership are

Table C.4: Correlation of flows and measures of speed of transition

	Change in SOE employment		Change in SOE share	
	Year-to-Year	Cumulative	Year-to-Year	Cumulative
OWNERSHIP	-1.384***	0.032	-0.704***	-0.149
	(0.306)	(0.264)	(0.110)	(0.200)
R^2	0.257	0.919	0.268	0.941
SECTORAL	0.115	-0.344	-0.167	-0.378
	(0.685)	(0.714)	(0.217)	(0.409)
R^2	0.220	0.919	0.170	0.941
OWNERSHIP & SECTORAL	-1.564***	-0.974*	-1.144***	-0.789**
	(0.495)	(0.522)	(0.156)	(0.313)
R^2	0.236	0.920	0.258	0.942
SAME	-0.229	-0.281	-0.100	-0.154
	(0.252)	(0.191)	(0.075)	(0.143)
R^2	0.222	0.920	0.173	0.941
OPPOSITE	1.696**	0.241	0.660***	0.230
	(0.790)	(0.599)	(0.239)	(0.510)
R^2	0.234	0.919	0.191	0.941
EXIT	-0.592***	-0.207	-0.140***	0.084
	(0.169)	(0.156)	(0.047)	(0.094)
R^2	0.254	0.920	0.189	0.941
ENTRY	0.853***	1.131***	-0.193	0.135
	(0.326)	(0.387)	(0.141)	(0.231)
R^2	0.231	0.921	0.175	0.941

Notes: Robust standard errors reported in parentheses, ***, ** and * denote significance at 1%, 5% and 10% significance levels. Each cell presents the results of regressing the given measure of speed of transition on the measure of flows in a model with country and year fixed effects (not reported). Flow definitions are the same as in the case of Table C.1. Speed of transition is measured as changes in employment in state-owned firms, both in absolute terms and as a share of total employment not in agriculture nor in the public sector. Two measures of change are displayed: year to year changes and cumulative (since 1989).

associated with higher unemployment rates. Models were also consistent in finding insignificant values for the coefficient on sectoral flows. The significance of joint ownership and sectoral flows is thus inherited from the cross-sectional and time variation in ownership rather than sectoral flows. Indeed, the sectoral flows have the same signs as the ownership flows but are estimated with much less precision. ENTRY and EXIT flows have generally no explanatory power for the variation in the unemployment rates.

Table C.5: The link between the unemployment rates and flows

	OWN.	SECT.	SAME	O. & S.	OPPOSITE	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
$\bar{flow} * \hat{\beta}$	-.447						
	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
$\bar{flow} * \hat{\beta}$	-.708						

Notes: Standard errors reported in parentheses, ***, ** and * denote significance at 1%, 5% and 10% significance levels. Each column presents the results of the regression of de-trended unemployment rates on the size of the flows and its square. Flow definitions are the same as in the case of Table C.1. Unemployment in LiTS defined as an individual in working age, not working in a given year, who has at least one employment spell in the sample. The numerator comprises all those individuals, who are not classified as non-working. 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 C.3 plus the coefficient on the linear term times the same mean value. Not statistically significant coefficients were treated as zeros.

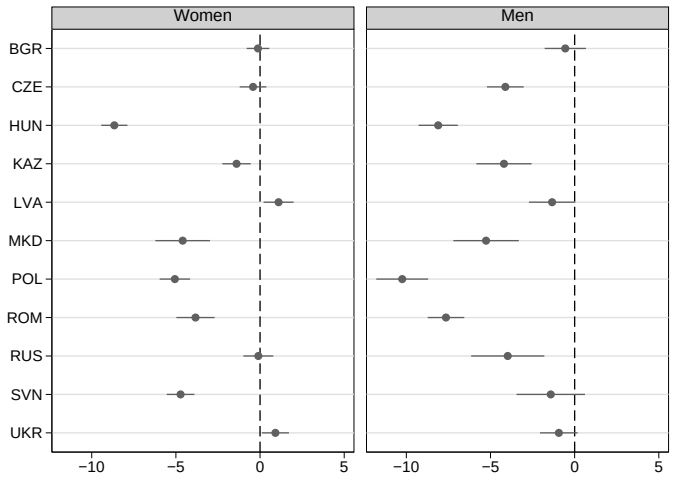
D Retirement patterns

D.1 Statutory retirement age

Figure D.1 depicts the difference between the (average) age at retirement and the statutory retirement age with a 95% confidence interval. Negative values indicate that workers retire before the statutory retirement age by x years. Statutory retirement ages were obtained from Cottarelli et al. (1998) and represent values taken from the years in the middle of our sample period.

