An in-depth analysis of the emigration of skilled labour. Latvia

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Abstract

Emigrant survey data confirm substantial university diploma drain from Latvia to various EU/EFTA destinations during 2000-2014. The share of tertiary educated among emigrants further increased during their stay in the host countries, reaching, by 2014, 45 %. The share of university graduates among Latvian emigrants in each of the destinations under inspection was higher than among their age peers in Latvia.

By 2014, two out of five high-educated Latvian nationals (or former nationals) aged under 25 and more than one-third of their high-educated compatriots aged 25-34 left Latvia between 2000 and 2014. Both overall and in each age group, high-educated people were more likely to emigrate than were their medium-educated counterparts.

During (and, except for the UK, also after) the crisis, diploma drain and brain drain from Latvia were more intensive than before, reflecting a rise of general disappointment and non-economic reasons for emigration among the high-educated and the future-oriented. Those not motivated by economic push factors account for the largest part of increase in the number of high-educated emigrants during the post-crisis periods.

The loss of skilled labour caused by emigration from Latvia is largely permanent. Probability to return within five years falls with completed education level among all emigrants and with study level among tertiary students abroad.

High-educated emigrants are overrepresented in Science, Mathematics, IT and Medicine, on one hand, and in Humanities and Arts on the other. The post-crisis skilled emigrants feature larger incidence of over-qualification and other types of brain waste, but the incidence of brain waste varies significantly across education levels and fields of study and across destination countries. High-educated graduates of Sciences, Mathematics, IT and Health feature the lowest over-qualification and skill underutilisation rates. The paper provides evidence that emigration has contributed to shortage of high- and medium-skilled professionals educated in Science, Mathematics, ICT and Medicine, as well as experienced engineers and technicians.

Keywords: emigration, brain drain, brain waste, field of study

JEL codes: F22, F66, J24, J61

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Labour Market Policy Thematic Review 2018: An in-depth analysis of the emigration of skilled labour

Latvia

Written by Mihails Hazans

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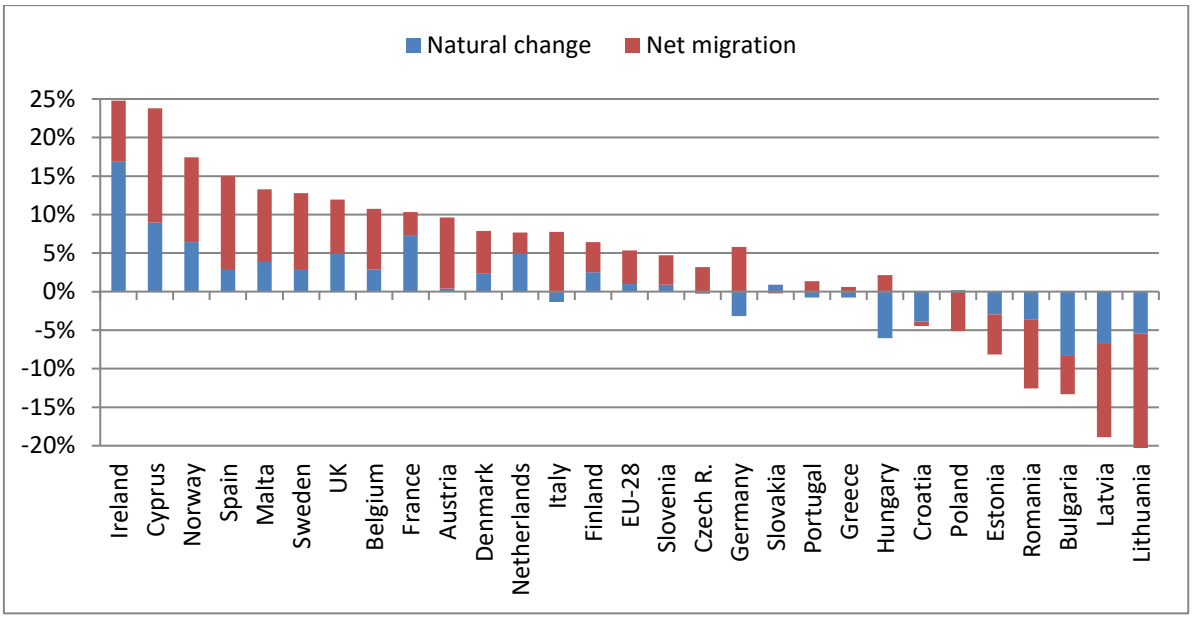
1 Introduction: the demographic and labour market situation in Latvia

Since the beginning of the 21st Century, loss of population due to emigration reinforced negative natural change in all three Baltic countries and in Bulgaria and Romania (Figure 1). In 17 years (2000-2016), Latvia and Lithuania lost the largest population shares (about 20 %) among EU countries. Latvia and Lithuania are also among the top three countries (after Bulgaria) with the largest negative natural population changes during this period. This contrasts with positive demographic developments in main destination countries of the Baltic migrants - the UK, Ireland, and the Nordic countries; only Germany features negative natural change, but it is not as large as in Latvia, and has been more than compensated by positive net migration (Figure 1).

Figure 1. Natural change of population and net migration, 2000-2016. EU28+Norway



Sources: Calculation with Eurostat data. For the Baltic countries data and Poland, migration statistics from destination countries has been used to correct national net migration data (see Hazans 2013a, 2015a, 2016a, 2017a); this procedure increased estimates of net migration outflows by 0.7 to 1.9 points for the Baltic countries and by 4.6 points for Poland.

Natural decline of Latvia's population has been driven both by low total fertility rate (well below that found in most destination countries in 2000-2014 but started to recover and expected to stabilize at about 1.85 in 2020-2050, see Figure A1.) and high mortality (particularly among men).

Latvia's population is aging steadily: during 2000-2015, the shares of children and teenagers were shrinking, while the shares of those aged 40-64 and especially65+ were growing (Figure A2). During 2000-2015, old dependency ratio (population aged 65+ as a share of population aged 15-64) in Latvia was higher and growing faster than in the main destination countries of Latvian emigrants (except for Germany). According to Eurostat baseline projection, by 2050, this ratio is expected to reach 60 %, compared to 51 % in Germany, 46 % in Ireland, and 40 % in the UK and Norway (Figure A3). Working age population in Latvia is shrinking faster than in any OECD country except Japan OECD (2016).

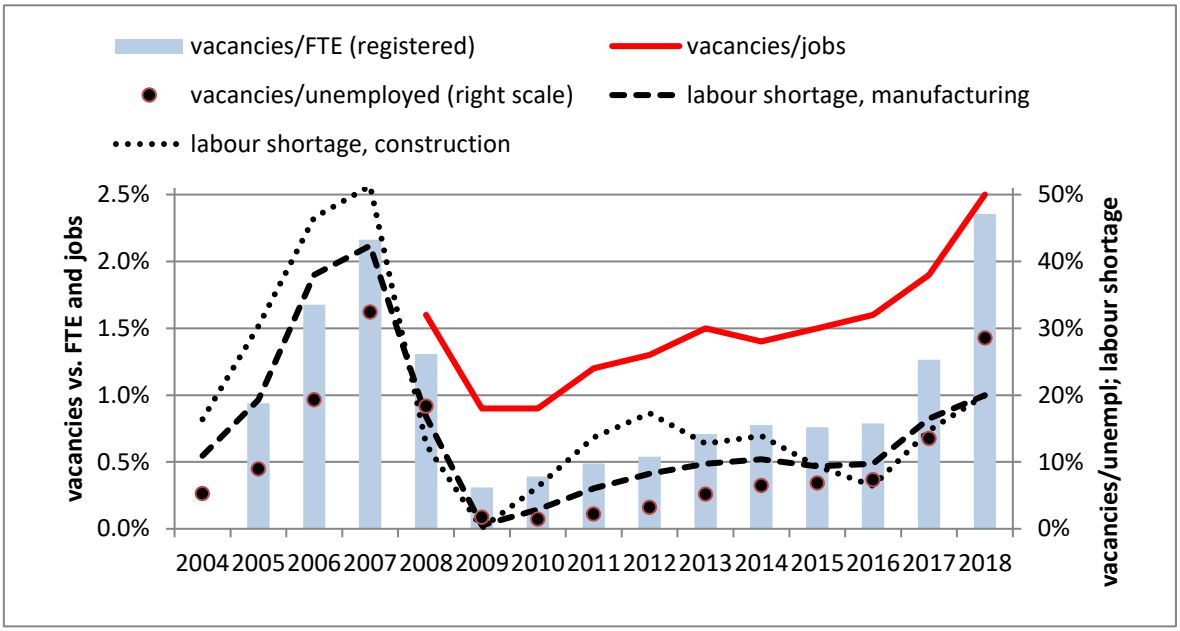
The Latvian labour market has largely recovered after the deep crisis of 2009-2010, but in certain aspects has not fully returned to the pre-crisis indicators. Employment rate in the age 15-64, at about 69 %, is slightly above the pre-crisis level; it exceeds the EU average for the whole population and for women but lags behind for men. Employment rates of population aged 20-64 and 25-54 are by about 2 points below the pre-crisis levels, while it is the other way around among those aged 55-64. Unemployment rate, at 9.6 % in 2016 and below 9 % in 2017/Q2, is well above the pre-crisis level (both in general and among the low- and medium-skilled, but particularly among the low-skilled aged 40+). However, employment and unemployment rates of the high-skilled are similar to that seen before the crisis (see Figure A4 for unemployment). Number of discouraged workers (those willing to work and available but not seeking, as percentage of labour force) is at an historic low 4 % (slightly above EU average though).

Despite recent impressive wage growth, average and median earnings in Latvia (measured in purchasing power standard) are yet to reach 50 % of that in the main destination countries of Latvian emigrants. Since 2012, according to *Eurostat* data, average real compensation per employee and per hour worked has been growing faster than average real labour productivity; nominal unit labour cost has increased by 25 % between 2010 and 2016 (partly this can be explained by falling share of envelope wages, see World Bank (2017), but wage rate growth was clearly the main driver). By 2016, average net annual earnings in Latvia in purchasing power standard (PPS) varied between 34 % and 40 % of that in the UK, Norway, Germany and Ireland[1]. Likewise, median hourly earnings (PPS) in Latvia in 2014 accounted to 25 %-30 % of that in Norway, Germany and Ireland and to 40 % of that in the UK[2].

Recently, experts and business community highlight signs of developing labour shortages[3], although data-based evidence for this is mixed. In 2018, percentage of enterprises reporting labour shortage as a limiting factor in manufacturing and construction reached 20 %, well above 10 % and 6 % two years earlier (but very far from 42 % and 51 % seen in 2007), see Figure 2. On the other hand, two-thirds of enterprise managers and owners described the situation of availability of workers as bad or very bad in a survey conducted at the end of 2016 (Citadele group, 2017a). Survey-based vacancy rate in Latvia, at 1.9 % in 2017 (up from 0.9 % in 2009-2010 and above the level of 2008, see Figure 2), was slightly below the EU average and well below that found in the main destination countries of Latvian emigrants. In the first half of 2018, however, vacancy rate in Latvia, at about 2.5 %, was close to that seen in the UK, Germany and Norway. In 2017-2018, the number of vacancies registered at the State Employment Agency was growing faster than both registered employment and registered unemployment and in 2018 matched the pre-crisis level of 2007 (Figure 2). However, an important difference with the pre-crisis situation in 2007-2008 is that both ethnic and regional gaps in employment currently are much larger (Hazans and Pluta 2016: Figure 2), suggesting that a substantial amount of labour is not utilised.

[1] Calculation based on data in Table 3.10a in OECD (2017)
[2] Calculation based on the Structure of Earnings Survey data (Eurostat).
[3] See Section 4 for references, quotes and discussion.

Figure 2. Job vacancy statistics and labour shortage indicators. Latvia, 2004 -2018



Notes: Vacancies/FTE and vacancies/unemployed refer to the ratio of vacancies registered at the State Employment Agency to registered employment (in full-time units) and unemployment, respectively. Vacancies/jobs refer to the standard enterprise survey-based job vacancy rate. Labour shortage is measured as percentage of firms reporting labour shortage as a factor limiting production (annual average of seasonally adjusted quarterly data). The 2018 data are based on the first eight months or two quarters. Sources: Calculations with Eurostat data and EC data of business surveys for Business Climate Indicators.

2 Emigration of skilled labour

For the purpose of this review, emigration of skilled labour (*brain drain*) is defined as outflow of working-age population with completed medium or high education (ISCED levels 3-4 and 5+, respectively). When possible, we will distinguish between these two groups. We will also provide estimates of the outflow of medium-educated individuals who acquire tertiary education abroad and stay there, thus increasing proportion of high-skilled among the emigrants. This latter process represents brain drain to the same (if not larger) extent as emigration of the high-skilled. While the focus is on post-2008 developments, available data for 2000-2008 are provided for comparison.

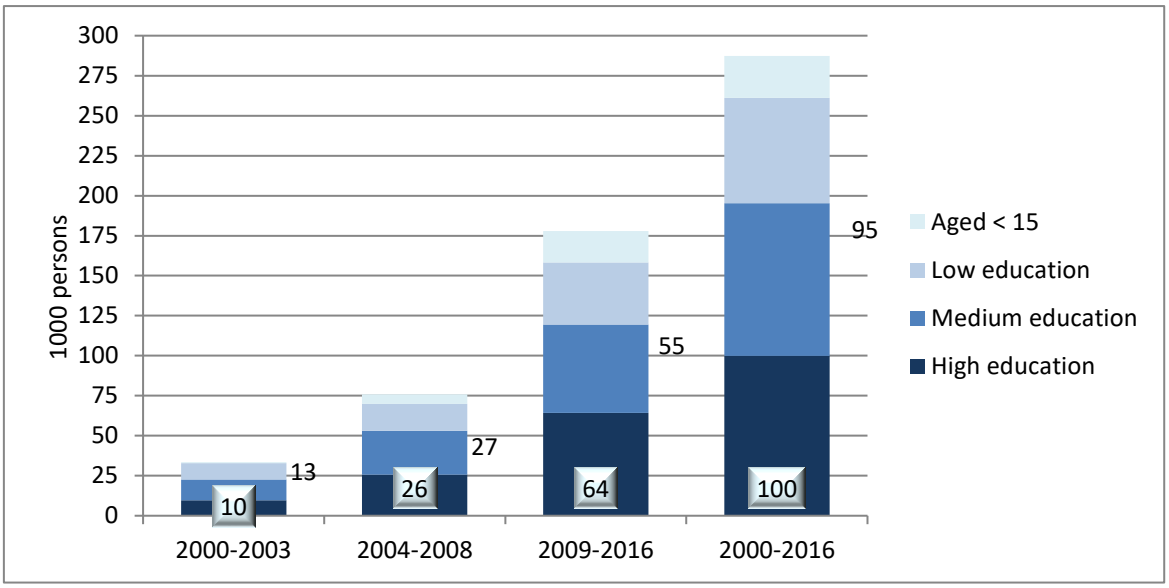
Given the well-known imperfections of available migration data, the analysis below is based on several independent data sources: Eurostat; OECD International migration database; Database on Immigrants in OECD Countries (DIOC 2010/11); online survey of Latvia's emigrants (hereafter referred to as *the emigrant survey,* see Hazans 2015b, 2015f; Mierina 2015) conducted in August - October of 2014, which attracted about 14 000 respondents across the world[4]; online survey of Latvia's

[4] Comparison of the respondents' distribution by host country, age, gender and period of leaving with data from other sources does not show any significant selection bias. Moreover, distribution of respondents from the UK and Ireland by educational attainment is largely consistent with the data from the year 2011 Population Censuses in these countries. The survey has been designed and conducted within ESF-funded project "The emigrant communities of Latvia: National identity,

return migrants (hereafter referred to as *the survey of returnees*, see Hazans 2016c*)* conducted in November-December 2016, which attracted about 3 000 respondents; four waves of representative Latvia's population surveys on migration intentions conducted in 2013-2016.

Outflow of skilled labour between 2009 and 2016 was 120 000 people (more than a half with tertiary education), equivalent to 11.3 % of current medium- and high-educated working-age Latvia's population and 17.4 % of its high-educated segment (Figure 3). These outflows are much larger than those seen in the previous nine years (2000-2008), see Figure 3. Overall, between 2000 and 2016, Latvia lost to [net] migration about 287 000 people (12.1 % of initial population), and skilled (respectively, high-skilled) labour accounts to more than two-thirds (respectively, one-third) of this loss (Figure 3).

Figure 3. Emigrants from Latvia at the end of 2016, by period of arriving to the host country and education level at the time of leaving Latvia



Sources: Size of outflow - calculation with Eurostat and OECD data, as well as Ireland and the UK data on allocation of social security numbers; these results update those in (Hazans 2013a, 2015a, 2016a, 2017). Breakdown by education level: calculation with the data of the emigrant survey conducted in August-October of 2014 (assuming for those who left Latvia in 2015-2016 the same distribution as for 2012-2014).

Results presented in Figure 3 rely heavily on the Latvia's emigrant survey conducted in 2014[5], **but robustness checks based on other sources support these results**. Table 1 presents lower-bound estimates of the outflow of skilled labour based on tracking [the LFS estimates of] the number of medium- and high-educated persons in a particular age cohort 5 years forward[6]. By limiting the age to 49 years we can, for a rough estimate, ignore mortality, and given that person's ISCED level of education cannot decrease over time, net migration is the only reason for decreasing cohort size. These estimates include sampling error; they might also be biased down by presence of individuals completing upper secondary education (ISCED level 3 or 4) at

transnational relations, and diaspora politics" (Institute of Philosophy and Sociology in cooperation with Faculty of Business, Management and Economics, University of Latvia).

[5] See Notes to Figure 3 for details.

[6] Applications of cohort tracking method for estimating emigration are found e.g. in Hazans (2016: Figure 7) and OECD (2016: Figure 1.18).

age above 20. Nevertheless, the estimates are robust and the preferred one (based on tracking the cohort aged 20-44 in 2009), at 106.4 thousands, is quite close to 64.3 + 55.2 = 119.5 thousands given in Figure 3.

