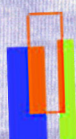# 282

Who leaves and who stays? Outmigration of Estonian immigrants from Finland and its impact on the economic assimilation of Estonian immigrants in Finland

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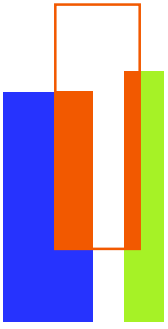Merja Kauhanen

282

Who leaves and who stays? Outmigration of Estonian immigrants from Finland and its impact on the economic assimilation of Estonian immigrants in Finland*

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Tiivistelmä

Tutkimuksessa on analysoitu Suomeen vuosina 2000-2006 tulleiden virolaisten maahanmuuttajien maastamuuttoa ja assimilaatiota työllisyyden ja palkan suhteen. Analyysissä on hyödynnetty rekisteripohjaista paneeliaineistoa. Poismuuton todennäköisyyttä estimoidaan elinaikamallilla, jonka tulokset viittaavat siihen, että korkeat työ- ja yrittäjätulot vähentävät poismuuton todennäköisyyttä alkuvuosina. Myös työvoiman ulkopuolella olemisella näyttää olevan positiivinen vaikutus poismuuttoon. Maahanmuuttajien työssäolotodennäköisyys nousee pääosin ajan myötä pisimpienkin havaittavien maassaolojaksojen aikana eli seitsemäntenäkin maassaolovuonna. Sen sijaan töissä olevien kuukausiansiot eivät neljännen maassaolovuoden jälkeen nouse. Alkuperäinen palkkaero riippuu paljon maahantuloiästä ja sukupuolesta. Työllisyys- ja palkkaprofiilit ovat pääosin samanmuotoisia silloinkin, kun ne maahanmuuttajat, joiden havaitaan poistuvan maasta, poistetaan aineistosta.

Abstract

This paper investigates the outmigration of Estonian immigrants from Finland and their economic assimilation. We use a register-based panel data set on new Estonian immigrants from the years 2000 to 2006 to analyse the determinants of outmigration in a duration model framework and to examine the economic assimilation of Estonian immigrants in terms of wages and employment. The results show that earnings have a negative coefficient in the estimated hazard function, in particular when interacted with the second to the fourth years of migration spells. In terms of employment, there is a considerable employment differential between immigrants and natives in the first year of immigration spells, but this gap narrows over time even in the longest observed durations. Employment assimilation also occurs within individual work histories. For wages, the initial immigrant-native gap is heavily dependent on the age at arrival and gender. Though immigrants initially gain in terms of wage, this trend fades after a few years. When we exclude those who are identified as outmigrants we observe qualitatively similar patterns.

1. Introduction

Permanent migration and its consequences have been widely researched in the economic literature. Although temporary migration is a significant phenomenon of migration behaviour, i.e. many of the immigrants leave the host country after some time[1], the role of outmigration has been frequently neglected in the analysis of the economic consequences of immigration. In particular, less attention has been paid in empirical literature to the selective nature of outmigration, i.e. those migrants who leave the host country are not randomly selected. Yet outmigration patterns may have significant consequences for the overall contribution of immigrants to the host country (Constant and Massey, 2003). The timing of emigration and the profiles of those who leave and those who stay have an impact on immigrants' contribution to the tax base and welfare participation (Reagan and Olsen, 2000). If outmigrants are non-randomly selected, outmigration may also distort measures of assimilation. It is also important to take selective emigration into account when one is measuring the economic effect of immigration on natives: temporary migration may lead to heterogeneity in assimilation patterns, as well as across immigrants, which cannot be captured by the standard set of human capital variables. Understanding factors that influence outmigration are also important for designing immigration policies.

The purpose of this paper is to study the determinants of the outmigration of Estonian immigrants in Finland, and to study the economic assimilation of immigrants as measured by the convergence of earnings and employment in comparison with working-age natives and also to observe the impact of selective outmigration. We utilise a register-based panel data set of new Estonian immigrants in Finland from the years 2000 to 2007 and we attempt to control for unobserved heterogeneity in our analyses by using the standard panel methods. We also contribute to the earlier literature by providing new information about re-migration and economic assimilation patterns among immigrants in the context of East-West migration. We focus on Estonian immigrants who constitute the second largest immigrant group in Finland and of which group a non-negligible number re-migrate within a couple of years of their arrival. The Estonian-Finnish country-pair provides an interesting case for analysing re-migration patterns: Finland and Estonia represent neighbouring countries with similar languages, but the wage and welfare gaps are of significant magnitude. As

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[1] A large proportion of economic migrations are temporary, and immigrants are inclined to return to their countries of origin. Return migration is the most common form of temporary migration. The other sub-categories of temporary migration are contract, circulatory and transient migration (Dustmann et al. 2003).

our data covers the time before and after Estonia joined the EU, we are also able to observe the impact of Estonia's EU membership on Estonian immigrants' outmigration behaviour.

Our results show that outmigration may be partly explained by poor labour market performance: being outside the labour force has a positive coefficient in the estimated hazard of outmigration, and higher labour-related income has a negative coefficient in certain years. Employment assimilation profiles indicate that employment rates of immigrants increase fairly consistently over the duration of their stay, though not every year. A similar pattern is not observed in wages. For those employed, the initial wage gap depends on the age at arrival as well as gender, being non-existent for males who arrive at the age of 19-24, and very large for those arriving at age 45-40 and generally wider for women. Immigrants' wages increase during the first years of migration spells compared with natives', but the growth subsides after year four. We are not able to control for education levels, which may have implications for the size of the wage gap in different age groups. Naturally we cannot identify all future leavers, but excluding known outmigrants from the sample does not qualitatively change these assimilation patterns.

The structure of this paper is the following. In section two we briefly survey the earlier theoretical and empirical literature on outmigration and its determinants, as well as on the economic assimilation of immigrants. In section three we describe the data used and provide a descriptive analysis of the groups analysed. In section four we investigate the determinants of the outmigration of Estonian immigrants in a duration-analysis framework. In section five we investigate the economic assimilation of Estonian immigrants in comparison with natives. Section six concludes.

2. Earlier literature

Reasons for outmigration

The theoretical work on immigrants' outmigration/ temporary migration indicates several reasons, such as the optimal life cycle, asymmetric information, erroneous decisions, preferred consumption at home, favourable purchasing power parity and human capital accumulated abroad, that can induce a migrant to return home. Borjas and Bratsberg (1996) show that return migration is a part of the optimal life-cycle if it is profitable for an individual to move abroad to accumulate savings and human capital, and then migrate back to the country of origin. Alternatively, return migration can

occur if the initial migration decision was based on erroneous information about economic opportunities in the destination country. Theoretical work has also attributed the decision to return to motives such as home consumption preferences, the advantages of the higher purchasing power of the host country's currency in the home country, higher returns to human capital acquired abroad in the home country (Dustmann and Weiss, 2007), concern for the well-being of children (Dustmann, 2003), and capital market imperfections (Mesnard, 2004).

Constant and Massey (2003) point out that return migrants are inherently more prone to move because they have already moved once. They also have more accurate information concerning the wage distribution, the language, the culture, and the climate in both the origin and destination countries. Constant and Massey also stress that the role of familial and cultural considerations might be relatively more important in return decisions compared with higher wages and employment opportunities. According to an Estonian survey among return migrants to Estonia, over half of the people who were surveyed stated family reasons as the primary reasons for returning (Krusell, 2009).

As different migrants face different incentives to return, the temporary nature of migrations can reinforce existing migration selection, thus making positive selection more positive and negative selection more negative (Borjas and Bratsberg, 1996). Their theoretical analysis argues that the direction of selection in out-migration depends on whether immigrants were originally positively or negatively selected. If immigrants were positively selected initially, then return immigrants tend to be the worst of the best; but if they were negatively selected, they tend to be the best of the worst.

Most studies on return migration using longitudinal data indicate that those returning are less successful in the host country's labour market than the permanent stayers are. Edin et al. (2000) found with Swedish data that among economic immigrants those who return are the least successful economically, i.e. they earn less and participate less in the labour market. According to Constant and Massey's (2003) results with German data, emigrants are negatively selected with respect to occupational prestige and stable full-time employment. The range and nature of social attachments to Germany and countries of origin also strongly influence the probability of return migration. Borjas and Bratsberg (1996) examined the quality of outmigrants from the USA, using the wages of remaining immigrants as a proxy for return selection. They find that outmigration decreases the wages of the remaining immigrants if they originate from a country where return to skills is higher (i.e. higher income inequality) than in the USA. Outmigration to countries where income inequality

is lower increases the wages of the remaining immigrants, which indicates that those who return to more equal western countries are negatively selected.

Economic assimilation of immigrants

Bellemare (2003) points out that earnings assimilation can be considered as an important policy parameter, as the economic benefits of immigration for the host country crucially depend on the earnings differentials of natives and immigrants. Successful assimilation might also narrow earnings inequality in the host country. Assimilation also serves as an indicator that the host country is able to absorb the labour force expansion that results from immigration.

