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## Ageing, local birth rates and attitudes towards immigration: Evidence from a transition economy

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**Ageing, local birth rates and attitudes towards immigration:  
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3 Ageing, local birth rates and attitudes towards immigration:  
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5 Evidence from a transition economy  
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4 Abstract:  
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9 This paper studies the links between local birth rates and individual attitudes towards  
10 immigration, focusing on Latvia – a country in economic transition and demographic decline.  
11 Possible channels through which local demographics may affect immigration preferences are  
12 discussed. Using 2005 survey data, a significant correlation between local birth rates and  
13 immigration preferences is found: people are more favourable to the inflow of foreign  
14 workers in municipalities where fewer children are born. The link tends to be stronger among  
15 the elderly and women.  
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31 Keywords: Attitudes towards immigration, ageing, local birth rate, Latvia.  
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34 JEL: F22, H55, J61  
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## 1. Introduction

Ageing populations, falling fertility rates and unsustainable pension systems have become major preoccupations of almost all developed countries. The transition economies of Central and Eastern Europe are particularly affected - they are about to experience major population declines and considerable population ageing (WORLD BANK, 2007; EUROSTAT, 2008; HOSSMAN et al., 2008). In this context, immigration is often suggested as one of the tools for sustaining public pension systems, population and economic growth (STORESLETTEN, 2000; SINN, 2001; KRIEGER, 2005; HOSSMAN et al., 2008). However, recognising that immigration may reduce taxes or increase pensions does not mean that all countries are eager to liberalise their immigration policies. In any democratic society, a particular policy reflects the voters' will; understanding individual attitudes towards immigration and the determinants of these attitudes is crucial for understanding the formation of immigration policy (FACCHINI and MAYDA, 2008).

Do demographic factors affect individual attitudes towards immigrants? Do people consider immigration as a substitute for the falling births? What is the role of the local birth rates? This paper tries to find answers to these questions by looking at the immigration attitudes of natives in Latvia (see Figure 1 for country information). There are several reasons why this country is a useful example. First, the birth rate in Latvia fell dramatically during the first decade of transition, and since then it has remained among the lowest in the world.<sup>1</sup> To counterbalance the future population decline, Latvia is expected to become a migrant receiving country in the medium run (HOSSMAN et al., 2008; WORLD BANK, 2007).

[Insert Figure 1 here]

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8 Second, emigration of Latvians to Western Europe creates domestic labour shortages  
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10 and increases the demand for foreign workers (WOOLFSON, 2009). Thus, in July 2008 the  
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12 Latvian government took concrete steps to facilitate the entry of foreign workers, by reducing  
13  
14 the employer fee for hiring an immigrant from 758 EUR to 211 EUR.  
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19  
20 Third, immigration for Latvians is not a new phenomenon - the country witnessed  
21  
22 massive levels of immigration in the Soviet era<sup>2</sup> (see e.g. MUNZ and OHLIGER, 2003). For  
23  
24 decades, ethnic Latvians have been living side by side with migrants from the former Soviet  
25  
26 Union, suggesting that people may be well aware of the positive and negative effects of  
27  
28 immigration. This is all the more important given that the Russian Federation and other CIS  
29  
30 countries remain a major source of immigrants for Latvia.<sup>3</sup>  
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36 Finally and crucially for this study, birth rates vary considerably across Latvian  
37  
38 municipalities (see Figure 2). In the most “fertile” municipalities births are comparable to the  
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40 top European performers – France, Norway and Iceland (more than 13 births per 1000  
41  
42 inhabitants); in the least “fertile” municipalities births are among the lowest in world (less  
43  
44 than 7 births per 1000 inhabitants). There may be various reasons for such variation. First and  
45  
46 foremost, the birth rate of a particular municipality will depend on its age structure, in  
47  
48 particular, the share of women of reproductive age. The age structure, in turn, may be affected  
49  
50 by the level of economic development of the municipality as younger people tend to emigrate  
51  
52 from areas with poor job prospects and low wages. Second, historically the regions of Latvia  
53  
54 were subject to different religious, cultural and linguistic influences (German, Russian,  
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56 Polish, Swedish); this might have affected people’s family planning behavior, especially  
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3 during the times of socio-economic turmoil. Third, Latvia hosts important ethnic minority  
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5 populations which in certain cases are concentrated in particular regions and for a variety of  
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7 reasons have different fertility rates compared to the ethnic majority.<sup>4</sup>  
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12 [Insert Figure 2 here]  
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17 The regional variation in birth rates represents a cornerstone for the theoretical and  
18  
19 empirical analysis of this paper. The next section discusses different channels through which  
20  
21 the local birth rates might affect attitudes towards immigration. Section three provides  
22  
23 evidence that Latvians are more likely to be pro-immigration if there are fewer children born  
24  
25 in the area in which they live. The empirical analysis is based on data from a survey  
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27 commissioned by the Ministry of Foreign Affairs of Latvia and conducted in 2005. The  
28  
29 unique feature of the data is that information is available on the place of residence of the  
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31 respondents at a very disaggregated (municipality/NUTS-5) level.  
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39 The findings of this paper contribute to the growing theoretical and empirical literature  
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41 on individual attitudes towards immigration. Previous contributions have emphasised the  
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43 impact of immigrants on the labour market (SCHEVE and SLAUGHTER, 2001; MAYDA,  
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45 2006; O'ROURKE and SINNOTT, 2006; MALCHOW-MØLLER et al., 2008; FACCHINI  
46  
47 and MAYDA, 2008), redistribution of tax revenues (HANSON et al., 2007; FACCHINI and  
48  
49 MAYDA, 2009; DUSTMANN and PRESTON, 2007), and the role of racial and ethnic  
50  
51 prejudice (GANG et al., 2002; MAYDA, 2006; O'ROURKE and SINNOTT, 2006;  
52  
53 DUSTMANN and PRESTON, 2007). This paper highlights the role of demographic  
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55 variables, in particular the local birth rates, as potential determinants of immigration  
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57 preferences.  
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8           2. Local birth rates and attitudes towards immigration: possible channels  
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10 and testable hypotheses.  
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15           Several explanations can be provided of why local birth rates could affect immigration  
16 preferences. This section briefly discusses the channels related to community sustainability  
17 concerns, segmented labour markets, education and fertility, altruism, imperfect information,  
18 municipalities' fiscal competition, and free-riding. At the end of this section testable  
19 hypotheses are identified.  
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### 28 29 30           Sustainable communities 31 32