Point estimates in Figure D.1 indicate that on average individuals retired sooner than the statutory retirement age. Women in Latvia and Ukraine are exceptions to the rule. In a handful of cases, confidence intervals are wide (e.g. Slovenia, men) which prevents us from drawing stronger conclusions. One concern might be that estimates of the difference present a downward bias due to survival bias. This might be the case if workers who retired in the early 1990's were relatively older, and we do not observe them due to differences in mortality rates. However, previous research suggests that this is unlikely. Fox (1994) indicates that the effective retirement age in transition countries during the 1990s was 57 for men and 53 for women. This suggests that early retirement was frequent even before the beginning of the transition. Furthermore, Cottarelli et al. (1998) indicate there was a sharp increase in the number of pensioners (including early retirement and disability pensions) already in the earliest years of transition. Finally, Fox (1994) and Cottarelli et al. (1998) argue that it was relatively easy to access the disability benefits as a possible pathway to retirement. Admittedly, the replacement rates of the disability benefits were relatively high.

Figure D.1: Statutory retirement age and average retirement age in sample



Note: the figure presents the difference between the average retirement age in LiTS and the statutory retirement age in several transition countries in the mid 1990. Lines indicate 95% confidence intervals around the difference. Data on statutory retirement age was extracted from Cottarelli et al. (1998).

D.2 Survival models

Table D.1: Sample characteristics for the survival models

		All		Under 45		Over 45	
Duration		Mean	SD	Mean	SD	Mean	SD
		11.60	6.19	8.75	4.27	15.90	6.16
Individual characteristics	Female	0.52	0.50	0.51	0.50	0.52	0.50
	Secondary education	0.63	0.48	0.68	0.47	0.55	0.50
	Tertiary education	0.16	0.37	0.18	0.39	0.13	0.34
	Married	0.64	0.48	0.69	0.46	0.55	0.50
	Urban	0.69	0.46	0.68	0.47	0.71	0.46
Firm characteristics	Manufacturing (at risk)	0.55	0.50	0.53	0.50	0.58	0.49
	SOE (at risk)	0.68	0.47	0.55	0.50	0.86	0.35
Risk separation: same sector and ownership		19.71	9.52	20.31	10.56	18.81	7.62
Entry: same sector and ownership		2.78	6.33	1.59	5.22	1.59	5.22
Labor market structure	Privatized (at risk)	42.44	12.79	45.31	11.61	38.08	13.26
	De Novo (at risk)	41.14	21.13	49.51	16.71	28.46	20.81
	Manufaturing (at risk)	39.10	7.78	36.88	6.65	42.47	8.14

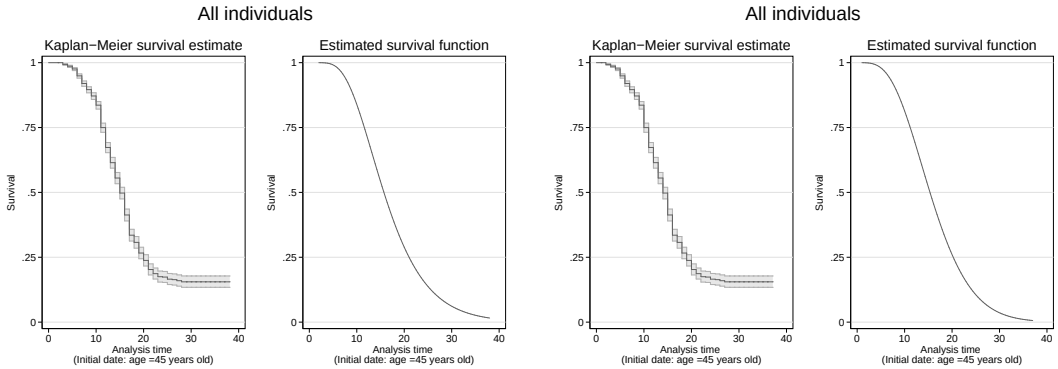
Notes: Table presents summary statistics of the continuous variables used in estimations presented in Table 1. *At risk* refers to the year when the individual becomes at risk, e.g. the most recent year between 1989 and the year when the individual turns 45 years old.