Beginning with Chiswick's seminal study (1979), the mainstream/classical way of testing the assimilation of immigrants has relied on a definition that equates the concept of economic assimilation with the rate of convergence between immigrants and natives in the host country (Borjas 1999). This assimilation hypothesis states that immigrants suffer an initial earnings disadvantage compared with natives because they have lower host country-specific human capital. With years of residence in the host country this gap should narrow because immigrants obtain host country experience, learn the local labour market customs, and learn the local language (e.g. Chiswick 1978, Borjas 1999). The speed of assimilation depends on how much immigrants invest in this human capital. According to Dustmann (1993, 1994) the intended length of stay and language proficiency are good predictors of economic assimilation. Friedberg (1992) has emphasised the importance of controlling for the age at which the immigrant arrives in the country for the relative earnings development.

A different definition of economic assimilation has been proposed by LaLonde and Topel (1992), where assimilation occurs if it is discovered that, of two equivalent foreign-born persons who have been observed between two dates, the one who has spent a longer time in the host country earns more The comparison group in this case is the immigrant himself instead of the native. (Borjas 1999)

Research on the labour market assimilation of immigrants has evolved from earlier studies of economic assimilation based on a single cross-section data set to studies of repeated cross-sections ('quasi-panels'), and increasingly in recent years to the use of longitudinal data (Kaushal, 2011, 323). Based on a single cross-section, 1970 US Census, Chiswick's seminal research (1978) found

that immigrants' earnings were assimilated to those of native US workers after 15 years. Borjas (1985), using repeated cross-sections of the same census, did not find as strong assimilation impact when taking into account the cohort quality of immigrants. The synthetic cohort framework proposed by Borjas has thereafter been widely adopted in studies on the economic assimilation of immigrants.

The analyses using quasi-panel data have also been recognized as suffering from shortcomings owing to the non-random outmigration of immigrants, changes in the composition of samples over time, and the difficulty of disentangling longitudinal changes from the period effects (Borjas 1994, Chiswick et al. 2002, Hu 2000).

The wider availability of longitudinal data sets has made it possible to take these factors into account, such as the bias caused by the selective outmigration of immigrants. The results based on longitudinal data in comparison with quasi panel data regarding the economic assimilation of immigrants have usually found a slower rate of assimilation. Muchof this research is related to the earnings assimilation of immigrants in comparison with natives in the US labour market (e.g. Borjas 1988, Hu 2000, Duleep and Dowhan 2002, Lubotsky 2007). Hu's (2000) results for earnings growth with a fixed effects model suggest that using longitudinal data for immigrants gives a more pessimistic portrait of immigrants' economic success in the US labour market. Lubotsky (2007) compared the earnings assimilation of immigrants in the USA by using both repeated cross-sections from the decennial census and real longitudinal data. In the same way as Duleep and Dowhan (2002), for example, he allowed varying earnings growth across cohorts. His results from using longitudinal data indicate that the closing of the earnings gap between immigrants and natives is half as fast as the results from the repeated cross-sections.

Similar results of slower assimilation when longitudinal data is used instead of quasi-panel data have been obtained from earnings assimilation studies from other countries as well, such as Edin et al. (2000) with Swedish data, Hum and Simpson (2004) with Canadian data, and Fertig and Schurer (2007) with German data, to give a few examples. An exception is Picot and Piraino (2011), who do not find a similar upward bias in the immigrant-native born earnings gap computed from repeated cross-sections compared with true longitudinal data using Canadian data[2].

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[2] In addition, Longva's (2000) results for Norway and Constant and Massey's (2003) cross-sectional analysis for Germany suggest that the exclusion of the outmigrants did not alter the predicted earnings profile of immigrants.

3. Data and profiles of Estonian outmigrants

This paper uses a representative micro-level register data set of newly arrived Estonian working-age immigrants and similar data on Finnish working-age natives from the years 2000 to 2007. The original data consists of 154,944 observations and 22,145 individuals, though some exclusions are made in the analysis.

The data was constructed as follows. A random sample (40%) of the new Estonian immigrants during 2000-2006 was extracted from the Finnish population register and this sample was followed from their entry to the year 2007 or to the possible exit. As the Finnish population register includes information about those immigrants whose stay in Finland lasts at least for a year, short-term temporary immigrants are not included in our data. Register data on Estonian immigrants' labour market status, income and social security transfers etc. while staying in Finland was collected from different Finnish registers such as the employment register, the tax register and the register of Social Insurance Institution by Statistics Finland and matched to the sample. For comparison purposes a random sample (0.5%) was drawn of the native Finnish working-age population.

We define outmigrants as those Estonian immigrants who leave our sample, i.e. cease to be observed. This may be due to their return to Estonia, migration to a third country, or death. The data do not allow us to distinguish between these groups. The overall re-migration rate of the migrants in our data is approximately 12 per cent. In the duration and regression analyses where we need to identify leavers, the observations for the year 2007 are excluded. Identifying outmigrants is based on observing whether they occur in the data the following year, and for the last year of the panel this is not possible.

Table 1 presents descriptive statistics of the key variables for the working-age Finnish natives, for all Estonian immigrants, and Estonian immigrants divided into stayers and outmigrants. On the basis of descriptive statistics Estonian immigrants are, on average, younger than the Finnish natives in the sample, are less often married, and have fewer children under 18 years of age. The average monthly earnings of immigrants are lower compared with the Finnish natives and they also have fewer working months annually.

A separate descriptive analysis for those immigrants who stay and who outmigrate implies that the outmigrants might be a selected group. Those immigrants who outmigrate from Finland are more

often males, younger, not married, and have fewer children under 18 years compared to those who stay in Finland. On the basis of average annual earnings (including zero income) and working months per year, outmigrants seem to be less attached to employment compared to the group of stayers, as their average earnings and the number of average working months are lower. Compared with the stayers a larger share of the outmigrants also belong to the lowest earnings quartile. They also experience more unemployment. Based on these descriptive statistics it would therefore seem that those immigrants who are less attached to the labour market and belong more often to the lower earnings quartiles leave Finland.

Figure 1 shows the survival probabilities for each cohort of Estonian immigrants in the data. It is obvious that a non-negligible share of Estonian immigrants re-migrate during this period. Between 2003 and 2004 there was a steep drop in the share of survivors, or an increase in the share of outmigrants. This phenomenon is obvious for all cohorts that were present in 2003.
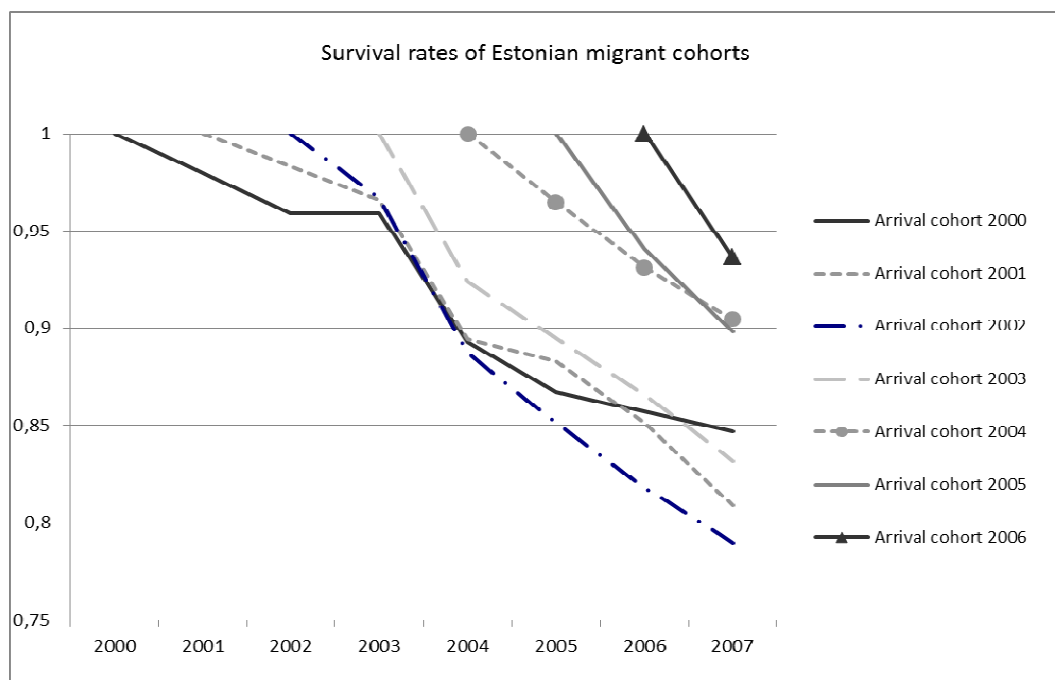
Figure 1. Survival rates of different migrant cohorts.