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34           Fewer children born in a particular area today implies that in the future there will be a  
35 smaller labour force to work in local industries and provide local services. To ensure  
36 economic and social sustainability of the area through an optimal mix of young and old  
37 people, one could invite immigrants. Therefore, people in low birth communities could be  
38 expected to be more favourable to immigration.  
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### 48 49           Segmented labour markets 50 51

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53           Assume that each geographical area within a country is a separate labour market with  
54 little or no mobility between the areas. Areas with high birth rates will have a high proportion  
55 of working-age people and, because of the higher labour supply, low wages. In addition,  
56 unemployment in such areas may be higher if there is a minimum wage. On the contrary,  
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3 areas with low birth rates will have fewer working-age people, higher wage rates and little or  
4  
5 no unemployment. If better labour market outcomes make people more receptive to  
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7 migration, birth rates will be negatively correlated with pro-immigration sentiment. Note,  
8  
9 however, that the segmented labour markets framework is unlikely to fit the reality of Latvia:  
10  
11 the actual data suggest that the local birth rates tend to be higher if wages are higher and  
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13 unemployment lower, not the other way around.<sup>5</sup>  
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### 16 17 18 19 20 Education and fertility

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25 There may be a negative correlation between the number of children a person has and  
26  
27 his/her education level. If this is the case, birth rates will be low in areas with high average  
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29 education/skill level. Assuming further that immigrants are low-skilled, people living in areas  
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31 with higher average skill level (and lower births) will less harmed by the (low-skilled)  
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33 immigration,<sup>6</sup> hence more favourable to it. However, the “higher education-lower birth rate”  
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35 framework is again unlikely to fit the case of Latvia. The actual data show that the correlation  
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37 between the local share of tertiary education and the birth rates is close to zero (and positive  
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39 rather than negative).<sup>7</sup>  
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### 45 46 Altruism and negative effects of immigration on future generations.

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51 Today’s immigration may increase the pensions of the current retirees, but at the  
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53 expense of natives’ children in the future. KRIEGER (2004, 2008) shows that, while the  
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55 retired generation will benefit from initial immigration,<sup>8</sup> extra burden may be shifted to the  
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57 children of natives (next generations). This is likely to happen if 1) immigrant children are  
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59 less skilled than natives’ children – since an average immigrant’s child will contribute less to  
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3 the pension system than an average native child while both will receive the same pensions  
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5 (KRIEGER, 2004); and 2) if there is return (or onward) migration and the children of  
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7 migrants do not stay in the host country<sup>9</sup> – since the children of natives will have to support  
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9 the pensions of both natives and returned migrants (KRIEGER, 2008).  
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15 If people are altruistic and take into account the negative effects of immigration on the  
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17 wellbeing of their children, voters in communities with more children will be more anti-  
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19 immigration than their counterparts in communities with few children. If a further assumption  
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21 is made that women (and in particular, mothers) are more altruistic than men (see e.g.  
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23 ESWARAN and KORWAL, 2004), gender differences in the relationship between  
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25 immigration preferences and local birth rates might be expected.  
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### 32 Pensions and imperfect information about the national birth rate

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37 Assume that the natives believe that immigration increases pay-as-you-go pensions of  
38  
39 the host country. Assume further that natives do not have access to full information about  
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41 birth rates at national level. There may be several reasons for this - limited access to national  
42  
43 statistics, insufficient coverage of the birth rate statistics in the media, difficulties to interpret  
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45 the birth rate statistics (e.g. is 10 births per 1000 inhabitants a high or a low population  
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47 growth rate and how it will affect my future pension?), and limited internal mobility of the  
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49 population. However, people are able to observe directly or easily obtain information (e.g. via  
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51 neighbours) about birth rates in their area of residence (region, district, municipality, city,  
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53 town or village). Then, they would use the information on local birth rates, rather than  
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55 population growth statistics at national level, to calculate their present or future pensions.  
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60 Fewer children born at one's place of residence would then be associated with higher future

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3 nation-wide ageing levels, hence lower pensions. However, if one way to compensate a  
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5 (perceived) fall in pensions is to attract immigrants, then people living in low birth areas will  
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8 favour higher immigration levels compared to their counterparts from high birth areas.  
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12 The point would be particularly relevant for the pre-retirement and retirement  
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14 generations - they are the main beneficiaries of the immigration-induced pension externality  
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16 and are arguably more likely to have incomplete information about the birth rate at national  
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18 level (e.g. because of the limited access to national statistics or limited geographical  
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20 mobility). In contrast, younger people may attach less importance to the future pensions and  
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22 be more concerned about the potential labour market competition from immigrants. Arguably,  
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24 they are also better informed about the birth rate statistics at national level compared to the  
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26 elderly.  
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34 In addition, one could expect the immigration preferences of women to be more  
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36 sensitive to the local birth rates variation, as women usually have a greater longevity than men  
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38 and receive pensions for a longer time.<sup>10</sup> The point is particularly relevant for Latvia, where  
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40 women live on average 10 years longer than men, and the retirement age is 62 years for both  
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42 men and women.  
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48 Unfortunately, the data in hand do not allow us to test whether the local birth rates (or  
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50 the perceptions thereof) affect people's perceptions of the nation-wide birth rate. Therefore,  
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52 the imperfect information and immigration-induced positive pension externality channel  
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54 remains purely hypothetical.  
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#### Fiscal competition among ageing municipalities

