INTERNATIONAL MONETARY FUND

REPUBLIC OF LATVIA

SELECTED ISSUES

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European Department	

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MEDIUM-TERM GROWTH IN LATVIA[1]

A. Introduction

1.   Latvia has rebounded from the economic crisis. Since 2010 real GDP growth has been among the fastest in Europe, despite a recent slowdown. Unemployment has come down from a peak of 20 percent in 2010 to around 11 percent in 2014, close to its historical average. The current account deficit, which had deteriorated to 21 percent of GDP in 2006, is now close to balance, and the real exchange rate is in line with fundamentals. The labor market is tightening, and the output gap is estimated to be close to zero.[2]

2.   Latvia's relatively low level of income per capita compared to euro area core economies presents an opportunity for rapid convergence. Per capita GDP in 2014 was only 33.1 percent and 33.5 percent of the average of Germany and France respectively (28 percent of that of the United States). In purchasing parity terms, the ratio was 53.1 percent and 59.5 percent (43.7 percent).

3.   On the other hand, future economic growth is subject to significant risks. In particular, labor supply will be subject to demographic headwinds, arising from both net emigration and low fertility rates. According to the United Nation Population Statistics, the working age (15–64) of the population of Latvia is projected to shrink from 1.4 million to 1 million between 2015 and 2050. Over the same period, the old age-dependency ratio, defined as the number of people aged 65 and over as a ratio to those aged between 15 and 64, is projected to increase from 28.2 percent to 37.7 percent. The aging of the labor force could make it more difficult for Latvian labor force to upgrade skills. Moreover, investment growth had been close to zero in 2013–14, caused by uncertainty arising from geopolitical tensions, tightened lending standards, and weak growth in major trading partners. Should these factors persist, investment could be anemic in Latvia in the medium term.
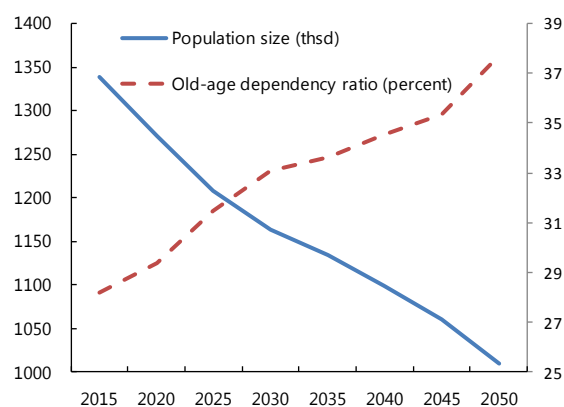
Sources: United Nation Population Statistics

4.   International experience suggests that countries that have reached Latvia's relative income level have a mixed record of success in closing the income gap. There is now a

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[1] Prepared by Weicheng Lian

[2] We estimate the output gap using a production function approach using a method similar to that used by the Congressional Budget Office of the United States (Congressional Budget Office (2001)). See chapter 1 of the 2012 Article IV of Latvia special issue papers for methodological details.

substantial body of literature documenting that while some economies have continued to grow rapidly after attaining middle-income status, thereby attaining per capita income levels comparable to advanced Western countries, others have stagnated, falling into the so-called "middle-income trap" (Aiyar et al (2013); Eichengreen, Park and Shin (2013)).

5.   This paper examines the prospects for Latvia continuing to rapidly reduce its distance from the productivity frontier. We look at the empirical record of countries that have in the past attained a similar relative level of income to that of Latvia at present, to gauge the plausibility of our forecast for Latvia's medium term GDP growth of about 4 percent per annum. We find that more than a third of the countries reaching a similar stage of development managed to sustain higher subsequent growth. A decomposition of the factors underpinning this growth record reveals that while Latvia faces unusually strong demographic headwinds, it can still achieve rapid growth through a combination of investment and reductions in structural unemployment. We confirm the importance of investment and structural reforms for Latvia's future convergence, using a sector-level analysis. We find that some sectors (e.g. the manufacturing sector) whose convergence is particularly sensitive to investment had less than robust investment in recent years. We also find that some sectors (e.g. the health sector) failed to converge despite intrinsically favorable conditions and robust investment, suggesting structural impediments. One challenge facing Latvia is that a large fraction of its work force[3] is now hired by sectors that failed to converge over time and many of which experienced both low productivity levels and slow productivity growth. To foster inclusive and rapid growth, Latvia needs to unleash the growth potential of these sectors and facilitate the reallocation of labor across the economy. Again, investment and structural reforms to improve labor force skills and enable better access to finance are crucial.

B.   An International Comparison of Income Convergence

6.   Latvia experienced rapid income convergence between 2000 and 2014. Latvia's per capita PPPGDP as a ratio to the United States' per capita PPPGDP was 25 percent in 2000 and increased to 44 percent in 2014. To compare Latvia's convergence with other countries' experience, we define the distance to frontier (DTF) as one minus the per capita PPPGDP as a ratio to that of the United States and choose countries whose DTF crossed 75 percent (Latvia's DTF in 2000). The dataset is the World Economic Outlook (WEO) Dataset and Table 1 shows countries' growth performance in the next 15 years after crossing the 75 percent threshold.

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[3] 42 percent in 2012

Table 1. Convergence After DTF Reached 75 Percent

Country	Year 1 (DTF crossed 75 percent)	Year 2 (15 years after DTF crossed 75 percent)	DTF (Year 1)	DTF (Year 2)	Change in DTF	Investment/ GVA	Growth of population	Growth of employment	Growth of the labor productivity	Change in employment ratio	Speed of convergence
Equatorial Guinea	1999	2014	77%	40%	-36%	80%	3.0%				
Taiwan Province of China	1976	1991	76%	53%	-23%	25%	1.5%				4.6%
Korea	1985	2000	76%	55%	-22%	34%	0.9%	2.3%	5.4%	0.1%	4.5%
Latvia	**1999**	**2014**	**76%**	**56%**	**-20%**	**26%**	**-1.1%**	**-0.5%**	**4.4%**	**0.0%**	**4.1%**
St. Kitts and Nevis	1978	1993	77%	58%	-19%	31%	-0.5%				4.2%
Antigua and Barbuda	1970	1985	76%	59%	-17%	26%	0.3%				3.7%
Bulgaria	1973	1988	75%	61%	-15%	28%	0.0%				3.2%
Malaysia	1979	1994	76%	66%	-10%	33%	2.7%				2.4%
Kazakhstan	1992	2007	72%	64%	-8%	23%	-0.6%	-0.1%	3.4%	0.0%	1.8%
Brazil	1968	1983	76%	69%	-8%	21%	2.3%				1.9%
Turkey	1960	1975	75%	71%	-4%	13%	2.5%				1.0%
Romania	1991	2006	73%	71%	-2%	20%	-0.5%				0.6%
Jordan	1971	1986	74%	73%	-1%	26%	3.0%				
Iran	1987	2002	72%	72%	0%	30%	1.7%	3.1%		0.0%	
Panama	1968	1983	75%	75%	0%	25%	3.0%				0.0%
Algeria	1993	2008	74%	75%	0%	25%	1.7%	4.0%	-0.5%	0.1%	-0.1%
Jamaica	1978	1993	75%	77%	3%	20%	1.1%	1.8%	0.3%	0.0%	-0.7%
Chile	1974	1989	73%	76%	3%	18%	1.6%	2.8%	0.4%	0.1%	-0.7%
St. Lucia	1991	2006	75%	78%	3%	24%	1.2%				-0.8%
South Africa	1991	2006	74%	78%	4%	17%	1.8%	3.2%	-0.3%	0.1%	-1.0%
Ecuador	1975	1990	75%	81%	5%	17%	2.7%				
Kiribati	1961	1976	75%	86%	12%		1.4%				
Peru	1977	1992	74%	86%	13%	19%	2.3%				-4.4%
Lebanon	1988	2003	59%	74%	15%	26%	2.2%				-3.1%

7. **Latvia outperformed most countries at a similar stage of development.** This is suggested by both the change in DTF over the 15-year period after the DTF crossed 75 percent, and the speed of convergence. We measure the speed of convergence using the per capita real GDP growth differential between a country and the United States. It is noteworthy that the speed of convergence in previous studies often means the half-life of convergence. Latvia is ranked among the top five out of 24 countries in Table 1[4].

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[4] One caveat is that some fast growing economies are dropped from the Table 1 as their DTF in available years was always smaller than 75 percent

Table 2. Convergence After DTF Reached 56 Percent

Country	Year 1 (DTF crossed 56 percent)	Year 2 (10 years after DTF crossed 56 percent)	DTF (Year 1)	DTF (Year 2)	Change in DTF	Investment /GVA	Growth of population	Growth of the labor productivity	Growth of employment	Change in employment ratio	Speed of convergence
Equatorial Guinea	2001	2011	59%	29%	-30%	76%	3.0%				
Singapore	1970	1980	57%	30%	-27%	36%	1.9%				5.0%
Greece	1963	1973	57%	32%	-25%	27%	0.5%				4.9%
Japan	1965	1975	57%	35%	-22%	33%	1.3%	6.7%	1.0%	-1.5%	4.4%
Hong Kong SAR	1975	1985	59%	41%	-18%	26%	2.3%				3.7%
Cyprus	1978	1988	62%	45%	-17%	35%	0.4%				3.8%
Spain	1960	1970	58%	41%	-17%	25%	1.0%				3.5%
Taiwan Province of China	1990	2000	57%	42%	-15%	26%	0.9%	4.8%	1.4%	2.0%	3.1%
Trinidad and Tobago	2002	2012	57%	43%	-14%	18%	0.5%		1.4%	3.8%	
Hungary	1973	1983	58%	48%	-10%	37%	0.3%				2.1%
Czech Republic	1997	2007	56%	47%	-9%	30%	-0.1%	3.8%	0.0%	0.5%	1.9%
Korea	1995	2005	57%	49%	-9%	33%	0.7%	3.8%	1.1%	2.2%	2.0%
Slovenia	1992	2002	57%	48%	-9%	24%	0.0%	4.4%	-0.4%	-1.7%	1.9%
Portugal	1973	1983	57%	53%	-4%	34%	1.0%	2.7%	0.5%	-2.5%	0.9%
Antigua and Barbuda	1986	1996	57%	53%	-4%	31%	1.2%				0.9%
St. Kitts and Nevis	1993	2003	58%	59%	1%	41%	1.5%				-0.2%
Iran	1969	1979	58%	59%	1%	31%	2.9%				
Algeria	1962	1972	59%	60%	1%	16%	2.9%				-0.3%
Barbados	1979	1989	58%	60%	2%	16%	0.0%				-0.4%
Mexico	1979	1989	59%	65%	7%	17%	1.9%				-1.8%
Argentina	1983	1993	56%	63%	7%	15%	1.5%				-1.9%
Gabon	1999	2009	56%	66%	10%	27%	2.3%				
Venezuela	1988	1998	52%	64%	12%	20%	2.3%	-2.0%	3.5%	4.9%	-2.8%
Lebanon	1975	1985	28%	40%	12%	17%	-0.4%				-1.9%

8.   **How likely is per capita real GDP growth of 4 percent[5] over the medium-term in Latvia?** According to the WEO dataset, per capita real GDP will grow by around 2 percent in the United States, so to achieve growth of 4 percent or more, the speed of convergence needs to be at least 2 percent. To shed light on this question, we choose countries whose DTF crossed 56 percent, Latvia's DTF in 2014, and examine their convergence experience over the 10 years after the 56 percent was crossed.[6] Table 2 suggests that more than one third of countries outperformed the United States by 2 percent or more in per capita real GDP growth.[7]

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[5] Latvia's population growth is projected to be close to zero over the next five years, so that real GDP growth and real GDP growth per capita are very similar.