The most likely reason for the increase in re-migration is Estonia's membership of the European Union, which commenced in June 2004. After this date the entry of Estonians into Finland and other EU countries was significantly facilitated. Completely free mobility of labour between the two countries was not implemented until 2006, but on the basis of free mobility of services it became very easy to enter Finland for short-term working spells. Migrants from the new member

countries, including Estonia, were also given priority over non-EU migrants in the granting of work permits. Temporary migrants are not included in the data, but the changes may have encouraged some individuals to return and take up permanent residence in Estonia and continue working in Finland on a short-term basis. The easing of entry into Finland may also have increased the return migration of those who wish to work and reside in Finland in the long run but experience temporary push-or-pull factors such as difficulties in finding employment or increased opportunities in Estonia. They may have decided to return to Estonia with the aim to relocate back to Finland later. Some re-migration may have been directed to the other EU countries.

Figure 2 presents the average real monthly earnings (including wages and entrepreneurial income but not social security and other income transfers) by years since immigration for individuals who have not been observed to leave Finland during the period that the data cover (stayers) and those who re-migrate[3]. Individuals with no earnings or missing information (which in most cases implies that they have not been employed at all) are included as zeroes. Those who return have generally lower monthly earnings with the exception of those who re-migrated after six years. The number of observations for re-migrants, however, is reduced quite significantly over time, so the values for high durations are relatively unreliable.
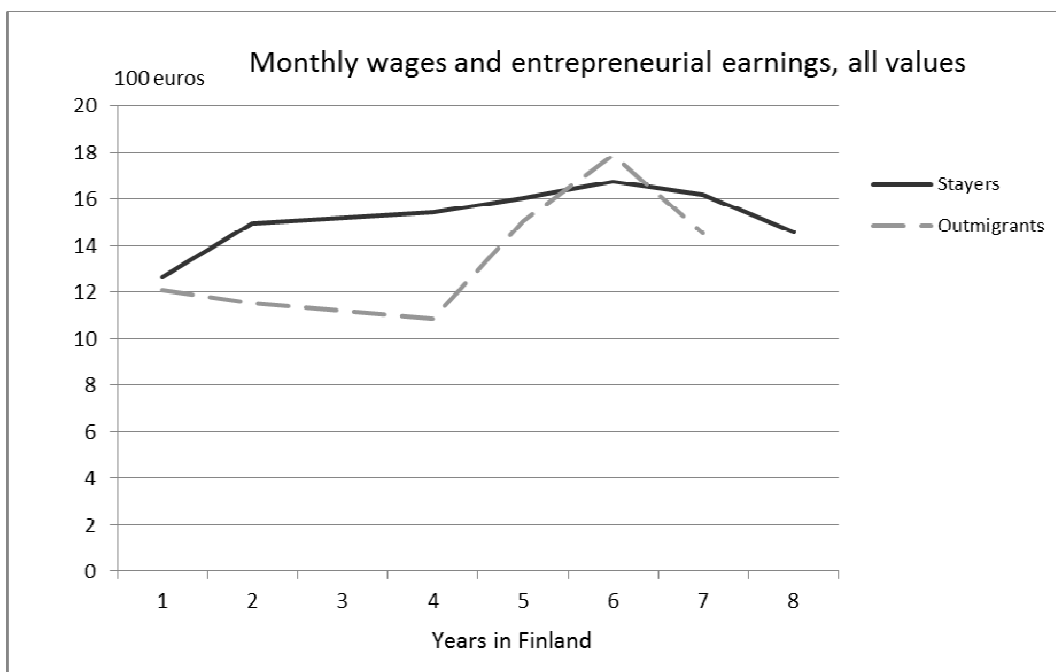
Figure 2. Average monthly wages and entrepreneurial income of stayers and outmigrants.

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[3] Each point includes all observations of individuals observed at that duration.

If we only include values larger than zero, the picture changes (Figure 3). There is a visible difference between stayers and re-migrants only at the duration of seven years where the earnings of outmigrants are very low. The number of re-migrants who leave after seven 7 years of residence, however, is very small. It seems that, for employed individuals in general, there is no major difference in labour earnings between those who re-migrate and those who do not.

Figure 3. Average monthly wages and entrepreneurial income of stayers and outmigrants.

These descriptive analyses suggest that there are two main features of re-migration. A part of the difference in earnings levels between stayers and re-migrants clearly arises from different levels of employment and/or selection into the labour force rather than from a pure wage differential. On the other hand, in terms of total monthly or annual earnings it seems that during the first four years of residence in Finland those who re-migrate earn less than those who do not. In figures 2 and 3 we have not separated individuals by the length of completed migration spells. Hence, the pattern of earnings for leavers may be due to outmigrating individuals with longer spells either having higher earnings all the time, or experiencing earnings growth towards the end of their stay or a combination of the two.

In figure 4 we have graphed separately the average monthly earnings for those migrants who stayed four years or less and those who stayed longer than four years, including only those individuals who are observed to leave. Those who leave early earn, on average, less every year of their stay and the

difference increases steeply during the second and third year. This suggests that early leavers perform consistently worse, whereas those who re-migrate later do not experience an equal disadvantage in the early years of their spell of migration.

Figure 4. Average monthly earnings of outmigrants with different durations of the migration spell.

4. Determinants of outmigration

In the above analysis, possible differences in the characteristics or the timing of arrival and departure of stayers and outmigrants were not taken into account. Furthermore, the migration spells of "stayers" are actually censored, so treating them (especially those of short durations) as if they represent a process essentially different from the spells that have genuinely ended may lead to a bias. The correct way to analyse these data and wholly incorporate incomplete spells into the analysis is to use methods of duration analysis.

For our interval-censored data we use a complementary log-log model which is essentially a discrete time representation of a continuous time proportional hazard model (see Jenkins 2005). In the model, hazard of the event taking place during an interval j of unit length is defined as:

(1) $$h(j, X) = 1 - \exp\left[- \exp\left(\beta'X + \gamma_j\right)\right]$$

where j=1…j are individuals, X are explanatory variables and gamma includes a random error term. As in all duration models, individuals may be heterogeneous in terms of their exit probability. Failing to take this into account may lead to misleading estimates of duration dependency. Those with higher individual exit probability leave early, irrespective of whether exit probability in general is higher at the beginning of each spell. In the context of a clog-log model a certain distribution for the underlying heterogeneity can be assumed and incorporated into the likelihood function. We also estimate a cloglog model with the assumption of Gamma distributed individual heterogeneity assumption by using Stephen Jenkins' Stata programme pgmhaz. Taking individual heterogeneity into account, however, does not change the estimates significantly, so we report the results from the basic cloglog specification.

In addition to the dummies indicating the elapsed duration of the migration spell, we include, as explanatory variables, the log of monthly labour-related income[4], its interaction with the duration dummies, marital status, gender, age at the start of the spell, labour force participation status, socio-economic status[5] and the amount of benefits received as well as a dummy for receiving unemployment benefits. We conduct the analysis for the whole sample and separately for those who arrived before EU membership and after it. For the pooled sample of all immigrants, as can be seen from the coefficients of the interactions of earnings and duration, the impact of monthly earnings on outmigration probability varies over the duration of migration spells (Table 1 in the Appendix, column 1). The most significant negative coefficient occurs in the years 2-4; in the first year and after year 4 the coefficients are insignificant[6]. This can be seen as further evidence that short-term migration or speedy return to Estonia or migration to another country is motivated by economic considerations. Demographic variables such as marriage, the presence of under-age children and female gender interacted with these variables have a predictable effect: marriage has a negative coefficient, as does the presence of children under 18 for men. For women the coefficient is positive. A dummy for having received unemployment benefit also has a negative sign and is significant for the pooled sample. Total transfers of income also seem to have a negative impact on the outmigration hazard. The effect of income transfers as well as that of unemployment benefits may reflect the role of social integration. Given their income, individuals receiving transfers

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[4] We added a value of 0.0001 to all observations in order to avoid the missing values of the logarithm.
[5] We imputed the missing values of socioeconomic status; the comparison group is blue collar worker/other, and self-employed, low white collar and high white collar can only be equal to one for those working.
[6] We find a similar pattern when we use total income instead of monthly labour-related earnings.

probably have more knowledge of the benefit system and Finnish institutions and they may also have better language skills, making it easier to obtain the benefits.

The negative coefficient of higher monthly labour income is larger in absolute value before EU membership than after (columns 2 and 3, table 1 in the Appendix). With less constrained mobility of labour between the two countries after 2003 it would be plausible that the relationship between income/earnings and re-migration persisted after 2003, but possibly due to a short period and few observations available for analysis we do not observe significant coefficients. As suggested by the descriptive figures, the annual dummy in 2003 has a positive coefficient. Perhaps the approaching EU membership made it possible or profitable for some of the Estonian immigrants in Finland to return. In general, it seems that the likelihood of outmigration decreases with durations of three and four years in the total sample.

It has to be emphasised that this analysis cannot fully control for the fact that those who earn generally less during their migration spell and return after a few years may have initially planned temporary migration. Their aim may have been to accumulate human capital or a certain amount of savings. This may have implications for the effort they put into learning the language or finding a job with a high match value. In order to study a pure causal impact of earnings on re-migration probability we would need to have a source of exogenous variation in earnings that could be used as an instrumental variable (for example, involuntary lay-offs as a result of plant closures or exogenous wage shocks). These data do not have information that could be used as such an instrument.

