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The Impact of Migration Policy on Migrants' Education Structure

Evidence from two Austrian policy experiments

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Abstract

We ask how two reforms of migration law (EEA-accession in 1994 and the integration agreement regulation in 2003) impacted on the education structure of migrants to Austria. To identify the effects of these reforms, we use the fact that EEA-accession affected only migrants from EEA member states, while third country citizens were unaffected and that the opposite is the case for the integration agreement regulation. We find robust evidence that the share of low educated permanent migrants from the EEA to Austria reduced relative to the share of low educated permanent migrants from other countries due to Austria's EEA-accession. With respect to the reform of residence law in 2003 our results are less robust. Most of them, however, point to an increased share of low skilled permanent migrants.

Keywords: Migration Policy, Self-Selection, European Economic Area

JEL-Codes: F22, J61, I20, O15

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1. Introduction

In the last two decades the share of foreign born residing in Austria more than tripled. In 1990 a mere 5% of the total resident population in Austria was born outside the country. In 2008 this applied to over 16%.[2] One of the consequences of this increase was an intensive public debate on appropriate migration and integration policies, which resulted in repeated and intensive policy changes. In particular three reforms mark the history of migration policy in Austria in this time period. These were the introduction of a foreigner and a residence law in 1993 ("Fremdengesetz", "Aufenthaltsgesetz") regulating entry, stay and residence of foreigners in Austria (see Biffl, 2007), the accession to the European Economic Area (EEA) in 1994, which liberalized immigration and labor market access from all member states of the EEA, and the so called integration agreement regulation ("Fremdengesetznovelle 2002"), which entered into force on 1st of January 2003 and aimed at increasing the share of highly educated foreign workers from third countries to Austria.

Of these reforms the experience of EEA-accession and the integration agreement regulation in 2003 may be of a wider policy interest in the light of future challenges to the Austrian migration regime and recent trends in international migration policy. On May 1st 2011 Austria liberalized labor market access to citizen of the new member states joining the European Union (EU) in 2004 and on January 1st 2014 at the latest also labor migration from Romania and Bulgaria will be liberalized. EEA-accession – although it concerned a set of countries that differ from the new member states in terms of economic structure and wealth – thus represents a historical example against which the effects of liberalization of labor market access can be assessed. The Austrian experience with EEA may be of particular relevance in this respect because it was a policy change not driven by migration issues.

Furthermore, a number of EU countries have recently put in place policies that are intended to increase the share of highly educated migrants (see OECD, 2008 for an overview) and migration experts (e.g. Chiswick, 2005) have long argued that developed countries should aim to attract more highly educated

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[2]Austria is, however, by no means the only EU country where the share of foreign born increased substantially in the last decades, other cases include Ireland (see Barrett 2009) and Spain (see: Bentolila et al. (2008)).

migrants. Therefore the so called integration agreement regulation, which aimed at attracting more highly skilled migrants, while at the same time making immigration law in general more restrictive, may be an interesting case study to analyze the impact of migration policy on the skill structure of migrants.

This may be even more so given that evidence on the effects of migration policy on the skill-structure of migrants is rather rare. Most of the recent literature (e.g. Mayda 2009 and Clark, Hatton and Williamson 2007) focuses on the impact of migration policy on overall migration. The few contributions considering the skill structure of migrants often come to contradictory conclusions. Among the theoretical papers Chiswick (2000) argues that if migrants are favorably self-selected increasing migration costs improves the skill structure of migrants, while Djajic (1989) and Bianchi (2006) argue that liberalization may also lead to the opposite effect. Empirically, Egger and Radulescu (2009) find that high personal income tax rates have a negative impact on the immigration of highly skilled and Chen (2005) finds evidence that masters degree students interested in migrating to the US were negatively selected in a less restrictive migration regime and positively in a more restrictive one. By contrast in a recent quantitative case study methodologically close to ours Kato and Sparber (2010) analyze the tightening of H-1b (student visas) in the US in October 2003. They find that this disproportionately discouraged high-ability international students from attending US schools.[3]

This paper augments this evidence by presenting an assessment of the effects of two policy changes which may have had very different impacts on the skill structure of migrants: a full liberalization of migration and a case of selective migration policy. In line with Bianchi (2006) and Djajic (1989) we show that from a theoretical perspective liberalizing migration may improve the skill structure of migrants in countries where negative self-selection prevails, and that selective migration policies may lead to ambiguous results.