[6] A ten year time period is chosen to reflect medium-term trends, but the results are very similar if a five year period is chosen instead

[7] For some countries, we cannot compute their speed of convergence, as their real GDPs are missing in the period of interest in the WEO dataset. Among countries for which we can compute the speed of convergence, about half outperformed the United States' per capita real GDP growth by 2 percent or more.

9.   A "growth accounting" decomposition is useful in comparing the underlying growth drivers in Latvia against other countries' experiences. We define the fast growth group to be countries whose per capita real GDP growth outstripped US growth by 2 percent or more in the 10 years after their DTF crossed 56 percent, and the slow group to be the rest. Table 3 lists the growth of real labor productivity, the level change in the employment ratio, where the employment ratio is defined as employment divided by population, population growth, and employment growth. All numbers are annual. We then create a spider chart based on the numbers in Table 3. The indices shown on the spider chart are created by dividing the deviation from the average of the whole sample by the standard deviation of the whole sample. From Table 3 and the spider chart, we can see that our projections for Latvia are underpinned by fairly conservative assumptions. Given that Latvia's employment growth is predicted to be merely 0.1 percent a year, real GDP growth depends on the labor productivity growth, which is around 3.7 percent. This number sits between the averages of the fast and the slow growth groups.

10.   The spider chart illustrates that Latvia faces much stronger demographic headwinds than other countries faced when they reached a similar stage of development, but also that these can be offset through measures to reduce high structural unemployment. For both fast and slow growth groups, the annual population growth is around 1 percent, while Latvia's population will decline by 0.3 percent per annum. Moreover, much of the decline will be driven by net emigration which tends to occur among people of working age, thereby increasing the dependency ratio (which in turn is associated with lower per capita income growth: see Bloom and Canning (2004) and Aiyar and Mody (2012)). To counteract that, structural reforms will be needed to reduce Latvia's still-high structural unemployment rate and improve employment as a share of the total population by 0.16 percent (the annual level change). A stronger increase in the employment ratio (from the current low level of below 50 percent) is projected than what had been experienced on average in other countries. But in this respect, Latvia starts from a much higher level of unemployment (10.3 percent)—seven out of eight countries had a lower rate of unemployment than Latvia when their DTF crossed 56 percent-- and hence has much more room to improve the ratio. In fact, the reduction in the unemployment rate needed to achieve the projected increase in the employment ratio would still leave the level of unemployment in Latvia (9.3 percent in 2020 and around 8 percent in 2025 if the trend continues) substantially higher than the average level of unemployment of fast growth group (3.0 percent).

Table 3. Comparison between Latvia's Projected Performance in 2015–20 and Historical Performances of Countries at a Similar Stage of Development

	Growth of the labor productivity	Change in employment ratio	Investment /GDP	Growth of population	Growth of employment
Fast growth	5.1%	0.09%	30.8%	1.0%	1.2%
Slow growth	2.2%	0.03%	23.8%	1.1%	0.9%
Average of the whole sample	3.5%	0.06%	26.9%	1.1%	1.0%
Standard deviation of the whole sample	2.7%	0.27%	7.9%	0.9%	1.3%
Latvia (projected, 2015 - 2020)	3.7%	0.16%	24.6%	-0.3%	0.1%
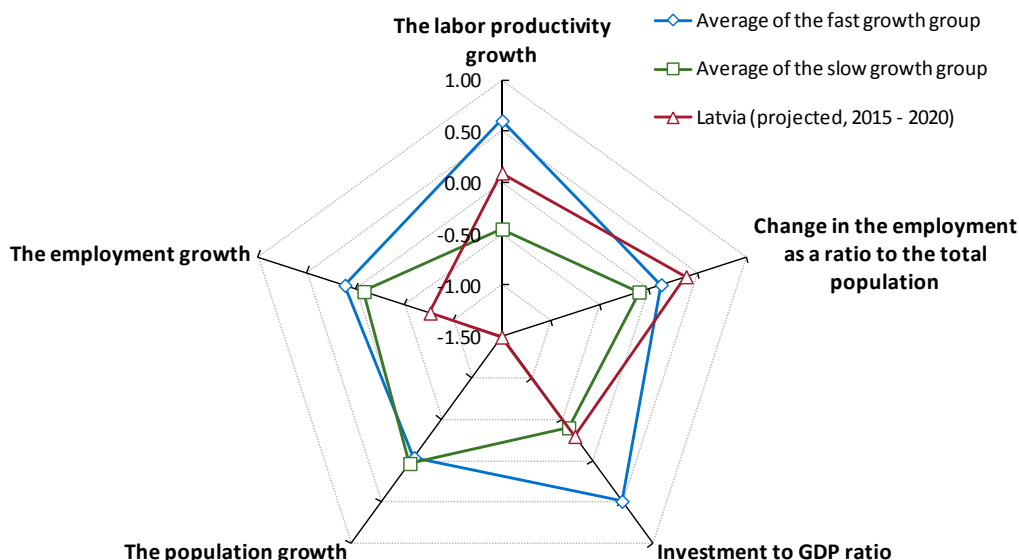
Note: The fast growth group is defined as countries with the speed of convergence higher than 2 percent, and the slow group the rest. For X, its index value of group Y is defined as follows: we subtract the sample average of X from the average of X in group Y, which is further divided by the standard deviation of X in the sample.

11.   The spider chart also illustrates that Latvia has the opportunity to converge much faster than forecast if it is able to boost its investment. Latvia's forecast investment ratio of about 25 percent is conservative, much closer to the average of the slow growth group than the fast growth group. If it is able to improve the business environment, upgrade infrastructure, and attract FDI, it should be able to sustain a higher rate of investment. The importance of investment is further demonstrated by running a regression of the speed of convergence on the investment to GDP ratio for countries in Table 2, with both referring to the ten-year period after a country's DTF crossed 56 percent. The text chart illustrates the relationship between the two variables. We find that investment's impact on the speed of convergence is both
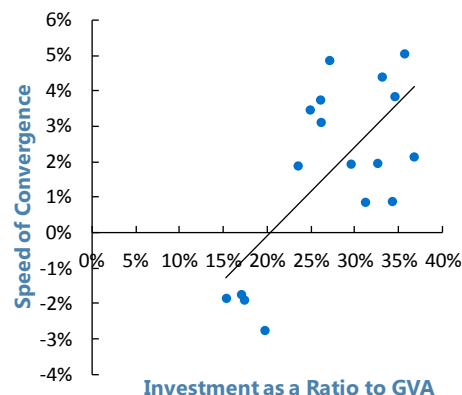
statistically and economically significant. Every 10 percent increase in the ratio of investment to GDP will raise the speed of convergence by 2.6 percent. To put this another way, if Latvia could increase its investment ratio from the projected 24.6 percent to the fast growth group level of 30.8 percent, this would result in raising the speed of convergence by 1.6 percent per annum.
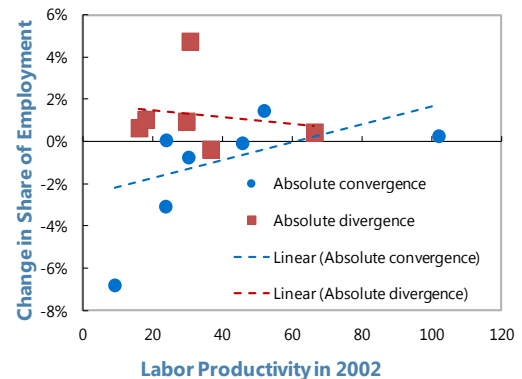
C.   Sectoral Convergence

12.   In this section, we conduct a convergence analysis at a more granular level than the previous analysis. We assess the performance of different sectors of the Latvian economy in terms of ability to reduce distance to the technology frontier, and then compare these results against the sectoral convergence record of a large sample of countries.

13.   At a sectoral level Latvia's convergence has been extremely heterogeneous, with a significant number of sectors exhibiting absolute divergence. To see this, we define the DTF of a sector as one minus the labor productivity of the sector as a ratio to the average labor productivity of the same sector in France, Germany, and the United Kingdom. We plot the change in DTF from 2002 to 2012, normalized by DTF in 2002[8], for 14 2-digit sectors. The text chart suggests that some sectors experienced absolute divergence between 2002 and 2012, having larger DTF in 2012 compared with in 2002. These include the education and health sectors.
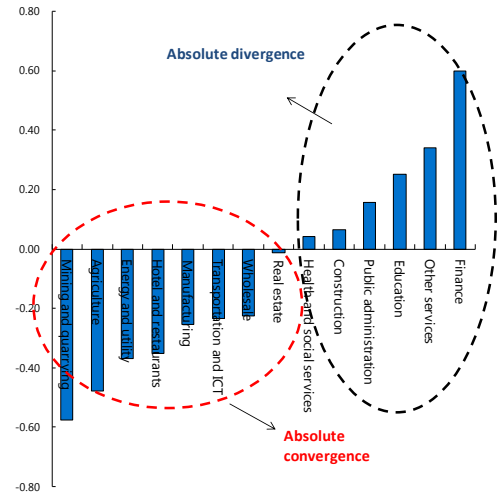
14.   A challenge for Latvia's convergence is that a significant fraction of the labor force was "stuck" in sectors that have failed to converge. Table 4 lists sectors' DTF, share of total employment, and labor productivity in 2002, 2007, and 2012. Sectors exhibiting absolute divergence over the full sample period hired 35 percent of the total employment in 2002, and the number increased to 42.3 percent in 2012. This pattern also holds at the individual sector level—except for the public administration sector, all other sectors that failed to converge had their share of total employment increase between 2002 and 2012. Moreover, the workers joining these sectors were not attracted by higher wage levels or better wage prospects (in which case the pattern may be actually good for the Latvian economy). Indeed, the data suggest the opposite. We plot sectors' labor productivity in 2002

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[8] The normalization captures the idea that the speed of convergence tends to be faster when the DTF is higher.

and the change in their share of total employment between 2002 and 2012. We can clearly see that first, except for one sector (finance), other sectors failing to converge had low productivity levels relative to other sectors. However, the fitted lines suggest that at the same level of productivity, sectors failing to converge tended to see a stronger increase in share of total employment[9]. Moreover, sectors failing to converge had slower productivity growth[10] relative to sectors successful in convergence. The average productivity growth between 2002 and 2012 was merely 23 percent in the former sectors, in contrast with 96 percent in the latter sectors.