Though the duration analysis presented above also clearly suggests that selection into re-migration is, if anything, negative in terms of labour-related income for certain years, it is not obvious whether leavers have a different level of employment and/or wage throughout their stay. Instead of or in addition to this, they may experience a dissimilar pattern of changes in their labour market performance. As pointed out in the introduction, the behaviour of outmigrants may also influence measures of assimilation. This may occur because of differences in levels and growth rates of employment and wages. In the following section we estimate equations for employment probability and the logarithm of wages for immigrants and a comparison sample of natives in order to disentangle these differences.

5. Assimilation

In studying the economic assimilation of Estonian immigrants we rely on a widely used definition that equates the concept of economic assimilation with the rate of convergence between immigrants and natives in the host country. In particular, we study the rate of convergence of employment and wages between Estonian immigrants and natives. On the basis of the above analysis it seems that the individuals who outmigrate early may experience different patterns of employment and/or wage, either in terms of levels or changes. Returns to education and to labour force experience usually differ between natives and immigrants, which, in turn, may generate different tradeoffs between leisure and consumption, and may lead to differing selection into employment (Bellemare, 2003).

Our specification resembles the one used by Chiswick (1978) and Borjas (1989), for example:

$$(2) \qquad y_{it} = \alpha_i + X_{it}\beta + \gamma A_{it} + \delta Y_{it} + \theta I_i + \lambda YSM_{it} {*} I_i + \mu C_{it} {*} I_i + \rho A_{ar,i} {*} I_i + \varepsilon_{it}$$

where y is employment or log(wage) for individual i in year t, X is a vector of socioeconomic variables which are assumed to affect earnings capacity, Y is the year dummy, I is the indicator variable for immigrant status, YSM is the years since migration, C_i is the arrival-cohort fixed effect, where i denotes the year of arrival, A_{ar} is the age at arrival in the host country, and ε is the error term which may include an individual specific term. We control for the years since migration by including a full set of dummies for the elapsed duration[7]. For the age at arrival, we use dummies for five year age brackets. We impose a restriction on the parameters that the coefficients for age and period effects (*γ* and *δ)* are the same for immigrants and natives in order to obtain the measure of assimilation (see Borjas 1999).

In the following we estimate separately employment probabilities and wage regressions for migrants as well as a comparison group of natives by using OLS and fixed effects methods[8]. In the basic OLS model an assumption made in both estimations is that migrants' employment and wages are assumed to differ from those of natives by a level effect that changes over time and depends on the number of years they spend in the country as well as the age at which they arrived. Their level of employment and wages also depend on the year they entered Finland as well as standard

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[7] We also have an extra set of dummies for the years spent in the country for those who arrived after the start of EU membership.
[8] We also conducted first difference estimations, the results of which were largely similar to those of the fixed effects estimations.

demographic variables such as age, gender, marital status, the presence of children under 18 and region. Wages also depend on dummies derived from the socio-economic status recorded in the data. The inclusion of these variables controls for the most obvious sources of heterogeneity among immigrants. Education, however, is not directly observable in the data, as qualifications obtained abroad that most immigrants hold are not coded consistently. In addition, an interaction term of the migrant dummy with gender is included in the equations.

With panel data, we are able to conduct both standard OLS regressions and fixed effect estimations where individuals are compared to their own level of employment or wages, reflecting within individual changes in these over time. There is no easy way to incorporate individual fixed effects into a non-linear probability model. Therefore we use a linear probability model for the probability of employment[9].

Naturally, differences in selection into employment may influence the migrant parameters of the wage equation. In a cross-section, using the Heckman sample selection correction is the standard way to control for possible differences in the selection process (see Dustmann and Rochina–Barrachina 2007) and obtain correct estimates for the determinants of wages. This takes into account the fact that we only observe wages for individuals whose wage exceeds their reservation utility from working or, from the employers' point of view, their expected productivity. In the case of migrants this may, for example, lead to overestimating the wage gap between migrants and natives, if migrants accept work for a lower wage. However, there is no single standard way to implement the Heckman procedure with panel data, though various approaches have been proposed (see, for example, Dustmann and Rochina–Barrachina 2007). They generally require further assumptions to be made about the selection equation and the equation of interest. If the selection term in wage equations arising from selection into employment is fixed over time, using panel methods that remove fixed effects in the standard wage equation will solve the problem. With fixed effects we are then able to trace the genuine within individual improvements in migrants' wages over time.

We do not have variables that could be used to instrument the decision to re-migrate in a wage or employment equation. In order to analyse the impact that outmigration has on the estimates we run each regression separately for the whole sample, and a sample that excludes those who are observed to leave Finland. Both groups also include individuals who are future outmigrants but are not

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[9] In order for the wage and employment equations to be consistent, we define "employment" as having a higher than zero labour-related income during year t.

identified as such. The results are also subject to limitations due to the length of the panel, the longest durations represent only a few cohorts of immigrants. We, for example, observe the individuals that arrived after the EU enlargement for a maximum of three years.

For the employment equation the results from the OLS and fixed effects specifications are presented in figures 5 and 6. The OLS estimate for the total employment gap is the sum of the coefficient of Estonian nationality which indicates the employment difference between a migrant and a similar native (effectively in the first year, as the difference to the latter years is controlled by further dummies) and the coefficient of the corresponding later year of a migration spell. The gap also depends on gender, the age at entry and the year of entry: in the coefficients presented in figures it is implicitly assumed that this is at the base level or 19-24 years, and that the migrant is male and entered in the year 2000[10]. According to the OLS estimates, the migrants' employment probability increases compared to the initial significant gap (-26.7%) relative to natives but immediately after the first year relatively slowly, in year three and four there is effectively no change. For the second year, a part of the increase may be due to the fact that some of the new immigrants do not arrive at the beginning of the year, and thus have less time to look for employment during their first year. A slightly larger leap in employment takes place in year 5. The patterns of the coefficients for the whole sample and the sample of stayers are very similar[11].

A similar pattern can be observed for the estimates where the impact of individual levels has been removed, or fixed effects estimates (figure 6). In the case of these estimates, we can naturally only observe differences compared to migrants' first year in Finland, and the interpretation of the coefficient is not the total employment gap per se. The estimates, however, indicate whether immigrants experience larger or smaller changes in employment rates compared to similar natives during the course of their stay in Finland. The estimates in general are larger than zero, implying that immigrants indeed improve their employment performance during the later years compared to their first year and relative to what is, on average, the change of the employment rate for similar natives.

The fixed effect estimates follow similar patterns for the whole sample as well as the sample of stayers. Overall, the results indicate that while there are slight differences in the average

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[10] The coefficients for the year of entry are, by and large, insignificant, and the age of entry has a significant effect mainly in the older age groups.
[11] Strictly testing the equality of the coefficients from the two samples would require estimating a nested model.

