# CHURNING FLOWS - EXPLANATION TO DISCREPANCY BETWEEN JOB AND WORKER FLOWS: EVIDENCE FROM ESTONIA AND POLICY IMPLICATIONS

Jaan Masso University of Tartu

## Introduction

Labour market flexibility (the ability of labour markets to accommodate shocks and to allocate human resources for their most efficient use) is crucial for economic growth and stability. The labour market flexibility is often considered to be a target of economic policy. An important aspect of it is labour market flows, i.e. the flows of workers between labour market states (employment, unemployment, and inactivity), flows of jobs between firms (job creation and job destruction at the firm level), occupational mobility of workers. By now, various papers have studied these issues also for Estonia, e.g. Eamets (2004) studied worker flows by using the Estonian Labour Force Survey (hereinafter also ELFS) data, Masso et al. (2004) studied job flows using Estonian Business Registry data, Campos and Dabušinskas (2003) investigated occupational mobility during 1989-1995 using the ELFS 1995 data. Still, one aspect that has been neglected, but we argue deserves attention (as we will show soon), is the difference between the jobs and worker flows, so called churning flows (Burgess et al. 1996).

The aim of this paper is to describe the basic dynamics of churning flows in Estonia during the late period of transition and to offer some explanations, why the importance of churning flows may have changed. Here, we need to recall that although sometimes in theoretical models (e.g. the matching model of Mortensen and Pissarides, 1994) the two (job flows and worker flows) are assumed to be equal, in fact there is no good reason why these should be. There are many papers that have analyzed the component of workers flows due to the job creation and destruction (for literature review see e.g. Davis and Haltiwanger 1999, the studies made using transition economies' data are reviewed in Haltiwanger et al. 2003), but relatively few papers have analyzed the worker flows that are over and above the job flows. The few examples in this literature include Burgess et al. (1996, 2000a, 2000b), Tattara and Valentini (2004). Burgess et al (2000b) argue that the distinction between job flows and churning flows isolates the two fundamental processes underlying job and worker reallocation. These are (1) the re-evaluation by the employer of the number of jobs it wants and (2) the re-evaluation by both parties of the match of a particular job and particular worker.

### **Definitions and data**

Following Burgess et al. (1996), the different labour market flows can be defined as follows. If  $E_{it}$  denotes employment at firm *i* at time *t*,  $H_{it}$  is the number of hires

and  $S_{it}$  the number of separations, then it holds that  $E_{it} = E_{it-1} + H_{it} - S_{it}$ . Job flows ( $JF_{it}$ ) is then the net change in employment,  $JF_{it} = E_{it} - E_{it-1} = H_{it} - S_{it}$ , and job reallocation (AJF) is the absolute value of job flows, AJF = |JF|. If aggregated over firms, the job reallocation is the sum of firm level job creations and destructions.

Total worker flows are defined as the sum of hires and separations,  $WF_{it} = H_{it} + S_{it}^{-1}$ . Thus, worker flows can be written also as  $WF_{it} = AJF_{it} + CF_{it}$ , where the second term stands for churning flows, i.e. the worker flows over and above those necessary to achieve the desired employment change ( $CF_{it} = WF_{it} - AJF_{it}$ ). The two components of churning flows are the workers quitting and being replaced and/or the simultaneous firing and hiring by enterprises. Usually these gross job flows and worker flows are expressed as rates by dividing them by the total amount of jobs available in an economy, sector or region. Sometimes the rates are calculated by using as the denominator the average of current and past employment. The rates for worker flows, job reallocation and churning flows are denoted respectively as WFR, AJFR and WFR.