Table 1. Net emigration of skilled labour over 2009-2016 implied by LFS estimates of decrease in size of selected cohorts of medium- and high-educated Latvia's population

1000 persons

	[1] Total population aged 20-44 in the first year			**[2] Excluding household members working abroad**		
5-year period	2008-2013	2009-2014	2010-2015	2008-2013	2009-2014	2010-2015
Decrease in 5 years [a]	37.9	43.7	36.7	41.5	46.5	37.5
	Implied net emigration of skilled labour over 2009-2016 [b]					
For population aged 25-49 in 2016	60.6	69.9	58.7	66.4	74.5	60.1
For population aged 18-64 in 2016[c]	86.6	99.9	83.9	94.9	106.4	85.8

Notes:

[a] *The difference between annual average cohort size in years t and t + 5. Actual calculations are made for 5-year cohorts, each of them declining.*

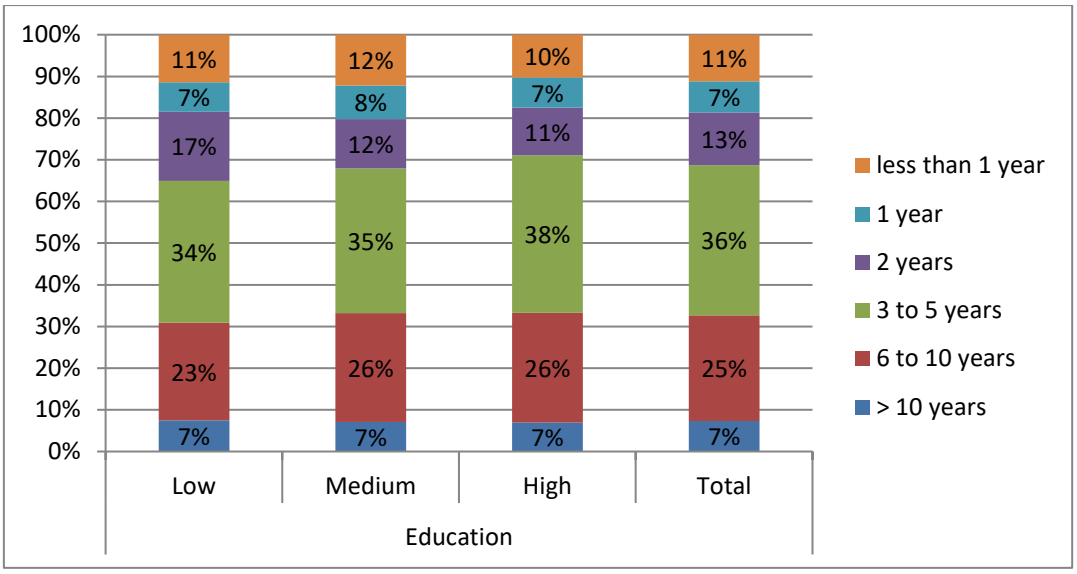
[b] *This refers to net outflow during 8 full years, so the estimates for population aged 25-49 are obtained* as (8/5)×(Decrease in 5 years); *note that the cohorts in question are also aged 25-49 in year t + 5*.

[c] *This estimate assumes that skilled emigrants aged 25-49 account for 70 % of emigrants aged 18-64, as it is in Latvia's emigrant survey data (according to both these data, which refer to Autumn 2014 and Eurostat data for January 2016, among all emigrants this share is 74 %).*

Sources: [1] - Calculation with Eurostat data; [2] - calculation with LFS microdata.

Post-crisis emigrants (as opposed to pre-crisis) **are much more oriented towards long-term or permanent emigration, interested in legal employment and social security and are more likely to move as entire families** (Hazans 2013a, Table 4.6). According to emigrant survey, by 2014 about 70 % of emigrants have stayed in their host countries three and more years (Figure 4).

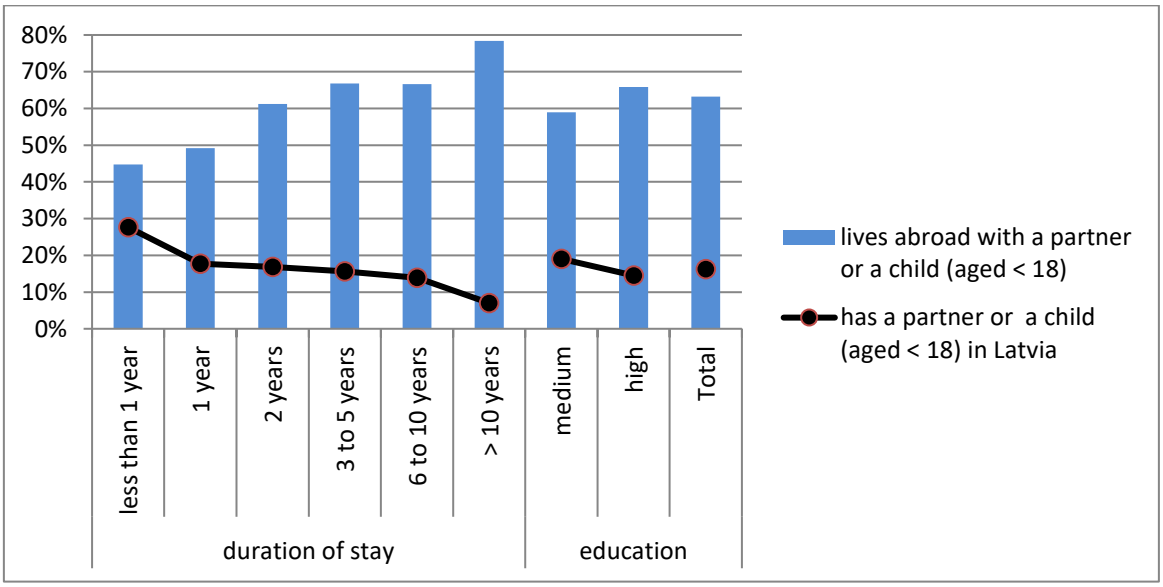
Figure 4. Post-2000 emigrants from Latvia, by completed education level and duration of stay in the host country, 2014



Sources: Calculation with emigrant survey data.

The longer skilled emigrants live in the host country, the smaller proportion of them has a spouse, partner or adolescent child left in Latvia, and the larger proportion lives with a partner and/or a child/children (aged <18) abroad (Figure 5). Econometric analysis of return intentions (Hazans, 2015e) shows that family members left in Latvia (respectively, living with the emigrant abroad) positively (respectively, negatively) affect probability of return. By 2014, two-thirds of high-educated emigrants lived abroad with either a partner or a child aged <18 (or both), and only 15 % had a partner or a child left in Latvia; for medium-skilled emigrants these proportions were, respectively, 59 % and 19 % (Figure 5).

Figure 5. Post-2000 skilled emigrants from Latvia, by duration of stay in the host country and completed education level: partners and children in Latvia and abroad



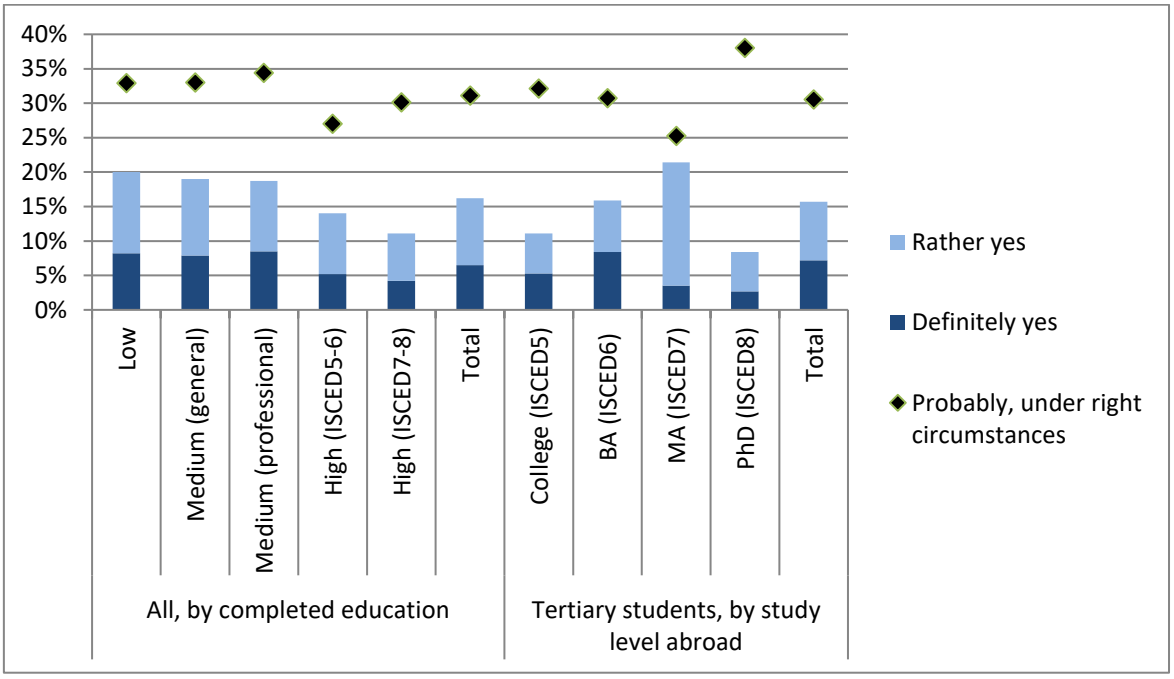
Sources: Calculation with emigrant survey data.

Apparently, the loss of skilled labour caused by emigration from Latvia is largely permanent. **Most emigrants (including the skilled ones) do not plan to return** (see Figure 6)[7], mainly because they are satisfied with their lives abroad more than they used to be in Latvia (Hazans, 2015f). However, **about one-third of emigrants, although not planning to return, may change their mind 'under right circumstances'** (Figure 6).

Stated likelihood to return within 5 years (16 % overall, including 6.5 % 'Definitely yes and 9.7 % 'Rather yes') **falls with completed education level**: from 20 % among low-educated and 19 % among medium-educated to 14 % among college graduates and BA degree holders to 11 % for master and PhD degrees holders (Figure 6). Tertiary students (who study abroad) as a group also feature 16 % potential returnees; incidence of a firm intention (7.2 % overall) falls from 8 % among BA students to 4 % among Master students and 3 % among Ph.D students (Figure 6).

When asked about factors preventing them from returning Latvians cite a wide variety of reasons, but three of them ('Can't find a decent job in Latvia', 'No adequate social protection in Latvia', 'Have settled down abroad') dominate across education levels (and other characteristics), each being mentioned by about three out of four emigrants (Figure A5; see also OECD 2016: Table 2.2). I will revisit return migration and its impact in Section 4.

Figure 6. Return plans within 5 years of post-2000 emigrants from Latvia, by completed education, and, for students, by study level abroad, 2014.



Sources: Calculation with emigrant survey data.

Analysis of trends in the brain drain, i.e. the patterns of emigrants' selectivity on human capital is complicated by a rather strong positive trend in skill composition of the Latvia's populations during the 21st Century. To facilitate

[7] This is in striking contrast with the situation observed in 2005-2006, when two-thirds of emigrants having left Latvia in in the first two post-accession years (2004-2005) were planning to return within two years, most of them (almost half of all emigrants) even within one year (Hazans and Philips, 2010, Figure 9).

comparison across time, we use selectivity index $SI = \ln(G_M/G_S)$, where G_M and G_S are shares of university graduates (or any other group of interest) among movers (i.e., emigrants) and stayers, respectively; thus, *SI* is positive (negative) if 'skilled' people are over-represented (under-represented) among movers (Hazans, 2011, 2012, 2013a, 2015d; 2016a). When necessary, the selectivity index is age-adjusted, i.e. emigrants are compared with similarly aged stayers.

Data from emigrant survey confirm substantial (and increasing over time, except for the most recent period) university diploma drain from Latvia to various EU/EFTA destinations during the whole period between 2000 and 2014 (Figure 7). Except for Ireland in 2000–2008, the shares of high-educated among emigrants were well above those found in respective periods among stayers of the same age as emigrants, as indicated by positive values of selectivity index at departure (ranging between 0.51 and 0.78 for the total outflow to EU/EFTA).

OECD (2016:77) compares graduation figures with LFS data and finds that 'out of the roughly 166 000 in the cohort who graduated in Latvia between 2002 and 2009, as many as one-third (55 000) were no longer in Latvia in 2014'. This is in line with estimates based on emigrant survey, according to which out of almost 88 000 emigrants who moved abroad in 2000-2014 with completed in Latvia higher education, about 53 000 left Latvia aged under 30, 26 000 - aged 30-44, and 9 000 - aged 45-64 (Table 2). OECD (2016:105) stresses that significant proportion of recent graduates have left Latvia in the years shortly after graduation; moreover, 27 % of high-educated emigrants reported their last status in Latvia as student or trainee, suggesting that they have not worked in Latvia after graduating.

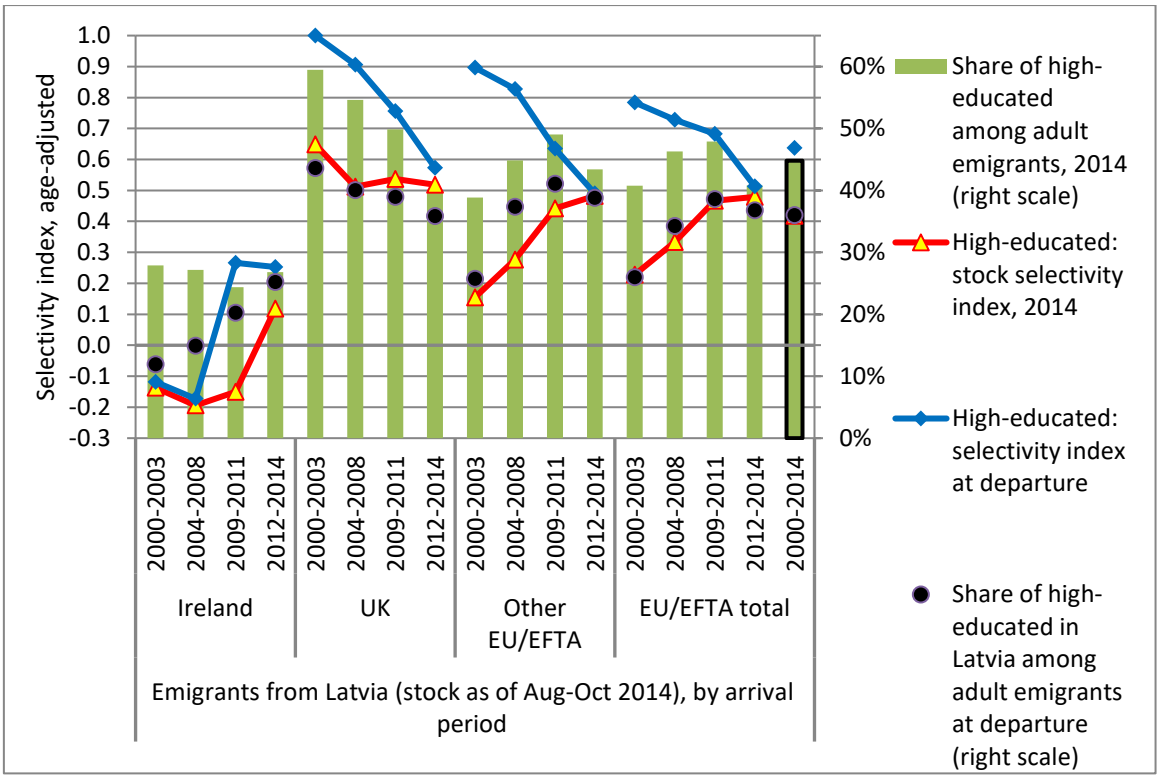
Table 2. Individuals which moved abroad in 2000-2014 with completed in Latvia higher education and lived abroad in 2014, by age when moving

Age when moving	18-24	25-29	30-34	35-44	45-64	18-64
1000 persons	27.1	25.5	13.3	13.0	8.7	87.6
%	31.0	29.0	15.2	14.9	9.9	100.0

Notes: The Table refers to emigrants aged 18 to 64 years in 2014. Sources: Calculation with emigrant survey data.

The share of tertiary educated among emigrants further increased during their stay in the host countries, reaching45 % by 2014 (on average across destinations and arrival periods). Ireland aside, the stock selectivity index (which measures total brain drain rather than just diploma drain) takes positive values, indicating that by 2014, the share of university graduates among Latvian emigrants in each of the destinations under inspection was higher than among their age peers in Latvia (Figure 7).

Figure 7. Shares, flow selectivity and stock selectivity of tertiary educated emigrants from Latvia, 2000–2014, by destination and arrival period



Notes: The (diaspora) stock selectivity index compares shares of high-educated among the stock of emigrants aged 18-64 (in August–October 2014) with similar shares among Latvia's population as of 2014, assuming the same (destination-and-arrival-period-specific) age distribution as for the stock of emigrants. The (flow) selectivity index at departure compares the share of emigrants who left Latvia aged 15+ with completed tertiary education with the share of high-educated stayers in that period, assuming the same age distribution as for those who moved from Latvia during that period. Sources: Calculation with emigrant survey data and Eurostat data. The Figure modifies and updates Figure 10 in Hazans (2016a) and Figure 6.1 in Hazans 2015d.

In 2014, two out of five high-educated Latvian nationals (or former nationals) aged under 25 and over one-third of their high-educated compatriots aged 25-34 belonged to the 'new diaspora' who left Latvia between 2000 and 2014 (Table 3). When only education completed in Latvia is accounted for, the expatriation rate (over 2000-2014) among the high-skilled aged 25-34 in 2014 is about one-third, while it is above one-fifth among those aged 20-24 and 35-39, as well as overall in the age group 20-64 (Table 3). Both overall and in each age group, **high-educated people were more likely to emigrate** than their medium-educated counterparts (Table 3). The latter finding is supported also by data from the 2010-2011 round of population censuses around the world (see Figure 9 below and IMF (2016: Figures 6-7)).