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[3] In addition Greenwood and McDowell (2011) find that social programs in sending countries have a significant impact on the skill structure of migrants to the US.

To empirically test the impact of these two policy changes we use the fact that the full liberalization of migration resulting from EEA-accession applied only to migrants from EEA-countries and the integration agreement regulation only applied to third country migrants. Thus only migrants from EEA member states were affected by Austria's EEA-accession, while third country citizens were not, and the opposite is the case for the integration agreement regulation. This allows us to use difference-in-difference estimation (see: Angrist and Pischke 2008 for an overview and Card 1990 and DeSilva et al. 2010 for applications in the migration literature) to evaluate the impact of migration policy changes on the education structure of migration.

The remainder of this paper is organized as follows: The next section provides some institutional background on the development of migration policy in Austria since the early 1990's, while section 3 discusses the theoretical background. Section 4 then describes the data used and section 5 the method. Section 6 presents results and section 7 discusses robustness issues. Section 8, finally, summarizes our findings and discusses their relevance for migration policy.

2. Institutional Background: Migration law in Austria

When the Iron Curtain came down in 1989, this marked the end of the traditional Austrian migration policy, which was based on a temporary foreign guest worker model. New groups of migrant workers came to Austria - from Central and Eastern Europe and from other parts of the world. Additionally, as a result of the civil war in former Yugoslavia, a large number of refugees moved to Austria. The inflow of foreigners to Austria increased notably. In only a few years the share of the foreign population in Austria grew from 4.5% (1989) to 7% (1992). In consequence, migration rules were tightened in the early 1990s - beginning with an amended Foreign Worker Law in 1990. According to this amendment, the share of foreign labor force in the Austrian labor market was limited to 10% and reduced twice in 1993, first to 9% and later to 8%. Additionally, the number of foreign workers in agriculture and tourisms was limited by quota in 1994.

Figure 1: Migration in Austria (1981-2008)
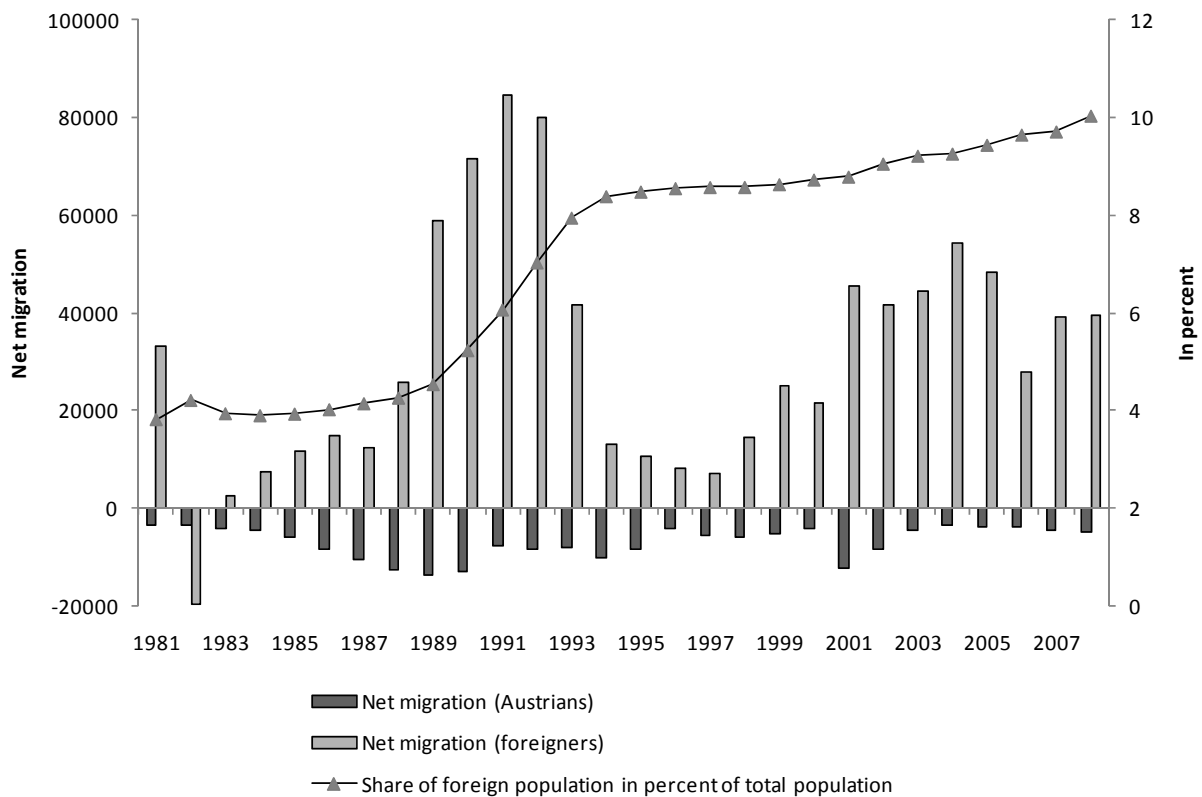
Source: Statistics Austria, own calculations. Right axis: share of foreign population in percent of total population, left axis: net migration per year.