15.   Why did workers join or remain in sectors that failed to converge, as they would expect to have a lower life time income as a result? First, it is possible that many workers had low skills and could not work in sectors with higher productivity: this is related to the problem of lack of skills and skill mismatch (see the Baltic Cluster Report, 2014). Second, sectors that converged successfully may depend more on external financing, which was constrained during the recession and thus might have acted as a brake on further employment expansion in those sectors.[11]

16.   The inefficient sectoral allocation of labor hurts aggregate labor productivity growth.
We decompose aggregate productivity growth into three components: individual sectors' productivity growth, reallocation of labor from less productive sectors to more productive sectors, and an interaction between the two. Box I explains the detailed methodology for the decomposition. We plot the three components' contribution to aggregate labor productivity growth between 2001 and 2012. In a country with some sectors showing absolute convergence and some showing absolute divergence, we would expect a strong reallocation from sectors with lower productivity levels and slower productivity growth to those with higher

(In Percent)

Sources: Eurostats, WEO and the author's calculations

productivity levels and faster productivity growth. The chart suggests that re-allocation contributed to one to two percent growth in aggregate labor productivity in 2003–08 and little afterwards.
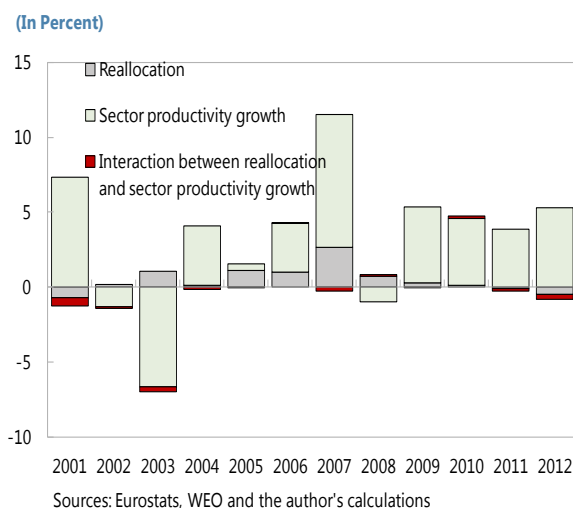
17.   Another important question is: why did sectors fail to converge? One explanation is the lack of convergence may reflect of a lack of skills. Similar to a mechanism shown by Young (2014), if low-productivity sectors attract relatively lower skill workers, a failure to converge may simply reflect the deterioration of the average worker's skill in these sectors. A second possibility is lack of

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[9] Sectors failing to converge all lie above the fitted line of sectors successful in convergence.

[10] Weighted by employment.

[11] In results not shown here, we found that sectors that failed to converge expanded more relative to those that converged successfully in 2007–12

financing, which may hamper the convergence of sectors heavily depending on external financing (Rajan and Zingales (1996)). A third explanation is that convergence may be intrinsically more difficult in some sectors than others. In their pioneering work on sectoral convergence, Bernard and Jones (1996) find that "manufacturing shows little evidence of either labor productivity or multifactor productivity convergence, while other sectors, especially services, are driving the aggregate convergence result". Their explanation for the finding is that for the tradable goods sector, comparative advantage make countries specialized in producing different goods. In contrast, technologies in non-tradable goods sectors are similar across countries, and hence, technology diffusion will be slower in tradable sectors compared to non-tradable sectors. Note, however, that Bernard and Jones (1996) study 1970–85, a period with different characteristics from the 2000–14 period on which we focus. For example, the 2000–14 period witnessed a faster growth in the global supply chain, which may help convergence in the manufacturing sector.

Table 4. Distance to Frontier, Share in Total Employment and Productivity
(2002, 2007, and 2012)

Sector	Change in DTF	DTF 2002	DTF 2007	DTF 2012	Share in total employment 2002	Share in total employment 2007	Share in total employment 2012	productivity in 2002	productivity in 2007	productivity in 2012
Mining and quarrying	-50.8%	88.2%	82.8%	37.4%	0.2%	0.3%	0.3%	23.9	52.0	83.1
Agriculture	-35.6%	74.5%	56.3%	38.9%	14.6%	8.2%	7.8%	9.1	16.7	29.2
Energy and utility	-17.2%	68.0%	67.4%	50.8%	2.2%	1.9%	2.2%	45.7	59.2	93.8
Hotel and restaurants	-15.7%	42.5%	32.1%	26.8%	1.8%	2.8%	3.0%	17.7	24.1	27.9
Manufacturing	-14.2%	60.6%	60.3%	46.4%	17.6%	14.6%	14.6%	23.7	31.1	45.6
Transportation and ICT	-8.3%	23.4%	42.4%	15.1%	9.2%	9.7%	10.6%	52.0	47.1	70.3
Wholesale	-6.1%	27.0%	18.6%	20.9%	17.2%	18.6%	16.5%	30.3	40.8	44.7
Real estate	-1.2%	82.9%	79.8%	81.7%	2.1%	2.2%	2.3%	102.1	144.6	176.3
Health and social work	2.4%	57.1%	48.2%	59.5%	5.0%	4.6%	5.6%	16.0	23.3	21.5
Construction	2.4%	36.8%	33.6%	39.3%	6.0%	10.2%	7.0%	29.6	39.6	40.2
Public administration	8.0%	23.5%	20.5%	31.5%	6.5%	6.6%	6.2%	36.5	46.6	49.1
Education	9.4%	59.9%	58.2%	69.3%	8.3%	8.3%	9.4%	17.9	21.7	19.2
Other services	9.6%	38.0%	38.3%	47.6%	7.7%	10.1%	12.5%	30.6	35.8	33.9
Finance	10.3%	17.2%	6.3%	27.4%	1.5%	1.9%	1.9%	66.3	110.0	82.6

18.   We extend Bernard and Jones (1996) along two dimensions in our examination of sectoral convergence in Latvia. First, we study 33 European countries[12] between 1977 and 2013, whereas Bernard and Jones (1996) look at 17 OECD countries between 1970 and 1987. Second, we consider distance to frontier (DTF) and the ratio of investment to gross value added,[13] whereas Bernard and Jones (1996) considers only the DTF.[14] We define sectors at a two-digit level and

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[12] They include all the European economies with sectoral information in the Eurostat. Some countries without data, such as Malta, are left out.

[13] We define investment to GVA ratio as the average in the previous three years, and the productivity growth as the average in the next three years.

[14] Our approach is in the same spirit of Mankiw, Weil and Romer (1992), by looking at conditional convergence.

consolidate some sectors[15] such that we can merge the period where information is classified using the NACE Rev. 1 with that using the NACE Rev. 2. Table 4 lists the names of these sectors.

19.   The regression function is specified as follows.

$$\text{Productivity growth}_{i,j,t} = \alpha_j + \beta_j \cdot \text{Distance to Frontier}_{i,j,t}$$

$$+ \gamma_j \cdot \frac{\text{Investment}_{i,j,t}}{\text{Gross Value Added}_{i,j,t}} + \varepsilon_{i,j,t},$$

where i indicates the country and j the industry. We first estimate this regression for the whole sample, with industry fixed effects, and then estimate this regression industry by industry. In the regression for the whole sample, the estimated co-efficients (and standard deviations) for the DTF and the investment to gross-value added ratio are are 7.56 (1.57), and 1.21 (0.58) respectively. Both are statistically significant. Latvia's average DTF in 2014, weighted by employment, was 37.8 percent.[16] The result suggests that Latvia will grow by 2.85 percent faster than countries that are already at the productivity frontier if all sectors have the same speed of convergence as suggested by the coefficient of the DTF. Again, this provides support for the possibility of rapid convergence in Latvia.

20.   Table 5 shows the estimation results of the industry by industry regressions. We can see that intrinsic convergence is absent in several sectors, many of which however are sensitive to investment. Similar to Bernard and Jones (1996), we find that the manufacturing sector lacks intrinsic convergence. Intrinsic convergence is also absent in construction, hotel, finance and public administration sectors.[17] Among these sectors, manufacturing, construction, and finance are quite sensitive to investment.

21.   The results in Table 5 provide two main messages. The first is that an investment recovery is crucial for Latvia's convergence. Take the manufacturing sector as an example: the results suggest that, given the lack of intrinsic convergence in this sector, generating sufficiently high investment is very important. The coefficient in Table 5 suggests that a 10 percent higher investment to gross value added ratio in the manufacturing sector can lead to 1.7 percent higher labor productivity growth.[18]

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[15] We treat the transportation sector and the information and communication sector as one, and put several sectors together as the "other services" sector.

[16] This value is different from the DTF defined using per capita PPPGDP relative to that of the United States.

[17] One explanation for the lack of convergence in these sectors could be that there has been limited technology progress in them and the improvement in productivity relies investment. For example, Davis and Heathcote, (2005) shows that the productivity growth in the construction sector is negative in the United States.

[18] This is in contrast with the small coefficient of investment to gross value added ratio when we estimate the regression among all the industries. The latter is consistent with what we see in Table 4, as in many industries, higher investment does not lead to an increase in the labor productivity. This however does not go against the idea that a higher capital to labor ratio should imply higher labor productivity, and the reason is that we did not

(continued)

Table 5. Estimation Results of the Sector-Level Convergence Regression						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Agriculture, hunting, forestry and fishing	Mining and quarrying	Manufacturing	Utilities	Construction	Wholesale and retail trade	Transportation, storage and communication
DTF	**4.053****	**7.164*****	-0.665	**8.297*****	1.157	**3.781***	**5.826*****
	(1.598)	**(1.352)**	(1.137)	**(1.244)**	(2.624)	**(2.050)**	**(0.974)**
I	0.303	1.723	**17.57*****	**2.501****	**2.708****	-4.969	-0.436
	(0.491)	(1.678)	**(3.746)**	**(1.051)**	**(1.163)**	(5.345)	(0.986)
Constant	2.343***	1.584	0.707	2.205***	3.701***	4.021***	2.825***
	(0.744)	(1.072)	(0.807)	(0.713)	(1.035)	(1.108)	(0.315)
Observations	127	140	122	159	85	82	166
R-squared	0.061	0.174	0.222	0.246	0.086	0.041	0.192
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
VARIABLES	Hotels and restuarants	Financial intermediation	Real estate, renting and related businesses	Other community, social and personal services	Public admin and defense, compulsory and voluntary pension	Education	Health and social work
DTF	2.679	-3.441*	**3.493***	**8.340*****	0.0144	**3.546*****	**6.094*****
	(1.671)	(1.993)	**(1.794)**	**(1.103)**	(0.908)	**(1.036)**	**(1.208)**
I	-5.788	**19.80*****	**5.968*****	0.656	0.777	-4.224	**11.27***
	(3.515)	**(4.289)**	**(1.247)**	(2.059)	(1.712)	(7.800)	**(6.693)**
Constant	2.848***	3.850***	-3.746**	1.427***	4.520***	3.775***	1.829**
	(0.806)	(1.008)	(1.687)	(0.404)	(0.564)	(1.057)	(0.811)
Observations	92	96	86	199	97	95	96
R-squared	0.046	0.187	0.218	0.239	0.002	0.113	0.351

22.   However, we find that Latvia had a shortfall in investment in this sector. In the sample, the average productivity growth rate in the manufacturing sector was around 5.2 percent. We plot labor productivity against the investment to gross value added ratio (we do not bother with controlling for DTF since it is not significant as suggested by Table 5). We can see that to achieve 5.2 percent growth, the investment to gross value added ratio should reach around 30 percent. Latvia's current investment level was significantly lower than that, and the average investment to gross value added ratio was only 26 percent between 2008 and 2012 (the same ratio was 41 percent between 2003 and 2007). So there is room for Latvia to promote the manufacturing sector's convergence through investment. Among other factors, reviving credit supply—which has been shrinking for many years—will be essential to underpin investment growth.

control employment growth and other factors in the regression. A full exploration of this issue is beyond the scope of the current paper.

23.   The second message is that the absolute divergence in some sectors cannot be simply blamed on lack of intrinsic convergence or lack of investment. A case in point is the health sector. Table 4 shows that the health sector has intrinsic convergence and is sensitive to investment. Moreover, this sector seems to have an investment level comparable to other countries' experiences: investment to gross value added ratio was 18 and 20 percent in 2002–07 and 2008–12 respectively, while the average investment to gross value added ratio in our sample was only 13 percent. This suggests that there are other structural impediments which keep the sector from performing in line with its potential. While it is beyond the scope of this paper to analyze the individual factors responsible for growth performance in each sector, it does allow us to say that DTF and investment are not responsible for underperformance in sector like health, so that further investigations should focus on areas such as governance, incentives and skills mismatches.