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6 MONTEN and THUM (2010) develop a theoretical model where ageing  
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8 municipalities engage in a competition for young people. By assumption, more (young)  
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10 people result in more budget funds for a municipality. The budget is then spent on the public  
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12 good for the young (e.g. child care and sport facilities) and for the old (e.g. public transport  
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14 and safety of neighbourhoods). If the elderly constitute a majority in a municipality, they will  
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16 vote for the higher provision of the public good for the elderly at the expense of the young;  
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18 the complete “exploitation” of the young is excluded by the exit option of migration.  
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20 However, at very high levels of ageing, the fiscal competition results in an over-supply of  
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22 public goods for the young.  
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30 If migrants are less concerned about the provision of local public goods than the local  
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32 young, external immigration may act as a less costly substitute for the competition among  
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34 municipalities. In this case, people in lower birth areas would be more pro-immigration than  
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36 people in higher birth areas; the elderly, for whom more people in a municipality means more  
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38 public good, will be the most favourable to immigration.  
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#### 43 Free-riding and strategic answers

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48 Immigration may be opposed by natives on cultural or racial grounds (HILLMAN and  
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50 WEISS, 1999; GANG et al., 2002; MAYDA, 2006; O’ROURKE and SINNOTT, 2006;  
51  
52 DUSTMANN and PRESTON, 2007), but people may be aware of the potential positive  
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54 economic effects of immigration at the national level (e.g. contribution to the pension system,  
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56 cheaper goods produced in industries which rely on immigrants). At the same time,  
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58 depopulation of a particular area is often paralleled with low economic activity, making the  
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3 areas with falling births unattractive to immigrants. If all these conditions hold, stating a high  
4 immigration preference may be a good deal for a person from a low birth rate community:  
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6 immigrants will choose to live in some other - economically booming - place, while the  
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8 positive economy-wide effects of immigration will spill over the municipality borders. For  
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10 somebody from a low birth community immigration would involve only benefits - at no cost.  
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### 15 16 17 Testable hypotheses 18

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22 In the next section the link between pro-immigration attitudes and local birth rates is  
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24 tested empirically. Most channels outlined above predict a negative correlation between the  
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26 two phenomena; therefore the first testable hypothesis is that lower local births rates are  
27  
28 associated with more favorable attitudes towards immigration. Several channels also suggest  
29  
30 that the elderly and females are more pro-immigrant in low birth areas than their counterparts  
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32 in high-birth areas. This leads to additional two testable hypotheses: immigration preferences  
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34 of the old people are more sensitive to the local birth rate variation compared to the  
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36 immigration preferences of the young people; and immigration preferences of women are  
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38 more sensitive to the local birth rate variation compared to the immigration preferences of  
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40 men.<sup>11</sup>  
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## 48 3. Data, specification and regression results. 49

### 50 3.1. Data 51 52 53 54

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56 The data used in this study come from a survey commissioned by the Ministry of  
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58 Foreign Affairs of Latvia and conducted by the Marketing and Public Opinion Research  
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60 Centre<sup>12</sup> in December 2005. The survey addressed a variety of issues about external migration

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3 to and from Latvia, including the attitudes towards the inflow of foreign workers. The sample  
4 consists of 1060 face-to-face interviews with individuals aged 15-74 and closely replicates the  
5 geographical, gender, ethnic and citizenship distributions of the population. Crucially for this  
6 study, information is available on the respondents' place of residence at a very disaggregated  
7 – municipality (NUTS-5) - level.<sup>13</sup>  
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18 To capture respondents' immigration preferences, the following question is used:  
19 "What is your attitude towards the inflow of foreign workers into Latvia?" with possible  
20 answers "very negative", "rather negative", "rather positive" and "very positive". Note that  
21 the answers do not allow for a neutral attitude towards immigration; as a result, people may  
22 be "forced" to answer in the positive or negative, thereby overstating the hostile as well as  
23 favourable attitudes towards immigration. Alternatively, people with neutral stance on  
24 immigration could end up in the "missing answer" group which constitutes 13% for this  
25 question. If the latter is the case, i.e., if the non-respondents are allowed to form a middle  
26 ("neutral") category of the immigration preferences variable, the results of this study remain  
27 qualitatively unchanged.  
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43 To check the robustness of the results, the alternative question "Should the  
44 government of Latvia facilitate or restrict the inflow of foreign workers into Latvia?", with  
45 possible answers "should facilitate", "should do nothing" and "should restrict", will be used.  
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53 The main explanatory variable – the municipality birth rate – is defined as the number  
54 of births per 1000 inhabitants per year. The data on birth rates come from the national  
55 statistics of Latvia. 2004 data are chosen, as it may take some time for the members of a local  
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community to obtain information about births in their area. However, the robustness of the results will be checked when the average birth rate of 2005 and 2004 is used.

Altogether, the survey covers 62 randomly selected municipalities. The NUTS-5 municipality birth rate data from national statistics are matched with information on the respondents' place of residence.

### 3.2. Empirical specification

The model explaining individual attitudes towards immigration is estimated with the ordered probit approach (see e.g. WOOLDRIDGE, 2002). The underlying latent variable, capturing immigration preferences of individual  $i$  living in municipality  $j$ , is specified as follows:

$$\begin{aligned}
 \text{Immigration preferences}_{ij} = & \alpha_0 + \alpha_1 (\text{individual controls}_{ij}) + \\
 & + \beta \text{ municipality birth rate}_j + \\
 & + \chi (\text{municipality level controls}_j) + \quad (1) \\
 & + \delta (\text{province fixed effects}) + \\
 & + \text{unobserved error term}_{ij}
 \end{aligned}$$

The set of individual level control variables includes dummies for six age groups, gender, marital status, having at least one child under 18, five educational and five income levels,<sup>14</sup> being unemployed and being a minority language (Russian) speaker.