In addition to the amendment to Foreign Worker Law in 1993 also the Alien Law ("Fremdengesetz") and Residence Law ("Aufenthaltsgesetz") came into force. The latter regulated the first entry, stay and residence of foreigners and restricted the number of people to settle in Austria through quota. According to these laws from 1993 onwards governors of the federal states together with the ministries of the interior and labor fixed the number of region specific residence quota (which henceforth coexisted with labor market access quota) on an annual basis. Differences by residence status in each region came into force in 1996 with quota differentiated by family reunion, employment and private persons. Also special rules excluded some migrant groups (such as some family members or some groups of migrant workers)[4] or asylum seekers from quota regulation.

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[4]The composition of migrants without quota regulation changed in 1997, when in addition special rules for instance for commuters, students, artists, intercompany transferees and persons working for foreign media were introduced.

Table 1: Annual quota by residence status and number of first settlement permits by quota type

	1998	1999	2000	2001	2002	2003	2004	2005
					Quota			
Total	8,540	9,565	7,860	8,338	8,280	8,070	8,050	7,500
Of which:								
Family reunion	4,550	5,210	5,000	5,490	5,490	5,490	5,490	5,460
Employment	950	1,120	1,000	815	495			
Key employment	1,860	1,130	1,010	1,613	1,905	2,405	2,200	1600
Private persons	630	660	490	420	390	175	360	440
					Permits granted			
First settlement permits by quota						8,027	5,138	6,258
First settlement permits outside quota						26,537	26,697	25,908

Source: Federal Ministry of the Interior ("Niederlassungsverordnung").

Table 2: Chronology of migration law in Austria

Year	Law
1975	Foreign Worker Law („Ausländerbeschäftigungsgesetz 1975")
1988	Amendment of Foreign Worker Law
1990	Alien Police Law (Fremdenpolizeigesetz)
	Amendment of Foreign Worker Law
1993	Alien Law („Fremdengesetz")
	Residence Law („Aufenthaltsgesetz")
	Amendment of Foreign Worker Law
1994	EEA-accession
1995	Amendment of Residence Law
1998	Alien Law 1997 („Fremdengesetz 1997")
2003	Alien Law 2002 (Amendment of Alien Law 1997)
2006	Alien Police Law („Fremdenpolizeigesetz 2005")
	Residence and Settlement Law („Niederlassungs- und Aufenthaltsgesetz 2005")

Source: Currle (2004), own research.

In 1994, Austria joined the EEA. Since that time only non-EEA-citizens are restricted by residence quota when coming to Austria and need work permits for labor market access – with continuing exceptions for some groups of foreigners and foreign workers from non EEA-countries. Total foreign population amounted to 669,453 in 1994 and total foreign employment comprised 291,018. The number of work permits, including amongst others temporary work permits, work entitlements, permanent licenses and settlement certificates amounted to 268,843.

In August 1997 a new legislation regulating residence and settlement of persons of third country origin was passed and came into effect in 1998. The new legislation - Alien Law ("Fremdengesetz 1997") - regulated short stays and long-term residence of persons from third countries. It was intended to facilitate integration of family members, who had arrived before 1992, into the labor market, with quota remaining largely unaffected.

A further comprehensive revision of Alien and Residence Law (the so-called integration agreement regulation) entered into force on January 1, 2003. According to this amendment the settlement of new low skilled workers of third country origin without family members in Austria was no longer possible. Permanent labor migration quota were restricted to highly educated employed, self-e,ployed, family reunion and for private persons without labor market access. Thus in effect this regulation made immigration to Austria more difficult, while at the same time easing conditions for the highly skilled. However, as before, a number of persons of third country origin could still settle in Austria outside the quota system. These were in particular partners and family members of Austrians and EEA-citizens, who were third country citizens, persons working for foreign media, artists and settlers on humanitarian grounds[5]. The total quota amounted to 8,070 persons in 2003 of which 8,027 were actually used. Of these 934 were taken by high skilled employed and 6,517 by family reunion. By contrast the total number of first settlement permits for foreigners of third country origin outside the quota system amounted to 26,537.