It appears that EU-LFS-based estimates of incidence of high education among post-enlargement emigrants presented in European Commission (2016: Chapter II.2, Chart 25) and Canetta et al. (2014: Fig. 22) are not reliable for Latvia and, plausibly, other small countries[8].

Table 3. Expatriation rates of skilled Latvian nationals over 2000-2014, by age in 2014

Age in 2014	20-24	25-29	30-34	35-39	40-44	45-49	50-64	20-64
	Expatriation rates, %							
[1] High edu. 2014	40.5	34.5	36.1	24.2	17.7	14.1	8.9	24.3
[2] High edu. in LV	22.8	30.9	33.7	21.2	15.5	12.9	9.0	21.0
[3] Medium edu. LV	17.7	22.3	20.4	11.1	6.9	5.1	2.9	10.0

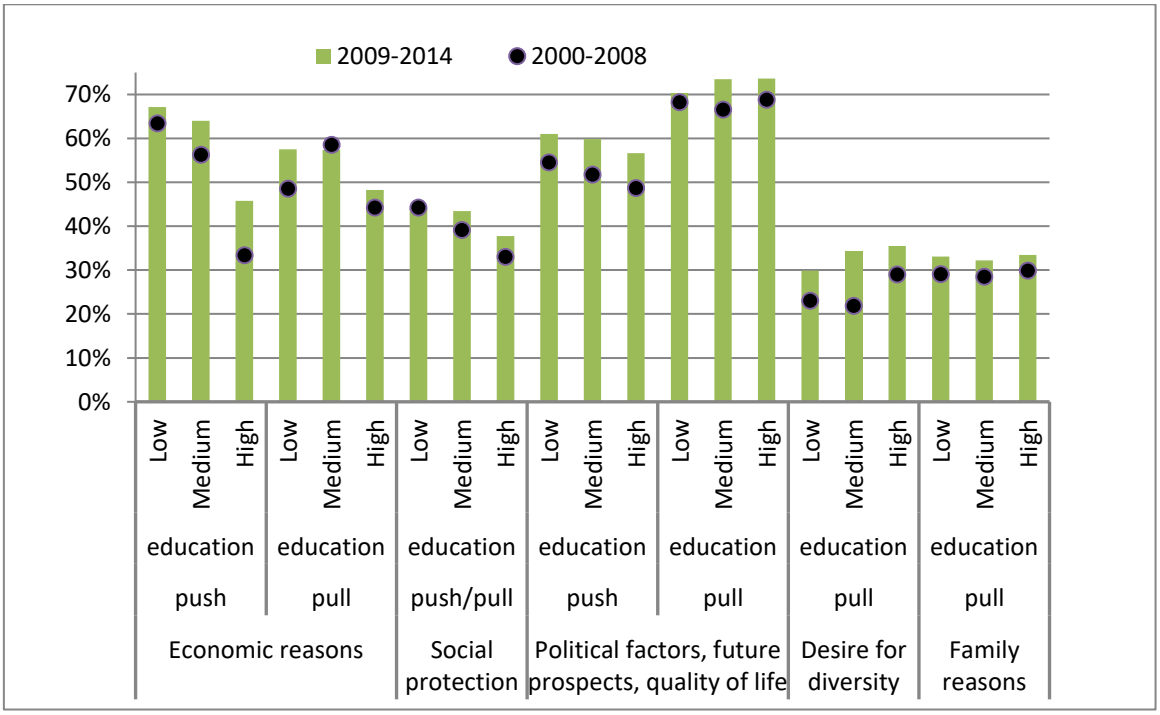
Notes: For a given age/skills category, expatriation rate is defined as M/(M + S), where M and S are the numbers of emigrants and stayers in the category. Sources: Calculation with emigrant survey data and Eurostat data on population by age and educational attainment.

[8] Several factors make EU LFS-based data on emigrants (especially recent emigrants) from small countries or countries with low emigration less reliable. One of them - small sub-sample size - is obvious and is acknowledged e.g. in Canetta et al. (2014): when estimated standard errors are too large, results are not reported or reported as "below reliability limits". The second factor is less obvious (although well known in other contexts): adult emigrants, say, from Latvia, account for just about 0.1% of active population of EU/EFTA countries and tend to cluster in some countries, regions and settlements to a much larger extent than in others. There is no guarantee that LFS, being representative for population of each country, is also representative for this group. In addition, recent emigrants are likely to feature high non-response rate due to insufficient knowledge of the host country's language. Finally, data reported Canetta et al. (2014) and European Commission (2016: Chapter II.2) are based on citizenship and do not account for emigrants who have acquired citizenship of the host country. Thus, emigrants from Latvia (especially recent emigrants) as a group are likely to be under-represented (or not identified) in the EU LFS data, and the structure of this group might be distorted. Indeed, Canetta et al. (2014: Table 29), based on EU LFS for 2013, report total number of Latvia's (respectively, Lithuania's) citizens aged 15-64 settled in other EU/EFTA countries in the last 10 years (i.e. between 2003 and 2013) as 74 000 (respectively, 152 000), while conservative estimate based on population and migration statistics of receiving countries is 123 000 (respectively, 236 000). It is therefore not surprising that European Commission (2016: Chapter II.2, Chart 25) and Canetta et al. (2014: Figure 22 and Table 29), based on EU LFS data for 2013, suggest that high-educated were (by 2013) under-represented among post-enlargement emigrants from Latvia - in contrast with findings based on emigrant survey (Table 3 and Figure 7) and on population Censuses in receiving countries (Figure 9; IMF (2016: Figures 6-7)). Note that for 2014 and 2015, LFS-based estimates of stocks of all (rather than recent) EU-28/EFTA movers of working age published in 2015 and 2016 Annual Report on Labour Mobility (Table 26, respectively 24) are, for Latvia and Lithuania, much closer to estimates based on population and migration statistics of receiving countries (underestimate by 8% to 12%), but these Reports do not provide country-specific data on emigrants education.

Latvia's accession to the EU in 2004 boosted the diploma drain in absolute terms , in relative terms, it became less intensive than before, as suggested by falling selectivity index at departure for all destinations considered and by stock selectivity index in Ireland and the UK (Figure 7). This is also true for the UK and Ireland (the two main destinations immediately after accession) in terms of the shares of high-educated emigrants found in 2014. This is consistent with theoretical expectations based on institutional and market factors: free movement of labour lowered both migration costs and the human capital threshold (Hazans 2011, 2012, 2013a, 2016a).

Evidence from the emigrant survey (both the share of university graduates at departure, and the stock selectivity index, see Figure 7) suggests that during (and, except for the UK, also after) the crisis, diploma drain and brain drain from Latvia were more intensive than before[9], reflecting a rise of general disappointment and non-economic reasons for emigration among the high-educated and the future-oriented (see Hazans 2011, 2012, 2013a, 2016a and Figure 8 below).

Figure 8. Motivation for emigration, by education level and period of emigration



Notes: Respondents could choose all relevant reasons from 17 given (median number of reasons is 4 for high-educated and 5 for others). See (OECD 2016: Figure 2.7) for detailed list of reasons in each group. Sources: Calculation with emigrant survey data.

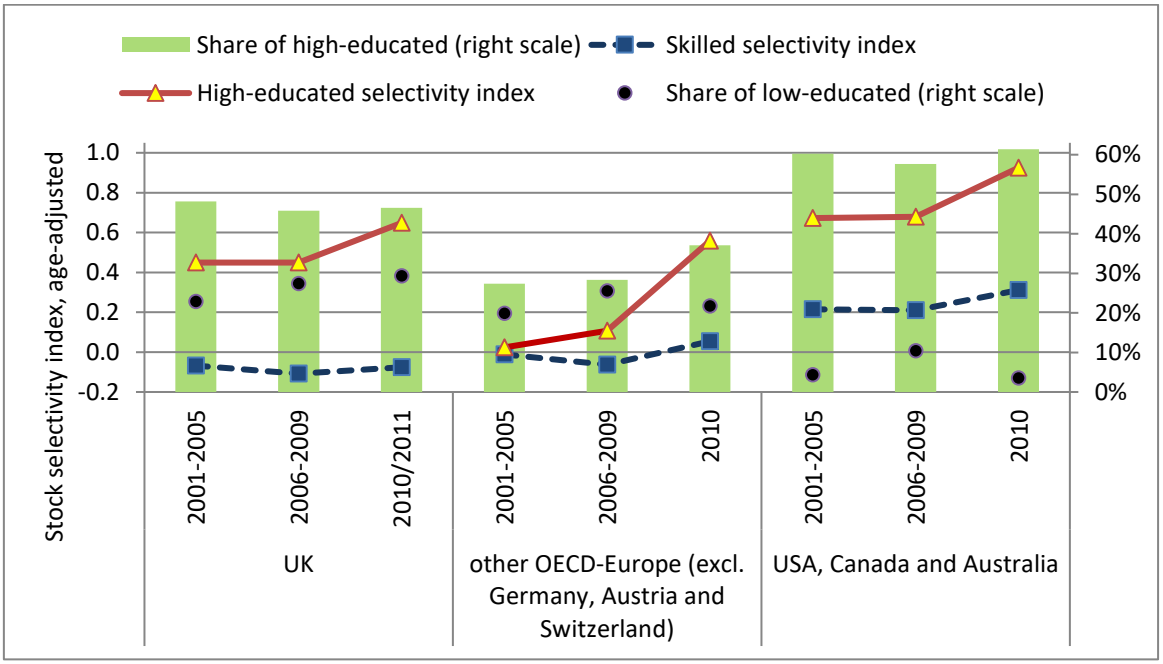
[9] Note, however, that growing share of high-educated among those leaving Latvia reflected fast growth of high-educated segment of the young and middle-aged population in Latvia, while the selectivity index at departure (for destinations other than Ireland) was falling. The case of UK differs: among movers to the UK, the brain drain and diploma drain during the crisis were at about the same level as before, and after the crisis the diploma drain was slightly less intensive. This is because UK absorbed relatively more low-skilled post-crisis emigrants (Figure 9).

For high-educated emigrants, economic reasons were much less a factor pushing or pulling them to leave Latvia than for other emigrants, both before and after the crisis (Figure 8). Economic push factors (financial difficulties, inability to find a job in Latvia) were cited by 46 % of post-crisis emigrants with higher education and by about two-thirds of their less-educated peers (Figure 8).

In early 2011, more than a half of high-educated potential emigrants reported *only* non-economic reasons for their plans to leave the country, while this proportion was below one-fourth and one-third among low- and medium-educated (Hazans 2013a: Figure 4.13). Moreover, increase in the number of high-educated emigrants between 2000-2008 and 2009-2014 was driven mainly by those who were not motivated by economic push factors (Figure A6), although the incidence of these factors among high-educated emigrants went up (Figure 8).

Evidence from Population Censuses (2010-2011) in OECD countries (Figure 9) **largely confirms findings from the emigrant survey:** by early 2011, emigrants from Latvia who lived in these countries for up to 10 years featured larger shares of tertiary-educated than their age peers in Latvia, and this was particularly pronounced among early post-crisis emigrants. On the other hand, the low-educated were also over-represented among Latvian emigrants in European OECD countries, resulting in slightly negative selectivity index of the skilled (i.e., medium- and high-educated) labour.

Figure 9. Skill composition and selectivity of the 21st Century emigrants from Latvia. OECD countries, early 2011



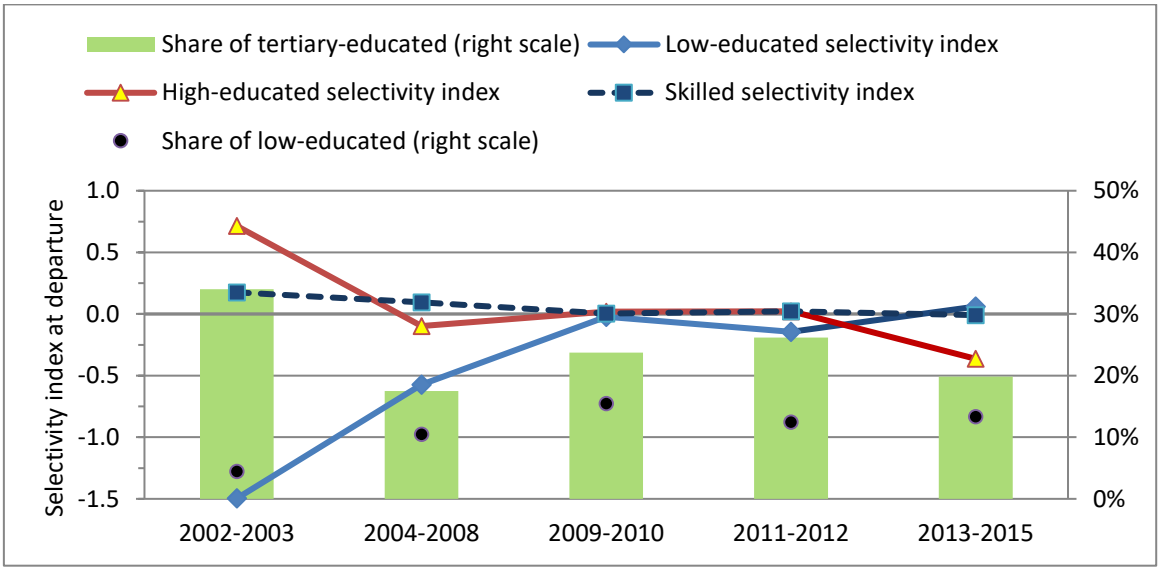
Sources: Calculation with data of OECD (2014) and Eurostat data.

Latvian mobile workers still considered household members back home appear to be less educated than settled emigrants, suggesting that high-skilled emigrants are more likely to stay in destination countries permanently or for prolonged periods. This finding emerges from comparison of Latvian LFS data (see Figure 10 below) with emigrant survey and Population Censuses data (Figure 7, Figure 9). The selectivity indexes in Figure 10 compare mobile workers with Latvia's population aged 18-64 in the same period, thus measuring the effect on working-age population. University graduates were over-represented among pre-accession mobile workers; the

share of high-educated and the corresponding selectivity index drop in the post-accession period, while the share and selectivity of the low-skilled increase (reflecting the effect of free mobility provisions which lowered human capital threshold for moving, as well as higher expected gains for the low- and medium-skilled).

During and after the crisis, the share and selectivity index of the high-educated among the mobile workers were above the pre-crisis levels (consistent with findings from other data) but fell again in 2013-2015. The latter observation needs care, because it might indicate either smaller outflows of the high-educated or switching to full-family emigration. The share and selectivity index of the low-educated stayed above the pre-crisis levels throughout 2009-2015, reflecting the fact that the low-skilled suffered stronger and longer from the recession-related joblessness.

Figure 10. Skill composition and selectivity of Latvian mobile workers reported as household members back home, 2002-2015 (Latvian LFS data)

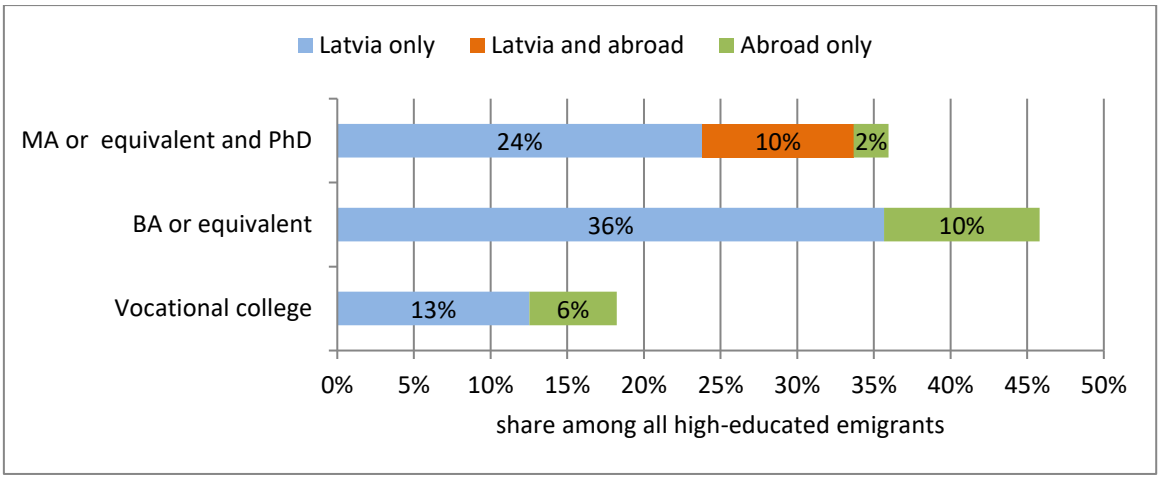


Notes: The selectivity indexes in Figure 6 compare mobile workers with Latvia's population aged 18-64 in the same period. Sources: Calculations with the Latvian LFS data.

Since 2009, skilled labour (i.e., medium- and high-educated together) is represented among Latvian mobile workers in almost the same proportion as among Latvia's working age population (respective selectivity index in Figure 6 is nearly zero in this period, down from modest positive values in 2002-2008).

Statistical portrait of skilled emigrants (as of 2014, based on the emigrant survey) reveals that **medium-educated emigrants are almost evenly split between those with general and vocational education;** in addition, about 20 % in each group have completed some professional or vocational development courses abroad. **Among high-educated emigrants, 18 % have graduated vocational colleges, 46 % have BA or equivalent degree, 36 % - MA (or equivalent) degree or Ph.D degree** (Table A1). More than two-thirds of college graduates and more than three-quarters of BA degree holders have completed their education in Latvia; among those with Master or Ph.D degree, two-thirds have left Latvia with such a degree already, and 94 % have left Latvia with tertiary education (Figure 11).

Figure 11. High-educated emigrants form Latvia by educational attainment and place of obtaining tertiary education



Sources: Calculations with emigrant survey data.

Among emigrants with general secondary education and among those with BA and MA degrees, about two-thirds are women; by contrast, among emigrants with vocational secondary education and graduates of vocational colleges female share is 53 % and 58 %, respectively (Table A2).