Importantly, given the cross-sectional nature of the data, the estimated coefficient of the municipality birth rate should be interpreted as conditional correlation between

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3 municipality births and immigration preferences (and not as causality). The variable is  
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5 potentially endogenous, and its coefficient biased, due to the unobserved/omitted co-  
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7 determinants of the municipality birth rates and individual immigration preferences. To  
8  
9 isolate the municipality birth rates effect, it is essential to include as many municipality level  
10  
11 variables as possible. Subject to data availability, the following municipality controls are  
12  
13 included (see table A1 of the appendix for the definitions, sources and summary statistics of  
14  
15 all variables, and table A2 for the correlation coefficients between the municipality level  
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17 variables):<sup>15</sup>  
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- 24     ▪ the share of people of working age (15-64) and the share of children (0-14) (to control  
25         for the broad structure of the municipality residents);
  - 26     ▪ the unemployment rate (to control for the level of economic development);<sup>16</sup>
  - 27     ▪ the share of ethnic minorities and its squared term (to control for ethnic diversity);
  - 28     ▪ the share of the non-citizens<sup>17</sup> and its squared term (to control for the presence of  
29         immigrants);
  - 30     ▪ the share of people with higher education;
  - 31     ▪ the log of population density (to control for rural-urban population);<sup>18</sup>
  - 32     ▪ the emigration rate;
  - 33     ▪ the crime rate.
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50         Next, six province dummies – for Vidzeme, Latgale, Kurzeme, Zemgale, Riga (the  
51         capital), and Riga agglomeration – are included in all specifications. As already mentioned,  
52         historically the provinces of Latvia were under different political rules, had varying levels of  
53         development and degrees of autonomy, and were subject to different cultural, religious, and  
54         linguistic influences. This could affect both the birth rates and the attitudes towards foreigners  
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3 today. The province dummies will account for the province-wide effects, and the estimated  
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5 municipality birth rate coefficient will reflect the correlation between the municipality birth  
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7 rate and immigration preferences within each province. In addition, the inclusion of province  
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9 dummies will mitigate the problem of omitted municipality-specific variables, as there are  
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11 likely to be important differences (many of them unobserved and/or unaccountable) between  
12  
13 the municipalities of different provinces, but not within each province.  
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20 To verify whether the link between the municipality births and immigration  
21  
22 preferences depends on age and gender, equation (1) will be estimated for the sub-samples of  
23  
24 younger (18-44) and older (45-74) respondents, as well as for women and men.  
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### 31 3.3. Regression results 32 33 34 35

#### 36 Main results 37 38 39 40

41 The ordered probit coefficients are reported in table 1 and the marginal effects of the  
42  
43 municipality birth rate variable in table 2. In all specifications the standard errors are  
44  
45 corrected for heteroscedasticity and clustered at municipality level. The respondents under 18  
46  
47 and those who did not report their immigration preferences (13% of the sample) are excluded  
48  
49 from the analysis.<sup>19</sup>  
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55 The coefficients of a restricted specification that excludes the local birth rate variable  
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57 are reported in column [1] of table 1. At individual level, the most favourable to immigration  
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59 appear the younger respondents, people with relatively low and high income, and especially  
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3 the Russian speakers - many of whom are migrants themselves or the descendants of  
4  
5 migrants. The negative effect of age and positive effect of foreign origin on pro-immigration  
6  
7 sentiment are consistent with the literature (see e.g. FACCHINI and MAYDA, 2008 and  
8  
9 O'ROURKE and SINNOTT, 2006). In addition, as already mentioned, Russia and the  
10  
11 Commonwealth of Independent States remain the main sources of migrants in Latvia; this  
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13 might help explain why the representatives of the Russian speaking minority are considerably  
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15 more pro-immigration than the Latvian speakers.  
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22         Among the residential variables, the coefficient of crime rate is significant and  
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24 negative, meaning that in areas with higher crime people become more anti-immigrant, as is  
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26 to be expected. The share of working age people is significant as well – other things equal,  
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28 more working age people in a municipality are associated with more pro-immigration  
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30 attitudes.  
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36         In column [2] the municipality birth rate is added. Its coefficient is highly significant  
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38 (Wald test:  $\text{Chi}^2(1) = 11.15$ ,  $p = 0.000$ ) and negative suggesting that, other things being equal,  
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40 people living in areas with higher births are less pro-immigrant. In terms of marginal effects<sup>20</sup>  
41  
42 (table 2), a decrease in municipality birth rate by 1 birth per 1000 inhabitants is associated  
43  
44 with a lower likelihood of reporting “very negative” attitudes towards immigrants, and a  
45  
46 higher likelihood of reporting “rather negative”, “rather positive” and “very positive” attitudes  
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48 towards immigrants. Importantly, the inclusion of the local birth rate variable leaves the  
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50 coefficients of other regressors practically unchanged.  
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57         Next, the sample is split into two age groups: younger (18-44 years old) and older (45-  
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59 74) respondents. The hypothesis is that the link between immigration preferences and the  
60  
municipality birth rate is stronger for older individuals. The results support this conjecture

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3 (columns [3] and [4] of table 1 and marginal effects in table 2): the absolute values of the  
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5 coefficient and the marginal effects of the municipality birth rate variable are higher for the  
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7 older respondents, and lower for younger respondents.  
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12 In order to see whether the immigration preferences of women are more sensitive to  
13  
14 the local birth rates variation than the immigration preferences of men, the model is estimated  
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16 for the women and men subsamples. In both cases a negative coefficient of the municipality  
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18 birth rate is obtained (columns [5] and [6]). However, its absolute value and the level of  
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20 significance are higher for women (statistically significant at 1%) than for men (insignificant).  
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22 This suggests that, other things being equal, women are more pro-immigrant than men in  
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24 lower birth areas. The marginal effects (table 2) confirm this result.  
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32 Finally, given that the marginal effects in non-linear regressions depend on the level of  
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34 the explanatory variable, the predicted probabilities of having “very negative”, “rather  
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36 negative”, “rather positive” and “very positive” attitudes towards immigrants are obtained.  
37  
38 Figure 3 plots them against the municipality birth rate for the whole sample, respondents of  
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40 different age, and women and men. It confirms that the link between the municipality birth  
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42 rates and immigration attitudes is more pronounced for the elderly (as compared to younger  
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44 respondents) and females (as compared to males).  
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50 [Insert table 1 here]

51 [Insert table 2 here]

52 [Insert figure 3 here]