Box 1. Aggregate Productivity Growth Decomposition, Data and Methodology of Convergence Regression, and Others

I. Aggregate labor productivity growth decomposition:

Define aggregate labor productivity X_t **as** $\dfrac{Y_t}{N_t}$ **where** Y_t is aggregate gross value added divided by GDP deflators, and N_t is total number of employees. Similarly, sector level productivity X_{it} can be defined as $\dfrac{Y_{it}}{N_{it}}$, **where** Y_{it} is sector level gross value added divided by GDP deflators and N_{it} is the number of employees in sector i.

Aggregate labor productivity is then the weighted average of sector-level productivity:

$$X_t = \sum_i \theta_{it} X_{it},$$

where

$$\theta_{it} \equiv \frac{N_{it}}{N_t}.$$

The growth rate of labor productivity can be decomposed as:

$$g_t \equiv \frac{X_t}{X_{t-1}} - 1$$

$$= \sum \omega_{i,t-1} g_{it}^{\theta} + \sum \omega_{i,t-1} g_{it}^{X} + \sum \omega_{i,t-1} g_{it}^{\theta} g_{it}^{X} \qquad (1)$$

where

$$g_{it}^{\theta} = \frac{\theta_{it}}{\theta_{it-1}} - 1, \ g_{it}^{X} = \frac{X_{it}}{X_{it-1}} - 1, \ \omega_{i,t-1} \equiv \frac{\theta_{it-1} X_{it-1}}{\sum_i \theta_{it-1} X_{it-1}}.$$

The three terms in equation (1) reveal different drivers for aggregate productivity growth: (i)

$$\sum_i \omega_{i,t-1} g_{i,t}^{\theta} = \sum_i \frac{\theta_{it} X_{it-1}}{\sum_i \theta_{it-1} X_{it-1}} - 1 \text{ measures the re-allocation of labor across sectors; (ii)}$$

$$\sum_i \omega_{i,t-1} g_{i,t}^{X} = \sum_i \frac{\theta_{it-1} X_{it}}{\sum_i \theta_{it-1} X_{it-1}} - 1 \text{ measures the individual sectors' productivity growth; (iii)}$$

$$\sum_i \omega_{i,t-1} g_{i,t}^{\theta} g_{i,t}^{X} \textbf{ measures the interaction between (i) and (ii).}$$

D.   Concluding Remarks

24.   International evidence from countries that previously attained a level of relative income similar to Latvia shows that subsequent growth of well over 4 percent per annum is feasible, but not guaranteed. Over one-third of countries reaching a similar stage of development as Latvia in 2014 outperformed the United States' per capita real GDP growth by more than 2 percent. A decomposition of growth drivers shows that Latvia faces particular challenges from adverse demographic trends; to counter these, efforts will be needed to increase the employment ratio by reducing still high structural unemployment. On the other hand, Latvia has much scope for improving its convergence prospects by generating higher investment ratios, which are well below the levels achieved by good performers in the sample.

25.   At a sectoral level, convergence in Latvia has had a mixed record since the early 2000s. We show that some sectors exhibited absolute divergence over 2002–12, while others converged at different speeds. We also find that sectors which lacked convergence hired an increasingly larger fraction of the total employment over time, which suggests that if the situation is not improved, workers in these sectors would lag behind in sharing prosperity. The evidence suggests that reallocation across sectors became worse after 2008, which hampered aggregate labor productivity growth.

26.   While some sectors lack "intrinsic" convergence, their productivity growth is quite sensitive to investment. A prominent example is the manufacturing sector. The current level of investment in the manufacturing sector in Latvia falls short of the level needed to achieve historical average labor productivity growth in this sector. One reason for the low level of investment could be the weak credit environment, with the stock of bank credit shrinking for many years. Reversing this trend could play an important role in supporting investment. On the other hand, some sectors have underperformed in terms of convergence despite being characterized by intrinsic convergence and attracting robust investment; further investigation will be needed to uncover the structural impediments to growth in these areas.

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EMIGRATION FROM LATVIA[1]

A. Introduction

1.   Latvia has experienced large outward migrations over the last fifteen years, contributing to reduce the labor force by more than 15 percent over that period. This process is to some extent inherent in a relatively low-income transition economy, in this case hastened by entry to a European Union with free labor mobility. But the loss of an important segment of the population could also have adverse effects on the country. This paper examines migration trends in Latvia in the past, its determinants, and some of its implications, with a view to assessing future developments and offering some policy recommendations. Section 1 examines historical developments with a brief review of the literature on the effects of emigration; Section 2 uses econometric analysis to identify its main determinants; Section 3 derives long-term forecasts; and Section 4 concludes.

B. Historical Trends

Historical and recent developments

2.   Up until the end of the previous millennium, migrations in and out of Latvia were tied to political developments in the former Soviet Union. The large inflows of population from CIS countries that Latvia experienced in the past partially reversed direction in the early 1990s.[2] Since the mid-1990s, emigration to CIS countries dwindled considerably, while emigration to other countries, mainly European countries, increased from 2000 onward, most likely driven by economic factors.

Source: Latvia Central Statistical Bureau

Source: Latvia Central Statistical Bureau

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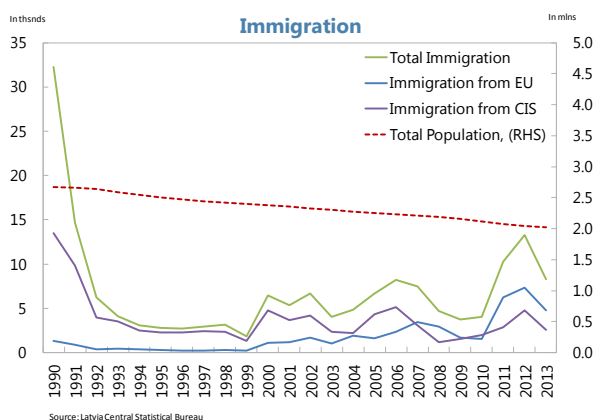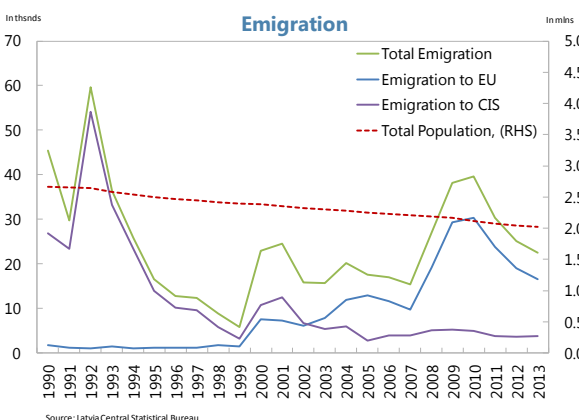
[1] Prepared by Astou Diouf, Weicheng Lian, and Gabriel Srour.

[2] There were large outflows as well as inflows of population prior to 1990, but the latter predominated over that period.

3.   Latvia's entry to the European Union (EU) in 2004 opened the door to almost free emigration within the European community. The UK, Ireland, and Sweden largely opened their borders to Latvians immediately upon the country's accession, followed by Finland, Portugal, and Spain in 2006, while other countries lifted restrictions gradually by May 2011 in line with EU mandates. Not surprisingly, emigration to European countries rose significantly in 2004, subsided during the boom period prior to the global financial crisis, and spiked during the deep recession (Chart).

4.   Immigration was generally negatively correlated with emigration over the last fifteen years and amounted to about a third of emigration on average. It is noteworthy that the ratio of immigrants to emigrants from CIS countries has been consistently and substantially higher than from EU countries, with the former occasionally exceeding unity while the latter stayed well below. This could reflect the larger number of emigrants heading to CIS than to EU countries in past years, some of whom may have been returning, or that a larger share of recent emigrants to CIS countries were returning to Latvia than was the case for emigrants to the EU. But it could also suggest that Latvia is attracting new immigrants from CIS countries as its economy develops, with the potential to offset emigration pressures in the future.

5.   Emigration has fallen sharply since the global financial crisis. As of 2013, the last year for which official data are available, net emigration stood at over 14,000, well below the peak of about 35,000 in 2009-10, but still higher than its pre-crisis level. For a more recent estimate of emigration we must turn to high frequency indicators. The most widely used such indicators are net arrivals in Latvia by air and ferry, which have shown a close correlation with official data on net emigration over a long period (Box 1). Available quarterly data on net passenger arrivals in airports and ferry terminals suggest that net emigration continued to decline significantly in 2014—net arrivals over the past four quarters up to 2014:Q3 fell to close to 5000 from over 9000 during the same period in the previous year (Box 1). Assuming net arrivals in the fourth quarter will be at the same level as in the fourth quarter of 2013, total net emigration over 2014 would amount to 5050. However such estimates should be interpreted with caution, as the latest downward trend is quite recent and could be driven by circumstantial changes in passenger flows.

Box 1. Passenger Flows

Net passenger arrivals in airports and ferry terminals, which are available on a quarterly basis, provide some indication of emigration developments in 2014. They show a significant decline in net passenger outflows in the second and third quarters of 2014 (the last period for which data are available) relative to the same period the previous year, as well as a y-o-y decline of net outflows over the last four quarters in 2014:Q3.

Net Arrivals: Airports and Ferries (in thousands)

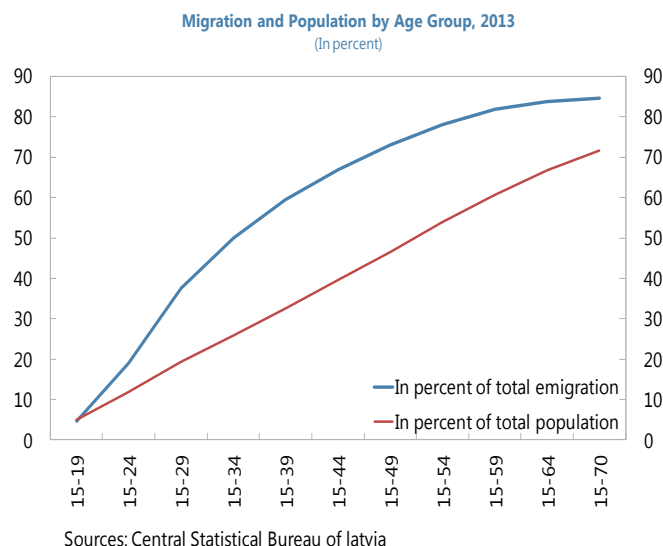|	2012				2013				2014		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Airports	-14.1	9.1	-14.1	17.4	-14.4	11.3	-15.7	15.9	-14.9	13.2	-8.9
Airports and ferries	-22.5	4.2	-14.4	22.5	-19.5	5.4	-17.3	21.7	-27.5	10.8	-10.1
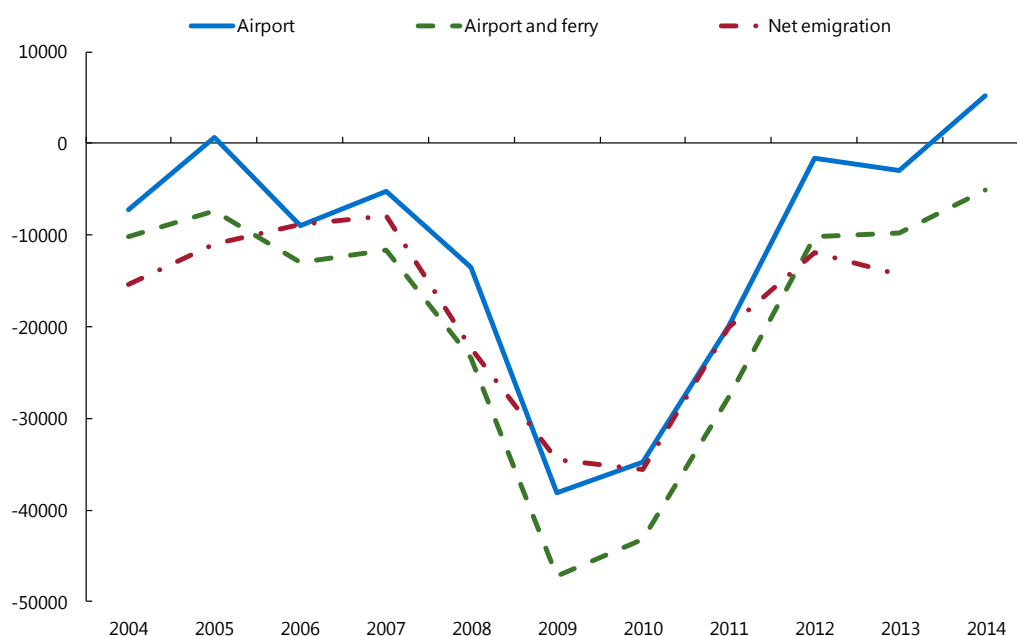
Source: Central Statistical Bureau of Latvia