Table D.2: Survival models – additional specifications with time varying covariates

		(3 P)	(3 Y)	(3 O)
Job related characteristics	Manufacturing	-0.757*	-0.330	-1.578***
		(0.396)	(0.357)	(0.462)
	SOEs	-0.625	-1.535***	-4.208***
		(0.662)	(0.461)	(0.681)
Same ownership and sector	Risk of separation	-0.620***	-0.041*	-0.138***
		(0.085)	(0.022)	(0.029)
	Entry	0.102**	0.046	-0.360*
		(0.049)	(0.146)	(0.185)
Personal characteristics	Female	-4.153***	-3.904***	-4.190***
		(0.368)	(0.456)	(0.494)
	Secondary education	-0.285	0.067	-0.246
		(0.383)	(0.390)	(0.477)
	Tertiary education	3.576***	2.348***	4.167***
		(0.691)	(0.758)	(0.904)
	Married	-1.073***	-0.699*	-0.912*
		(0.373)	(0.363)	(0.474)
	Urban	0.654*	0.926**	0.681
		(0.364)	(0.367)	(0.489)
Labour market structure	% privatized at risk	-0.241***	0.054	-0.218***
		(0.050)	(0.074)	(0.077)
	% de novo at risk	-0.002	-0.108	0.078
		(0.073)	(0.098)	(0.107)
	% manufacturing at risk	-0.044	0.133***	0.050
		(0.034)	(0.046)	(0.043)
No pf unique individuals		3,182	1,916	1,266
No of observations		26,913	14,855	12,058

Notes: The table present placebo and cohort heterogeneity analysis analogous to those in Table 1 estimated using time varying covariates. Individuals become at risk when they turn 45 years old. Sample restricted to exits from employment. Risk of separation computed for the same industry and sector as a given individual. Youth entry computed as cumulated youth entry in the same industry and sector until the year a given individual becomes at risk of retiring +2, relative to total employment in a job characteristic for a given individual (ownership and industry). Column denoted by (P) shows result of the placebo test (risk measure for all countries but the one in which individual lives in a given year). Column (Y) reports results for the cohorts who were under 46 years of age in 1989. Column (O) reports results for cohorts aged 45 or above in 1989. The specification with 3,182 individuals at risk includes 1,489 retirements (failures). Robust standard errors reported in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels.

Figure D.2: Parametric and non-parametric survival curves



(a) Only time constant covariates (b) Time varying covariates

Note: Survival curves estimated using the Kaplan-Meier estimator with 95% confidence intervals (left panel) and parametrically recovered survival curves (right panel). Estimates used to recover survival curve are taken from Table 1, Columns (1) and (1 W).

IAAEU Discussion Paper Series in Economics

01/2012 Relative Consumption Concerns or Non-Monotonic Preferences?
Inga Hillesheim and Mario Mechtel

02/2012 Profit Sharing and Relative Consumption
Laszlo Goerke
[published as: Goerke, L. (2013). Profit Sharing and Relative Consumption. *Economics Letters* 118, 167-169.]

03/2012 Conspicuous Consumption and Communism: Evidence From East and West Germany
Tim Friehe and Mario Mechtel
[published as: Friehe, T. and M. Mechtel (2014). Conspicuous Consumption and Political Regimes: Evidence from East and West Germany. *European Economic Review* 67, 62-81.]

04/2012 Unemployment Benefits as Redistribution Scheme for Trade Gains - A Positive Analysis
Marco de Pinto
[published as: de Pinto, M. (2013). International Trade and Unemployment: on the Redistribution of Trade Gains when Firms Matter, Physica-Verlag (Springer), Berlin.]

05/2012 Failure of Ad Valorem and Specific Tax: Equivalence under Uncertainty
Laszlo Goerke, Frederik Herzberg and Thorsten Upmann
[revised version published as: Goerke, L., F. Herzberg and T. Upmann (2014). Failure of Ad Valorem and Specific Tax Equivalence under Uncertainty. *International Journal of Economic Theory* 10, 387-402.]

06/2012 The Redistribution of Trade Gains and the Equity-Efficiency Trade-Off
Marco de Pinto
[published as: de Pinto, M. (2013). International Trade and Unemployment: on the Redistribution of Trade Gains when Firms Matter, Physica-Verlag (Springer), Berlin.]

07/2012 Trade Union Membership and Sickness Absence: Evidence from a Sick Pay Reform
Laszlo Goerke and Markus Pannenberg
[published as: Goerke, L. and M. Pannenberg (2015). Trade Union Membership and Sickness Absence: Evidence from a Sick Pay Reform. *Labour Economics* 33, 13-25.]