UK host almost two-fifths of medium-skilled emigrants from Latvia and more than two-fifths of high-skilled ones. Ireland hosts one-fifth of medium-educated emigrants but only 6 % of high-educated. Almost a quarter of medium-skilled and more than a quarter of high-skilled Latvian expatriates live in Germany and Nordic countries taken together. Remaining EU/EFTA destinations host 13 % of medium-skilled and 16 % of high-skilled emigrants from Latvia. Only 5 % of medium-skilled and 10 % of high-skilled have settled outside EU/EFTA. See Figure A7 for details.

High-skilled post-crisis male emigrants and their medium-skilled counterparts with vocational education enjoy very high employment rates (as of 2014): 86 % for BA degree holders and graduates of vocational colleges and 91 % for those with MA or Ph.D degrees or medium level vocational education, in line with (for high-skilled) or well above (for medium-skilled) the rates found among similarly aged stayers with the same qualifications, see Figure 12. Post-crisis male emigrants with general secondary education feature employment rate of 72 %, also above corresponding rate among stayers. Both for high- and medium-skilled male emigrants, observed employment rates are in line with those found (for the age group 20-64) among native population in the main destination countries of Latvian emigrants - the UK, Germany and Norway.

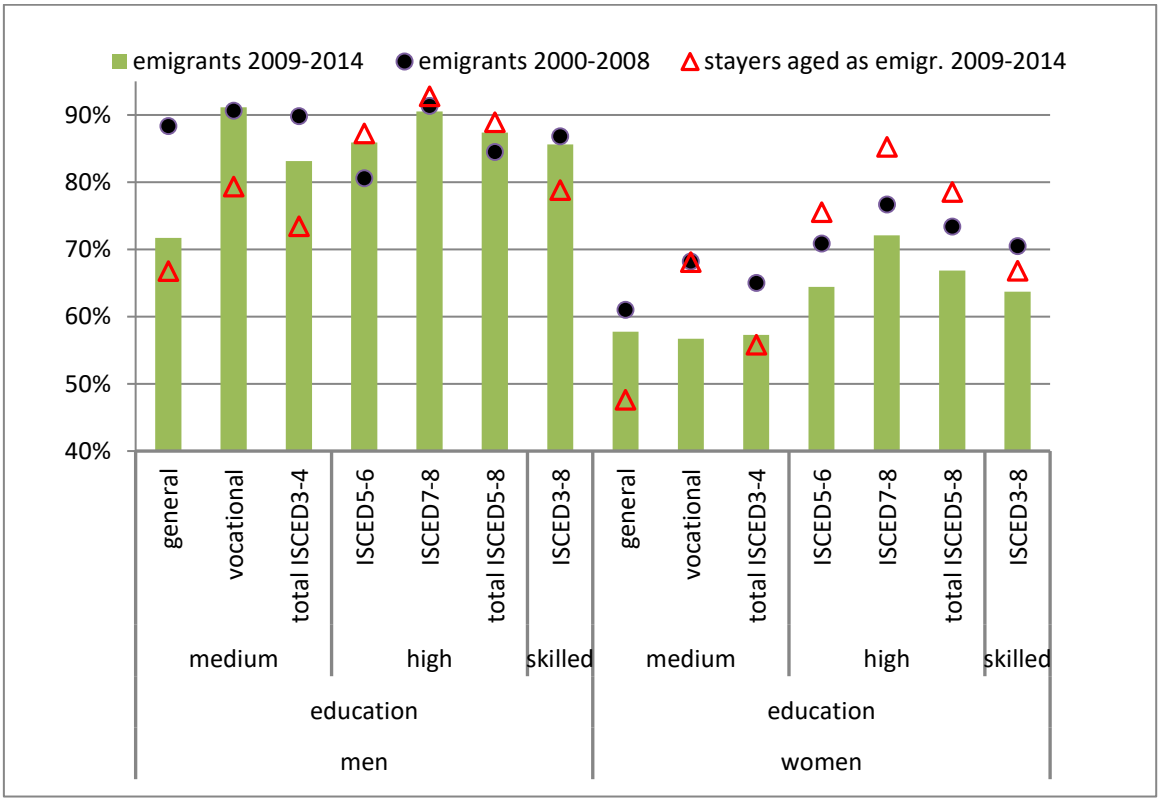
Compared to pre-crisis emigrants, post-crisis male emigrants' employment rates are either the same (for ISCED7-8 and secondary vocational education) **or higher** (for ISCED5-6 and general secondary education), see Figure 12.

Employment rates of skilled post-crisis female emigrants, at 57 % for medium-skilled and 67 % for high-skilled, are below those of both their pre-crisis counterparts and (except for the case of general secondary education) similarly aged stayers (Figure 12). These rates are lower than skilled female employment rates in the UK, Germany or Norway.

Occupational profile of emigrants from Latvia employed in EU/EFTA countries in 2014 (Figure 13) **reveals that 44 % of post-crisis high-skilled emigrants and**

29 % of their medium-skilled peers were overqualified for their jobs, according to the OECD definition. Among the high-skilled, more than a half (56 %) were employed in high-skilled non-manual occupations; over one-fifth worked as clerks, service or sales workers; 9 % - as skilled manual workers; 14 % - in elementary occupations. Majority (61 %) of the medium-skilled were employed in manual occupations (32 % - as skilled workers and 29 % - in elementary occupations); over a quarter worked as clerks, service or sales workers; 13 % worked as managers, professionals or technicians.

Figure 12. Employment rates of pre-crisis and post-crisis skilled emigrants from Latvia and stayers therein, by gender and educational attainment, 2014



Notes: The Figure refers to emigrants in EU/EFTA countries aged 18 to 64 years in 2014 (recall from Figure A7 that fewer than 10 % of emigrants from Latvia live outside EU/EFTA). Sources: Calculations with emigrant survey data.

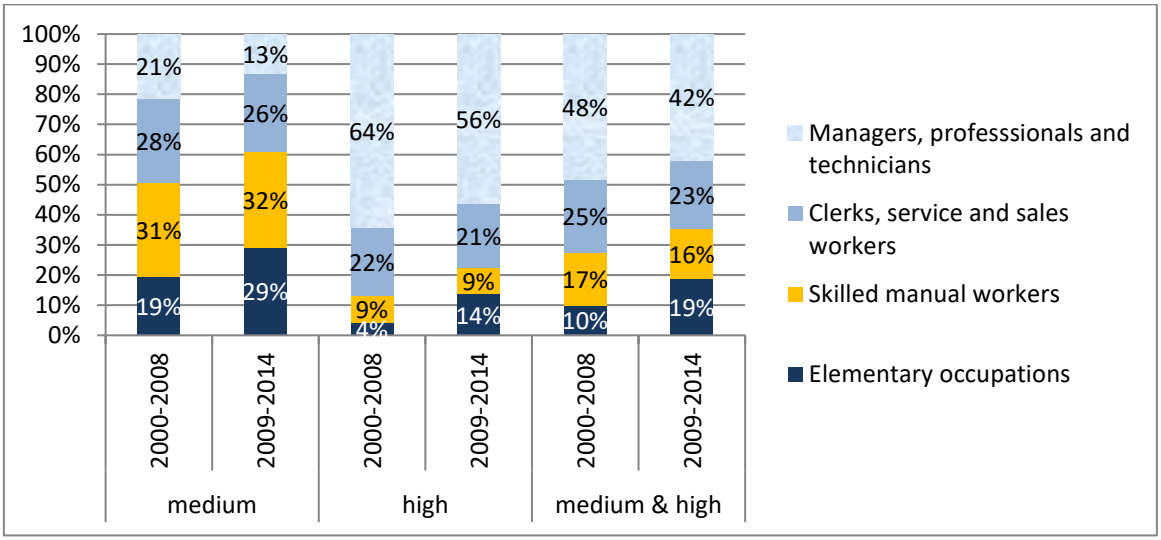
Compared to the emigrants who left Latvia in 2000-2008, the post-crisis emigrants (both high-skilled and medium-skilled) feature substantially smaller shares of high-skilled non-manual occupations and larger shares of elementary occupations (Figure 13). These findings are in line with those in Hazans (2016a: 330-332) based on other data sources.

Contraction of the share of high-skilled non-manual occupations among the post-crisis medium- and high-educated emigrants concerned mainly business, administration, legal, social and cultural professionals, but among the medium-educated - also managers; by contrast, the share of health professionals substantially increased (Table A3). Among the medium-skilled, the share of clerks and personal service workers increased at the expense of sales workers (Table A3).

The share of science, engineering, IT and health professionals among post-crisis emigrants (both medium- and high-educated) is comparable with the total share of business, administration, legal, social and cultural professionals,

in a striking contrast with the situation among the pre-crisis emigrants, for which the latter share is twice as big as the former (Table A3).

Figure 13. Employed skilled emigrants from Latvia by level of education, period of emigration, and occupation in the host country. EU/EFTA countries, 2014



Notes. Emigrants aged 18-64 in 2014. Sources: Calculations with emigrant survey data.

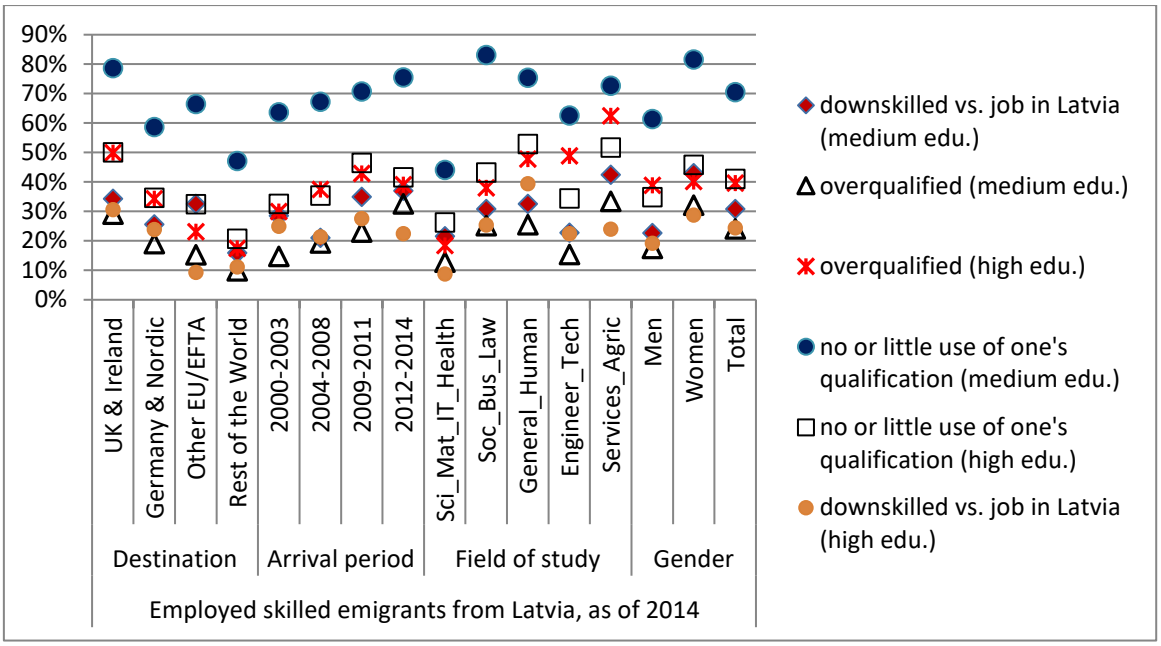
The shares of elementary, all types of skilled manual occupations and personal service workers fall (and the shares of all types of professional occupations but health rise) as one moves from vocational college graduates to BA degree holders to MA degree holders (Table A4). The largest share of health professionals is found among vocational college graduates, followed by MA (or equivalent) degree holders (Table A4).

The incidence of brain waste among skilled emigrants varies significantly across education levels and fields of study, as well as across destination countries (Figure 14). High-educated emigrants are more often formally overqualified than medium-educated ones (40 % vs. 24 %), but less often report underutilisation of their education and qualifications (41 % vs. 70 %). Both over-qualification and skill underutilisation rates are found to be the highest in the UK and Ireland, followed by Germany and Nordic countries, and then by other EU/EFTA destinations, while the lowest incidence of brain waste is observed outside EU/EFTA (Figure 14).

High-educated graduates in Sciences, Mathematics, IT and Health feature the lowest over-qualification (18 %) and skill underutilisation (26 %) rates, well below graduates of Social sciences, Business and Law (38 % and 43 %), Engineering and Technologies (49 % and 34 %), Humanities, Arts and Education (48 % and 53 %), Services and Agriculture (62 % and 52 %), see Figure 14. Remarkably, the two rates are quite close (and not significantly different) in all cases but Engineering (plausibly, engineers use their skills even if employed as skilled manual workers).

Fields ranking in terms of over-qualification rates among medium-educated emigrants follow the same pattern as for high-educated, except for Engineering (which feature as low rate as Sciences, Mathematics, IT, and Health), see Figure 14. But for all fields, self-reported skill underutilisation rates among medium educated are well above over-qualification rates.

Figure 14. Incidence of brain waste among employed skilled emigrants from Latvia, 2014.



Notes: An employed person with tertiary (respectively, upper secondary) education is overqualified (according to OECD definition) if he/she works in manual or low-skilled non-manual (respectively, elementary) occupation. Downskilling (Hazans 2016a) compares emigrant's current job with the last job in Latvia; those who moved from high-skilled non-manual to other occupations have experienced downskilling, as well as those who moved from low-skilled nonmanual or skilled manual to elementary occupations. Skill (qualification) underutilisation refers to negative answers to the question 'Do you to a large extent use your education/qualification in your job?' from the emigrant survey. Field General_Human refers to Humanities, Arts, and Education, but in the case of medium-educated included also general education. Sources: Calculations with emigrant survey data.

Overqualified high-educated emigrants were largely already overqualified in Latvia (Hazans 2016a: 331-332 and Fig. 16), as the rate of downskilling vs. last job in Latvia (24 %) is much lower than over-qualification and skill underutilisation rates (both about 40 %). The rate of downskilling vs. last job in Latvia can be seen as the measure of direct brain waste effect of migration. By this measure, the brain waste effect of migration is modest for graduates of Engineering and Technical fields (both high- and medium-educated), see Figure 14.

3 Emigration of skilled labour and its impact on domestic economies beyond the labour market

Beyond the labour market, the economic impact of emigration occurs through different (but closely inter-related) primary channels: direct depopulation, aging, migration networks, undermining demographic potential, population sentiment, brain drain and brain circulation.

The effect further materialises through **secondary channels: fiscal effects at the central and local levels, remittances, investment, productive capacity, innovation potential, social security, social infrastructure**, **structural reforms**.

Combined effect on growth: Labour force contraction and adverse changes in skill composition due to migration have a negative effect on GDP growth. IMF (2016: Figure 12) estimates this effect for Latvia, at -1.3 % per annum over 1999-2014, to be the strongest among 11 new EU member states, 6 non-EU Balkan countries and 5 CIS countries. Moreover, forecasted (conditional on Eurostat/UN baseline migration scenario) cumulative output loss due to emigration over 2015-2030 for the Baltics is close to 9 %, while expected loss in real GDP per capita is 4 % (IMF 2016: Figure 16).

Direct depopulation channel (1): **By reducing population and hence labour force and domestic market size, emigration discourages investment[10] (both domestic and foreign) and encourages closing businesses**. Reduced labour force and investment both lead to falling productive capacity (and hence lower household income) and reduced tax base (Gibson and McKenzie, 2012). IMF (2016) notes in this context that negative fiscal effects of emigration '**reinforce the potential benefits of shifting away from distortionary labour taxation to more growth-friendly consumption taxes'.**

Direct depopulation channel (2): Depopulation makes the public services in small cities and the countryside more expensive in per capita terms. Combined with reduced tax base, this leads to **reduced supply and/or lower quality of public services. A vicious circle emerges: lower wages and reduced public services foster emigration.**

Direct depopulation channel (3): deterioration of the situation with the public services (most importantly, education and health care) increases pressure for much needed and long awaited structural reforms (see e.g. FICIL (2016), Bitāns (2017a, 2017b), Dombrovskis (2017), Strautiņš (2017), on education; The Latvian Ministry of Health (2016a, 2016b) on health. IMF (2016) notes that, for Central, Eastern, and Southeastern Europe (CESEE), 'the higher social expenditure burden associated with emigration calls for improving the efficiency of social spending, particularly that related to healthcare'.

Remittances sent to Latvia accounted for more than 5 % of GDP in 2006-2015 and 4.6 % in 2016 (Figure A8). Through VAT, remittances partly compensate negative fiscal effects of emigration (Ebeke, 2010), but in Latvia this compensation goes only to the central budget.

Aging channel (1): **emigration accelerates aging and distorts the age structure of the population**[11]. **This, in turn, increases the old-age dependency ratio** (see Figure A3), **thus threatening sustainability of the social security system**. Moreover, this indirectly contributes to further emigration - recall from Figure 5 that 40 % of emigrants cite better social protection abroad as one of the important reasons for leaving Latvia.