Whereas several earlier papers have studied the problem with matched employeremployee datasets, that is unfortunately not available for Estonia, nor do we know at the enterprise data the values of hirings  $H_{it}$  or separations  $S_{it}$ , thus we have to calculate the worker flow rates from the Estonian Labour Force Surveys (1997-2003), and combine these numbers with the job flow figures calculated from the Estonian Business Registry database. Though workers and jobs flows are calculated from two different sources, these should be still comparable, given that the Business Registry includes data on the population of enterprises and the appropriate surveying weights have been used in calculations of numbers from the ELFS data. We hereby neglect a more detailed description of the data sources in order to save space. The features of Estonian Business Registry database are described in Masso et al. (2004).

### The churning flows in Estonia: dynamics and factors

The churning flows have been analyzed for the USA by Burgess et al. (1996), Burgess et al. (2000a) and Burgess et al (2000b). Burgess et al. (1996) found that in manufacturing 38% of worker flows were not associated with any net change of firm size; in services the figure ranged from 46 to 64%. Concerning other countries, Tattara and Valentini (2004) found from Italian data that churning flows accounted for 65% of all worker flows. According to the OECD data, in OECD countries over

<sup>&</sup>lt;sup>1</sup> Often the worker flows are measured between three labour market states, employment (*E*), unemployment (*U*) and inactivity (*O*). Let us denote *XY* as the flow from state *X* to state *Y*. Then the total number of hirings H = OE + UE + EE and total separations S = EO + EU + EE, where *EE* is job-to-job flow. The corresponding rates are calculated in respect to the employment in base year.

the late 1980's and the early 1990's the worker flows not related to job flows accounted from 60 to 75 % of all worker flows (Cazes and Nesporova 2001). Cazes and Nesporova (2001) studied the labour churning in CEE countries by comparing the job flows estimates obtained from enterprise data and worker flow estimates obtained from labour force surveys. They argued that while structural changes relate only to the process of job creation and job destruction while churning points to labour mobility related to non-structural reasons. Cazes and Nesporova showed that while in Estonia job turnover accounted for almost 40% and in Slovenia about 30 % of overall labour mobility in 1994-1997, then in some other countries (Bulgaria and Russia) the ratio was below 20 %. They interpreted that as the sign of successful reallocation in Estonia compared to excessive workers mobility among low productivity and poorly remunerated old jobs in Bulgaria and Russian Federation.

We start the analysis with having a look at the behaviour of jobs flows, workers flows and churning flows. Tabel 1 depicts the dynamics of these flows in Estonia during 1996-2002. First, we may note that the workers flows (the sum of hirings and separations) has decreased from 41 % in 1996 32 % in 2000, and thereafter stayed basically at the same level. As worker flows have declined in the course of the transition, one might expect job flows to have declined as well. But that has not happened, our job flows estimates are rather stable over the years (23 % in 1996, 24 % in 2000). The job reallocation rate can be interpreted as the sum of firm level job creation and job destruction, i.e. each year the sum of destroyed and created jobs is about one quarter of the total number of jobs in the Estonian economy.

Table 1 Jobs flows, workers flows and churning flows in Estonia, 1995-2002

Year	WFR	Hiring rate	Separation rate	Job realloca- tion, AJFR	CFR/ WFR	Quit rate	Quit rate, non-em- ployed
1996	41%	20%	21%	23%	43%	14.4%	6.0%
1997	35%	17%	18%	27%	23%	12.9%	4.7%
1998	35%	15%	20%	24%	30%	13.2%	6.0%
1999	38%	17%	20%	24%	36%	11.6%	5.9%
2000	32%	16%	17%	24%	25%		5.7%
2001	34%	17%	17%				5.3%
2002	32%	16%	16%				4.9%

Source: Worker flows – Estonian LFS, 1997-2003, author's calculations; Job reallocation – Estonian Business Registry database, author's calculations.

Note. The survey weights have been exploited in calculations using ELFS data. The quit rate could be calculated only till 1999, because since the 3d quarter of year 2000 the reason for the termination of employment relationship was given only for those non-employed during the time of survey, not for each termination of the employment relationship. Therefore, we have also calculated a ratio of currently non-unemployed quitting from the last place of employment to employment (the last column).