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Robustness checks

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6 The results of some robustness and sensitivity checks are presented in table 3. First, it  
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8 is important to verify whether the results are not driven by the largest municipality – capital  
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10 Riga where about one third (32%) of the respondents live. Omitting Riga, the marginal effects  
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12 of the municipality birth rate variable are highly significant and have similar values and the  
13  
14 same signs as in the first row of table 2. Second, the results remain substantively unchanged  
15  
16 when the local birth rates of year 2004 are substituted by the average births rate of years 2004  
17  
18 and 2005, i.e. after smoothing out the birth rate blips that might have occurred in certain  
19  
20 municipalities in 2004. Third, other things equal, the Russian speaking respondents are more  
21  
22 likely to be pro-immigration than their Latvian speaking majority counterparts (table 1). Is it  
23  
24 possible that these minority respondents – many of whom are former migrants or the  
25  
26 descendants of former migrants – are affecting the results? Excluding the Russian speakers, a  
27  
28 negative and highly significant coefficient of the municipality birth rate is obtained again.<sup>21</sup>  
29  
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33 Fourth, the results remain qualitatively unchanged if the metropolitan areas with their  
34  
35 suburbs,<sup>22</sup> where most of the internal migration is likely to happen, are excluded from the  
36  
37 sample. Fifth, using more aggregated district level (NUTS 4) birth rates (as well as other  
38  
39 regional controls) instead of municipality level (NUTS 5) birth rates,<sup>23</sup> it is found that people  
40  
41 with more pro-immigration attitudes are more likely to live in districts with a lower birth rate.  
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44  
45 Sixth, an alternative question “Should the government of Latvia restrict, keep the same or  
46  
47 facilitate the inflow of foreign workers into Latvia?” is used to capture respondents’  
48  
49 immigration preferences. The marginal effects, reported at the bottom row of table 3, suggest  
50  
51 that, other factors kept constant, a decrease in the local birth rates significantly reduces the  
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53 probability of supporting more restrictive immigration policy and increases the probabilities  
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55 of supporting the status quo and a more liberal immigration policy. As a final robustness  
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3 check, the models are estimated with OLS and ordered logit. Both OLS and ordered logit  
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5 results are consistent with ordered probit results and are available upon request.  
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10 [ Insert table 3 here]  
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## 14 15 Conclusion

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20 Following the major drop in birth rates in 1990s, most Central and Eastern European  
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22 countries are expected to lose significant proportions of their populations and grow older.  
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24 Immigration has often been suggested as one of the tools to counterbalance the population  
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26 decline and slow the ageing process. However, in a democratic society immigration would  
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28 only be possible if the majority of the people are in favour of it.  
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34 This paper considers demographic factors as potential determinants of individual  
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36 attitudes towards immigration. In particular, it examines whether people's immigration  
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38 preferences depend on the local birth rates. After discussing possible channels, through which  
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40 the local demographics might affect immigration preferences, empirical evidence is provided  
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42 suggesting that people in Latvia are more favourable to immigration if there are fewer  
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44 children born in the area they live.  
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51 The study contributes to the growing literature explaining what shapes individual  
52  
53 attitudes towards immigration, highlighting the role of local demographics. It focuses on  
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55 Latvia – a country in economic transition and demographic decline. Extending the analysis to  
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57 other countries, in particular Western welfare states and Central and Eastern Europe, is an  
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59 important direction for future research. Are people more pro-immigrant in countries with  
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3 lower birth rates? Does it matter how pensions in different countries are determined? How  
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5 important are demographic factors compared to other - economic and non-economic -  
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7 determinants of attitudes towards immigration?  
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For Peer Review Only

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## Appendix.

Table A1. Definitions and summary statistics of the respondents' socio-demographic characteristics and region-specific variables.

Variable	Definition	Mean	St.dev.	Min.	Max.
Individual-level variables					
Age	Years	43.699	16.705	15	74
Child	1 – has (at least) 1 child under 18, 0 – otherwise	0.414	0.493	0	1
Male	1 - if male, 0 – female	0.455	0.498	0	1
Married	1 – if married or lives with a partner, 0 – otherwise	0.562	0.496	0	1
Russian speaker	1 – if speaks Russian in the family, 0 – otherwise (Latvian)	0.621	0.485	0	1
Income	Monthly income per household member, in LVL	109.09	96.93	0	840
Unemployed	1 – if unemployed, 0 – otherwise	0.056	0.229	0	1
Primary education	1 – if primary education (8 or 9 years), 0 – otherwise	0.158	0.365	0	1
Secondary education	1 – if secondary education (including secondary vocational and higher non-completed), 0 – otherwise	0.626	0.484	0	1
Higher education	1 – if higher education, 0- otherwise	0.216	0.412	0	1
Municipality (NUTS-5) level variables					
Birth rate <sup>a</sup>	Number of births per 1000 inhabitants, in 2004	8.778	1.740	1.34	14.47
Unemployment rate <sup>b</sup>	Unemployment rate in %, in 2005	6.837	5.474	1.9	35.4
Share of people under working age <sup>c</sup>	The number of people under working age (0-14) divided by the total population in % , in 2005	14.432	1.889	9.06	20.19
Share of people of	The number of people of working age	64.124	2.124	57.88	67.3

working age <sup>c</sup>	(15-64) divided by the total population in % , in 2005				
The share of ethnic minorities <sup>c</sup>	Share of ethnic minorities in %, in 2005	40.176	21.058	3.90	82.69
The share of foreigners <sup>c</sup>	The share of non-citizens (see footnote 19) of Latvia in %, in 2005	20.270	12.413	1.58	34.06
The rate of emigration <sup>c</sup>	The number of individuals who “de-registered” from a particular municipality in 2005, in %	2.684	1.486	0.127	6.067
Ln (Density of population) <sup>a</sup>	Ln (inhabitants per km <sup>2</sup> ), in 2005	5.881	2.280	1.63	7.77
The share of individuals with higher education <sup>d</sup>	The share of individuals with higher education in 2000, in %	12.592	5.199	2.6	18.9
The crime rate <sup>a</sup>	Number of recorded crimes per 10000 inhabitants, at district (NUTS-4) level, (data not available at municipality level)	221	55.0	91	311
District (NUTS-4) birth rate <sup>a</sup>	Number of births per 1000 inhabitants, in 2004	8.808	0.744	7.2	10.9

<sup>a</sup> source: Central Statistical Bureau of Latvia, [www.csb.gov.lv](http://www.csb.gov.lv)

<sup>b</sup> source: State Regional Development Agency [www.rvaa.gov.lv](http://www.rvaa.gov.lv)

<sup>c</sup> source: Office of Citizenship and Migration Affairs of Latvia, [www.ocma.gov.lv](http://www.ocma.gov.lv)

<sup>d</sup> source: Population Census of Latvia 2000

Table A2. Correlation matrix of municipality level variables.