Table 3: Annual quota for contingent work permits and agricultural worker permits

	Contingent work permits	„Erntehelfer"-permits
2003	8,000	7,000
2004	8,000	7,000
2005	8,000	7,000
2006	7,500	7,000
2007	7,500	7,000
2008	7,500	7,000
2009	8,000	7,500
2010	7,500	7,500
2011	7,500	7,500

Source: „Niederlassungsverordnung".

At the same time short-time, contingent work of foreign workers was restricted by a maximum number of initial work permits. Contingent work permits are valid for six months and can be extended for another six months at most. After one year of employment contingent foreign workers have to leave Austria for two months. The number of initial work permits for contingent foreign workers of third country origin amounted to 8,000 in 2003. This temporary residence status does not allow permanent

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[5]In addition the amended Foreign Worker Law ("Ausländerbeschäftigungsgesetz") granted executives, researchers, scientists of third country origin as well as certain groups of private persons without labor market access, quota free residence permitts.

residence and family reunion. In addition the number of initial work permits for agricultural workers, who were allowed to work in the agricultural sector for a maximum of 6 weeks, amounted to 7,000.

Finally, in 2005, the legislation regarding foreigners was once more fundamentally revised, affecting the regulation of residence and settlement ("Niederlassungs- und Aufenthaltsgesetz"), Alien Police Law ("Fremdenpolizeigesetz") und asylum seekers ("Asylgesetz") and came into force on January 1, 2006. The legislation was aligned with existing EU guidelines (Biffl 2007). Hence, the annual quota for long-term immigration, which contained quota for family reunion, highly skilled employed, highly skilled self-employed and private persons, were augmented by quota for permanent residents of third country origin in another EU-country (employed, self-employed, private persons) and for transferred permits ("Zweckänderungen"). Highly skilled migrants were still committed to fulfill the various requirements. Additionally, family reunion was hampered by income requirements. New residence permits outside the quota system were restricted to family members and new settlers of third country origin with no or limited labor market access.

3.   Theoretical Considerations

In sum in the time period from the early 1990's to the mid 2000's Austrian migration policy was marked by three developments. First, migration law, which had been based on the presumption of (temporary) guest worker migration until the late 1980's increasingly moved in the direction of a more settlement based model of regulation. Second, changes in migration law also reflected attempts to reduce inflows of migrants by making the migration regime more restrictive. Finally, increasing the skill content of migration by making migration law increasingly skill-selective was a third recurrent theme of migration law reforms. Our interest in this paper is with the last of these objectives.

To analyze this we start from the standard model of migrant selectivity developed for instance in Borjas (1987, 1999), as well as Chiswick (1999) and consider two countries (indexed by $j \in \{f, h\}$, with h denoting the sending and f the receiving country). We assume that individuals (indexed by i)

differ with respect to education (s^i) and derive utility from (expected lifetime) income (w_j^i) which depends on education according to the function:

$$\ln (w_j^i) = \omega_j + \theta_j \ln (s^i) \tag{1}$$

where that $\ln (s^i)$ is normally distributed with mean μ_s and standard deviation σ_S and θ_j measures country specific returns to migration. Furthermore, we assume that the (financial, administrative and psychological) costs of migration (K) are given by fixed financial and administrative costs of migration (k_0) that have to be paid by everyone, a skill dependent cost component (k_1) and a normally distributed stochastic cost term ε_m^i (with mean 0 and standard deviation σ_m) reflecting individual specific preferences for mobility and/or home country specific amenities, so that costs of migration are given as:

$$K = k_0 - k_1 \ln (s^i) + \varepsilon_m^i \tag{2}$$

where in accordance with empirical results by Hunt (2004), who finds that highly skilled often have access to low-cost migration channels for example as posted workers, we assume that the highly skilled face ceteris paribus lower costs of migration.