employment growth patterns of all migrants and the sample of stayers, the assimilation pattern of employment rates is not qualitatively different in the two samples.
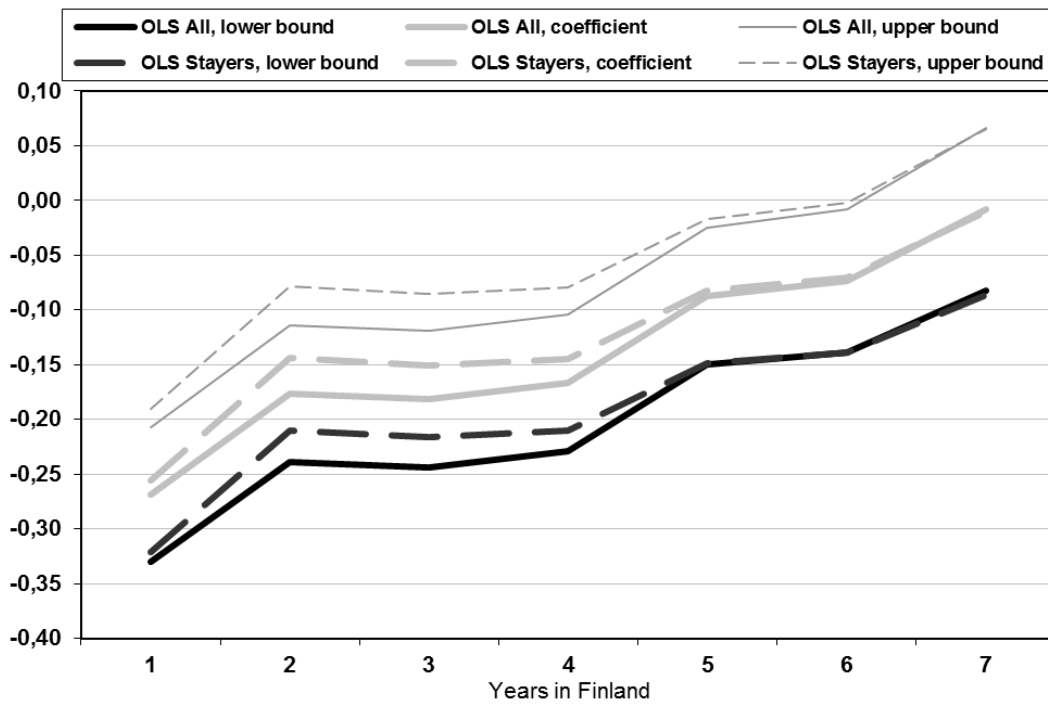
Figure 5. OLS estimates of the employment gap and their 95% confidence intervals.
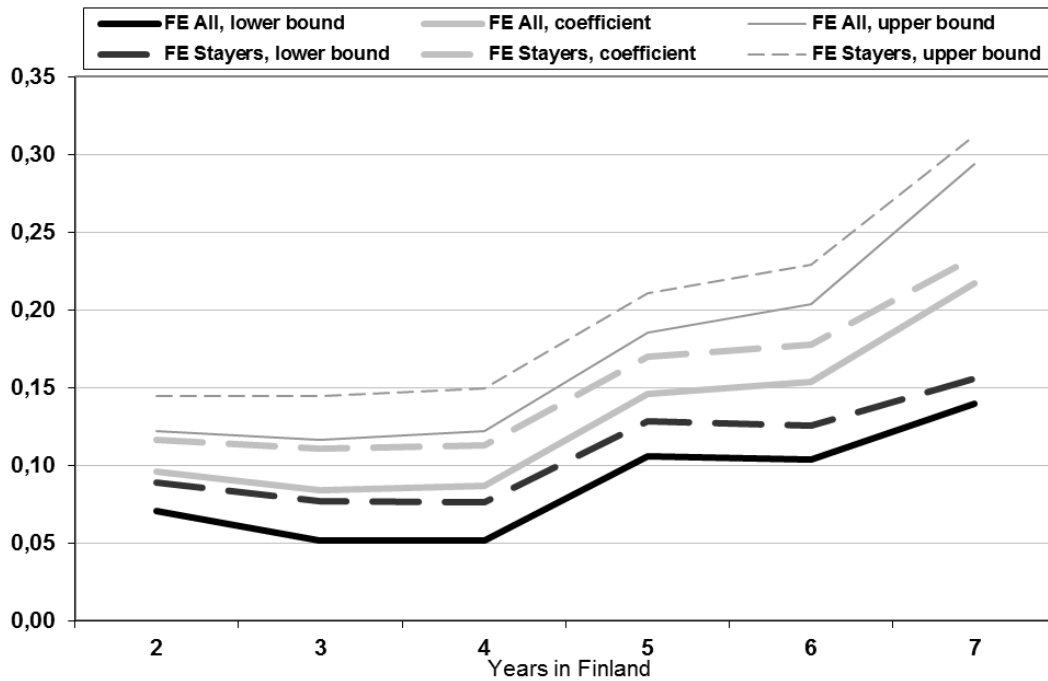
Figure 6. Fixed effects estimates (difference compared to the first year in Finland) and their 95% confidence intervals.

A comparison of the estimates obtained by using different methods provides further insight into what extent immigrants' employment growth in general is due to overall differences in employment levels or different profiles for stayers. In figure 8 we explicitly compare the OLS coefficients and those estimates where fixed effects or individual levels have been removed, taking only into account the change in individual employment rates. The employment profiles for migrants are slightly flatter when fixed effects have been removed or people are compared to their own initial level of employment. However, there is still a rising employment profile.
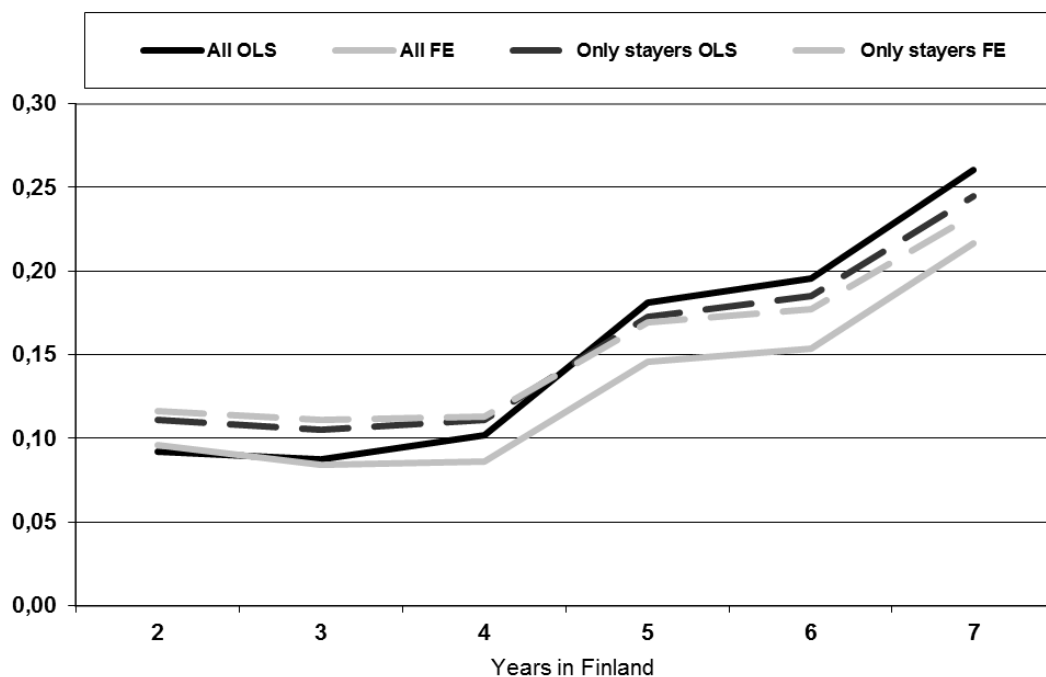
Figure 7. Comparison of the OLS and fixed effects estimators of employment assimilation.

The OLS results from wage estimations (Figure 8 and table 3 in the Appendix) for males who arrived at the age of 30-34 show that wages grow slightly during the first years of migration spells, but the increase becomes minimal or even negative after the fourth year. The initial wage differential between natives and migrants, given that the individual is employed, depends heavily on the age at arrival as well as gender, but the assimilation profile is constrained to be similar for all individuals.

The results are very similar for both the whole sample and the sample restricted to stayers (see table 3 in the Appendix). The fixed effects estimates (figure 10 and table 3 in the Appendix) show similar

profiles that indicate an increase compared to the individual's own initial wage level, but no significantly higher total wage growth compared to natives over long durations.
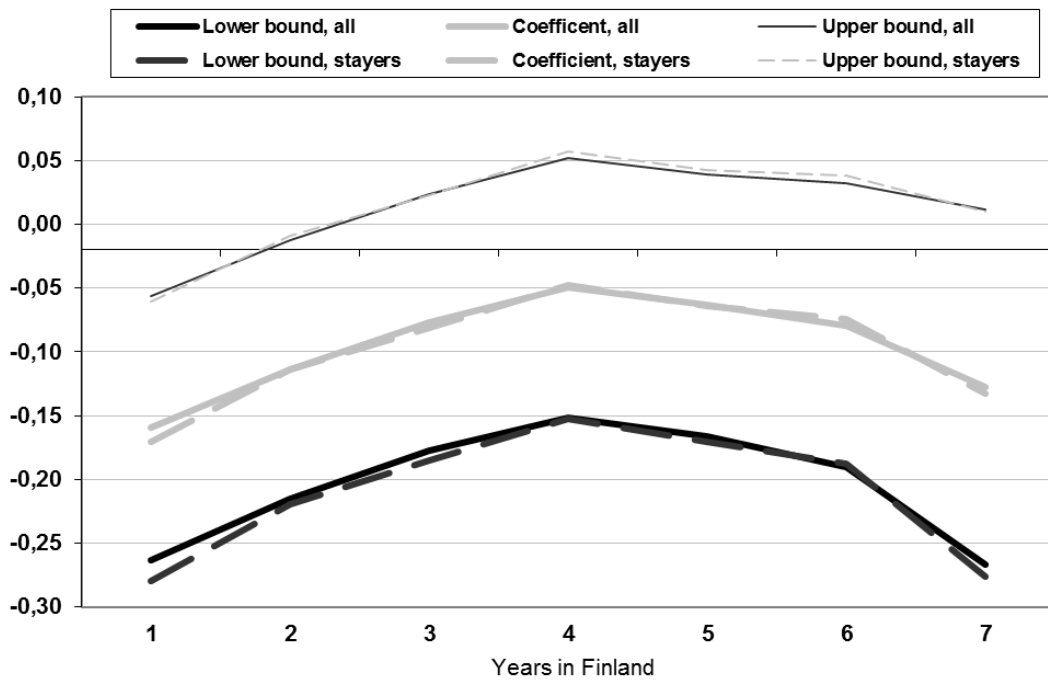
Figure 8. Wage difference between natives and migrants who arrived at the age 30-34 and its 95% confidence interval, OLS estimates.
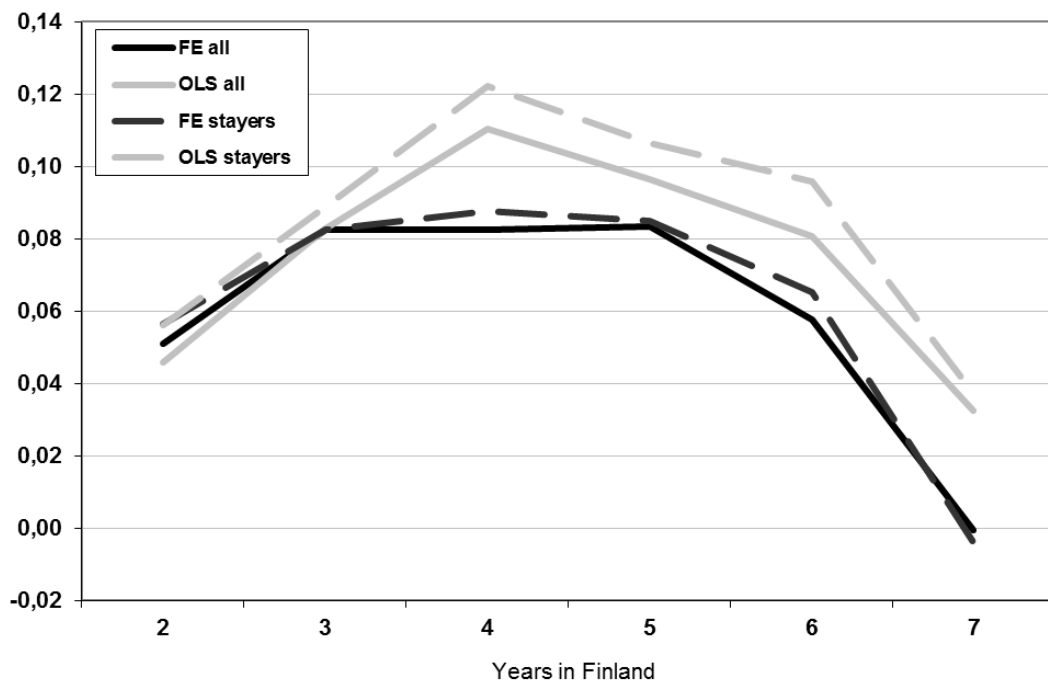
Figure 9. Migrants' wage difference compared to their first year in Finland, OLS and fixed effects estimates.