	Birth rate	Unemployment rate	Share of children	Share of working age	Share of ethnic minorities	Share of non-citizens	Ln(population density)	Emigration rate	Crime rate
Unemployment rate	-0.12	1							
Share of children	0.08	-0.14	1						
Share of working age	-0.02	-0.27*	-0.20	1					
Share of ethnic minorities	-0.06	0.39*	-0.27*	0.31*	1				
Share of non-citizens	0.02	-0.25*	-0.27*	0.41*	0.63*	1			
Ln(population density)	0.06	-0.22*	-0.32*	0.42*	0.37*	0.53*	1		
Emigration rate	-0.01	-0.20	-0.34*	0.42*	0.49*	0.72*	0.77*	1	
Crime rate	-0.00	-0.38*	-0.07	0.40*	-0.05	0.12	-0.03*	0.14	1
Share of people with higher education	0.12	-0.47*	-0.40*	0.47*	0.24*	0.56*	0.68*	0.71*	0.30*

Note: \* denotes a correlation significant at 10 %.

## NOTES

<sup>1</sup> The average annual birth rate was 15.5 births per 1000 inhabitants in 1985-1990; it fell to 11.4 in 1990-1995 and 8.0 in 1995-2000, slightly recovering to 8.7 in 2000-2005. Source: UN population database.

<sup>2</sup> The share of the foreign born in Latvia is 15.8%. Most immigrants were born in the Russian Federation (8.3% of the total population of Latvia), Belarus (2.8%), Ukraine (2.0%) and Lithuania (1.0%). Source: 2008 data from Eurostat.

<sup>3</sup> In recent years, official immigrant inflows to Latvia have been as follows: 1364 in 2003, 1665 in 2004, 1886 in 2005, 2801 in 2006, 3541 in 2007, 3465 in 2008, and 2688 in 2009. Immigrants were principally coming from the Russian Federation, Lithuania, Ukraine, Bulgaria, Germany and Poland (source: Eurostat data for 2007). Considerable increases of inflows in 2006 and 2007 correspond to high GDP growth rates (12% and 10%); the decrease in the immigrant inflow in 2008 and 2009 can be attributed to the financial and economic crisis which hit Latvia in the most severe way (GDP fell by 4% 2008 and by 18% in 2009). It is likely that the poor economic performance will decrease the demand for foreign labour in the nearest future. Note, however, that this paper is based on a survey conducted in December 2005 – in the middle of the economic boom in Latvia.

<sup>4</sup> For example, the birth rates of ethnic Russians, Byelorussians, Ukrainians and Poles living in Latvia (37,4% of the total Latvian population in 2005) were at least 20 % lower than the birth rate of ethnic Latvians in 2000-2005 (source: Central Statistical Bureau of Latvia).

<sup>5</sup> The correlation coefficient between the district (NUTS-4) birth rates and wage rates is 0.50, and the correlation coefficient between the district birth rates and unemployment rates is - 0.45. Data from the Central Statistical Bureau of Latvia for 2005.

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<sup>6</sup> DUSTMANN et al. (2008) show that immigrants considerably downgrade their skill level upon arrival, and immigration negatively affects the wages of the relatively low-skilled natives. BORJAS (2003) shows that immigration lowers the wage of competing workers.

<sup>7</sup> The correlation between the two variables at NUTS-4 level is equal to 0.04. Data for 2005 from the Central Statistical Bureau of Latvia.

<sup>8</sup> Depending on the structure of the pension system, immigration can either increase the pension level (defined contribution pension system) or reduce the workers' contribution rate (defined benefit pension system), see e.g. SCHOLTEN and THUM, 1996; HAUPT and PETERS, 1998; KRIEGER, 2003; KRIEGER, 2005; and LACOMBA and LAGOS, 2010.

Latvia adopted a three pillar model of pension financing in 2001. It is based on the compulsory first pillar pay-as-you-go notional defined contributions (which allow the pensions to be linked to individual earnings, also known as pay-as-you-go defined contributions, see WILLIAMSON and HOWLING, 2003); the compulsory for younger workers (born after 1971) second pillar contributions into privately managed funds; and voluntary contributions to third pillar private pension funds (KASEK et al., 2008; FOX and PALMER, 1999). Therefore, people, and especially retirement and pre-retirement generations, would welcome immigrants as it increases the number of the first pillar contributors and, through redistribution, the pensions. The younger generation would arguably attach more importance to the funded parts of the pension.

<sup>9</sup> Note that children of immigrants born in Latvia do not have an automatic right to Latvian citizenship; the dual citizenship is also not allowed (HANSON, 2009). Arguably, these factors would encourage rather than discourage the return (or transit) of former migrants and their descendants.

<sup>10</sup> Here I assume that both men and women calculate the present value of their future (pension) income stream. Relaxing this assumption (e.g. because of life-time uncertainty and

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4 a strong preference for present consumption) would equalise the effect of immigration on  
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6 pensions of males and females.

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9 <sup>11</sup> This hypothesis does not exclude that women *on average* can be as pro- or anti-  
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11 immigration as men.

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13 <sup>12</sup> See SKDS (2005) for the survey report and  
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15 <http://www.skds.lv/index.php?lng=lEng&c=3#lomn> for survey design.