Given these assumptions individuals with $(\theta_f - \theta_h + k_1)\varepsilon_s^i - \varepsilon_m^i > \omega_h - \omega_f - (\theta_f - \theta_h + k_1)\mu_s + k_0$ (where ε_s^i is the stochastic component of s^i which for simplicity we assume to be uncorrelated with ε_m^i)[6] will migrate and the expected education level of migrants is given by:

$$E\left(\ln (s^i)\middle|M\right) = E\left(\ln (s^i)\middle|\frac{\zeta}{\sigma_\zeta} > z\right) = \mu_s + \frac{(\theta_f - \theta_h + k_1)\sigma_s^2}{\sigma_\zeta}\lambda(z) \tag{3}$$

with $z = \frac{\omega_h - \omega_f - (\theta_f - \theta_h + k_1)\mu_s + k_0}{\sigma_\zeta}$, $\zeta = (\theta_f - \theta_h + k_1)\varepsilon_s^i - \varepsilon_m^i$, $\sigma_\zeta = \sqrt{(\theta_f - \theta_h + k_1)^2\sigma_s^2 + \sigma_m^2}$ the standard deviation of ζ, $\lambda(z) = \frac{\phi(z)}{1 - \Phi(z)}$, the inverse mills ratio and $(\theta_f - \theta_h + k_1)\sigma_s^2$ the covariance of ε_s^i and ζ.

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[6] Note that an extension to the case where ε_s^i and ε_m^i are correlated is straight forward but – aside from adding notation and giving rise to further ambiguities – provides no additional insights to our analysis. We therefore make this assumption only for reasons of expositional ease (see Brücker and Defoort 2009 for such extensions)

As amply demonstrated in the literature on migrant selectivity (e.g. Borjas 1999 and Chiswick 2000), migrants will be more highly educated than stayers (positively self-selected) if returns to education (net of skill dependent migration costs) in the receiving country are higher than in the sending country (i.e. $\theta_f + k_1 > \theta_h$) and negatively self-selected if the opposite applies (i.e. $\theta_f + k_1 < \theta_h$). In addition assuming that policy can influence both the fixed costs (k_0) as well as the skill dependent cost (k_1) of migration and noting that $\frac{\partial E(\ln (s^i)|M)}{\partial k_0} = (\theta_f - \theta_h + k_1)\frac{\sigma_s^2}{\sigma_\zeta}\frac{d\lambda(z)}{dz}$, [7] we see that if migrants are positively self-selected an increase in migration costs will increase the expected education levels of migrants, while in case of negative self-selection of migrants an increase in migration costs will reduce the expected education level of migrants to a country.

Policy reforms changing the administrative costs of migration (captured by the parameter k_0 in our model) therefore have a different impact on the education structure of migrants depending on whether they are positively or negatively self-selected. In this respect previous research (Belot and Hatton, 2008, and Huber et al 2010) suggests that migrants in Austria are negatively self-selected. In particular Belot and Hatton (2008) show that the share of high educated migrants is 0.3 percentage points lower than could be predicted from the education structure of the sending countries alone. This suggests that liberalization of migration due to EEA-accession should have improved the education structure of migrants to Austria.

The situation is somewhat more complicated with respect the integration agreement reform since in this case both the fixed (k_0) and skill dependent (k_1) costs of migration were affected by policy changes. Taking the derivative of $E(\ln (s^i)|M)$ with respect to k_1 gives:

$$\frac{E(s^i|M)}{dk_1} = \frac{\sigma_s^2}{\sigma_\zeta^2}\left[\lambda(z)\left\{\frac{\sigma_\zeta^2 - \sigma_s^2(\theta_f - \theta_h + k_1)}{\sigma_\zeta}\right\} - (\theta_f - \theta_h + k_1)\sigma_\zeta\{\mu_s - z(\theta_f - \theta_h + k_1)\sigma_s^2\}\frac{d\lambda(z)}{dz}\right] (4)$$

which is ambiguously signed both in the case of negative and in the case of positive self-selection.

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[7] Note that $\frac{d\lambda(z)}{dz} > 0$ and $\frac{dz}{dk_0} = \frac{1}{\sigma_\zeta}$.

Thus in the case of both positive and negative self-selection a simultaneous change in fixed and skill dependent migration costs as in the integration agreement regulation has an ambiguous effect on the average skill level of migrants. Therefore, the impact of the integration agreement regulation on the average education level of migrants cannot be unambiguously signed.