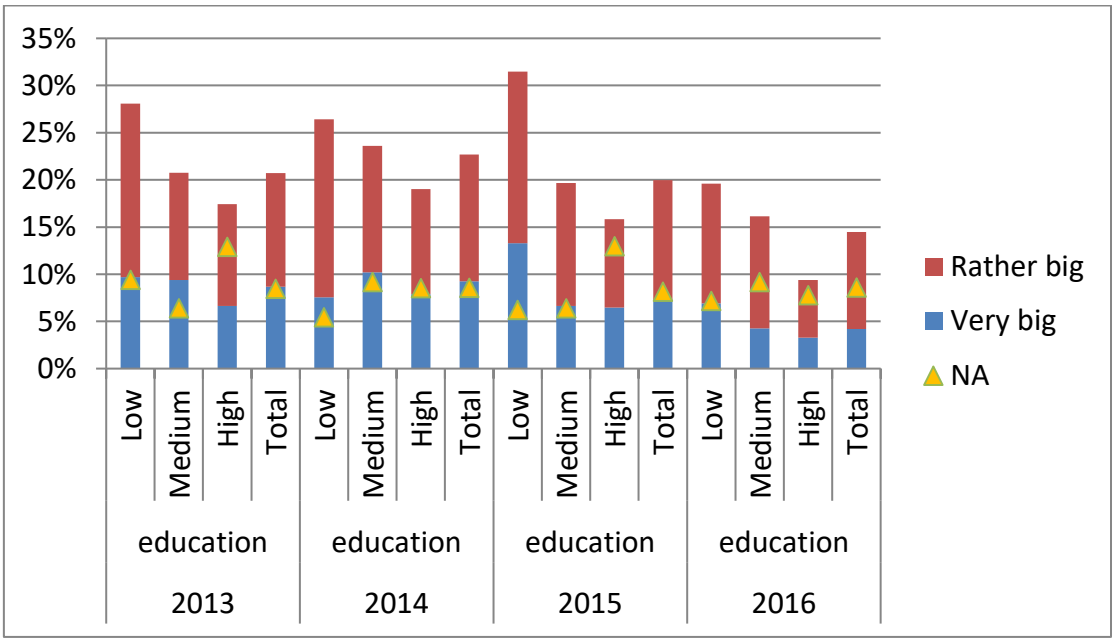
Aging channel (2): **Accelerated aging increases fiscal burden on both central and local budgets** (see e.g. Clements et al (2015) and IMF (2016)) **and changes the structure of demand for public and private services. IMF** (2016: Figure15) **estimates the overall migration impact on social spending in the Baltics at 3.5 % of GDP** (pension and health spending alone account for 3%). Spriņģe (2017) reports that, 'In the recent years, six new nursing homes [for elderly] per year have been

[10] See Kugler and Rapoport (2005); Javorcik et al. (2011); Gormsen and Pytlikova 2012.
[11] See e.g. Hazans 2016: Figure 7.

opened' in Latvia; and 'at least 14 schools that have been turned or are planning to turn into old people's homes'.

Migration networks channel. Migration networks are very dense in Latvia: already at the end of 2005, 75 % of population aged 18-65 had some relative or friend with foreign work experience, and this proportion increased to 82 % by 2011 (Hazans (2011: Box 2.25), while a recent survey puts it at 91 % among those aged 18-74 (LETA 2017). This suggests work abroad has become an integral part of the Latvian national identity (Hazans 2013a), and **in the post-crisis period emigration has become 'the new normal'** (Hazans 2016a). Powerful migration networks significantly reduce information and job search costs, as well as psychic and adaptation costs for potential emigrants, which explains **persistently high emigration potential**, see Figure 15. In surveys of emigration intentions conducted in 2013-2015, about 20 % of medium-skilled and 15 % of high-skilled working-age population stated 'Very big' or 'Rather big' probability to move abroad in the near future; in 2016, these figures fell to 16 % and 9 %, respectively - still substantial (note that among the youth the proportions are twice as high). On average, likelihood to emigrate in the near future declines with education level, but econometric analysis does not reveal significant effects (Hazans 2016b; see also Table A5 below).

Figure 15. Emigration intentions in Latvia, 2013-2016 (population aged 18-64), by completed education level. How big is the probability that in the near future you might move to work abroad?



Sources: Calculations with representative population survey data conducted by SKDS.

Population sentiment channel: Continuous for many years, massive emigration, together with published evidence on substantial potential for further emigration, has a negative effect on population sentiment, which, in turn, fosters emigration intentions.

Undermining demographic potential channel (1): About three-quarters of emigrants leave Latvia between the age of 15 and 34 [12]; hence, **the reproductive age cohorts group shrink faster than the population in general, thus accelerating aging and putting at risk sustainability of the social security system**. As of 2015,

[12] See Table 2 for high-educated emigrants.

old-age dependency ratio would be 25 % instead of 30 % if about 240 000 working-age emigrants stayed at home. Hazans (2016a: Figure 7) shows that cohorts aged 15-24 in the beginning of 2004 over the next 10 years lost to migration about 20 % (compared to 9 % for the whole population).

Undermining demographic potential channel (2): Families with the largest demographic potential (the ones with children or planning to have a child within three years) are more likely to emigrate, as shown in (Hazans 2013a, 2014) based a representative household survey conducted in Riga in 2012. In a more general setting, using four waves (2013-2016) of representative surveys of Latvia's population, I show that among population aged 18-34, those having a child under 18 in the family (other things equal) are significantly more likely to move to work abroad in the near future (Table A5; see Hazans (2016b) for related results by gender). See also Kamerāde (2015) for related discussion.

Brain drain and brain circulation channels: Beyond the labour market, the main potential impact of brain drain and brain circulation is on innovation potential. **Given that emigrants are more numerous and better educated than returnees, the expected net effect appears to be negative. But returnees bring different experience, possibly crucial for innovations.** Arguably, quality of innovation is more important than quantity, so the net effect is ambiguous. According to a survey of emigrants from Latvia conducted in 2014, 25 % of the post-2000 emigrants plan to start a business in Latvia or to help their employers to establish business relations with Latvia (Hazans, 2015f). Fostering the diaspora engagement in economic and social development seems the most significant way to generate potential gains from emigration.

4 Emigration of skilled labour and its impact on labour market conditions

Emigration of skilled labour affects the sending country's labour market in several ways.

First, emigration contributes to **reduction of unemployment, as the actual or potential unemployed and economically inactive individuals move abroad or fill the vacancies left behind by previously employed emigrants.** For Latvia, evidence for unemployment-reducing impact of emigration in general is found in Hazans (2014; 2016a: Table 3; Fig. 19). Table 4 and Table 5 below provide evidence for skilled labour: in different periods between 2000 and 2015, **one-fifth to one-third of Latvian mobile workers and one sixths to one-fourth of settled emigrants with completed medium or high education experienced unemployment or economic inactivity in Latvia shortly before departure**; the share of those coming from unemployment was especially high during the crisis.

Table 4. Spells of unemployment or economic inactivity in Latvia during the year prior to departure. Medium- and high-educated Latvian mobile workers, 2002-2015

%

	Period of work abroad				
	2002-2003	2004-2008	2009-2011	2012-2013	2014-2015
Unemployed	11.8	20.6	26.7	17.4	20.2
Inactive	16.1	11.4	4.2	3.6	4.9
Total	27.8	32.0	30.9	21.0	25.1

Notes: Mobile workers here are labour emigrants still considered household members back home. Sources: Calculations based on Latvian LFS data.

Table 5. Incidence of unemployment or economic inactivity as the last labour status in Latvia. Medium- and high-educated emigrants from Latvia, 2014

%

	Period of arriving to the host country				
	2000-2003	**2004-2008**	**2009-2011**	**2012-2014**	**2000-2014**
Unemployed	13.7	11.1	20.8	16.2	16.4
Inactive (excl. students)	6.3	5.4	4.5	5.7	5.2
Total	20.0	16.5	25.3	21.9	21.6

Notes: Data refer to emigrants which left Latvia aged 15 to 64. Sources: Calculations with emigrant survey data.

Second, **large outflows of skilled labour negatively affect composition of labour force which, due to human capital externalities and low degree of substitutability between skilled and unskilled workers, lowers productivity** (IMF 2016). IMF (2016: Figure 13, based on a macro level econometric model) finds that in absence of skilled emigration in 1995-2012 real productivity growth in the countries which joined the EU in 2004 (excl. Cyprus and Malta) would be larger by two to seven percentage points, Latvia being on the lower end of this range.

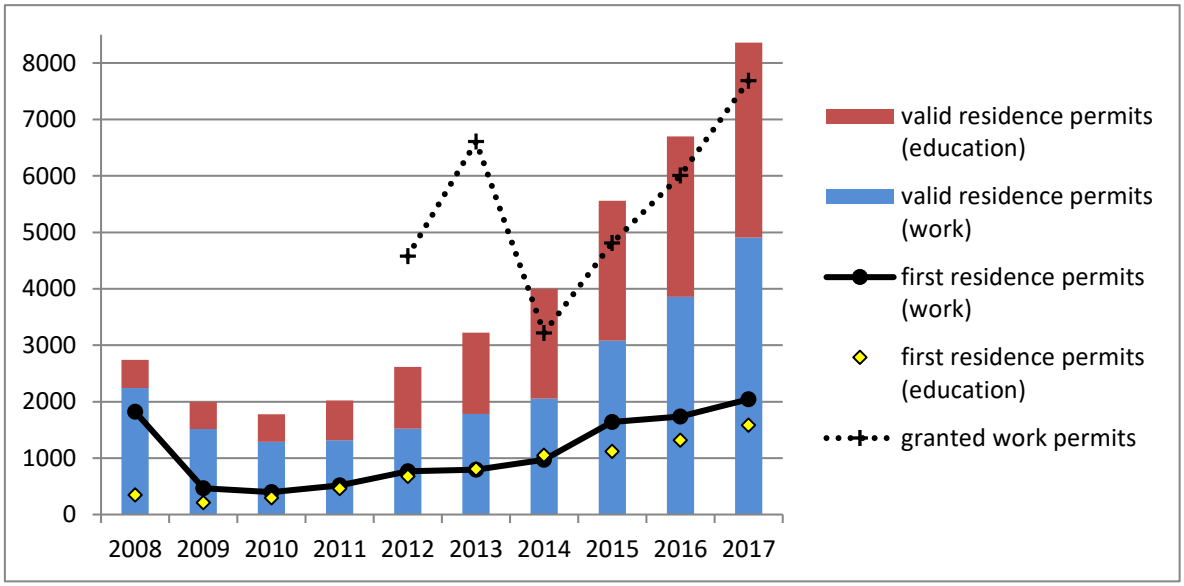
Third, **emigration of skilled labour may lead to labour and skill shortages in particular sectors and/or occupations and in the whole economy**. **A more detailed account of this effect in the Latvian context follows here.** Discussion and early evidence from Central Europe and the Baltics is found in Rutkowski (2007) and Hazans and Philips (2010). IMF (2016: Figure 10) provides a descriptive evidence for positive association between emigration rates and the index of shortage of high-skilled workers (measured as the difference between the share of high-educated persons in employment and in the working-age population) across CESEE countries in 2000-2015.

Fourth, **labour shortages caused by emigration accelerate wage growth in affected sectors and occupations -** see evidence for developing countries in Mishra (2015) and for CESEE in IMF (2016: Figure 13). According to the IMF (2016) estimate for Latvia, emigration contribution to nominal wage growth (while controlling for inflation, among other factors) during 1995-2012 is just 2 %, while Hazans (2013) estimates the (comparable) effect on real wage growth over 2000-2010 at 2.5 %. As argued in Hazans and Philips (2010), European Commission (2012:276) and Hazans (2016a: 337), macroeconomic models tend to underestimate the effect of emigration on real wages, while **the effects for specific skill groups, occupations, or sectors might be significantly larger**. Elsner (2013a, 2013b) shows that in Lithuania, a one percentage-point increase in the emigration rate increases the real wage of men, on average, by 1 % and that over five years, emigration increased the wages of young workers by 6 %, while it had no effect on the wages of old workers. In Latvia, many of the sectors experiencing labour shortages feature positive growth in unit labour costs between 2008 and 2015, unlike the whole economy.

To investigate the labour shortage issue in the Latvia's context, I start by providing evidence for emerging shortages and identifying sectors, occupations and fields of study for which there is robust evidence of existing or emerging shortages. Then, for each of such cases I provide evidence for intensive outflow of relevant category of skilled labour.

Recall from Figure 2 above that **economy-wide job-vacancy rate has risen since 2015 and the labour shortage indicator in manufacturing and construction increased in 2017, just as the number of residence permits for work-related reasons granted to non-EEA citizens more than doubled between 2014 and 2017, as did the number of work permits (Figure 16).** Noteworthy, work-related residence permits are growing faster that education-related ones (Figure 16).

Figure 16. Work and education related residence permits and work permits granted to non-EEA nationals, 2008-2017



Sources: Residence permits - Eurostat. Work permits - Siliņa-Osmane (2018).

The highest job vacancy rates, both in 2016 and 2017, are found in public administration, manufacturing, construction, health, finance and insurance,

accommodation and food service activities, and information and communication. **In 2017-2018, above-average vacancy rate were seen also in water supply and waste management, as well as in transportation and storage** (Table 6).

In 2018, trade entered the list with **the 4th highest job vacancy rate**, as the number of vacancies in this sector more than doubled (while number of jobs declined). On the other hand, **in 2018 two sectors lost status of those with high vacancy rates: information and communication (where employment growth outpaced the growth of vacancies) and finance (where vacancies declined faster than jobs),** see Table 6.

Table 6. Sectors with above-average job vacancy rates, 2016-2018

	Vacancy rate					FTE
	Level, %			Change, % points		% Chg
	2016	2017	2018q2	2008-2017	2017q2-2018q2	2015-2017
(O) Public administration and defence	4.0	4.6	5.1	0.9	0.4	2.7
(I) Accommodation and food service activities	2.2	2.1	3.8	1.7	2.3	1.3
(F) Construction	1.7	2.3	3.7	1.4	1.5	-4.1
(G) Trade	1.3	1.5	3.1	0.9	1.7	-3.1
(C) Manufacturing	1.9	2.3	3.0	0.8	0.7	1.0
(E) Water supply and waste management	1.4	2.1	3.0	1.2	0.9	4.8
(H) Transportation and storage	1.5	2.0	2.9	-1.3	1.0	2.1
(Q) Health and social work	2.0	2.2	2.7	0.1	0.6	3.5
(J) Information and communication	1.9	2.0	2.1	1.2	0.2	16.7
(K) Finance and insurance	2.0	2.0	1.7	0.3	-0.1	4.0
ECONOMY TOTAL	1.6	1.9	2.6	0.3	0.8	1.1

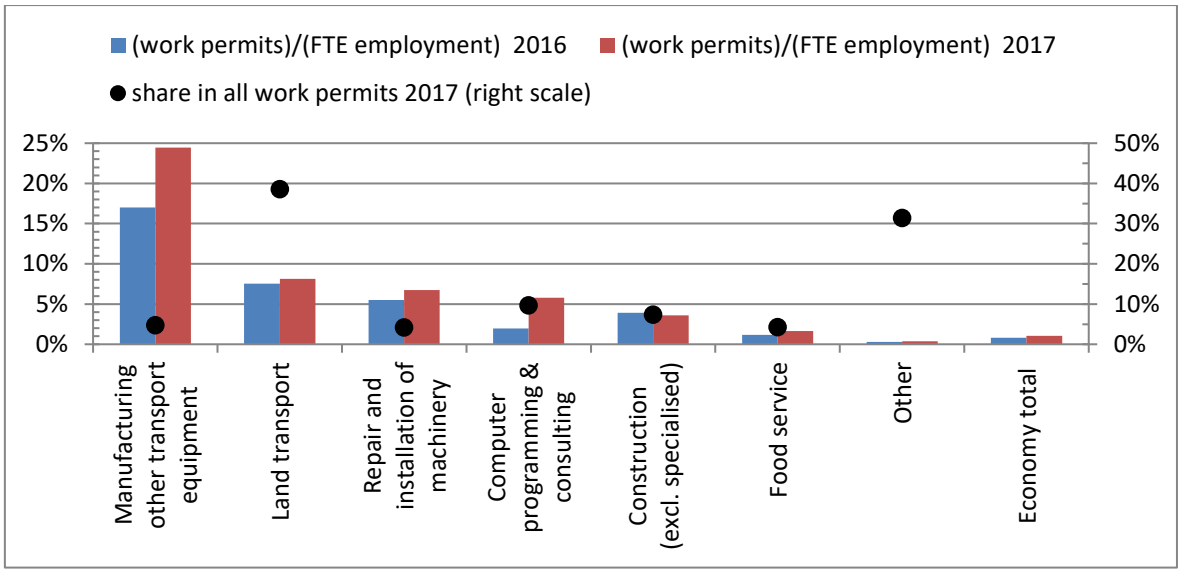
Notes: FTE is employment in full-time units. Sources: Calculation with Statistics Latvia data.

All sectors listed in Table 6 feature recent vacancy rates above (or, in transportation and finance, similar to) those observed in 2008. Moreover, all these sectors but construction and trade experienced positive growth in employment (in full-time units) between 2015 and 2017 (in manufacturing, situation varies by sub-sector, but pharmaceuticals, electronic and optical equipment, repair and installation feature strong employment growth).

According to the State Employment Agency, **the largest labour shortages are observed in IT, manufacturing and transport** (LETA 2017a)**.** Complementary evidence on emerging labour shortages is given in Figure 17-Figure 18.

Top six sectors with the largest numbers of work permits for non-EEA nationals in 2017 include, in line with evidence from Table 6, two manufacturing sectors, land transport, computer programming, construction, and food services. These sectors cover about 70 % of all permits and feature above-average ratio of permits to employment (Figure 17). Noteworthy, **computer programming features the strongest growth in work permits between 2016 and 2017**.