We can infer from these data that net emigration continued to fall in 2014, but with some caveats. Assuming that net arrivals in the last quarter of 2014 will maintain the same level as in 2013, this suggests that net emigration in 2014 would amount to 5050. However, this estimate should be treated with caution. In contrast to the second and third quarter flows, net passenger outflows increased strongly (y-o-y) in the first quarter of 2014 as well as cumulatively over the four quarters leading up to Q1 and Q2. It may therefore be too early to view the most recent movements as a trend. Also, given their small magnitude relative to gross flows—net airport arrivals recorded in the last two years are in single digit figures, while gross airport inflows and outflows averaged 600,000 per quarter—small lags/overlap in the gross flows between quarters could entail large deviations in net outflows. For instance, a large decline in net passenger outflows in Q3 could be generated by a small percentage increase in passengers entering Latvia in Q3 and leaving in Q4.

6. **Latvian emigrants tend to be of working age and relatively younger than the general population.** In 2013, 85 percent of emigrants were of working age (15–64), compared to only 65 percent of the total population; about 65 percent of emigrants were of age 20–49, versus only about 50 percent among the whole population over 20 years of age (Chart). The gender distribution of emigrants tends to be fairly even.

Migration and Population by Age Group, 2013
(In percent)

— In percent of total emigration
— In percent of total population

Sources: Central Statistical Bureau of latvia

7. **Thus emigration has significantly reduced the labor force in recent times.** In 2013, net emigration amounted to 0.7 percent of the total population and 0.9 percent of the labor force. It reduced the labor force by more than 6 percent over the crisis period 2008–11 alone and by close to 15 percent over 2000–13; it reduced the age 20–49 population by almost 10 percent during the years 2008–11, and by almost 20 percent over 2000–13. Moreover, these are the data captured by official statistics, which some authors argue are an underestimate.[3] Emigration rates of such magnitude raise important questions: what is driving emigration in Latvia, how will it evolve in the future, and what is its impact on the economy? A detailed analysis of these questions for Latvia is hindered by the relatively short sample and insufficient micro-data regarding the social and economic conditions (employment, income, education) of emigrants. However the general literature on emigration provides some guidance.

The literature

8. **While estimates vary widely, there is a consensus that income differentials and employment prospects are key determinants of emigration.[4]** Other important factors include the size of the diaspora in the host country and social and cultural links, including a common language, as well as access to education and social benefits.

9. **It is also generally agreed that emigration improves the economic conditions of both emigrants and those remaining behind.[5]** Emigration allows more efficient allocation of labor resources, and typically puts upward pressure on wages in the home country as it reduces the oversupply of labor. It reduces unemployment directly by the number of emigrants who were

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[3] Hazan (2013)

[4] See Kancs and Kielyte (2002) or Sprenger (2013).

[5] See for instance Asch (1994) and Ratha et al. (2011).

unemployed, and indirectly by the number of jobs vacated by emigrants who were employed.[6] Thus emigration can mitigate the impact of a downturn. Furthermore, emigrants contribute to raising economic and social standards in their home country through remittances, which are usually countercyclical, direct investment, exchange of ideas, technology transfers and trade linkages, and in some cases by returning with their accumulated capital.

10.   But emigration also carries significant costs. Those who emigrate are typically drawn from the young working age segment of the population (as seen in Latvia). Their loss increases the dependency ratio, and may raise the burden on social welfare systems unless compensated by remittances.[7] Moreover, emigration could involve the loss of highly motivated entrepreneurs who would have been the country's engine of growth and skilled individuals (brain drain) with considerable spillover effects (e.g. from the loss of much-needed doctors and nurses).[8] There could also be social costs, such as the destabilizing effect on families.

Impact on Latvia

11.   Past emigration flows in Latvia are largely consistent with the patterns found in the literature. A steady decline of net emigration prior to the financial crisis coincided with both rising wages and a drop in the unemployment rate, reaching a trough in 2007. Emigration shot up in 2008, as wages began to drop and unemployment to pick up (Chart). Subsequently, these trends reversed direction with the onset of the recovery.

Emigration, Unemployment, and Wages
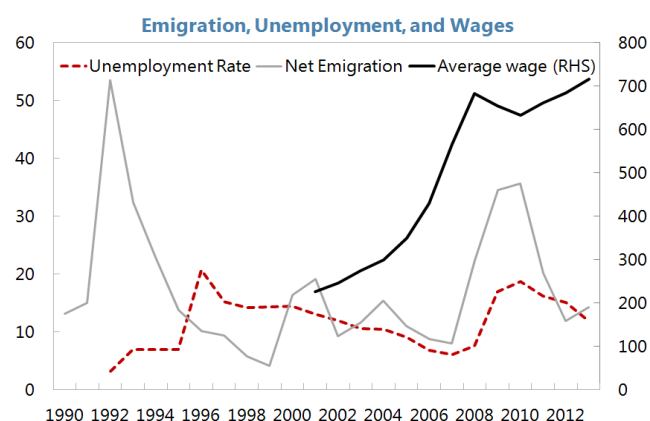
Sources: Haver and IMF staff calculations.

12.   Emigration contributed to reduce unemployment. The rise in emigration during the crisis and aftermath (2008–11) suggests that unemployment could have been even higher during this period were it not for the substantial outflow of emigrants. This is consistent with the fact that employment growth in the recovery period following the crisis was relatively weak and robust GDP growth was largely driven by productivity gains (Table below).[9] It is however much harder to say to what extent the drop in unemployment due to emigration is long-lived, or put differently to what extent emigration contributes to a

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[6] Although in principle a fraction of these positions, for instance related to self-employment, could be lost permanently.

[7] See EC (2012)

[8] See Ozden and Schiff (2006)

[9] See Blanchard et al. (2013)

reduction of the NAIRU as a result of a reduction of long-term or structural unemployment.[10] There are some indications that emigration has not significantly altered the Okun ratio in Latvia, suggesting that structural unemployment was not affected.[11]

Employment-Unemployment (thsd)														
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total population	2382	2353	2321	2299	2277	2250	2228	2209	2192	2163	2121	2075	2045	2024
Population age 15-64	1600	1568	1553	1544	1533	1517	1505	1491	1479	1453	1417	1382	1352	1333
Active population	1075	1060	1064	1063	1063	1049	1069	1083	1097	1069	1034	1007	1006	986
..employed	918	912	930	938	936	942	992	1016	1009	877	829	841	852	867
..unemployed	157	148	134	126	127	107	77	67	88	192	205	166	154	119
Inactive population	525.6	507.1	488.1	480.0	470.6	468.1	436.1	408.2	382.2	384.4	383.2	375.4	346.0	346.6
Net emigration	16.4	19.2	9.2	11.6	15.3	11.0	8.8	7.9	22.4	34.5	35.6	20.1	11.9	14.3
In percent of the active population														
Unemployed	1.5	1.8	0.9	1.1	1.4	1.0	0.8	0.7	2.0	3.2	3.4	2.0	1.2	1.4
Net emigration	14.6	14.0	12.6	11.8	12.0	10.2	7.2	6.2	8.0	18.0	19.8	16.5	15.3	12.1

Source: Central Statistical Bureau of latvia and IMF staff calculations

13.   Emigration also contributed to enhance welfare through remittances. Migrant remittances to Latvia have grown continuously and considerably since the 2000s (Annex I). From a negligible level in the early 2000s, remittances have grown to more than 2.5 percent of GDP. Remittances have proven very stable, growing at double digit rates for a large part of the last two decades. Most importantly, remittances have tended to be counter-cyclical, providing an important buffer to consumption during downturns. Indeed, they are one of the only important sources of inflows to the country that were negatively correlated

Latvia: Remittances and other capital inflows, 2000-14
(Millions of Euros)

Legend: Remittances; Portfolio investment; Direct investment in Latvia; Other investment

Sources: The World Bank and IMF staff calculations.
[1] Remittances are defined as compensation of employee.s

with economic growth since the 2000s (unlike, for example, FDI and portfolio inflows). Even in 2007-08, at the peak of the crisis, remittances decelerated but did not decrease, partly reflecting an increase in emigration flows out of the country. From 2010 onwards remittances have leveled off as a ratio to GDP.
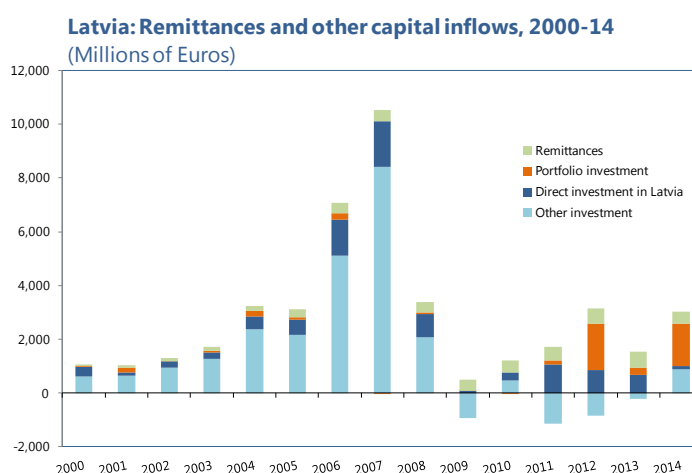
C. Econometric Analysis

14.   This section seeks to shed light on the determinants of emigration in Latvia using panel analysis on a sample of East European countries. We apply the methodology developed in Kennan and Walker (2011), which looks at inter-state migration in the United States, to examine

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[10] Data on the prior employment status and education/skill level of Latvian emigrants is very limited. The analysis is further complicated by the simultaneity effects between unemployment, wages, and emigration.