Due to these movements, we may say that the churning flows as a percentage of worker flows (the column titled as CFR/WFR) have decreased from 43% in 1996 to 25% in 2000. This data illustrates the so-far unanswered paradox, why have the job flows been rather high and stable during the late transition period in Estonia, while worker flows have decreased considerably. We may also note that the churning flows in Estonia have been fairly low compared with estimates either from developed economies (Burgess et al. 1996) or CEE transition economies.

We argue that there are several explanations (that however call for more formal testing, than we are able to provide hereby) behind the observed dynamics of churning that are related either to decreasing churning of workers by firms (replacement of workers) or decreasing churning of firms by workers (quits).

First of all, we may wonder whether over the observed time period better match has been achieved between workers and jobs. Employers are churning workers in order to improve either the quality of their workforce or to reconfigure their skill mix. The matching might have improved as the result of better personnel policy of firms. It is especially true about white collar workers, because while during earlier period of transition firms had much less knowledge about personnel policy and main method was learning-by-doing then today professional firms are hired to improve firms personnel policy. The managers' differing ability to select well-matched applicants was used as an explanation for the variation of churning flows also by Burgess et al. (2000b). Data about matching is presented in Table 2.

Match quality	Occupation	1996	1997	1998	1999	2000	2001	2002	2003
Job corresponds to education level	Blue collar	78%	78%	79%	80%	78%	79%	80%	80%
to education level	White collar	85%	86%	85%	89%	89%	92%	92%	93%
Job requires a more advanced	Blue collar	3%	3%	2%	2%	3%	2%	2%	2%
level of education	White collar	5%	5%	7%	7%	6%	4%	4%	3%
The respondent's level of	Blue collar	19%	19%	19%	18%	19%	19%	19%	19%
education is higher	White collar	9%	9%	9%	4%	5%	4%	4%	3%

Table 2 Job matching by occupation

Source: author's calculations based on ELFS data. Note. The survey weights have been used in the calculations.

If we look ELFS data (Table 2) we can see that the share of those who answered that their job corresponds to education level, has increased from 85,5% to 93% (1996 and 2003, respectively) among white collar workers and from 79,6 % to 85,7 % among employees with higher levels of education (ISCED 1997 categories 8-10;

data not tabulated here); the changes are marginal among blue collared workers and workers with lower levels of education (ISCED 1997 categories 1-2). We also ran the multinomial regressions to study the effect of job mismatch on the flows from employment (the reference level being the stay in the present job, other options job-to job flow, flow to unemployment and flow to inactivity)<sup>2</sup>. We used both observations where job required more advanced level of education as well as where the respondents' level of education was higher than that required by the job. The mismatch variable had indeed (as expected) a positive impact on the probability to move from one job to the other and movement to unemployment, but a negative impact on the movement to inactivity (though the results were not always significant). We could run the regressions only for 2002 and 2003, for earlier years the job-education match was known only for the end (not for the beginning) of the sample period.

Given the sorting of workers, we could also expect, that the average job match quality (productivity) increases with the time passed after entry into working relationship with the current employer. Anyhow we failed to see such a relationship (the results are available upon request). Another estimation strategy would be to run a wage equation (controlling for relevant individual characteristics) for new hires, to see, whether the dependence of wage on job tenure has changed; we however leave that for future work.