08/2012 Risk-Sorting and Preference for Team Piece Rates
Agnes Bäker and Vanessa Mertins
[published as: Bäker, A. and V. Mertins (2013). Risk-Sorting and Preference for Team Piece Rates. *Journal of Economic Psychology* 34, 285-300.]

09/2012 Union Wage Setting and International Trade
Hartmut Egger and Daniel Etzel
[published as: Egger, H. and D. Etzel (2014). Union wage-setting and international trade with footloose capital. *Regional Science and Urban Economics* 48, 56-67.]

10/2012 How Much Do Others Matter? Explaining Positional Concerns for Different Goods and Personal Characteristics

Inga Hillesheim and Mario Mechtel

[published as: Hillesheim, I. and M. Mechtel (2013). How Much Do Others Matter? Explaining Positional Concerns for Different Goods and Personal Characteristics. *Journal of Economic Psychology* 34, 61-77.]

11/2012 Benefit Morale and Cross-Country Diversity in Sick Pay Entitlements

Daniel Arnold

[published as: Arnold, D. (2013). Benefit Morale and Cross-Country Diversity in Sick Pay Entitlements. *Kyklos* 66, 27-45.]

01/2013 Relative Consumption and Tax Evasion

Laszlo Goerke

[published as: Goerke, L. (2013). Relative Consumption and Tax Evasion. *Journal of Economic Behavior & Organization* 87, 52-65.]

02/2013 Variants of the Monoamine Oxidase A Gene (MAOA) Predict Free-riding Behavior in Women in a Strategic Public Goods Experiment

Vanessa Mertins, Andrea B. Schote and Jobst Meyer

[published as: Mertins, V., A.B. Schote and J. Meyer (2013). Variants of the Monoamine Oxidase A Gene (MAOA) Predict Free-riding Behavior in Women in a Strategic Public Goods Experiment. *Journal of Neuroscience, Psychology, and Economics* 6, 97-114.]

03/2013 Direct Evidence on Income Comparisons and Subjective Well-Being

Laszlo Goerke and Markus Pannenberg

04/2013 Flexibilisation without Hesitation? Temporary Contracts and Workers' Satisfaction

Adrian Chadi and Clemens Hetschko

[published as: Chadi, A and C. Hetschko (2016). Flexibilisation without Hesitation? Temporary Contracts and Job Satisfaction. *Oxford Economic Papers* 68, 217-237.]

05/2013 Structural and Cyclical Effects of Tax Progression

Jana Kremer and Nikolai Stähler

[published as: Kremer, J. and Stähler, N. (2016). Structural and Cyclical Effects of Tax Progression. *FinanzArchiv: Public Finance Analysis* 72, 41-73.]

06/2013 Regional Unemployment and Norm-Induced Effects on Life Satisfaction

Adrian Chadi

[published as: Chadi, A. (2014). Regional Unemployment and Norm-Induced Effects on Life Satisfaction. *Empirical Economics* 46, 1111-1141.]

07/2013 Third Person Effects in Interview Responses on Life Satisfaction

Adrian Chadi

[published as: Chadi, A. (2013). Third Person Effects in Interview Responses on Life Satisfaction. *Journal of Applied Social Science Studies* (*Schmollers Jahrbuch*) 133, 323-333.]

08/2013 The Role of Task Meaning on Output in Groups: Experimental Evidence

Agnes Bäker and Mario Mechtel

[forthcoming as: Mechtel, M. and A. Bäker. The Role of Task Meaning on Output in Groups: Experimental Evidence. *Managerial and Decision Economics*.]

09/2013 Gender Differences in Responsiveness to a Homo Economicus Prime in the Gift-Exchange Game

Vanessa Mertins and Susanne Warning

10/2013 Relative Consumption, Working Time, and Trade Unions

Laszlo Goerke and Inga Hillesheim

[published as: Goerke, L. and I. Hillesheim (2013). Relative Consumption, Working Time, and Trade Unions. *Labour Economics* 24, 170-179.]

11/2013 The Role of Interviewer Encounters in Panel Responses on Life Satisfaction

Adrian Chadi

[published as: Chadi, A. (2013). The Role of Interviewer Encounters in Panel Responses on Life Satisfaction. *Economics Letters* 121, 550-554.]

12/2013 It's the Occupation, Stupid! Explaining Candidates' Success in Low-Information Elections

Mario Mechtel

[published as: Mechtel, M. (2014). It's the occupation, stupid! Explaining candidates' success in low-information elections. *European Journal of Political Economy* 33, 53-70.]