[11] See IMF (2014)

emigration flows from East European countries with similar characteristics to Latvia (see Annex II for details). The analysis is restricted to the period after 2004 when these countries joined the EU, and it tries to control for other important structural changes, including the gradual lifting of barriers on emigration within the EU. Following the broad literature, which finds that migration decisions are driven by wage differences and economic conditions in the home country, two economic factors play a key role in our model: wage differences and the output gap in the home country. The output gap is a measure of cyclical conditions in the home economy, which are likely to be important in the short run. Over a sufficiently long period of time, however, booms and recessions should roughly cancel out, leaving the wage differential as the main force determining the secular trend of emigration. In turn wage differentials in the long run should reflect productivity differentials. Our regression function then takes the form:

$$\frac{\text{Gross migration flow}_{i,j,t}}{\text{Population}_{i,t}} = \alpha + \beta \times \frac{\text{W}age_{j,t}}{\text{W}age_{i,t}} + \gamma \times \text{Output gap}_{i,t} + \phi \times Z_{i,j,t} + \varepsilon_{i,j,t}$$

where the dependent variable is the gross emigration flow from country i to country j as a share of population in country i in year t, $Z_{i,j,t}$ are other explanatory variables such as the proximity or the presence of a common language between country i and country j, β is the bilateral elasticity of emigration flows with respect to the wage difference, and γ is the bilateral elasticity of emigration flows with respect to the output gap.

15.   Wage differences and the output gap are found to be significant determinants of emigration flows in the sample. In a first exercise we run regressions under alternative model specifications over the full sample of bilateral flows in our sample (Table 1). The elasticity of total emigration from country i to the rest of the world is then derived by multiplying the corresponding bilateral elasticity by the number of host countries (25). We find that the signs of the coefficient on the two key variables are consistent with our prior: the larger the wage difference and the weaker the economy the more people will choose to emigrate. Furthermore, the estimated coefficient on the wage differential appears robust across specifications and both economically and statistically significant: as a share of the home country's population, emigration is 0.5 percent higher to a country with wages five times higher than another. To put this into perspective, Latvia's net emigration size in 2013 was 14,000, or 0.7 percent as a share of population. In contrast, the output gap plays a limited role: a 10 percent increase in the output gap will drive up emigration as a share of the home country's population by 0.25 percent. It also becomes statistically insignificant when more explanatory variables are included in the specification.

16.   However, the above results may be distorted by negligible emigration flows to some countries included in the sample. To remove such potential distortions, we now restrict the sample of emigration flows to the top five destinations for each home country. In this case, the elasticity of total emigration from country i to the rest of the world is derived by multiplying the corresponding bilateral elasticity by the number of host countries (5), and dividing by 0.7 since the top five destination countries constitute roughly 70 percent of the share of the total emigration flow. Table 2 summarizes the results.

17.   It is noteworthy that the estimated coefficients on the wage differential and the output gap are substantially larger in the restricted sample compared to the full sample. This confirms the presence of heterogeneous elasticities across (host) countries. Furthermore both coefficients are significant in the restricted sample. Thus if the wage ratio increases from one to five (roughly the current wage-ratio between the U.K. and Latvia), the emigration flow as a ratio to the home country's population will increase by 0.4 percent per annum; and if the (negative) output gap in Latvia increases from zero to ten percent (roughly comparable to the increase experienced during the crisis), the emigration to home population ratio increases by 0.27 percent.

	(1) Gross outflow/population size of the home country	(2) Gross outflow/population size of the home country	(3) Gross outflow/population size of the home country	(4) Gross outflow/population size of the home country	(5) Gross outflow/population size of the home country	(6) Gross outflow/population size of the home country	(7) Gross outflow/population size of the home country
VARIABLES							
Host wage/home wage (average in the previous five years)	0.00521*** (0.00111)	0.00520*** (0.00111)	0.00457*** (0.00116)	0.00477*** (0.00117)	0.00467*** (0.00139)	0.00282 (0.00203)	0.00526*** (0.00158)
Output gap of the home country	-0.00112*** (0.000371)	-0.00134*** (0.000401)	-0.00125*** (0.000424)	-0.000810 (0.000539)	-0.000862 (0.000623)	-0.000667 (0.000641)	-0.000939 (0.000636)
Output gap of the host country		0.000719 (0.000500)	0.000840 (0.000525)	0.000782 (0.000526)	0.000785 (0.000604)	0.000664 (0.000613)	0.000745 (0.000612)
Emigration stock in the host country divided by pop of the home country			0.000872 (0.000964)	0.000770 (0.000966)	0.00156 (0.00114)	0.00140 (0.00116)	0.00148 (0.00116)
Log (population of the home country)				-0.00493 (0.00370)	-0.00489 (0.00438)	-0.00361 (0.00455)	-0.00541 (0.00443)
Log (distance between capital cities of the host and home countries)					-0.00806 (0.00556)	-0.00986* (0.00571)	-0.00862 (0.00561)
Sharing border					-0.00704 (0.0107)	-0.00956 (0.0110)	-0.00714 (0.0108)
More than 9% of populations speak the same language					-0.00830 (0.0231)	-0.0103 (0.0232)	-0.00623 (0.0233)
The wage growth rate in the host country minus the wage growth rate in the home country						-0.00105 (0.000773)	
Wage growth rate in the home country							-0.000733 (0.000832)
Constant	0.00212 (0.00419)	0.00114 (0.00425)	-0.00330 (0.00741)	0.00249 (0.00859)	0.0539 (0.0386)	0.0670* (0.0397)	0.0638 (0.0394)
Observations	844	844	772	772	653	637	640
R-squared	0.031	0.034	0.029	0.031	0.033	0.035	0.033

Table 1. Estimation Results of Determinants of Emigration

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

	(1) Gross outflow/population size of the home country	(2) Gross outflow/population size of the home country	(3) Gross outflow/population size of the home country	(4) Gross outflow/population size of the home country	(5) Gross outflow/population size of the home country	(6) Gross outflow/population size of the home country
VARIABLES						
Host wage/home wage (average in the previous five years)	0.0144** (0.00657)	0.0129* (0.00731)	0.0134* (0.00719)	0.0150** (0.00658)	0.00792 (0.00786)	0.0137* (0.00750)
Output gap of the home country	-0.00479** (0.00190)	-0.00515** (0.00206)	-0.00467** (0.00211)	-0.00326 (0.00227)	-0.00393* (0.00233)	-0.00478** (0.00203)
Output gap of the host country		0.00168 (0.00351)				
Emigration stock in the host country divided by pop of the home country			0.000362 (0.00577)			
Log (population of the home country)				-0.0210 (0.0172)		
Log (distance between capital cities of the host and home countries)					0.00696 (0.0197)	
Sharing border					-0.0473 (0.0474)	
Wage growth rate in the home country						-0.000371 (0.00376)
	0.0295 (0.0290)	0.0323 (0.0297)	0.0309 (0.0466)	0.0527 (0.0347)	0.0215 (0.140)	0.0348 (0.0390)
Observations	140	140	124	140	121	138
R-squared	0.064	0.066	0.057	0.074	0.068	0.058

Table 2. Estimation Results of Determinants of Emigration for Top Five Destinations

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

D. Long-Term Forecasts

18.   The co-efficients obtained from the panel analysis of the previous section can be used to obtain long run estimates of emigration from Latvia. At the outset it should be noted that these forecasts are simply illustrative in nature, using the parsimonious specification of the previous section (in the restricted sample) together with further simplifying assumptions to arrive at a rough estimate of long run emigration dynamics. Assuming that explanatory factors other than the wage differential and output gap are constant over time, the model entails:

$$\frac{\text{Gross out flow}_{\text{Latvia, j, t}}}{\text{Population}_{\text{Latvia, t}}} = \frac{\text{Gross out flow}_{\text{Latvia, j, 2014}}}{\text{Population}_{\text{Latvia, 2014}}} + \Delta_{\text{Latvia, j, t}}$$

$$\Delta_{\text{Latvia, j, t}} = \beta(\frac{\text{Average wage}_{j,t}}{\text{Average wage}_{\text{Latvia, t}}} - \frac{\text{Average wage}_{2014t}}{\text{Average wage}_{\text{Latvia, t}}})$$
$$+ \gamma \cdot (\text{output gap}_{\text{Latvia, t}} - \text{output gap}_{\text{Latvia,2014}})$$

Thus, provided the model continues to hold under different scenarios considered below, given initial conditions and projected paths for the wage differential and output gap, we can use the estimation results to forecast emigration flows in the future.

19.   Assumptions. In line with recent data we assume: in 2014 the average wage in the destination countries is five times that of Latvia's average wage, and the net emigration outflow is 5000; the immigration flow amounts to 0.25 percent of the population per year; the average wage in the destination countries grows at the constant rate of 1.5 percent a year; and the output gap in Latvia declines from -0.5 percent in 2014 to zero in 2017 and afterwards.

Wage Dynamics (Latvia 2014 = 100)
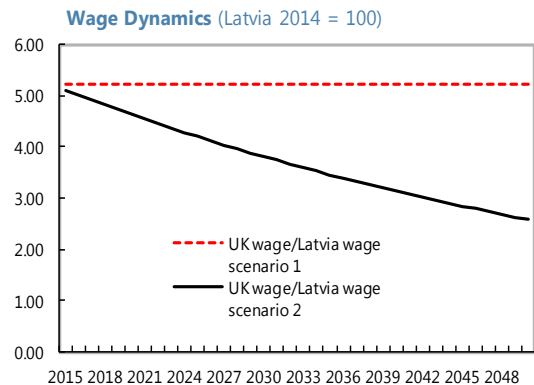
20.   Future emigration levels, and hence population dynamics in Latvia depend on the pace of wage convergence. We consider two scenarios. In the first scenario, the average wage in Latvia grows at the same rate as in destination countries, hence maintaining the wage gap constant over time at its initial level. In the second scenario, the average wage in Latvia grows at 3.5 percent bringing wages in Latvia close to half that in destination countries by 2050. As expected, in the first scenario, the population declines each year by the same net emigration outflow witnessed in 2014 (abstracting from the small effect of the output gap in the first few years) (Chart). In the second scenario, emigration outflows gradually dwindle as wages in Latvia converge to wages in the destination countries, and the decline in population due to emigration tapers around 2040.

Population Dynamics
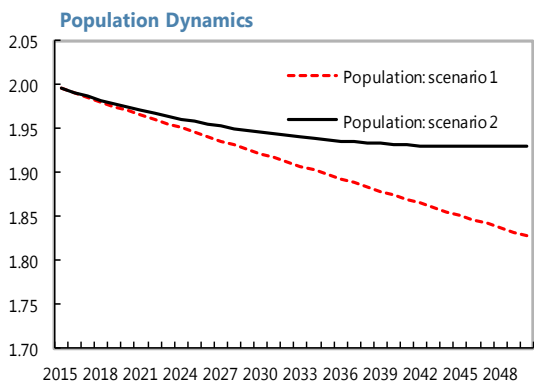
21.   Similar qualitative results obtain under alternative initial conditions. A higher net emigration outflow in 2014 would entail a more prolonged decline in population before it stabilizes, while a more responsive immigration to wage conditions in Latvia or a higher rate of wage growth would entail a smaller and shorter decline in population.