Overall, it seems that Estonian immigrants' assimilation patterns observed in employment are largely consistent with the traditional view of how migrants' labour market performance improves over time. For wages, there is an obvious initial gap between immigrants and natives for individuals who arrived at or after the age of 30 and women, whereas for immigrants who arrived before the age of 30 the initial gap is not equally significant. Early improvements in immigrants' average wage cease over the duration of their migration spell. The length of the panel is not adequate to assess whether those who arrived at an early age maintain the non-existent wage gap compared to natives in the long run.

The measure of the wage gap cannot be equated with discrimination or even occupational downgrading, as we do not have measures of education in our data. On the basis of our results from another paper (Kauhanen and Kangasniemi 2012), immigrants from Central and Eastern European countries (mainly Estonia) do not typically hold tertiary qualifications. Thus, for some groups of people the estimated initial wage gap may even exaggerate the disadvantage that Estonian immigrants face. On the other hand, the most relevant education level for younger individuals is probably secondary education, which is relatively common among CEE immigrants, and therefore inclusion of education controls could increase the wage gap for young immigrants. We cannot control for hours of work, either, and thus higher hours of work among Estonian immigrants could also explain the lack of a wage gap for young arrivals.

The length of the panel implies that the coefficients for longer durations are determined only on the basis of the overall performance of the early immigrant cohorts. Thus, it is possible that with a longer panel we would observe a more consistently narrowing wage gap, though the result may obviously also arise from the lack of opportunities for migrants and the fact that in younger groups the wages of those employed do not eventually differ from natives' wages. Another explanation is that immigrants do not put any effort into job searching, as they only intend to stay for a limited period of time, resulting in a lack of improvement in job matches. Overall, the results are not inconsistent with an earlier study of immigrant assimilation in Finland. Sarvimäki (2011) studies immigrants (split into-OECD and non-OECD immigrants) in 1990-2004 and finds that assimilation in total incomes is largely due to employment assimilation. Our observations are also consistent with his result that a non-random subpopulation of immigrants in Finland leaves after a few years in the country.

6. Conclusions

The enlargement of the European Union initiated almost unrestrained flows of migration from Central and Eastern European countries to Western Europe. This has raised concerns about the burden Eastern European immigrants place on welfare states. These migration flows have also proved to be circular: some of the migrants return to their home countries after just a few years in the host country. The circular pattern of migration may have important implications for the consequences of migration flows on the whole. In this paper we have tried to establish some facts regarding the re-migration and assimilation of Estonian immigrants in Finland in 2000-2007. During this period Estonia joined the EU, and the data also allow us to observe changes in outmigration patterns as a result of membership.

Our descriptive analysis suggests that those who outmigrate experience a lower level of employment and weaker labour force attachment. Our survival analysis indicates that higher monthly labour-related earnings have a negative coefficient when interacted with the early years of migration spells, but these coefficients cease to be significant when the duration of a spell exceeds five years. The regression analysis on immigrant assimilation reveals that, controlling for background characteristics, the immigrants' employment rate increases even in the last years of the longest spells observed, but with little change in some of the earlier years. As for wages, the initial wage gap depends on the age of arrival and gender and during the first few years of migration spells employed immigrants experience wage growth, but with longer spells there is no equally significant difference compared to the migrants' first year in Finland. Excluding the identified outmigrants does not qualitatively change the patterns of assimilation: despite obviously non-random outmigration we also observe genuine improvement in employment and wage outcomes for those who are not observed to leave the sample.

Literature

Bellemare, C. (2003), Identification and estimation of economic models of outmigration using panel attrition. IZA Discussion paper No. 1065.

Borjas, G. J. (1985), Assimilation, changes in cohort quality, and the earnings of immigrants. Journal of Labor Economics 3, 463-489.

Borjas, G. J. (1989), Immigrant and Emigrant Earnings: A Longitudinal Study. Economic Inquiry 27(1), 21-37.

Borjas, G. J. (1999), The Economic Analysis of Immigration, In (D. Card and O. Ashenfelter (eds.)), Handbook of Labor Economics, Vol. 3, Amsterdam: North-Holland.

Borjas, G. J. and Bratsberg, B. (1996), Who Leaves? The Outmigration of the Foreign-Born. The Review of Economic and Statistics 78(1), 165-176.

Chiswick, B. (1978), The Effect of Americanization on the Earnings of Foreign-born Men. The Journal of Political Economy 86(5), 897-921.

Chiswick, B. R., Lee Y. L., Miller, P. W. (2002), Longitudinal Analysis of Immigrant Occupational Mobility: A Test of the Immigrant Assimilation Hypothesis. IZA Discussion Paper No. 452.

Constant, A. and Massey, D. (2003), Self-Selection, Earnings, and Out-Migration: A Longitudinal Study of Immigrants to Germany. Journal of Population Economics 16(?), 631-653.

Duleep, H. and Dowhan, D. (2002), Insights from longitudinal data on the earnings growth of U.S. foreign-born men. Demography 39(3), 485-506.

Dustmann, C. (2003a), Return Migration, Wage Differentials, and the Optimal Migration Duration. European Economic Review, Vol. 47, 353-369.

Dustmann, C. (2003b), Children and Return Migration. Journal of Population Economics, Vol. 16, 815-830.

Edin, P-A., LaLonde, R. and Åslund, O. (2000), Emigration of Immigrants and Measures of immigrant Assimilation: Evidence from Sweden. Swedish Economic Policy Review 7, 163-204.

Fertig, M. and Schurer, S. (2007), Labour Market Outcomes of Immigrants in Germany: The importance of Heterogeneity and Attrition Bias. IZA Discussion paper 2915.

Friedberg, R. M. (1992), The Labor market assimilation of immigrants in the United States: The role of age at arrival. Mimeo (December 1992), Brown University.

Hu, W.-Y. (2000), Immigrant earnings assimilation: estimates from longitudinal data. The American Economic Review Papers and Proceedings of the One Hundred Twelfth Annual Meeting of the American Economic Association, Vol. 90, 368–372.

Hum, D. and Simpson, W. (2004), Reinterpreting the performance of immigrant wages from panel data. Empirical Economics 29, 129-47.

Kaushal, N. (2011), Earning Trajectories of Highly Educated Immigrants: Does Place of Education Matter? Industrial & Labor Relations Review, Vol. 64, No. 2, 323-340.

Krusell, S. (2009), Employment of Estonian Residents Abroad. Eesti Statistika Kvartalikiri – Quarterly Bulletin of Statistics Estonia 2/09, 63-74.

LaLonde, R. and Topel, R. (1992), The Assimilation of Immigrants in the U.S. Labor Market. In G. Borjas and R. Freeman (eds.), Immigration and the Work Force, 67–92, Chicago: University of Chicago Press.

Longva, P. (2001), Out-Migration of Immigrants: Implications for Assimilation Analysis. Memorandum, No. 4, Department of Economics, University of Oslo.

Lubotsky (2007), Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings. Journal of Political Economy, Vol. 115, No. 5, 820-867.