Another measure of the job match quality used in the literature is the length of job tenure at present job (Jovanovic 1979); the argument is that due to the asymmetric information between employers and employees, the quality of job match becomes apparent only in the course of time; since bad matches are dissolved, and good matches continue, the job tenure can be thus used as a measure of match quality. In our data (see Table 3) an inverse U-shaped pattern is observable, the tenure decreased 7.49 years in 1995 to 6.89 years in 1998, but thereafter increased to 7.53 in 2003 (the changes are more apparent among smaller sized firms, while only marginal in large firms) - in the early transition tenure decreased due to increasing labour market flows, but later has started to increase again due to the cooling-off, economic stabilization and the end of structural changes. The job tenure has increased mostly among small firms, and very little among larger firms. The increasing of job tenure with firm size is consistent with the higher gross job flows rates among smaller firms. In the light of interpreting the lower tenure in small firms with weaker enforcement of employment protection (an interpretation due to Cazes and Nesporova 2001), the increasing tenure among small firms may be due to improving law enforcement. The break-down by age shows the increasing tenure among young and middle-aged employees; one may ponder whether the modest increase of tenure among young employees could be associated with decreasing job

 $<sup>^2</sup>$  The control variables in the regressions were age, age squared, nation, sex, marital status, education level dummies, dummy for white-collared workers, 6 industry dummies, and 4 dummies for firm size groups. The detailed results are not presented herein due to the space constraints but are available from author upon request.

shopping (experimentation with different jobs in the beginning of working life) among them.

year	1996	1997	1998	1999	2000	2001	2002	2003
Total average	7.49	7.24	6.92	6.89	7.31	7.32	7.47	7.53
Job matching Job corresponds to education level Job requires a more	7.89	7.64	7.31	7.18	7.74	7.7	7.82	7.87
advanced level of education The respondent's level of	5.61	6	5.26	5.27	5.88	6.29	5.58	6.24
education is higher	5.69	5.32	4.79	5.16	4.64	4.65	4.8	4.88
Enterprise size								
1-10	4.51	4.6	4.3	5.1	5.47	5.58	5.92	5.84
11-19	5.26	5.16	4.98	5.66	6.49	6.46	6.93	6.84
20-49	6.41	6.35	6.51	6.91	7.7	7.5	7.23	7.68
50-99	7.91	7.48	7.51	8.24	8.87	8.39	8.74	9.37
100-199	8.56	8.25	8.66	7.63	9.41	9.11	10.08	9.56
200-499	10.16	9.55	10.06	9.43	9.57	10.77	10.97	10.67
>500	11.34	10.98	10.52	10.78	9.97	12.03	10.14	10.15
Age								
15-29	2.15	2.10	2.41	2.62	2.59	2.63	2.70	2.50
30-44	5.85	5.58	5.27	5.54	5.71	6.05	5.92	6.07
45-74	11.52	11.11	10.24	9.68	10.29	9.97	10.27	10.61

Table 3 Average job tenure by job matching and enterprise size

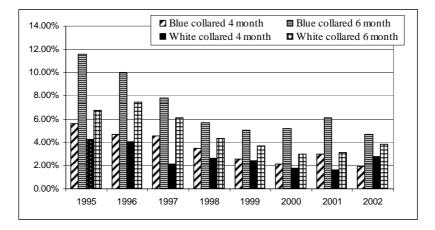
Source: ELFS 1997-2003, author's calculations

Note. The survey weights have been used in the calculations.

Decreasing churning of workers by the firms could be related to the increasing onthe-job training. Generally in CEE countries the within-firm training is on lower levels than in the EU15, the percentage of employees who had not undergone any training over the preceding 12 month was respectively 69 % and 74 % (in Estonia 66 %; EIRO 2004). It could be regarded somewhat normal in the turbulent early transition period. As transition matures and labour market tightens, firms may choose to educate the necessary workforce within the firms instead of trying to find them on the external labour market. In the WLB survey in 1999 the number of workers claiming the training possibilities have increased (decreased) was 21% (15%) (Antila and Ylöstalo, 2002). On the other hand the ELFS data shows the

percentage of workers having participated in training courses over the past 4 weeks not increasing over 1996-2003 (author's calculations).