22.   Expectations are also likely to play a significant role. The forecasts above presume that the same model estimated in history continues to hold under the two scenarios, and in particular that expectations do not change significantly. However, it is likely that if positive changes in wage growth and economic conditions are perceived to be sustained over longer periods of time than was experienced in

Population Dynamics: Considering Permanent Income (in million)
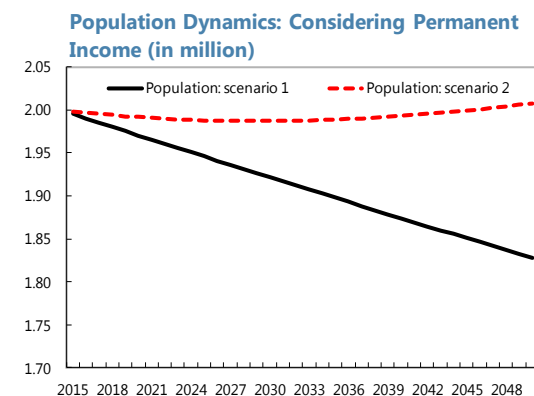
the past, the impact on emigration would be higher as individuals would take into account the change over the long horizon. Under such conditions, the tapering-off of the population decline in the second scenario could actually be realized much faster. Annex II offers some arguments to support a scenario where the population stops declining very quickly if agents believe the wage growth will be permanently higher (Chart).

E.   Conclusions and Policy Implications

23.   Latvia has experienced high levels of emigration in the past, with a mix of adverse and beneficial consequences for the economy. Emigration likely raised welfare by providing a counter-cyclical consumption buffer through remittances, while reducing unemployment (relative to a counterfactual of no emigration) during the crisis. On the other hand, emigration has reduced the workforce relative to the population, thereby raising the dependency ratio, and may have entailed a loss of skills and entrepreneurship. Moreover, in a country of Latvia's size, long run emigration at the rates experienced since the 2000s is unsustainable, raising existential questions for the country.[12]

24.   Latvia is taking some steps to curb emigration and facilitate emigrants return. This includes various measures to improve access to information for emigrants, such as about labor market conditions; expand cooperation with the diaspora; and provide economic and social support for Latvian nationals and their families who are considering returning or who have already returned.

25.   Over time the pace of productivity growth in Latvia will be the key determinant of emigration dynamics. The literature shows that the impact of return policies tends to be limited, especially where underlying economic conditions are not favorable, and these policies are not cost-free.[13] Our econometric analysis suggests, in line with the literature, that in the long run the wage gap with host countries will play a crucial role in determining the speed with which net emigration tapers-off. Although our analysis is illustrative rather than comprehensive, it does show that emigration dynamics are very sensitive to whether Latvia can sustain productivity growth of 3–4 percent per annum (thus rapidly closing the gap with frontier economies like the UK) or whether it fails to close the productivity gap. So policies need to focus on delivering sufficiently high productivity growth on a consistent basis. This requires maintaining macroeconomic stability and implementing structural reforms to encourage investment, upgrade infrastructure and reduce skills mismatches. Of course, these are recommendations that would apply to most economies, independent of the degree of openness to labor flows. But in Latvia they assume particular importance, given their relevance to stemming emigration over the medium-term.

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[12] See IOM (2004) for practices across European countries.

[13] See Kaczmarczyck (2013),

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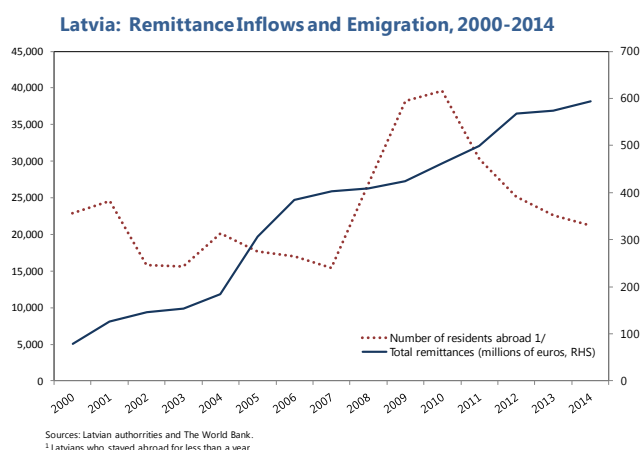
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Annex I. Remittances in Latvia

Although migrants' remittances to Latvia have grown considerably over the last two decades, reaching 2.5 percent of GDP, the country's dependence on remittance inflows remains low by international standards. Remittances strengthen Latvia's balance of payments by providing stable and countercyclical inflows of private capital. They may also have supported households' living standards, in particular during the financial crisis.

Stylized facts

Migrants' remittances to Latvia have considerably grown over the last two decades, partly fueled by emigration. From a negligible level in 2000, remittances have steadily grown to more than half a billion euros. Over the period, remittances have generally increased faster than GDP and private consumption, including in the aftermath of the financial crisis (Figure 1). The ratio of remittance inflows to GDP has exceeded 2.5 percent of GDP since 2010.

Latvia: Remittance Inflows and Emigration, 2000-2014

Sources: Latvian authorities and The World Bank.
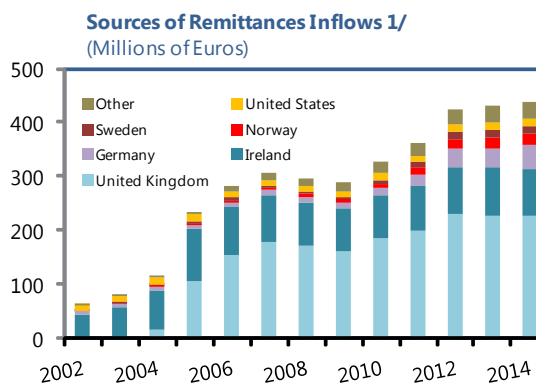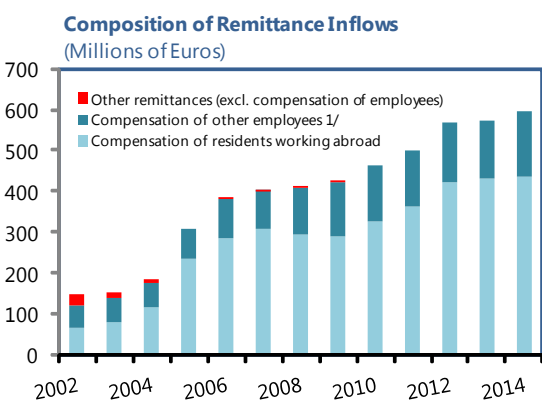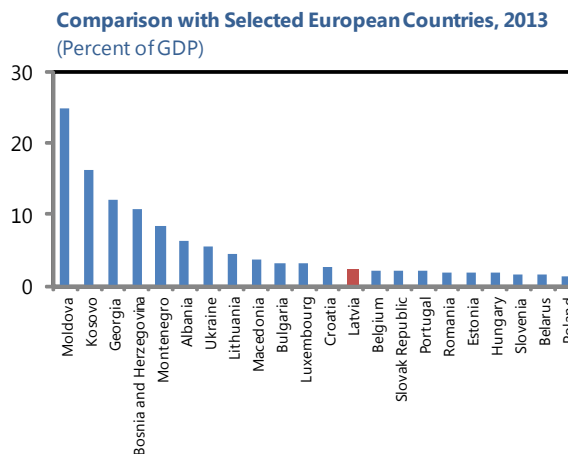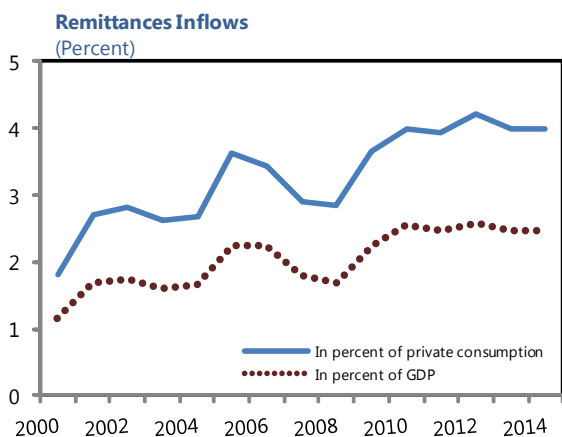[1] Latvians who stayed abroad for less than a year.

Although growing fast, Latvia's dependence on remittance inflows remains low by international standards (Figure 1). Latvia's ratio of remittance inflows to GDP is low compared to the largest recipients of remittances in the world, including European countries such as Moldova (25 percent of GDP in 2013), Kosovo (16 percent of GDP), and Georgia (12 percent of GDP). Latvia is the second largest recipient of remittances among Baltic countries, after Lithuania.

Remittances to Latvia come almost entirely from individuals who stayed abroad for a short period (Figure 1). A large part of remittances to Latvia comes from compensation of employees, which comprises mostly remuneration of residents working abroad (Latvians who stayed abroad for less than one year). Workers' remittances and migrants' transfers represent less than 7 percent of total remittances, suggesting that individuals who stayed outside Latvia for one year or longer do not remit much or use informal channels.[1]

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[1] Formal inward remittances are the sum of workers' remittances, compensation of employees, and migrants' transfers (The International Transactions in Remittances, Guide for Compilers and Users, IMF, 2009). Workers' remittances refer to transfers in cash or in kind from migrants, i.e. workers staying abroad for one year or more. Compensation of employees refers to remuneration, in cash or in kind, paid to individuals who work in a country where they have stayed for less than one year. It also includes wages and salaries earned by the local staff of foreign institutions, such as embassies and international organizations, and companies based abroad but operating locally. Migrants' transfers include flows of goods and financial assets linked to the migrants' cross-border movements.
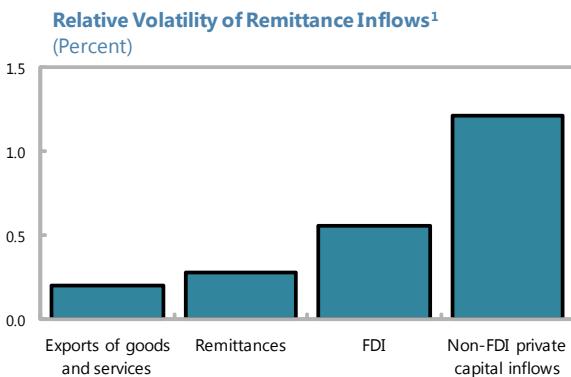
## Figure 1. Republic of Latvia: Remittances Inflows, 2000–14

Remittances Inflows
(Percent)

- In percent of private consumption
- In percent of GDP

Comparison with Selected European Countries, 2013
(Percent of GDP)

Composition of Remittance Inflows
(Millions of Euros)

- Other remittances (excl. compensation of employees)
- Compensation of other employees 1/
- Compensation of residents working abroad

[1] E.g., sailors, employees of foreign embassies, and sportsmen.

Sources of Remittances Inflows 1/
(Millions of Euros)

- Other
- Sweden
- Germany
- United Kingdom
- United States
- Norway
- Ireland

[1] Compensation of residents working abroad (Latvian who stayed abroad for one year or less) .

Relative Volatility of Remittance Inflows[1]
(Percent)

Exports of goods and services | Remittances | FDI | Non-FDI private capital inflows

[1] Coefficient of variation (Standard deviation in percent of the mean) of the ratio of the relevant inflows to GDP. Remittances are defined as compensation of employees and non-FDI private capital inflows include inflows related to financial derivatives, capital account, and portfolio and other investment.

Cyclicality of inflows[1,2]

Exports of goods and services | Remittances | FDI | Non-FDI private capital inflows
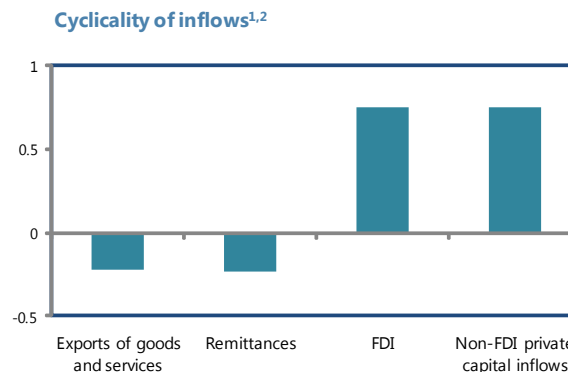
[1] Correlation between the relevant inflows and the growth rate of GDP. Remittances are defined as compensation of employees.