Mesnard, A. (2004), Temporary Migration and Capital Market Imperfections. Oxford Economic Papers, Vol. 56, 242-262.

Picot, G. and Piraino, P. (2011), Immigrant Earnings Growth: Selection Bias or Real Progress? Canadian Labour Market and Skills Researcher Network Working Paper No. 69.

Reagan, P. B. and Olsen, R. J. (2000), You Can Go Home Again: Evidence from Longitudinal Data. Demography 37(3), 339–350.

Sarvimäki, M. (2011), "Assimilation to a Welfare State: Labor Market Performance and Use of Social Benefits by Immigrants to Finland." Scandinavian Journal of Economics, Wiley Blackwell, Vol. 113(3), 665-688, 09.

Table 1. Descriptive statistics of characteristics of Finnish natives, all Estonian immigrants and immigrants subdivided into stayers and outmigrants during 2000-2007 – means and standard deviations (in the brackets).

Variable	Natives	Estonian immigrants	Outmigrants	Stayers
Female	0.496	0.509	0.366	0.523
	(0.499)	(0.499)	(0.482)	(0.499)
Age (average)	41.4	36.6	35.0	36.7
	(13.2)	(10.54)	(10.92)	(10.51)
Age at entry (average)	-	34.7	33.7	34.8
		(10.47)	(10.79)	(10.43)
Age group:				
Age 18-24	0.140	0.123	0.166	0.12
	(0.347)	(0.329)	(0.372)	(0.325)
Age 25-54	0.665	0.819	0.763	0.824
	(0.475)	(0.384)	(0.425)	(0.380)
Age 55-64	0.204	0.057	0.07	0.05
	(0.403)	(0.231)	(0.257)	(0.229)
Married	0.474	0.438	0.338	0.447
	(0.499)	(0.496)	(0.473)	(0.497)
Children under 18	0.352	0.309	0.20	0.32
	(0.477)	(0.462)	(0.400)	(0.466)
Socioeconomic status:				
Entrepreneur	0.047	0.038	0.02	0.039
Upper white-collar worker	0.091	0.049	0.04	0.050
Lower white-collar worker	0.152	0.082	0.05	0.086
Blue-collar worker	0.148	0.412	0.277	0.424
Other	0.186	0.204	0.152	0.208
Socio-economic status is missing	0.375	0.214	0.457	0.192
Monthly earnings (average for the whole period) (>0)	2311.5	2041.4	2031.1	2042.2
	(22.65)	(17.17)	(18.09)	(17.10)
Monthly earnings (average for the whole period) (including zeroes)	1788.6	1428.1	1177.4	1450.6
	(22.12)	(17.14)	(22.12	(17.13)
Annual earnings quartiles by mean earnings for the whole period[1]				
1	21.5	27.4	38.0	26.5
2	25.0	36.9	33.4	37.2
3	26.4	21.5	17.1	21.9
4	27.0	14.1	11.2	14.3
Average number of working months per year for the whole period	10.2	8.93	7.75	9.02
	(3.39)	(3.87)	(4.11)	(3.84)
Number of observations	127,824	12,658	1,042	11,616

Appendix

Table 1. Coefficient estimates of the complementary log-log hazard of outmigration

	(1)	(2)	(3)
	All	Arrival before 2004	Arrival after 2004
Unemployment benefit paid	-0.931**	-0.553	-2.572*
	(-3.12)	(-1.62)	(-2.49)
Entrepreneur	-0.223	-1.228	0.926*
	(-0.58)	(-1.71)	(1.97)
Low white collar	-0.252	-0.537	0.00210
	(-0.84)	(-1.16)	(0.01)
High white collar	-0.0645	-0.491	0.346
	(-0.26)	(-1.31)	(1.06)
Age at entry	-0.00181	-0.00270	-0.000485
	(-0.37)	(-0.41)	(-0.06)
Outside labour force	0.590***	0.524*	0.700**
	(3.57)	(2.40)	(2.82)
Married	-0.311*	-0.264	-0.276
	(-2.04)	(-1.41)	(-1.03)
MarriedXFemale	-0.330	-0.366	-0.552
	(-1.40)	(-1.27)	(-1.22)
Female	-0.279*	-0.172	-0.431*
	(-2.07)	(-0.93)	(-2.15)
Children under 18	-0.721**	-0.996**	-0.500
	(-3.24)	(-2.99)	(-1.66)
FemaleX Children under 18	0.580*	0.954*	0.246
	(2.01)	(2.36)	(0.57)
log(benefits)	-0.0537***	-0.0735***	-0.0289
	(-3.64)	(-3.71)	(-1.31)
log(monthly earnings)	-0.00198	-0.0139	0.00188
	(-0.11)	(-0.51)	(0.08)
2nd year	-0.219	-0.184	-0.306
	(-1.52)	(-0.75)	(-1.57)
3rd year	-0.485**	-0.225	-0.788*
	(-2.72)	(-0.86)	(-2.45)
4th year	-0.557*	-0.300	
	(-2.37)	(-0.96)	
5th year	-0.172	0.161	
	(-0.74)	(0.46)	
6th year	-0.0153	0.349	
	(-0.06)	(0.89)	
7th year	-1.181	-0.829	
	(-1.05)	(-0.71)	

2nd yearX ln(monthly earnings)	-0.0695**	-0.0951**	-0.0288
	(-3.16)	(-2.83)	(-0.92)
3rd yearX ln(monthly earnings)	-0.0802**	-0.0757*	-0.0518
	(-3.16)	(-2.22)	(-1.12)
4th yearX ln(monthly earnings)	-0.105***	-0.0914*	
	(-3.37)	(-2.50)	
5th yearX ln(monthly earnings)	-0.0168	0.000236	
	(-0.46)	(0.01)	
6th yearX ln(monthly earnings)	0.0549	0.0734	
	(1.10)	(1.37)	
7th yearX ln(monthly earnings)	0.234	0.251	
	(0.71)	(0.76)	
Year 2001	-0.242	-0.248	
	(-0.41)	(-0.41)	
Year 2002	-0.0605	-0.0962	
	(-0.11)	(-0.17)	
Year 2003	1.330*	1.263*	
	(2.57)	(2.38)	
Year 2004	0.395	0.375	
	(0.75)	(0.66)	
Year 2005	0.627	0.398	0.477
	(1.21)	(0.68)	(1.75)
Year 2006	0.713	0.538	0.569*
	(1.38)	(0.89)	(2.19)
Constant	-3.735***	-3.956***	-3.327***
	(-6.72)	(-6.57)	(-8.17)
N	9927	6362	3565

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

Table 2. Coefficient estimates of the linear probability of having labour-related income

	OLS, All Prob(Monthly labour-related earnings>0)	FE, All Prob(Monthly labour-related earnings>0)	OLS, Only stayers Prob(Monthly labour-related earnings>0)	FE, Only stayers Prob(Monthly labour-related earnings>0)
Year 2001	0.009***	-0.004	0.009***	-0.004
	(3.30)	(-1.37)	(3.36)	(-1.37)
Year 2002	0.010**	-0.013***	0.010***	-0.013***
	(3.21)	(-3.72)	(3.30)	(-3.73)
Year 2003	0.005	-0.024***	0.006	-0.024***
	(1.54)	(-6.24)	(1.76)	(-6.16)
Year 2004	0.005	-0.029***	0.005	-0.029***
	(1.60)	(-6.70)	(1.43)	(-6.78)
Year 2005	-0.004	-0.042***	-0.004	-0.042***
	(-1.16)	(-8.69)	(-1.13)	(-8.73)
Year 2006	0.000	-0.042***	0.000	-0.042***
	(0.01)	(-7.84)	(0.13)	(-7.87)
Estonian	-0.269***	.	-0.256***	.
	(-8.53)	.	(-7.68)	.
Year of entry 2001	0.052	.	0.054	.
	(1.78)	.	(1.74)	.
Year of entry 2002	0.029	.	0.034	.
	(0.94)	.	(1.05)	.
Year of entry 2003	0.077*	.	0.051	.
	(2.44)	.	(1.51)	.
Year of entry 2004	0.005	.	-0.002	.
	(0.01)	.	(-0.01)	.
Year of entry 2005	0.001	.	-0.018	.
	(0.00)	.	(-0.05)	.
Year of entry 2006	0.089	.	0.076	.
	(0.26)	.	(0.23)	.
Age at entry 1518	0.049	.	0.031	.
	(1.10)	.	(0.67)	.
Age at entry 2529	-0.002	.	-0.006	.
	(-0.07)	.	(-0.24)	.
Age at entry 3034	0.020	.	0.022	.
	(0.75)	.	(0.79)	.
Age at entry 3539	0.037	.	0.035	.
	(1.40)	.	(1.27)	.
Age at entry 4044	0.030	.	0.020	.
	(1.10)	.	(0.71)	.
Age at entry 4550	0.101***	.	0.092**	.
	(3.58)	.	(3.11)	.