Burgess et al. (2000b) also noted that excess churning could be in-optimal, as churning rates are associated with lower probabilities of young firm survival (inability to make a good job match may exploit resources; or workers may quit from dying firms and are replaced). Particularly, we could test the explanation by looking at what proportion of new hires are fired during the probation period (or during some time after hiring). The caveat of that approach is that in Estonia probation period is actually used often by entrepreneurs to increase labour flexibility, rather than to sort out appropriate workers. To account for that, we should analyze separately e.g. blue collared and white collared workers. According to the ELFS data during 1996-2003 the probability for the closure of new employment relationship with first 6 month declined among blue collared workers from 11.6 % to 4.7 %, while for the white collared workers the numbers are 6.8 % and 3.9 % (see also Figure 1). The numbers are consistent with the declining churning of workers.



# Figure 1 The failure of new hires, 1996-2003

Source: Estonian Labour Force Survey 1997-2003, author's calculations

Next explanation would be the decreasing rate of restructuring processes and technological changes. The reported job flows rates ( $\Delta N_{it}$ ) under-report the true ones. For instance, when a firm reconfigures its skill mix with keeping the total number of jobs the same, replacing jobs of one type with the other type, the actual job flows is above the net employment change. This unreported job flows is part of the churning flows. We may realistically assume that in the early transition such

flows were more important than now, when the major restructuring processes are over.

In accordance to the end of transition process and fast restructuring of Estonian economy, we can see the ageing of firms. Although the average age of Estonian firms is rather low, because whole market economy is young, it is obvious from previous studies (Masso et al. 2004) that firms' age is increasing (the rates of firm entry and exit are declining). From earlier studies we also know that with increase of firms age workers flows are declining (see Burgess et al 2000), the intuition being that as surviving firms get sorted out after entry, they identify their better workers or particular skill mix they require.

According to the definitions of labour market flows declining rates of quits could explain differences between relatively stable job flows and declining worker flows over time, as well. Quits could decline because working conditions have improved, labour market became more tight (i.e. smaller probability to find a new job after voluntary quits) or due to less job-shopping among young employees (for the latter, see e.g. Johnson 1978). If we look empirical findings from ELFS data, we can see that the share of quits in the case of unemployed people has been relatively stable. During 1994-2000 the share of those who quitted from their previous job and then became unemployed has been between 17-29% from total unemployment (Philips 2001). As far as job-to-job flows have declined we can expect that the total number of quits has declined as well; indeed during 1996-1999 the ratio of quits to employment declined from 14.4 to 11.6 % (see Table 1). Concerning the improving working conditions being an explanation to the declining quits, the Working Life Barometer showed for 2002 compared to 1998 marginal improvement in job satisfaction (81 to 83 %), as well as decreasing work intensity, mental and physical stress (Antila and Ylöstalo, 2002). The Living Conditions Study in Estonia (part of survey NORBALT. Living Conditions in the Baltic Countries) in 1994 and 1999 also record the increasing satisfaction with working hours (from 65 % to 80 %), physical and mental stress, satisfaction with salary.

Finally, part of the job-to-job movements could be in fact the occupational mobility within the same enterprises. In the ELFS, the respondents are to report the changing occupation within the same enterprise as two different jobs. Considering, that the occupational mobility has decreased in Estonia over the time (Campos and Dabušinskas 2003), that could explain part of decreasing churning.

# **Conclusions and implications**

Although the paper is only a preliminary attempt to shed light on the interactions between workers and jobs flows in Estonia, the paper has shown a few facts clearly emerging. There is a clear discrepancy on that while during 1996-2001 worker flows have decreased, job flows have been fairly stable. We set up several possible explanations and found some facts supporting these, e.g. 1) the accordance of job requirements with the worker's qualifications has improved; 2) job tenure has

increased among small firms, young and middle-aged employees; 3) the failure of new hires has decreased.

The study and its results carry important implications for economic policy. In particular, the different explanations for decreasing churning flows carry very different implications for labour market policy. On the one hand, if the churning is decreasing as the consequence of the ending of transition (e.g. firms have become older and identified the kind of workers they need), then that is completely normal, and calls for no policy changes. Another possibility is that the declining churning is connected to the decreasing labour flexibility, i.e. the unsuccessful job-worker matches are not dissolved due to the increasing power of institutions (better law enforcement, workers knowledge about laws are increased, trade unions have became active etc). The latter could result in undesirable economic consequences, like less efficient allocation of human resources.