Sources: Latvian authorities, The World Bank, and IMF staff calculations.

The bulk of remittance inflows are from Latvians staying in large European countries and North America (Figure 1). Inflows from the United Kingdom are the largest, representing 52 percent of compensation of residents working abroad, followed by inflows from Ireland, Germany, and Norway. Inflows from the United States represent 14 percent of compensation of residents working abroad. These countries also host large Latvian communities. Remittances from the other two Baltic countries are small. Various factors may have influenced the magnitude and geographical distribution of remittance inflows, including immigration policies and economic conditions in host countries (e.g., GDP growth and growth differential between host countries and Latvia) and the profile of migrants (e.g., skill level, marriage, age, and ties with the home country).[2] In the case of Latvia, it is hard to find analytical evidence of these effects because of data scarcity.

Macroeconomic effects

Remittance inflows strengthen Latvia's balance of payments stability by providing stable and countercyclical inflows of private capital, which has partly mitigated the volatility of other capital flows in particular since the financial crisis (Figure 1). Inflows of remittances have grown steadily since 2000, with double digit growth rates for most of the period and low volatility. Remittances are also less volatile than other private capital inflows, including FDI, and portfolio and other investment inflows. Remittance inflows remained stable during the financial crisis, decelerating only slightly also reflecting an increase in emigration flows out of the country. The countercyclical inflows compensated partly for the reversal in non-

Latvia: Remittances and other capital inflows, 2000-14
(Millions of Euros)

Legend: Remittances; Portfolio investment; Direct investment in Latvia; Other investment

Sources: The World Bank and IMF staff calculations.
[1] Remittances are defined as compensation of employee.s

resident deposits and Nordic parent bank funding. As a result, remittances have represented a large share of private capital inflows since the crisis, even higher than foreign direct investment in some years.
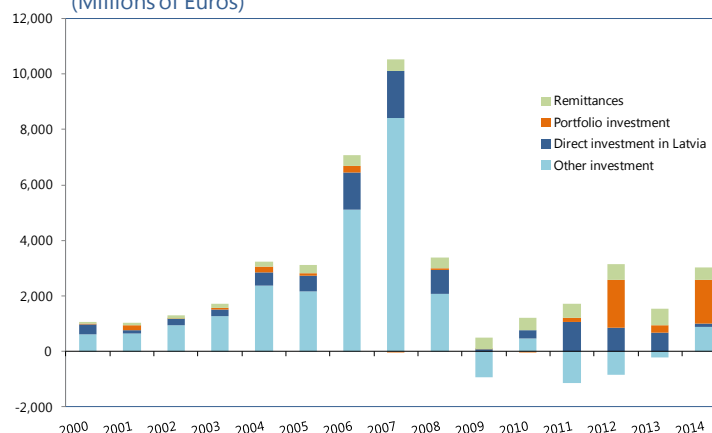
Remittance inflows can also support economic growth and increase households' living standards. First, remittances increase financing available for consumption and investment, and reduce dependence on foreign capital including foreign direct investment. Second, in many countries including Latvia, remittances are stable and countercyclical, which can increase their beneficial impact on growth. Third, remittances are directly targeted at households, helping raise

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[2] Schrooten (2006); The World Bank (2008).

standards of living and reduce poverty. However, these beneficial effects could be (at least partially) offset by the negative impact of remittances on recipients' incentives to work, possible Dutch disease effects (Mansoor and Quillin, 2006), and unattractive investment environment in recipient countries (De Haas, 2005). These effects could explain why some studies did not find a positive impact of remittances on economic growth (e.g., Spatafora, 2005).

How to increase emigrants' economic contribution?

Initiatives to strengthen remittance inflows through formal channels, including by strengthening ties with the diaspora, could help increase emigrants' economic contribution to Latvia. Latvia has recently adopted an action plan prepared by the Ministry of Foreign Affairs to strengthen ties with the diaspora and encourage migrants' return. Implementation of this action plan could help boost remittance inflows and serve as a framework to attract more investment by the diaspora (e.g., increasing support to migrant associations and encouraging pension schemes targeted at migrants). Similarly, in light of the little evidence of transfers by long-term migrants found in official data, it might be worth assessing whether there are any impediments to using formal channels for remittance transfers that could deter long-term migrants from using them (e.g., fees or taxes on financial services). Banks could also explore the possibility of lending to emigrants who would like to invest in Latvia (e.g., mortgage lending).

Initiatives to develop innovative ways of tapping the diaspora as an alternative funding source for the government and banks could also increase emigrants' economic contribution to Latvia, and provide a cushion against future headwinds. In the current environment of near-zero interest rates and abundant liquidity, banks and the government do not face any immediate financing constraints. However, funding needs could emerge in the future, at a different point of the cycle. To prepare for such possibility, policymakers could consider tapping the diaspora as an alternative funding source using innovative instruments including diaspora bonds or loans. Such instruments have been used by many countries to access funding at lower interest rate and longer maturity than sovereign bond terms. Israel, the pioneer in this type of instrument, issued its first diaspora bond in 1951 and has been issuing diaspora bonds for US$1 billion every year for a decade. Similarly, India has issued several diaspora bonds to finance infrastructure projects in 1991, 1998, and 2000.

Annex II. Econometric Analysis

Data and methodology

The home countries in our sample are East European countries, which include the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia, and Slovenia. The sample period is 2004–12. Most economic variables including emigration flows and wages come from Eurostat, the output gap from the World Economic Outlook Database, geographic information from Geodist, and the stock of emigration from United Nation Population Statistics.

The basic regression specification takes the form:

$$\frac{\text{Gross out flow}_{i \cdot j, t}}{Pop_{i,t}} = \alpha + \beta \cdot \frac{\text{Mean wage}_{j,t}}{\text{Mean wage}_{i,t}} + \gamma \cdot \text{output gap}_{i,t} + \vec{\phi} \cdot \vec{Z}_{ij} + \varepsilon_{ijt}$$

where the dependent variable is gross out flow from country i to country j at time t divided by the population size of country i at time t, and the explanatory variables include the mean wage of country j at time t divided by the mean wage of country i at time t, the output gap of country i at time t, and a vector of time-invariant measures of country pair i-j, $\vec{Z}_{ij}$, which includes the distance between the capital city of country i and that of country j, a dummy indicating whether country i and country j share a border, and a dummy indicating whether in country i and j, more than 9 percent of their populations speak the same language. We do not control for country pair fixed effects or home country fixed effects, because the ratio of the mean wage of the host country to that of the home country is slow moving for a given home country and similar across major destination countries (elaborated below). Including these fixed effects would largely absorb the effects of the ratio of mean wages. We do not include host country fixed effects, as they are not likely to play a significant role if we restrict our sample to major destination countries (elaborated below).

We use a two-step analysis to forecast aggregate emigration flows. First, for each of the home countries in our sample, we only study emigration flow to the top five destinations in terms of the size of emigration flow. Second, we multiply the estimated elasticity of emigration flow to economic conditions by five, which is further divided by an adjustment factor to get the elasticity of the aggregate emigration flow to economic conditions. We choose the adjustment factor to be the average of the share of emigration flows from a home country to its corresponding top five destinations in the total emigration flow from the home country.

Alternative assumptions regarding expectation formations

As noted in the main text, expectations are likely to play an important role in the relationship between the wage gap and emigration, but are not accounted for in the main forecasts. Here we describe an alternative method for taking expectations into account, corresponding to the last text chart in Section IV of the paper. Since permanent income is not observable, we rely on the

following three assumptions to analyze how Latvia's aggregate emigration outflow responds to different wage growth expectations.

Assumption 1. Emigration is a linear function of the ratio of the permanent income in the host country to that of the home country. Thus:

$$\frac{\text{Gross out flow}_{i\text{-}j,t}}{Pop_{i,t}} = \lambda \cdot \frac{\text{Permanent income}_{j,t}}{\text{Permanent income}_{i,t}} + f(\vec{X}_{ijt}) + \varepsilon_{ijt}$$

where $\vec{X}_{ijt}$ are other factors influencing emigration from country i to country j.

Assumption 2. Latvia's elasticity of migration with respect to wage difference in 2014 is the same as the average in Eastern European economies in 2004–14:

$$\lambda \cdot \frac{\text{Permanent income}_{j,2014}}{\text{Permanent income}_{\text{Latvia},2014}} = \hat{\beta} \frac{\text{Wage}_{j,2014}}{\text{Wage}_{\text{Latvia},2014}}$$

Since the coefficient of the wage ratio in equation (1), $\hat{\beta}$, is estimated from eastern European countries' emigration history between 2004 and 2014, which is a mix of boom and bust cycles, we think assumption 2 is not implausible.

Assumption 3. Latvia public's perception of permanent wage growth was 1.5 percent in 2014. This can be justified by assuming that people use adaptive rules to form their forecasts of future wage growth. To put this number into context, note that the average wage growth between 2009 and 2013 was only 0.9 percent, and the level of wage in Latvia in 2013 was still 3.5 percent lower than its peak in 2008.

Then, we can use the following formula to compute the emigration flow as a share of Latvia population in year t >= 2014 if the expected wage growth rate in year t is g%:

$$\frac{\text{Emigration}_{\text{Latvia-}j,t}}{Pop_{\text{Latvia},t}} = \frac{\text{Emigration}_{\text{Latvia-}j,2014}}{Pop_{\text{Latvia},2014}} - \Delta(g,t)$$

Some remarks are as follows:

where $\Delta(g,t) = \hat{\beta} \dfrac{\text{Wage}_{j,2014}}{\text{Wage}_{\text{Latvia},2014}} (1 - \dfrac{\text{Wage}_{j,t} / \text{Wage}_{j,2014}}{\text{Wage}_{\text{Latvia},t}/\text{Wage}_{\text{Latvia},2014}} \times \dfrac{f(1.5)}{f(g)})$ and $f(x) = \sum_{s=25}^{65} \dfrac{x^{s-25}}{R^{s-25}}$

Fourth, in 2015, even if $\text{Wage}_{\text{Latvia},2015}/\text{Wage}_{\text{Latvia},2014}$ is not going to be much different from $\text{Wage}_{j,2015}/\text{Wage}_{j,2014}$, $\Delta(g,t)$ can be quite different from zero if g is different from 1.5. This captures the idea that the perception of future wage growth can strongly affect the emigration decision.

Then, for each scenario with a certain wage growth assumption, we can compute the corresponding $\Delta(g,t)$, based on which we can forecast emigration outflow using equation (2).

First, $f(x)$ is the ratio of permanent income divided by the current wage from the perspective of a worker aged 25 and who is expected to retire in age 65;

Second, we use the year 2014 as a starting point, and change in wage growth can lead to a change in emigration flow relative to what is observed in 2014. It is easy to check in the special case where t = 2014 and g = 1.5, $\Delta(g,t) = 0$;

Third, when g > 1.5 and $\text{Wage}_{\text{Latvia, t}}/\text{Wage}_{\text{Latvia, 2014}} > \text{Wage}_{j,t}/\text{Wage}_{j,2014}$, $\Delta(g,t) > 0$.