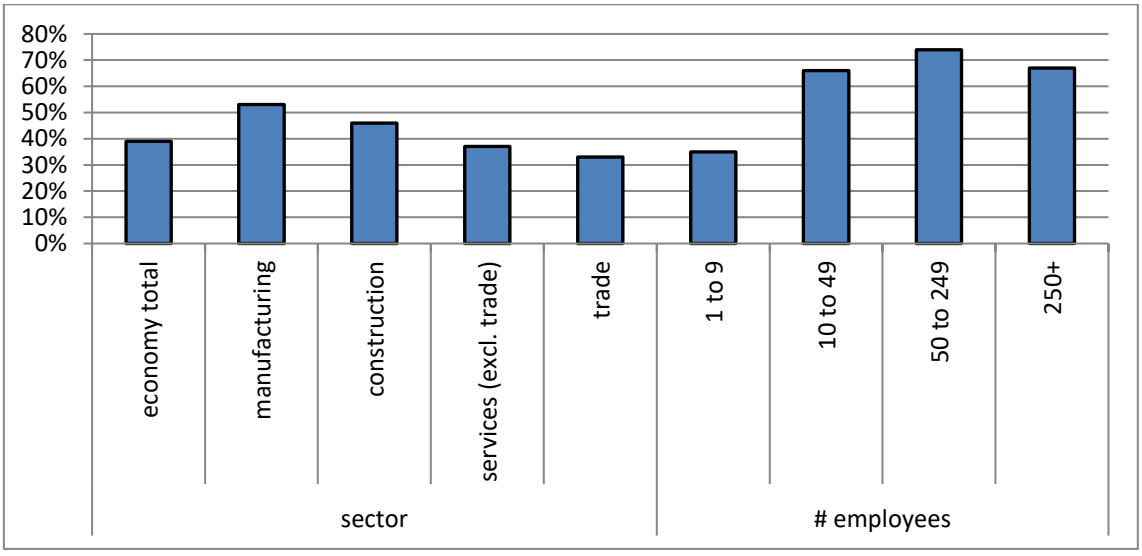
Figure 17. Sectors with largest numbers of work permits to non-EEA nationals, 2016-2017



Sources: Work permits - Hlapkovskijs (2017) and Siliņa-Osmane (2018); FTE employment - Statistics Latvia; own calculation.

In 2017, about 40% of Latvia's enterprises reported significant difficulties in filling vacancies; this proportion is higher in manufacturing (53%) and construction (46%). The incidence of such difficulties becomes two-thirds among enterprises with 10 or more workers and reaches three-fourths among those with 50+ workers (Figure 18).

Figure 18. Reported difficulties in filling vacancies, by sector and enterprise size, 2017



Sources: Unpublished results of SKDS enterprise survey (N=750) for Citadele Index, June-July 2017 (see SKDS 2017 for details on the survey).

More evidence for difficulties in filling vacancies is found in Figure A9: in June 2017, **nearly half of vacancies registered at the State Employment Agency were unfilled for more than a month, and one in six vacancies - for 3 or more months**. Significant portion of vacancies were unfilled for 5 or more months in Riga region (4%)

and Latgale (6%). The list of corresponding occupations is consistent with the list of sectors in Table 6 and Figure 17: in Riga, it includes truck drivers, programmers and a couple of skilled manual occupations used in shipbuilding, while in Latgale, apart from truck drivers and managers, it consists of eight (!) medical professions: nurse, surgeon, anesthetist, resuscitator, neurologist, gynecologist, accoucheur, and ophthalmologist (State Employment Agency 2017:14).

The challenge of the labour shortage is increasingly referred to by experts, investors and policymakers, both in general and in sector-specific context. Āboliņš (2017) notes that the economy is increasingly affected by depopulation and that availability of labour force emerges as a serious challenge for the business, according to surveys. Citadele group (2017a), based on a survey of business owners and managers, concludes that shortage of qualified labour force is a serious threat to Latvia's competitiveness and economic growth in the long run (see also Hāka, 2017). Gašpuitis (2017) expects the demand for workers to be felt in all sectors, and continuing emigration, particularly of the young, combined with aging to narrow choice for employers, resulting in increasing upward pressure on wages and inflation; he concludes that 'Latvia's economy is approaching the situation when labour shortage becomes an obstacle to growth'. Strautiņš (2017b) warns that wage growth signals scarcity of human resources. Rutkaste (2017) stresses that 'the number of vacances is steadily growing, and there is a shortage of workers', in line with Krasnopjorovs (2017) who notes that 'vacancy dynamics suggests that shortage of workers is developing in some sectors of the economy and some labour market segments'.

Foreign Investors Council in Latvia (FICIL, 2016) warns about '**burning workforce shortages in different sectors of economy (e.g. production, shared services and outsourcing, ICT, hospitality etc.**)'. Chairman of the board of HansaMatrix, a leading Latvian high-tech producer, refers to 'rather big problems in finding qualified employees'; likewise, the owner of Zoltners, a countryside-located hospitality sector business, says that availability of workers in the future is his largest concern (Citadele group, 2017a, 2017b). Similar concerns have been expressed by the acting president of the Association of Hotels and Restaurants of Latvia, who also mentions difficulties to find good employees with sufficient skills in both English and Russian languages, while the state language legislation makes it impossible to hire foreign students (Kasjauns.lv/LETA, 2017). The leading Latvia's hospital was forced to reschedule planned surgeries (some being postponed by a month) due to shortage of employees (LETA /www.DELFI.lv, 2017).

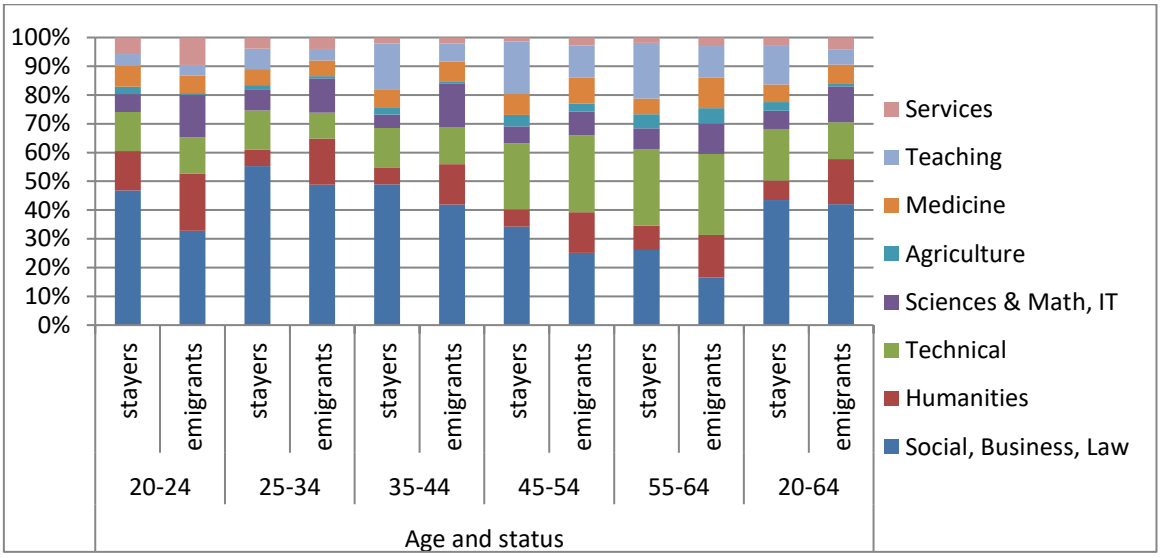
Spuriņš (2017a) notes that the **high-qualified workforce in the pharmaceutical sectors is aging and over the next 10 years, it will be necessary to replace about 40 % of them**. As of 2016, **19 % of high-qualified professional jobs and 32 % of medium-qualified jobs in manufacturing of metal products and machinery were not filled**, according to the head of the producer's association in this sector Mr. Rantiņš (Orupe, 2016). According to Rozīte (2017) and Spuriņš (2017b), Latvia's **economy will need up to 3 000 new high-educated ICT professionals in the years to come, and this demand is not possible to satisfy without attracting foreign students.**

Behind shortage of high-skilled labour in many sectors, such as manufacturing, ICT, finance, and health, there is **a shortage of knowledge in science and mathematics, as well as digital skills, among high school graduates** (FICIL 2016; Bitāns, 2017a; Citadele group, 2017a; Rozīte 2017; Strautiņš 2017a; Orupe 2016, among others).

Which categories of skilled labour are in short supply in Latvia because of emigration?

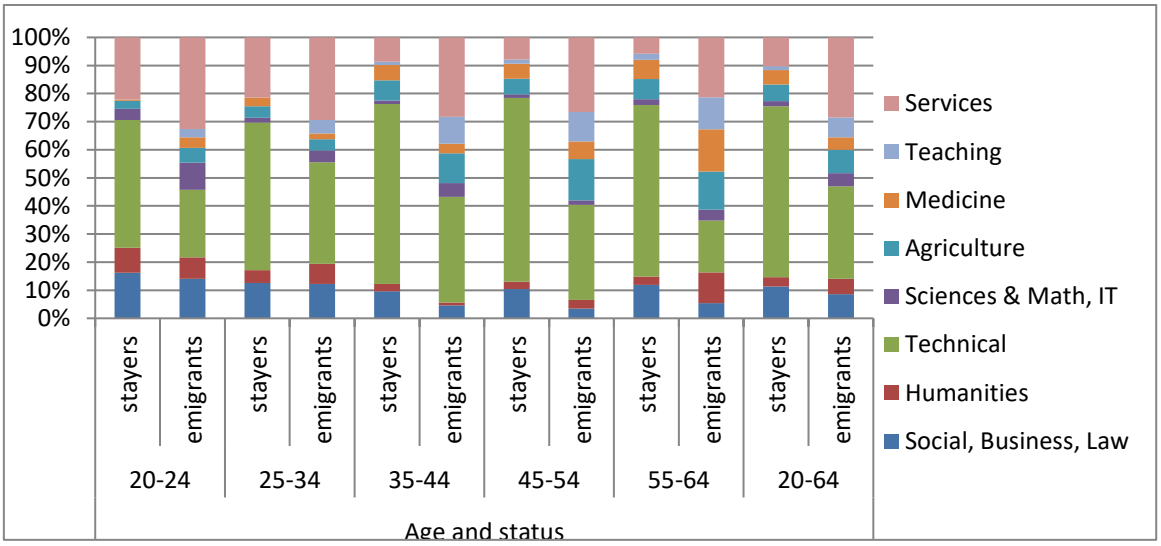
Evidence in Figure 19-Figure 20 (combined with the information on existing shortages presented above) suggests that **emigration has contributed to shortage of high- and medium-skilled professionals educated in science, mathematics, and information technologies and medicine**: share of these fields among high- and medium-educated emigrants is higher than among stayers. Moreover, for science, mathematics and IT, this is the case in all age groups, while among health professionals the most intensive outflow was among high-educated aged 35+ (as of 2014) and medium-educated aged 45+, although it was significant also among those aged 20-34;

Figure 19. High-educated emigrants from Latvia and stayers by field of study, 2014



Notes: Data refer to emigrants which left Latvia in 2000-2014 and were aged 20-64 in 2014. Sources: Calculations with emigrant survey and the Latvian LFS data.

Figure 20. Emigrants from Latvia and stayers with non-tertiary vocational education by field of study, 2014



Notes: Data refer to emigrants which left Latvia in 2000-2014 and were aged 20-64 in 2014. Sources: Calculations with emigrant survey and the Latvian LFS data.

Latvia also lost to emigration many experienced engineers and technicians, as related fields are over-represented among high- and medium-educated emigrants aged 45-64, see Figure 19-Figure 20).

Finally, **STEM (science, technology, engineering and mathematics) fields taken together are overrepresented among high-educated emigrants in all age groups** (Figure 19), and no doubt emigration has contributed to shortage of related skills in Latvia.

Analysis of professional experience emigrants and mobile workers from Latvia had before moving abroad (Table 7) reinforces the finding based on the field of study and further supports the idea that shortages identified in Table 6 and Figure 17-Figure 18 above are largely caused by emigration**: people with pre-migration experience as STEM and ICT professionals, personal service workers[13], sales workers, skilled building workers are strongly overrepresented among both emigrants and mobile workers. Outflow of health professionals intensified in the post-crisis period, when this group was proportionally represented among emigrants. Post-crisis mobile workers feature proportional representation of skilled metal and electrical workers, while operators (including truck drivers) and assemblers are strongly overrepresented.**

Table 7. Emigrants (as of 2014) and mobile workers (2011-2015) from Latvia, by last occupation in Latvia, in comparison with employed stayers aged 18-64

%

	Emigrants (by year of moving)			Mobile workers	Stayers
	2000-2008	2009-2014	2000-2014	2011-2015	2011-2015
Managers & officials	7.3	7.4	7.4	3.3	10.0
Science, engineering & ICT professionals	**8.8**	**11.2**	**10.4**	**7.7**	**6.5**
Health professionals	**1.2**	**3.0**	2.4	0.3	**3.3**
Business, admin., legal, social & culture professionals	19.4	24.9	23.0	7.9	15.5
Teaching professionals	4.0	3.5	3.7	1.1	5.1
Clerks	5.2	6.9	6.3	1.9	5.8
Personal service workers	**11.7**	**10.0**	**10.6**	**12.6**	**8.5**
Sales workers	**12.6**	**9.8**	**10.8**	**1.5**	**6.8**
Skilled building workers	**5.2**	**6.9**	**6.3**	**13.0**	**3.7**
Other skilled workers	12.3	8.4	9.7	**12.2**	**12.6**
Operators & assemblers	6.6	4.0	4.9	**16.7**	9.5
Elementary	5.7	3.9	4.5	21.7	12.7

[13] This category includes, among others, many occupations typical for such sectors as accommodation and food service, sports and entertainment.

Total	100	100	100	100	100
N obs	1191	4107	6098	1036	74476

Notes. 'Professionals' refer to ISCO major groups 2 and 3 (i.e. include also associated professionals and technicians). Mobile workers are persons working abroad (usually for less than a year) but still considered household members in the home country. Sources: Calculation with emigrant survey data and the Latvian LFS data.

Return migration flows to Latvia have been much smaller than outflows (in most of the recent years - about 25 % of outflow in the same year, even according to the official national data which underestimate outflows), **while the proportion of high-educated among returnees is similar to that among working-age stayers** (Hazans 2016c) - in contrast with the situation in both in EU on average and in EU-13 (see Fries-Tersch et al, 2017: Fig. 41-42). Most emigrants do not plan to return (Figure 6 above). This means that **return migration alone cannot compensate the shortage of skilled labour caused by emigration from Latvia**.

Nevertheless, returnees are a valuable asset. According to a survey of return migrants conducted at the end of 2016, returnees of both genders who returned at least a year ago feature substantially higher employment rate, and almost twice as high proportion of self-employed and employers as working-age (18-64) stayers (Hazans 2016c: Figure 14 and Table P3)[14]. The returnees bring useful foreign work experience, which manifests itself in higher earnings (Hazans 2013a: 89). According to a recent survey, return migrants' earnings are, on average, by 45 % higher than that of stayers (Hazans 2017a). They **more often than stayers work in sectors experiencing labour shortages** (e.g. ICT, see Hazans 2017b: Graph 1).

A vast majority of returnees report that foreign experience had a positive effect on their professional skills and self-confidence (Hazans 2013a: 88). One-third of employed return migrants see themselves as difficult-to-replace employees (among those with higher education received abroad this proportion is 43 %). This category of returnees enjoys a very substantial earnings premium that increases with education level, reaching 88 % among those with MA degree (Hazans 2017b: Graph 4). Three out of four of those difficult-to-replace (including virtually all of them with higher education received abroad) say that skills which make them 'unreplaceable' have been completely or partially developed abroad.

5 Actions undertaken by Member States to address the outflows of skilled labour

Remigration support and the new diaspora policy only began to emerge in Latvia in 2011 when a special ambassador for diaspora issues was appointed at the Ministry of the Foreign Affairs; until that, only a legislative framework existed to support repatriation of the 'old' (pre-1990) diaspora and their descendants, see OECD (2016: Box 2.1 for details). In 2013, the Government approved a 'Remigration Support Measure Plan 2013-2016' (Remigration Plan hereafter) aimed at providing support to Latvian nationals and their families living abroad in returning to Latvia, and to those diaspora members who wish to establish business in Latvia.

[14] Fries-Tersch et al (2017: Figure 43) misleadingly refer to all returnees but in fact their results refer to those who returned less than a year ago.

The Remigration Plan (owned by the Ministry of Economy) **covered a wide range of intended actions and objectives.** Some were meant to help the potential and actual returnees to find jobs and integrate in the society in Latvia, by creating a **one-stop information agency for returnees and improving information on the Latvian labour market to Latvians abroad**; **the former is yet to be done, and the latter has much room to improve**, according to a recent survey or return migrants (Hazans 2016c). Other measures were aimed to **support Latvians who return with families** acquired or raised abroad: Latvian language support for returnees' family members and special support at school for school-age children. Also in this direction, **achievements fall short of intentions, according to survey evidence**.

A third domain involves **trying to reach highly educated emigrants**, with a proposal to provide grants to high-skilled Latvians abroad to return, including potential student loan forgiveness. On this front, a small size programme is functioning in public administration sector but, generally, there is **some opposition** (on equity grounds) among policymakers and experts **to focusing the diaspora policy on the high-skilled.**

Fourth, these are co-operative efforts with other actors (including European Latvians Association, World Federation of Free Latvians (WFFL) and the Latvian Chamber of Industry and Commerce) to **expand business network development with the Latvian diaspora**.

An Action Plan for the Diaspora 2015-2017 was introduced by the Government in 2014, and covers four fields. First, **reinforcing Latvian identity**, through summer camps, media, and other outreach initiatives. The Ministry of Culture, Society Integration Fund (SIF) and The Latvian Language Agency are important players. Second, **civic and political engagement** includes project support to diaspora NGOs (SIF, MFA, as well as the Ministries of Culture and Education are engaged) and facilitating emigrant participation in elections held in Latvia (MFA and the Ministry of Interior). The third is **cooperation in economics, culture, education and science**. In this regard, a promising initiative is the World Latvian Economics and Innovations Forum (supported by WFFL and the Latvian MFA) which takes place regularly since 2013. The MFA supports also the Diaspora and Migration Study Centre at the University of Latvia, and the Ministry of Culture organises annual Diaspora Conferences. The fourth field is **assistance to returnees** (along the same lines as described above in the context of Remigration Plan). In this regard, the Ministry of Environmental Protection and Regional Development has established (in March 2018) a **network of regional coordinators for remigrants** and potential remigrants; details (in Latvian) are available at https://www.paps.lv/par-projektu/; see also Helmane (2018).

A comprehensive Diaspora Law has been prepared but (at the moment of writing) is still **under discussion in the Parliament.**

In practical terms, the most important policy measure to reduce emigration thus far was the **decision to increase child benefits** for the second and third children as of 2015 (see Hazans and Pluta (2017: 13); a further increase was implemented in 2018.