We have found some evidence that since the accordance of job requirements with the worker's qualifications has improved, the declining churning flows are probably to large extent connected simply to the ending of the transition and transformation processes in Estonia, thus the declining churning flows should not be used as an argument to reshape the labour market policy. The author plans to continue the work on that issue. Additional data e.g. a survey of the personnel managers of firms could be useful to test for the validity of different hypothesis.

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# Kokkuvõte

# VAHETAMISVOOD – SELETUS TÖÖTAJATE JA TÖÖKOHTADE VOOGUDE ERINEVUSELE. FAKTE EESTI KOHTA JA MAJANDUSPOLIITILINE TÄHENDUS

## Jaan Masso Tartu Ülikool

Tööturu paindlikkus (tööturu võime absorbeerida šokke ja tagada tööjõu efektiivne allokatsioon) on oluline majanduskasvu – ja stabiilsuse tegur. Seetõttu loetakse seda ka oluliseks majanduspoliitika eesmärgiks.

Käesoleva artikli eesmärgiks on analüüsida seda osa töötajate voogudest, mis ületab ettevõtetes toimuvat töökohtade loomist ja sulgemist, millele viidatakse kui vahetamisvoogudele (ingl k. *churning flows*). Analüüsi motiveerib see, et kui hilisemal üleminekuperioodil (alates 1996) on töötajate vood (töökajate liikumine tööturuseisundite vahel) langenud, siis töökohtade vood (töökohtade loomine ja sulgemine ettevõttetasandil) on olnud stabiilselt kõrged, niisiis n.ö. vahetamisvood on langenud. Töös pakutakse sellele mitmeid seletusi, mis nõuavad siiski edasist põhjalikumat empiirilist analüüsi.

Töö empiirilises analüüsis on kasutatud Eesti Äriregistri ettevõtete andmebaasi ja Eesti Tööjõuuuringu andmeid aastatest 1996-2003. Andmete analüüsil õnnetus leida järgmist põhjendust vahetusvoogude langemisele: 1) vahetusvood on langenud 418 tulenevalt töökoha nõuete ja inimese kvalifikatsiooni vastavuse paranemisest aja jooksul; 2) keskmine antud töökohal oldud aeg on suurenenud väikeettevõtetes ning noorte ja keskeas töötajate hulgas; 3) uute töösuhete hulgas on vähenenud nende lõppemine vahetult peale töölevõtmist, mis võiks samuti viidata ettevõtete paranenud oskusele töötajaid välja valida.

Erinevad võimalikud põhjused, miks vahetusvood on vähenenud, omavad täiesti erinevat majanduspoliitilist tähendust. Ühelt poolt, kui põhjuseks on üleminekuperioodi lõppemine (ettevõtted on saanud vanemaks ja identifitseerinud, millist liiki tööjõudu nad vajavad), siis ei ole majanduspoliitilised muutused vajalikud. Teiseks võimaluseks on, et voogude vähenemise põhjuseks on tööturu paindlikkuse vähenemine, s.t. antud ametikohale mittesobivaid töötajaid ei vallandata tulenevalt jäigemaks muutuvatest tööturu institutsioonidest (parem seaduste jõustamine, ametiühingute tugevnemine) jne. Antud töös saadi teatavat tõendusmaterjali töötajate kvalifikatsiooni ja töökoha nõuete vastavuse paranemisest, niisiis langevad vahetamisvood on tõenäoliselt suures osas tingitud üleminekuprotsesside lõppemisest Eesti tööturul, niisiis langevate vahetamisvoogudega ei saa põhjendada muutuste vajalikkust tööturupoliitikas.