13/2013 Do Overconfident Workers Cooperate Less? The Relationship between Overconfidence and Cooperation in Team Production

Vanessa Mertins and Wolfgang Hoffeld

[published as: Mertins, V. and W. Hoffeld (2015). Do Overconfident Workers Cooperate Less? The Relationship between Overconfidence and Cooperation in Team Production. *Managerial and Decision Economics* 36, 265-274.]

01/2014 Income Tax Buyouts and Income Tax Evasion

Laszlo Goerke

[published as: Goerke, L. (2015). Income Tax Buyouts and Income Tax Evasion. *International Tax and Public Finance* 22, 120-143.]

02/2014 Family Employees and Absenteeism

Jörn Block, Laszlo Goerke, José María Millán and Concepción Román

[published as: Block, J., L. Goerke, J.M. Millán and C. Román (2014). Family employees and absenteeism. *Economics Letters* 123, 94-99.]

03/2014 Dissatisfied with Life or with Being Interviewed? Happiness and Motivation to Participate in a Survey

Adrian Chadi

04/2014 Gambling to Leapfrog in Status?

Tim Friehe and Mario Mechtel

[published as Friehe, T. and M. Mechtel (2015). Gambling to Leapfrog in Status. *Review of Economics of the Household*. 1-29]

05/2014 The Magic of the New: How Job Changes Affect Job Satisfaction

Adrian Chadi and Clemens Hetschko

[forthcoming as Chadi, A. and C. Hetschko. The Magic of the New: How Job Changes Affect Job Satisfaction. *Journal of Economics & Management Strategy*.]

06/2014 The Labor Market Effects of Trade Unions – Layard Meets Melitz

Marco de Pinto and Jochen Michaelis

[published as: de Pinto, M. and J. Michaelis (2016). The Labor Market Effects of Trade Unions – Layard Meets Melitz. *International Economics and Economic Policy* 13(2), 223-232.]

07/2014 Workers' Participation in Wage Setting and Opportunistic Behavior: Evidence from a Gift-Exchange Experiment

Jörg Franke, Ruslan Gurtoviy and Vanessa Mertins

[published as: Franke, J.; Gurtnoviy, R. and Mertins, V. (2016). Workers' participation in wage setting: A gift-exchange experiment. *Journal of Economic Psychology* 56, 151-162.]

08/2014 Wage Delegation in the Field

Sabrina Jeworrek and Vanessa Mertins

09/2014 Tax Evasion by Individuals

Laszlo Goerke

[published as: Goerke, L. (2015). Tax Evasion by Individuals. *Encyclopedia of Law and Economics: Springer Reference*.]

10/2014 Sickness Absence and Works Councils

Daniel Arnold, Tobias Brändle and Laszlo Goerke

[forthcoming as: Arnold, D., T. Brändle and L. Goerke. Sickness Absence and Works Councils – Evidence from German Individual and Linked Employer-Employee Data. *Industrial Relations: A Journal of Economy and Society*.]

11/2014 Positional Income Concerns: Prevalence and Relationship with Personality and Economic Preferences

Tim Friehe, Mario Mechtel and Markus Pannenberg

[forthcoming as: Friehe, T., M. Mechtel and M. Pannenberg. Positional income concerns and personality: evidence from Germany. *Applied Economics Letters*.]

12/2014 Unionization, Information Asymmetry and the De-location of Firms

Marco de Pinto and Jörg Lingens

01/2015 The One Constant: A Causal Effect of Collective Bargaining on Employment Growth? Evidence from German Linked-Employer-Employee Data

Tobias Brändle and Laszlo Goerke

02/2015 How Job Changes Affect People's Lives – Evidence from Subjective Well-being Data

Adrian Chadi and Clemens Hetschko

03/2015 Concerns about the Euro and Happiness in Germany during Times of Crisis

Adrian Chadi

[published as: Chadi, A. (2015). Concerns about the Euro and Happiness in Germany during Times of Crisis. *European Journal of Political Economy* 40, 126-146.]

04/2015 Missing at Work – Sickness-related Absence and Subsequent Job Mobility

Adrian Chadi and Laszlo Goerke

05/2015 Social Identity and Social Free-Riding

Mark Bernard, Florian Hett and Mario Mechtel

[published as: Bernard, M., F. Hett and M. Mechtel. (2016). Social Identity and Social Free-Riding. *European Economic Review* 90, 4-17.]