Important developments in 2017-2018 have been triggered by private (business and NGO) initiatives. First, a **private job-matching firm YourMove.lv** has developed a web platform which "**connects Latvian and foreign professionals to companies in Latvia that are looking for global talent**" (see more at https://www.yourmove.lv/). Second, a **business movement "Latvia works"** (see https://www.latvijastrada.lv/), initiated by mobile operator *Tele2* **aims at reaching out to emigrants with job offers, convincing them to accept these offers and**

helping them and their families upon return. The movement has been launched in May 2018 and by September was joined by 66 employers, each of them committing to employ a certain number of returnees. Finally, ***AppLV* is a NGO of and for return migrants**; its activities are aimed at developing social infrastructure helping remigrants and promoting their engagement in civil society (see more at https://arpasaulespieredzi.lv/).

To sum up, some policy steps towards facilitating return and intensifying diaspora engagement have been taken but much more needs to be done. In 2017, PM Kučinskis said, 'The time has come to discuss certain measures to support return migration' (LETA 2017c).

6 Conclusions

For Latvia, emigration is a major problem. Outflow of skilled labour from Latvia between 2009 and 2016 is equivalent to 11.3 % of current medium- and high-educated working-age Latvia's population and 17.4 % of its high-educated segment.

Emigrant survey data confirm substantial (and increasing over time, except for most recently) university diploma drain from Latvia to various EU/EFTA destinations during the whole of 2000 and 2014. The share of tertiary educated among emigrants further increased during their stay in the host countries, reaching, by 2014, 45 %. The share of university graduates among Latvian emigrants in each of the destinations under inspection was higher than among their age peers in Latvia.

In 2014, two out of five high-educated Latvian nationals (or former nationals) aged under 25 and more than one-third of their high-educated compatriots aged 25-34 left Latvia between 2000 and 2014. Both overall and in each age group, high-educated people were more likely to emigrate than their medium-educated counterparts.

During (and, except for the UK, also after) the crisis, diploma drain and brain drain from Latvia were more intensive than before, reflecting a rise of general disappointment and non-economic reasons for emigration among the high-educated and the future-oriented. The increase in the number of high-educated emigrants between 2000-2008 and 2009-2014 was driven mainly by those who were not motivated by economic push factors.

The post-crisis emigrants (as opposed to the pre-crisis ones) are much more oriented towards long-term or permanent emigration, interested in legal employment and social security and are more likely to move as entire families.

The loss of skilled labour caused by emigration from Latvia is largely permanent. Most emigrants do not plan to return, mainly because they are satisfied with their lives abroad more than they used to be in Latvia. However, about one-third of emigrants, although not planning to return, may change their mind 'under right circumstances.

Probability to return within five years falls with completed education level among all emigrants and with study level among tertiary students abroad.

High-educated emigrants are over-represented in Science, Mathematics, IT and Medicine, on one hand, and in Humanities and Arts on the other. The post-crisis skilled emigrants feature larger incidence of overqualification and other types of brain waste, but the incidence of brain waste varies significantly across education levels and fields of study and across destination countries. High-educated emigrants are more often formally overqualified than medium-educated ones, but less often report underutilisation of their education and qualifications. High-educated graduates of Sciences, Mathematics, IT and Health feature the lowest over-qualification and skill underutilisation rates.

Many overqualified high-educated emigrants were already overqualified in Latvia. The rate of downskilling vs. last job in Latvia can be seen as the measure of direct brain waste effect of migration. By this measure, the brain waste effect of migration is modest for graduates of Engineering and Technical fields.

Emigration of skilled labour has contributed to the reduction of unemployment: in different periods between 2000 and 2015, one-fifth to one-third of Latvian mobile workers and one-sixth to one-fourth of settled emigrants with completed medium or high education experienced unemployment or economic inactivity in Latvia shortly before departure; the share of those coming from unemployment was particularly high during the crisis.

Recently, however, shortage of qualified labour force caused by emigration became a serious challenge and is perceived as a threat to Latvia's competitiveness and economic growth long-term. This article provides data-based evidence that emigration has contributed to shortage of high- and medium-skilled professionals educated in Science, Mathematics, ICT and Medicine, as well as experienced engineers and technicians. STEM (science, technology, engineering and mathematics) fields taken together are overrepresented among high-educated emigrants in all age groups.

Furthermore, people with pre-migration experience as STEM and ICT professionals, personal service workers, sales workers, and skilled building workers are strongly overrepresented among both emigrants and mobile workers. Outflow of health professionals intensified in the post-crisis period, when this group was proportionally represented among emigrants. Post-crisis mobile workers feature proportional representation of skilled metal and electrical workers, while operators (including truck drivers) and assemblers are strongly overrepresented. This evidence is well matched with the list of sectors and occupations featuring above-average vacancy rates and inflow of foreign workforce.

Beyond the labour market, the economic impact of emigration occurs through different (but closely inter-related) primary and secondary channels: direct depopulation, aging, migration networks, undermining demographic potential, population sentiment, brain drain and brain circulation.

Emigration accelerates aging and distorts the age structure of the population. This then increases the old-age dependency ratio, thus threatening sustainability of the social security system. Moreover, this indirectly contributes to further emigration (40 % of emigrants cite better social protection abroad as one of the important reasons for leaving Latvia). Families with the largest demographic potential (the ones with children or planning to have a child within three years) are also more likely to emigrate.

Accelerated aging increases fiscal burden on both central and local budgets and changes the structure of demand for public and private services. IMF estimates the overall migration impact on social spending in the Baltics at 3.5 % of GDP.

Largely due to network effect, in the post-crisis period emigration has become ‘the new normal’. Powerful migration networks significantly reduce information and job search costs, as well as psychic and adaptation costs for potential emigrants, which explains persistently high emigration potential (which, however, felt in 2016 as compared to 2013-2015).

Labour force contraction and adverse changes in skill composition due to migration have a negative effect on GDP growth. IMF estimates this effect for Latvia to be the strongest among 11 new EU member states, 6 non-EU Balkan countries and 5 CIS countries.

By reducing population and hence labour force and domestic market size, emigration discourages investment (both domestic and foreign) and encourages closing businesses

Depopulation makes the public services in small cities and the countryside more expensive per capita. Combined with reduced tax base, this leads to reduced supply and/or lower quality of public services. A vicious circle emerges: lower wages and reduced public services foster emigration. On the positive side, deterioration of the situation with the public services (most importantly, education and health care) increases pressure for much needed and long awaited structural reforms.

Return migration alone, due to its composition and limited size cannot compensate the shortage of skilled labour caused by emigration from Latvia.

Nevertheless, returnees are a valuable asset. According to a recent survey of return migrants, returnees who returned at least a year ago feature substantially higher employment rate and almost twice as high proportion of self-employed and employers as working-age stayers. They more often than stayers work in sectors experiencing labour shortages (including ICT). One-third of returnees see themselves as difficult-to-replace employees and most of them say that skills which make them 'unreplaceable' have been completely or partially developed abroad.

Both people and the Government of Latvia perceive emigration as a very serious challenge. Some policy steps towards reducing emigration, facilitating return and intensifying diaspora engagement have been taken, but much more needs to be done. Several promising projects have been launched in 2018 by government institutions, business, and NGO.

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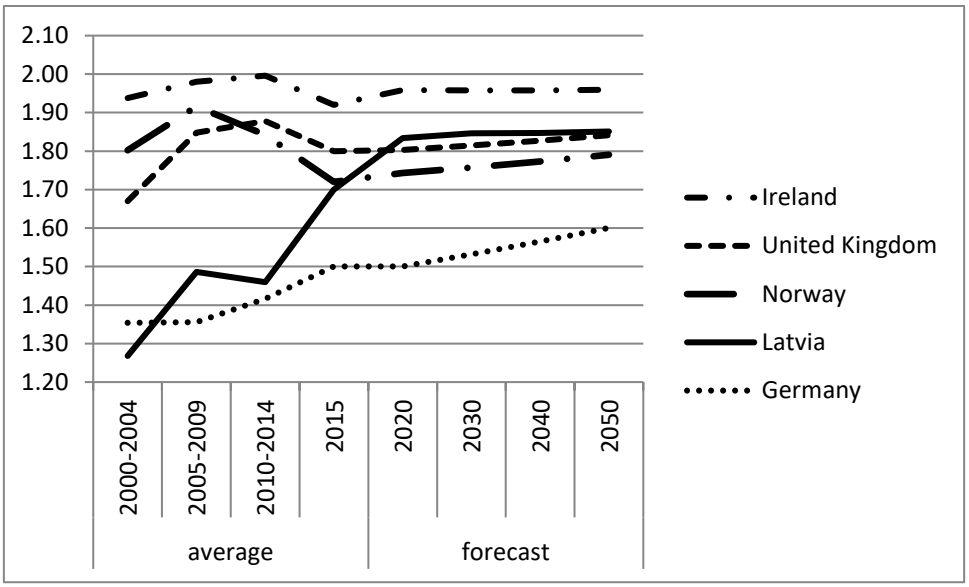
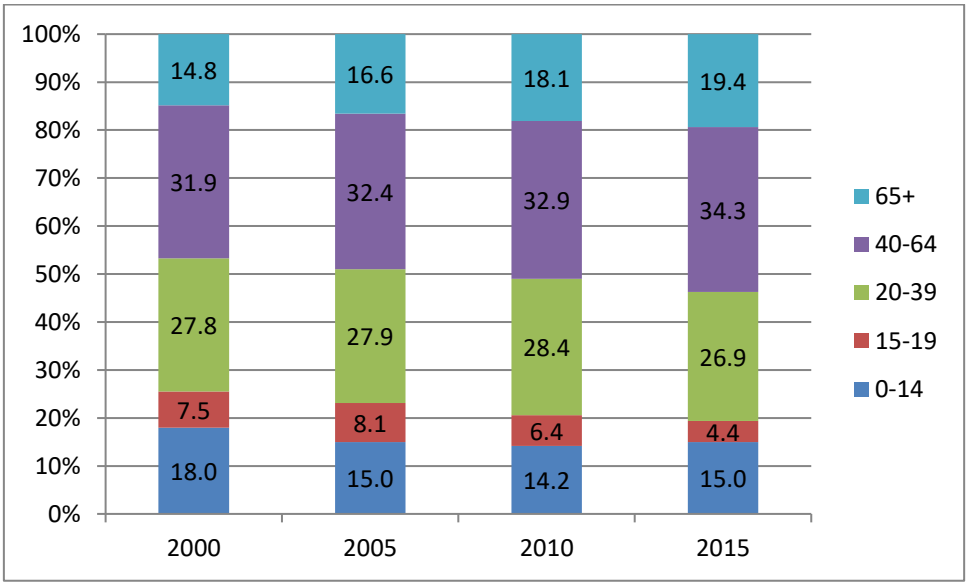
Annex 1 Additional Figures

Figure A1. Total fertility rate in Latvia and main destination countries of Latvian emigrants, 2000-2015 and forecast for 2020-2050



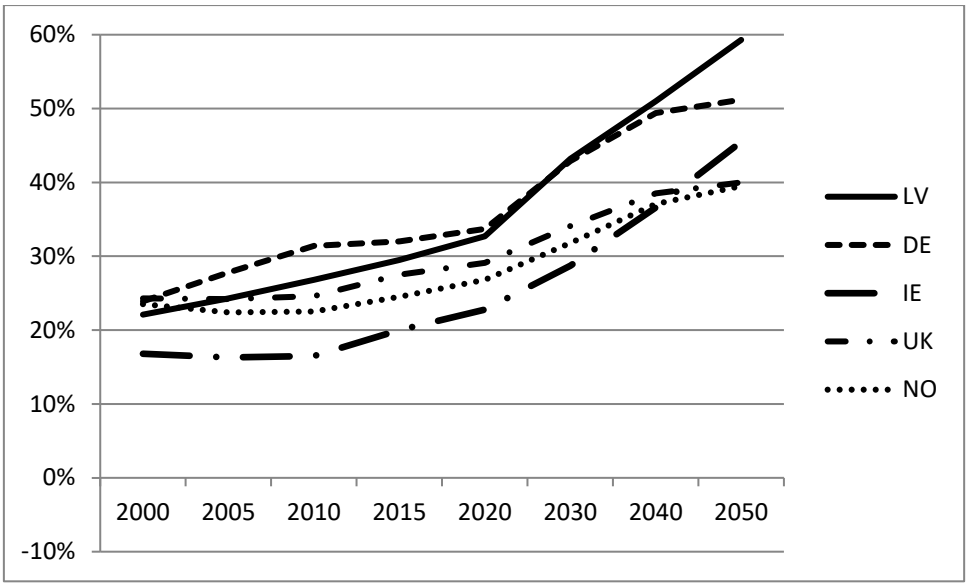
Source: Eurostat data and baseline projections

Figure A2. Age structure of Latvia's population, 2000-2015



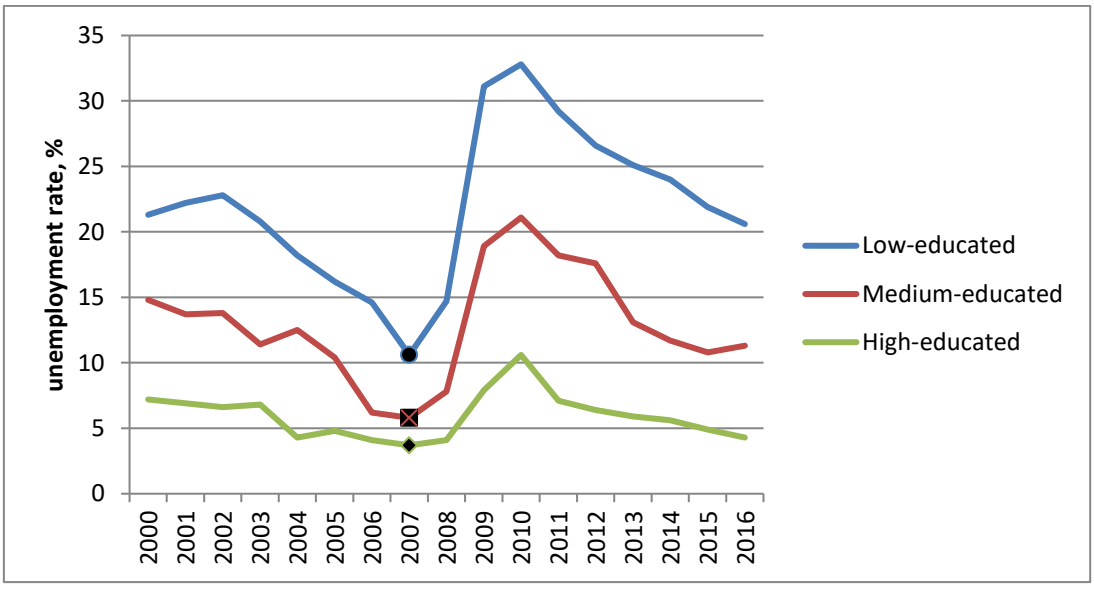
Source: Eurostat data

Figure A3. Old dependency ratio, 2000-2015 and forecast for 2020-2050. Latvia and main destination countries of Latvian emigrants



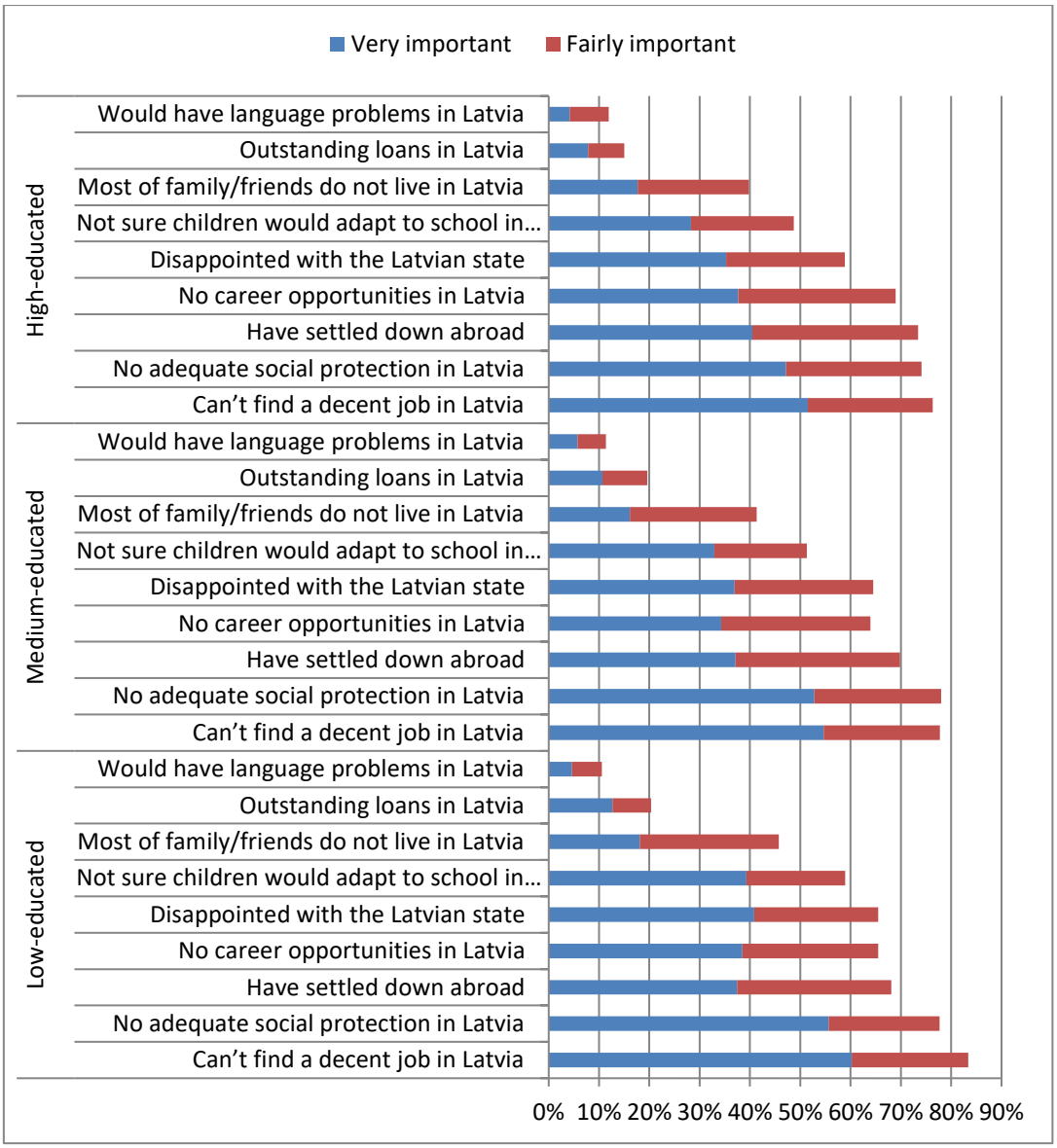
Notes: Old dependency ratio is the ratio of population aged 65+ to those aged 15-64. See Auers and Gubins (2017) for more optimistic projection for Latvia. Source: Eurostat data and projections.