Age at entry 50 over	0.165***	.	0.153***	.
	(5.26)	.	(4.61)	.
Age_1518	-0.461***	-0.344***	-0.460***	-0.345***
	(-51.44)	(-21.24)	(-51.24)	(-21.31)
Age _1924	-0.041***	-0.110***	-0.040***	-0.110***
	(-5.27)	(-9.67)	(-5.14)	(-9.72)
Age _2529	0.009	-0.049***	0.010	-0.049***
	(1.29)	(-6.42)	(1.51)	(-6.40)
Age _3539	0.010	0.052***	0.011	0.053***
	(1.57)	(7.59)	(1.74)	(7.67)
Age _4044	0.015*	0.089***	0.016*	0.090***
	(2.03)	(9.00)	(2.12)	(9.09)
Age _4549	-0.007	0.108***	-0.007	0.108***
	(-0.93)	(8.61)	(-0.87)	(8.68)
Age _5054	-0.057***	0.105***	-0.056***	0.106***
	(-6.99)	(7.03)	(-6.89)	(7.06)
Age _5559	-0.185***	0.064***	-0.184***	0.065***
	(-19.85)	(3.66)	(-19.81)	(3.73)
Age _60yli	-0.612***	-0.084***	-0.612***	-0.083***
	(-67.63)	(-4.13)	(-67.60)	(-4.08)
Region_2	-0.025**	-0.064**	-0.025**	-0.064**
	(-3.05)	(-3.14)	(-3.09)	(-3.14)
Region _3	-0.042***	-0.061**	-0.043***	-0.060**
	(-5.31)	(-3.03)	(-5.40)	(-2.99)
Region _4	-0.055***	-0.080***	-0.056***	-0.080***
	(-11.24)	(-6.67)	(-11.36)	(-6.61)
Female	0.053***	.	0.053***	.
	(7.71)	.	(7.68)	.
Female&Estonian	-0.162***	.	-0.158***	.
	(-10.63)	.	(-10.02)	.
Married	0.106***	0.019*	0.107***	0.019*
	(16.07)	(2.40)	(16.18)	(2.41)
Female&Married	-0.077***	-0.031*	-0.077***	-0.030*
	(-9.09)	(-2.46)	(-9.04)	(-2.41)
Children under 18	0.048***	-0.021***	0.047***	-0.021***
	(8.26)	(-3.34)	(8.09)	(-3.40)
Female&Children under 18	-0.096***	-0.061***	-0.095***	-0.061***
	(-12.15)	(-6.43)	(-12.11)	(-6.38)
2nd year	0.092***	0.096***	0.111***	0.116***
	(7.66)	(7.35)	(8.61)	(8.24)
3rd year	0.087***	0.084***	0.105***	0.111***
	(5.78)	(5.10)	(6.61)	(6.39)
4th year	0.102***	0.086***	0.111***	0.113***
	(6.17)	(4.81)	(6.45)	(6.02)

5th year	0.181***	0.146***	0.173***	0.169***
	(9.67)	(7.16)	(8.86)	(8.05)
6th year	0.195***	0.153***	0.185***	0.177***
	(8.30)	(6.01)	(7.58)	(6.72)
7th year	0.260***	0.217***	0.245***	0.234***
	(7.22)	(5.51)	(6.67)	(5.87)
1st year for arrivals after EU	0.166	0.057*	0.171	0.082**
	(0.49)	(2.13)	(0.51)	(2.99)
2nd year for arrivals after EU	0.125	0.011	0.115	0.021
	(0.37)	(0.52)	(0.34)	(0.96)
3rd year for arrivals after EU	0.109		0.093	
	(0.32)		(0.28)	
_cons	0.827***	0.807***	0.826***	0.807***
	(103.86)	(72.72)	(103.60)	(72.51)
N	133720	133720	132753	132753

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

Table 3. Coefficient estimates of the wage regression

	All, OLS	All, FE	Only stayers, OLS	Only stayers, FE
	Log(wage)	Log(wage)	Log(wage)	Log(wage)
Year 2001	0.033***	0.005	0.033***	0.005
	(5.29)	(0.92)	(5.24)	(0.89)
Year 2002	0.025***	-0.021***	0.025***	-0.021***
	(3.70)	(-3.66)	(3.74)	(-3.59)
Year 2003	0.058***	-0.006	0.058***	-0.006
	(7.98)	(-0.94)	(7.98)	(-0.97)
Year 2004	0.068***	0.004	0.068***	0.004
	(9.13)	(0.60)	(9.18)	(0.64)
Year 2005	0.084***	-0.009	0.083***	-0.009
	(11.26)	(-1.81)	(11.24)	(-1.79)
Year 2006	0.103***	.	0.103***	.
	(13.61)	.	(13.58)	.
Estonian	0.037	.	0.033	.
	(0.70)	.	(0.59)	.
Year of entry 2001	0.086	.	0.077	.
	(1.87)	.	(1.61)	.
Year of entry 2002	0.038	.	0.036	.
	(0.79)	.	(0.73)	.
Year of entry 2003	0.021	.	0.024	.
	(0.42)	.	(0.45)	.
Year of entry 2004	0.663***	.	0.637***	.
	(10.31)	.	(9.51)	.
Year of entry 2005	0.687***	.	0.663***	.
	(10.72)	.	(9.98)	.
Year of entry 2006	0.637***	.	0.631***	.
	(11.97)	.	(11.20)	.
Age at entry 1518	-0.130	.	-0.129	.
	(-1.64)	.	(-1.57)	.
Age at entry 2529	-0.044	.	-0.033	.
	(-1.06)	.	(-0.75)	.
Age at entry 3034	-0.197***	.	-0.203***	.
	(-4.64)	.	(-4.61)	.
Age at entry 3539	-0.312***	.	-0.306***	.
	(-7.52)	.	(-7.12)	.
Age at entry 4044	-0.331***	.	-0.337***	.
	(-8.02)	.	(-7.83)	.
Age at entry 4550	-0.344***	.	-0.349***	.
	(-7.99)	.	(-7.82)	.
Age at entry 50 over	-0.190***	.	-0.201***	.
	(-4.11)	.	(-4.14)	.

Age	0.129***	0.182***	0.130***	0.182***
	(48.22)	(35.21)	(48.17)	(35.28)
Age squared	-0.001***	-0.002***	-0.001***	-0.002***
	(-41.75)	(-29.85)	(-41.72)	(-29.92)
Region_2	-0.065***	-0.042	-0.067***	-0.044
	(-4.54)	(-0.91)	(-4.63)	(-0.95)
Region _3	-0.064***	-0.065	-0.064***	-0.066
	(-4.34)	(-1.57)	(-4.36)	(-1.59)
Region _4	-0.108***	-0.135***	-0.109***	-0.139***
	(-11.81)	(-4.89)	(-11.87)	(-5.01)
Entrepreneur	-0.304***	-0.190***	-0.305***	-0.192***
	(-13.10)	(-5.21)	(-13.12)	(-5.24)
Upper white collar	0.545***	0.093***	0.545***	0.092***
	(49.42)	(6.01)	(49.30)	(6.00)
Lower white collar	0.229***	0.060***	0.230***	0.060***
	(27.80)	(5.08)	(27.90)	(5.10)
Female	-0.207***	.	-0.207***	.
	(-17.26)	.	(-17.24)	.
FemaleXEstonian	-0.144***	.	-0.145***	.
	(-5.97)	.	(-5.86)	.
Married	0.141***	0.010	0.141***	0.009
	(11.53)	(0.61)	(11.47)	(0.59)
FemaleXMarried	-0.138***	-0.071**	-0.138***	-0.073**
	(-8.54)	(-2.70)	(-8.50)	(-2.79)
Children under 18	-0.028*	-0.061***	-0.028*	-0.061***
	(-2.48)	(-4.83)	(-2.49)	(-4.83)
FemaleX Children under 18	-0.127***	-0.169***	-0.128***	-0.168***
	(-8.08)	(-8.38)	(-8.11)	(-8.33)
2nd year	0.046	0.051	0.056*	0.056
	(1.84)	(1.83)	(2.09)	(1.89)
3rd year	0.083**	0.082*	0.089**	0.083*
	(2.71)	(2.47)	(2.70)	(2.31)
4th year	0.110***	0.083*	0.122***	0.088*
	(3.66)	(2.47)	(3.83)	(2.47)
5th year	0.096**	0.083*	0.106**	0.085*
	(2.82)	(2.17)	(2.92)	(2.10)
6th year	0.081	0.058	0.096*	0.065
	(1.89)	(1.29)	(2.17)	(1.44)
7th year	0.032	-0.001	0.037	-0.004
	(0.49)	(-0.01)	(0.55)	(-0.05)
1st year for arrivals after EU	-0.578***	0.006	-0.554***	0.004
	(-15.21)	(0.12)	(-14.37)	(0.08)

2nd year for arrivals after EU	-0.579***	0.005	-0.558***	-0.003
	(-11.28)	(0.14)	(-10.54)	(-0.07)
3rd year for arrivals after EU	-0.591***		-0.551***	
	(-9.51)		(-8.72)	
_cons	0.294***	-1.057***	0.294***	-1.058***
	(6.25)	(-9.88)	(6.24)	(-9.88)
N	95318	95318	94768	94768