06/2015 Peer Settings Induce Cheating on Task Performance

Agnes Bäker and Mario Mechtel

07/2015 The Protestant Fiscal Ethic: Religious Confession and Euro Skepticism in Germany

Adrian Chadi and Matthias Krapf

[published as: Chadi, A and Krapf, M. (2017). The Protestant Fiscal Ethic: Religious Confession and Euro Skepticism in Germany. *Economic Inquiry,* 55(4): 1813-1832.]

08/2015 Firm-level versus Sector-level Trade Unions – The Role of Rent-Sharing Motives

Marco de Pinto

[forthcoming as: de Pinto, M. The Impact of Unionization Structures with Heterogeneous Firms and Rent-Sharing Motives. *Scandinavian Journal of Economics*.]

09/2015 Direct Evidence for Income Comparisons and Subjective Well-Being across Reference Groups

Laszlo Goerke and Markus Pannenberg

[published as: Goerke, L. and M. Pannenberg. (2015). Direct Evidence for Income Comparisons and Subjective Well-Being across Reference Groups. *Economics Letters* 137, 95-101.]

10/2015 Leadership and persistency in spontaneous dishonesty

Susanne Braun and Lars Hornuf

11/2015 How are Work-related Characteristics Linked to Sickness Absence and Presenteeism? – Theory and Data –

Daniel Arnold and Marco de Pinto

[published as: Arnold, D. and M. de Pinto. (2015). How are Work-related Characteristics Linked to Sickness Absence and Presenteeism? – Theory and Data. *Journal of Applied Social Science Studies (Schmollers Jahrbuch)* 135(4), 465-498.]

01/2016 Paid Vacation Use: The Role of Works Councils

Laszlo Goerke and Sabrina Jeworrek

02/2016 Identification of Attrition Bias Using Different Types of Panel Refreshments

Adrian Chadi

03/2016 Welfare-enhancing Trade Unions in an Oligopoly with Excessive Entry

Marco de Pinto and Laszlo Goerke

04/2016 Sick Pay Reforms and Health Status in a Unionised Labour Market

Laszlo Goerke

[published as: Goerke, L. (2017). Sick Pay Reforms and Health Status in a Unionised Labour Market. *Scottish Journal of Political Economy* 64(2), 115-142.]

05/2016 Tax Evasion in a Cournot Oligopoly with Endogenous Entry
Laszlo Goerke
[published as: Goerke, L. (2017). Tax Evasion in a Cournot Oligopoly with Endogenous Entry. *International Tax and Public Finance,* 24: 754-779.]

06/2016 The Emergence of the Global Fintech Market: Economic and Technological Determinants
Christian Haddad and Lars Hornuf

01/2017 The Impact of Unionization Costs when Firm-selection Matters
Marco de Pinto and Jörg Lingens

02/2017 Can Television Reduce Xenophobia? The Case of East Germany
Lars Hornuf and Marc Oliver Rieger

03/2017 The effect of cigarette taxes during pregnancy on educational outcomes of the next generation
Sonja Settele and Reyn van Ewijk

04/2017 Social comparisons in oligopsony
Laszlo Goerke and Michael Neugart
[published as: Goerke, L. and M. Neugart. (2017). Social comparisons in oligopsony. Journal of Economic Bahavior & Organization 141, 196-209.]

05/2017 Young, Gifted and Lazy? The Role of Ability and Labor Market Prospects in Student Effort Decisions
Adrian Chadi, Marco de Pinto and Gabriel Schultze

06/2017 Income or Leisure? On the Hidden Benefits of (Un-)Employment
Adrian Chadi and Clemens Hetschko

07/2017 Does Commuting Matter to Subjective Well-Being?
Olga Lorenz

08/2017 Minimum Wages and Vocational Training Incentives in Germany
Kim Leonie Kellermann

09/2017 There Is No Place like Work: Evidence on Health and Labor Market Behavior from Changing Weather Conditions
Adrian Chadi

10/2017 Firm Selection and the Role of Union Heterogeneity
Marco de Pinto and Jochen Michaelis

11/2017 Employment protection legislation and mismatch: evidence from a reform
Fabio Berton, Francesco Devicienti and Sara Grubanov-Boskovic

12/2017 Commuting and Sickness Absence
Laszlo Goerke and Olga Lorenz

01/2018 Wage inequality and structural change
Joanna Tyrowicz and Magdalena Smyk

02/2018 Labor reallocation and demographics
Joanna Tyrowicz and Lucas van der Velde