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18 <sup>13</sup> Administratively Latvia consists of 524 NUTS-5 municipalities (*pagasti*), which are  
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20 aggregated into 33 NUTS-4 districts (*rajoni*) (26 districts and 7 republican cities), which in  
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22 turn can be aggregated into 6 provinces (*novadi*).  
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26 <sup>14</sup> Among five income dummies, I include a category “non-reported income” (24.6% of all  
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28 respondents did not report their income).  
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31 <sup>15</sup> Table A2 suggests a relatively high correlation between some municipality level controls  
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33 (e.g. the share of ethnic minorities and the share of non-citizens; the emigration rate and the  
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35 share of people with higher education). However, in order to isolate the effect of the  
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37 municipality birth rate variable as completely as possible, all of them are included into  
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39 analysis (but because of potential collinearity, their coefficients have to be interpreted with  
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41 caution). Note that the municipality birth rate – the variable of primary interest for this study  
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43 - is not significantly correlated with any of the municipality level controls.  
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47 <sup>16</sup> The unemployment rate may be an unreliable measure of economic opportunities since fast  
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49 growing areas may attract newcomers at a faster pace than they can be absorbed into jobs,  
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51 while in very depressed areas those who want to work but cannot find a job may have all left.  
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53 However, I include the unemployment rate as it is the only variable which can be used as a  
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55 proxy for economic development *and* for which data are available at municipality level.  
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59 <sup>17</sup> The *non-citizen of Latvia* is a special status for people who arrived in Latvia during the  
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Soviet rule (1945-1991) from the other parts of the Soviet Union, and their descendants born

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5 in Latvia until 1991. The share of non-citizens in Latvian population decreased from 25% in  
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7 1994 (when the status was introduced) to 17% in 2007.

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9 <sup>18</sup> Note that the municipalities in Latvia are relatively small and similar in size (figure 2), and  
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11 can be either rural or urban. This makes the population density a good proxy for the degree of  
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13 urbanisation of the area. The results remain qualitatively unchanged if urban/rural dummies  
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15 are used instead of the population density variable.

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18 <sup>19</sup> Excluding individuals who did not report their immigration preferences could result in  
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20 selection bias and inconsistent estimates. The Heckman selection procedure is applied to  
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22 check whether the problem is present. Using information on whether or not a respondent  
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24 answered a question on attitudes towards emigration as identification variable, no evidence of  
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26 selection bias is found.

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30 <sup>20</sup> The marginal effects are calculated for the “average” respondent, i.e. by keeping all  
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32 individual and municipality-level variables at their mean values. In particular, the “average”  
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34 respondent lives in a municipality with 8.7 births per 1000 inhabitants.

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36  
37 <sup>21</sup> The results also remain unchanged if only the non-citizens of Latvia are excluded.

38  
39  
40 <sup>22</sup> Excluding Riga, Riga agglomeration (Pieriga), cities with population over 50 000  
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42 (Daugavpils, Liepaja, Jelgava) and the corresponding NUTS-4 districts. The results also are  
43  
44 robust to the exclusion of only Riga and Riga agglomeration, as well as to the exclusion of all  
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46 urban areas.

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49 <sup>23</sup> Importantly, in this specification, besides controlling for the broad age structure (under the  
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51 working age/ working age/ over the working age) of the district residents, it is also possible to  
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53 control for their average age (such data are not available at the municipality level).

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Table 1. Determinants of attitudes towards immigration: ordered probit coefficients.

Dependent variable → Specification → Explanatory variable ↓	Attitudes towards the inflow of foreign workers (1 – very negative, .... 4 – very positive)					
	[1]	[2]	[3]	[4]	[5]	[6]
	Whole sample	Whole sample	Age 18-44	Age 44-74	Women	Men
Municipality birth rate	-	-0.086***	-0.058*	-0.122***	-0.109***	-0.057
<u>Individual controls</u>						
Age 18-24	0.237*	0.222	0.203	-	0.235	0.291
Age 25-34	0.339***	0.332**	0.318**	-	0.400**	0.188
Age 45-54	-0.004	-0.028	-	0.096	0.068	-0.091
Age 55-64	-0.066	-0.072	-	0.145	-0.036	-0.018
Age 65-74	-0.176	-0.202	-	Ref.	-0.096	-0.294
Male	0.065	0.068	0.074	0.016	-	-
Married	-0.007	-0.020	-0.093	0.051	0.062	-0.073
Child	0.008	0.011	-0.068	0.138	-0.038	0.123
Unemployed	-0.172	-0.122	0.148	-1.046**	0.003	-0.371
Minority (Russian) language speaker	0.624***	0.645***	0.675***	0.684***	0.615***	0.762***
Income <50 LVL	0.258**	0.211*	0.134	0.497*	0.254	0.134
Income 100-149 LVL	-0.015	0.014	-0.123	0.090	0.314**	-0.617***
Income >149 LVL	0.332**	0.364**	0.447**	0.137	0.329*	0.377*
Income missing	0.138	0.128	0.044	0.178	0.101	0.054
Primary education	-0.168	-0.161	-0.004	-0.279*	-0.347*	0.005
Higher education	0.042	0.043	0.162	-0.092	-0.044	0.131
<u>Municipality level controls</u>						
Share of people of the working age	0.070**	0.068**	0.093***	0.054	0.076	0.054
Share of children (0-14 years old)	-0.085	-0.053	-0.092	-0.018	0.003	-0.116*
Unemployment rate	-0.012	-0.005	-0.023	0.009	-0.009	0.004
Share of ethnic minorities	0.005	0.008	0.019	-0.010	-0.006	0.025
Share of ethn. minorities <sup>2</sup> /100	-0.009	-0.000	-0.021	-0.010	-0.000	-0.000**
Share of foreigners	-0.014	-0.025	-0.060	0.036	-0.071	0.037
Share of foreigners <sup>2</sup> /100	0.022	0.001	0.129	-0.024	0.002	-0.001
Rate of emigration	0.048	-0.005	-0.011	0.033	0.092	-0.100
Higher education (share)	0.006	0.020	0.040	-0.005	0.019	-0.018
Crime rate	-0.005***	-0.005***	-0.008***	-0.002	-0.007***	-0.001
Ln (population density)	-0.077	-0.062	-0.086	-0.058	-0.059	-0.042
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	874	874	435	439	480	394
Pseudo R <sup>2</sup>	0.0675	0.0730	0.0878	0.0874	0.0859	0.1034
Wald chi <sup>2</sup>	472.0	386.9	413.0	534.4	2076.6	328.2
Prob>chi <sup>2</sup>	0.000	0.000	0.000	0.000	0.000	0.000

Notes: 1) \*- coefficient significant at 10%, \*\* - at 5%, \*\*\* - at 1%.

2) Standard errors clustered at municipality level.

3) Age 35- 44 is a reference category for age, Income 50-99 LVL - for income, secondary education – for education.

4) See table A1 of the appendix for definitions and summary statistics of the variables.