Figure A4. Unemployment rate by educational attainment (age 15-74). Latvia, 2000-2016



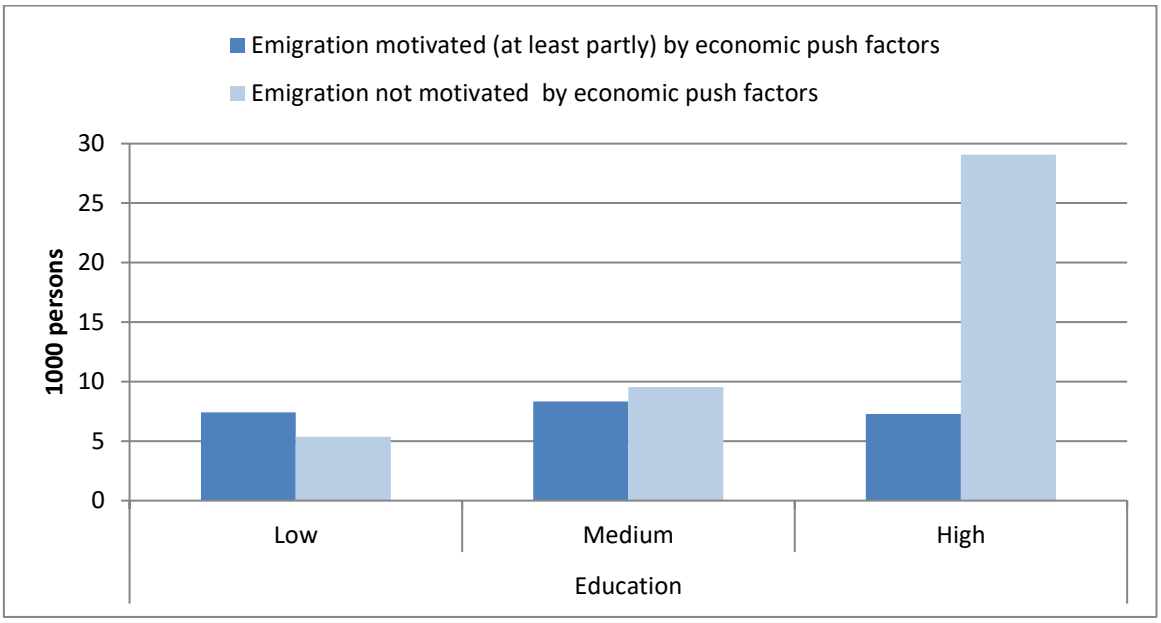
Source: Eurostat.

Figure A5. Factors preventing Latvian emigrants from returning: Percentage who find it very important or fairly important, by completed education level



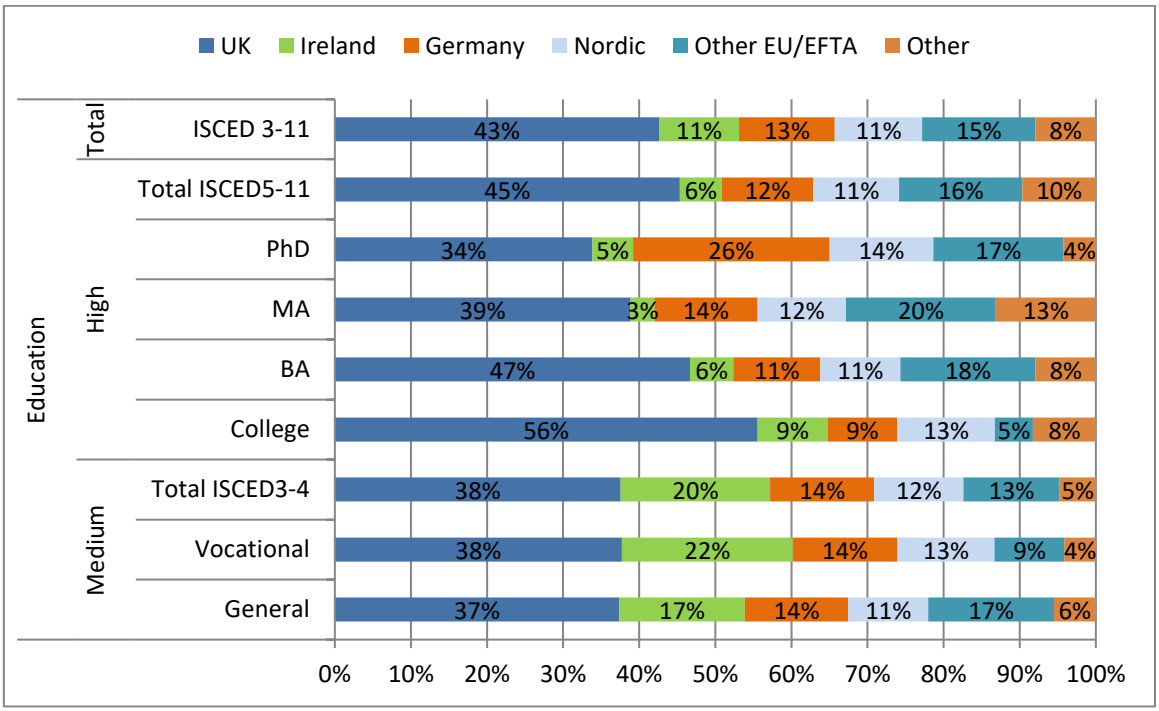
Sources: Calculation with emigrant survey data (Hazans 2015e).

Figure A6. Increase in the number of settled emigrants from Latvia between 2000-2008 and 2009-2014, by education level in 2014 and presence of economic push factors as reasons for emigration



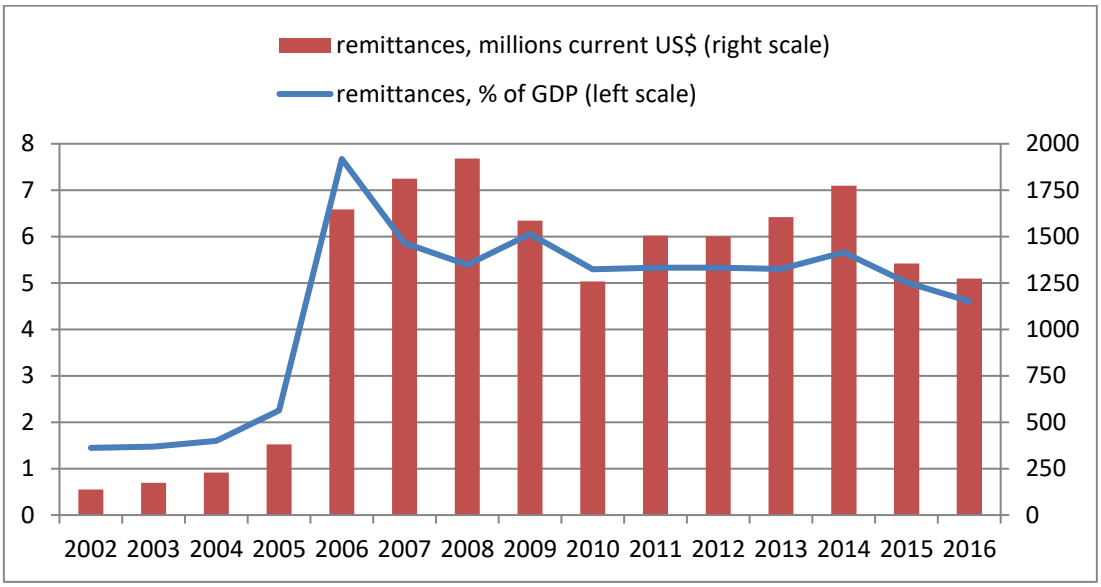
Notes: Economic push factors include: (i) financial difficulties; (ii) inability to make ends meet; (iii) inability to find a job in Latvia. *Sources:* Calculation with emigrant survey data.

Figure A7. Skilled emigrants from Latvia by education and host country, 2014



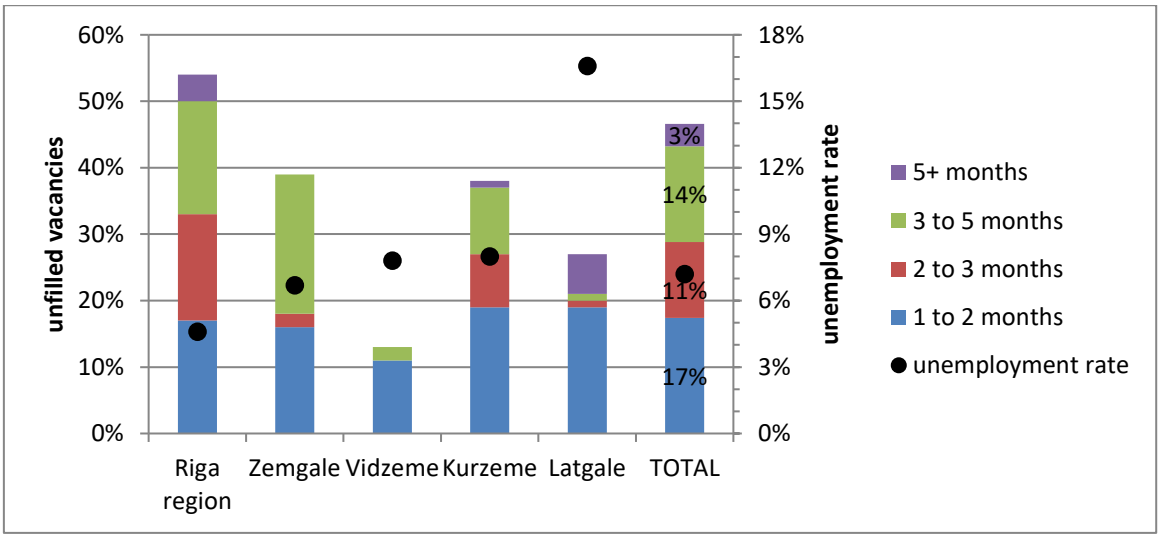
Sources: Calculation with emigrant survey data.

Figure A8. Remittances sent to Latvia, 2002-2016



Sources: World Bank.

Figure A9. Proportion of registered vacancies unfilled for more than a month, June 2017, by region



Notes: The Figure refers to vacancies registered at the State Employment Agency. Unemployment rate is registered unemployment rate as of end of June, 2017
Sources: Calculation with data from State Employment Agency (2017).

Annex 2 Additional Tables

Table A1. Skilled emigrants from Latvia by type and level of education, 2014

%

	General school	Vocational school	Vocational college	BA or equivalent	MA or PhD	Total
Medium-educated	47.1	52.9	0.0	0.0	0.0	100
High-educated	0.0	0.0	18.0	46.1	35.9	100

Notes: Data refer to emigrants which moved from Latvia in 2000-2014 and were aged 18-64 in 2014. Sources: Calculation with emigrant survey data.

Table A2. Skilled emigrants from Latvia by type and level of education and gender, 2014

%

	General school	Vocational school	Vocational college	BA or equivalent	MA or PhD	Total
Men	35.0	48.2	42.4	30.6	31.4	38.7
Women	65.0	51.8	57.6	69.4	68.6	61.3
Total	100	100	100	100	100	100

Notes: See Table A1. Sources: Calculation with emigrant survey data.

Table A3. Employed skilled emigrants from Latvia by level of education, period of emigration and occupation in the host country. EU/EFTA countries, 2014

%

	Medium-skilled		High-skilled		Total skilled	
	2000-2008	2009-2014	2000-2008	2009-2014	2000-2008	2009-2014
Managers & officials	4.3	1.8	3.9	4.5	4.0	3.6
Science, engineering & ICT professionals	4.0	4.3	13.9	14.5	10.2	11.1
Health professionals	1.5	1.1	3.5	7.8	2.8	5.5
Business, admin., legal, social & culture professionals	11.4	5.8	39.7	26.5	29.1	19.6
Teaching professionals	0.1	0.0	3.3	3.1	2.1	2.1
Clerks	5.2	7.9	7.0	7.6	6.3	7.7
Personal service workers	13.3	14.6	12.9	10.4	13.0	11.8
Sales workers	9.7	3.7	2.5	3.2	5.2	3.4
Skilled building workers	6.3	9.6	3.5	1.3	4.6	4.1
Other skilled workers	11.3	10.8	1.9	3.5	5.4	6.0

Operators & assemblers	13.5	11.2	3.7	4.0	7.3	6.4
Elementary	19.4	29.2	4.2	13.7	9.9	18.9
Total	100	100	100	100	100	100
N obs	640	1187	768	1294	1408	2481

Notes. Emigrants aged 18-64 in 2014. "Professionals" refer to ISCO major groups 2 and 3 (i.e. include also associated professionals and technicians). Source: Calculation with emigrant survey data.

Table A4. Employed skilled emigrants from Latvia by level and type of education and occupation in the host country. EU/EFTA countries, 2014

%

		ISCED level					
Occupations	**ISCO codes**	**3-4 gen.**	**3-4 voc.**	**5**	**6**	**7-8**	**3-8**
General managers & officials	11-12	1.7	0.8	2.4	1.4	3.5	1.9
Production & service managers	13-14	1.0	1.9	3.6	1.7	1.5	1.8
Science, engineering & IT professionals	21, 31, 25, 35	5.4	3.4	11.7	14.8	1.	10.7
Health professionals	22, 32	1.2	1.3	8.1	4.7	7.6	4.6
Business & administr. profs	24, 33	6.1	4.8	16.4	25.7	31.7	19.0
Legal, social and cultural professionals	26, 34	4.6	1.2	1.2	2.7	8.0	3.8
Teaching professionals	23	0.1	0.1	0.7	1.8	5.9	2.1
Clerks	41-44	8.4	5.9	6.1	11	3.7	7.2
Personal service workers	51, 53, 54	15.4	13.2	16.6	12.6	7.3	12.2
Sales workers	52	5.8	6.0	3.2	3.3	2.6	4.0
Skilled agricultural workers	61-63	0.9	0.9	0.3	0.3	0.1	0.5
Building workers	71	6.3	9.9	5.7	1.7	0.8	4.3
Metal, machinery, electrical & related	72-74	2.0	6.5	2.7	1.9	1.2	2.8
Food & wood processing	75	4.9	5.8	2.3	1.1	0.3	2.5
Operators & assemblers	81-83	9.3	13.8	4.8	4.5	2.8	6.7
Elementary	91-96	26.9	24.6	14.1	10.8	8.6	15.8
Total		100	100	100	100	100	100

Notes: Data refer to emigrants which moved from Latvia in 2000-2014 and were aged 18-64 in 2014. Sources: Calculation with emigrant survey data.

Table A5. Determinants of claiming a very big probability of moving to work abroad in the near future, 2013-2016. Average marginal effects

	Age 18 - 34 (Pr(Y=1)=0.126)			Age 18 - 64 (Pr(Y=1)=0.081)		
	dy/dx	s.e		dy/dx	s.e	
Age/10	-0.087	0.028	***	-0.033	0.005	***
Female	-0.029	0.022		-0.013	0.011	
With partner	-0.067	0.025	***	-0.032	0.012	***
With children aged <18	0.054	0.024	**	0.020	0.012	*
Education (vs. Medium)						
Low	-0.032	0.024		-0.020	0.013	(*)
High	0.039	0.032		0.004	0.015	
Ethnicity & citizenship						
Non-Latvians, LV ctz.	0.040	0.027		0.013	0.013	
Non-Latvians, other	-0.020	0.035		0.026	0.019	
Status (vs. nonmanual worker)						
Manual worker	0.072	0.032	**	0.028	0.015	*
Self-employed	-0.001	0.053		0.017	0.024	
Unemployed	0.117	0.047	**	0.086	0.024	***
Student	-0.031	0.028		-0.015	0.016	
Other	0.020	0.038		-0.010	0.015	
Region (vs. Riga)						
Pierīga	0.082	0.032	***	0.036	0.015	**
Vidzeme	0.025	0.036		0.014	0.018	
Kurzeme	0.064	0.039	(*)	0.040	0.020	**
Zemgale	-0.047	0.024	*	-0.023	0.013	*
Latgale	0.082	0.036	***	0.028	0.016	*
Year (vs. 2013)						
2014	0.013	0.029		0.008	0.015	
2015	-0.011	0.029		-0.008	0.015	
2016	-0.065	0.025	***	-0.041	0.013	***
N	1077			3067		
Pseudo R-sq.	0.0938			0.0923		

Notes: Results of logistic regression based on the data of 4 waves of representative population surveys implemented by SKDS. Dependent variable =1 if the answer to the question "How big is the probability that you will move to work abroad in the near future?" is "Very big". Respondents who have not answered this question (10.9% in the age group 18-34 and 8.5% among those aged 18-64) excluded.
, **, * - estimates statistically significant at 10%, 5%, 1% level, respectively.*
(*) - marginally insignificant (p-value between 0.10 and 0.15) estimates.
Sources: Calculations with survey data.

End Notes