Table 2. Marginal effects: the change in probability (in percentage points) of having “very negative”, “rather negative”, “rather positive” and “very positive” attitudes towards immigration if the municipality birth rates decreases by 1 birth per 1000 inhabitants.

	Very negative	Rather negative	Rather positive	Very positive
Whole sample	-3.41*** (3.34)	1.44*** (3.12)	1.62*** (3.31)	0.36*** (2.99)
Age 18-44	-2.27* (1.85)	0.69* (1.76)	1.31* (1.86)	0.26* (1.70)
Age 45-74	-4.86*** (3.77)	2.76*** (3.51)	1.71*** (3.51)	0.38*** (2.64)
Women	-4.34*** (2.94)	1.93*** (2.75)	2.06*** (2.80)	0.34** (2.28)
Men	-2.23 (1.57)	0.95 (1.53)	1.04 (1.55)	0.23 (1.54)

Note: 1) \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , absolute value of z-statistic in parenthesis.  
2) The marginal effects calculated keeping all control variables at their mean values.

Table 3. Robustness and sensitivity checks: municipality birth rate marginal effects, in percentage points.

	Marginal effects (change in attitudes towards immigration if the municipality birth rate decreases by 1 birth per 1000 inhabitants)				Number of observations
	Attitudes towards immigration				
	Very negative	Rather negative	Rather positive	Very positive	
Without Riga	-3.53*** (3.35)	1.58*** (2.97)	1.65*** (3.26)	0.30*** (2.60)	581
Average 2004/ 2005 birth rate	-4.24*** (2.99)	1.78*** (2.84)	2.01*** (2.97)	0.45*** (2.72)	874
Excluding Russian speakers	-4.43*** (3.63)	2.72*** (3.43)	1.59*** (3.63)	0.12** (1.96)	539
Excluding big cities (>50 000) and their NUTS-4 districts	-3.52*** (2.58)	1.95*** (2.45)	1.37*** (2.55)	0.20* (1.87)	323
NUTS-4 district level birth rate	-13.36*** (2.45)	5.58** (2.36)	6.36*** (2.43)	1.42** (2.39)	874
	Government's action vis-a-vis immigration policy				
	Should restrict	Should do nothing	Should liberalise		
Whole sample	-1.61** (2.21)	1.06** (2.19)	0.55** (2.16)		810

Notes: 1) \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , absolute value of z-statistic in parenthesis.  
 2) The regressions on which the marginal effects are based include the same control variables as in table 1. The coefficients and the marginal effects of these controls are not reported for space saving reasons and are available upon request.  
 3) The marginal effects are calculated keeping all control variables at their mean values.

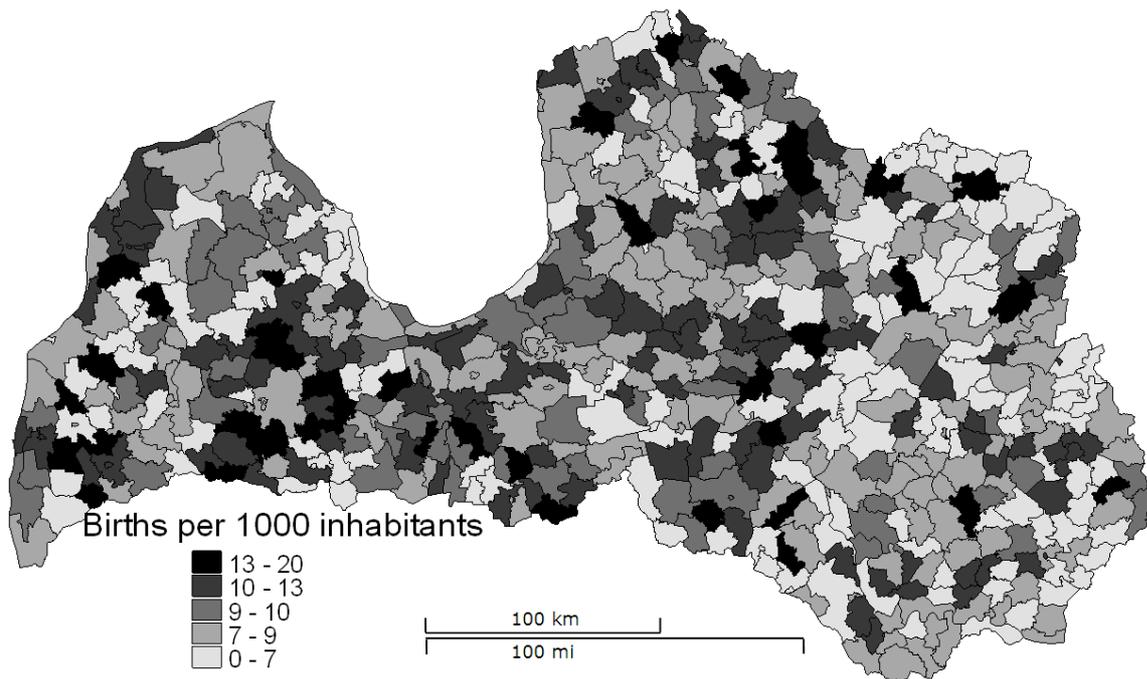
Figure 1. Latvia: key information



Total population (2008): 2.3 m  
 GNI per capita, PPP (2008):  
     16,740 USD; 57% of EU-27 average  
 Labour force with tertiary education (2007):  
     23.6%  
 Life expectancy at birth (2007): 71 years  
 Rural population (2008): 31.8%  
 Ethnic composition (2009):  
     Latvians 59.3%  
     Russians 27.8%  
     Belarusians 3.6%  
     Ukrainians 2.5%  
     Poles 2.4%  
     Lithuanians 1.3%  
     Others: 3.1%

Source: World Development Indicator, Eurostat, Central Statistical Bureau of Latvia, map from [www.worldatlas.com](http://www.worldatlas.com)

Figure 2. Municipality (NUTS 5) birth rates in Latvia, 2004.



Source: Author's presentation based on data from Central Statistical Bureau of Latvia.

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Figure 3. Probabilities of having “very negative”, “rather negative”, “rather positive” and “very positive” attitudes towards immigrants, by age and gender.