4 Data and stylized facts

4.1 Data Construction and Sample

To empirically analyze the impact of the two policy reforms on the skill structure of migrants, we therefore use data from a pooled sample of the Austrian Labor Force Survey (ALFS) of the years 2004 to 2007. In this representative quarterly survey of around 40,000 Austrian residents are asked on a number of personal characteristics (such as age, gender, educational attainment level and employment status) as well as on their country of birth and their year of immigration to Austria. Thus from this data it is possible to calculate the number of persons that migrated to (and still reside in) Austria from a particular country in a particular year. In addition the data also provide ample information on personal characteristics for this group. One limitation, however, is that we can only focus on migrants that were still residing in Austria in the time period from 2004 to 2007 and thus on permanent (or at least long term) migration. This, however, arguably is also the group most relevant, since at least policy changes in 2003 were explicitly directed at persons with permanent settlement intentions and because among all migrant groups permanent migrants are most likely to have a lasting impact on the human capital endowment of their host country.

A second limitation stems from the fact that the 1990s aside from being a period of substantial institutional change in migration policy were also particularly turbulent in terms of migration to Austria. In these years the civil war in former Yugoslavia led to a massive increase in the number of Yugoslav refugees to Austria (see Figure 2). This leads us to exclude all migrants born in former

Yugoslav Republics from our data out of a concern that this influx of refugees may have differed

substantially from other migration flows in terms of education structure.[8]

Figure 2: Foreign born residents in Austria by year of migration and region of birth
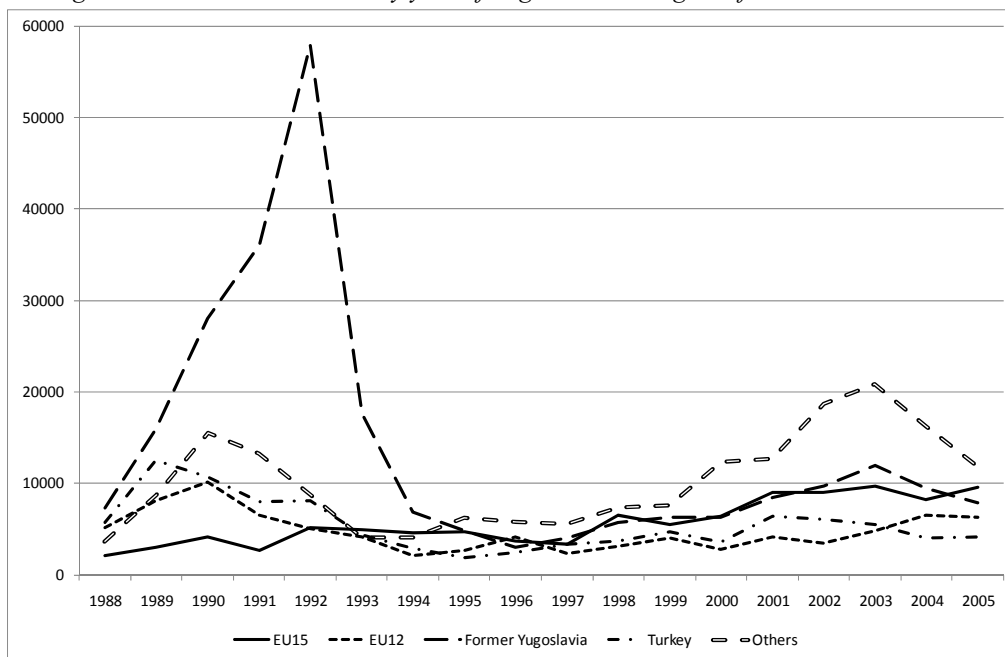
Source: Austrian Labor Force Survey (pooled values 2004-2007). Note: Figure displays the average annual number of foreigners residing in Austria in the period 2004 to 2007 by year of migration to Austria, horizontal axis = year of migration to Austria.

In addition political developments in the home country may lead to distortions with respect to the

education structure of migrants from developing and less developed countries. Thus for our

benchmark results we focus on migrants that settled in Austria in the years between 1988 and 2005

and compare migration to Austria from the EEA and other developed countries (excluding former

Yugoslavia), which we define as the countries with an average human development index exceeding

0.8 in the years 1995 to 2005 (see appendix 1). To check for the robustness of our results we, however,

also perform a parallel analysis in which we compare EEA migrants to migrants from all other

countries (including less developed countries but excluding Yugoslavia). In addition in our robustness

section we restrict our sample to migrants that settled in Austria in the period 1991 to 2005.

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[8] Results of a robustness test including former Yugoslav Republics (see Appendix 2), however, suggest that this concern is unwarranted.

Figure 3: Foreign born residents in Austria (excluding former Yugoslavia) by year of settlement and country of birth (years of immigration 1988-2005)
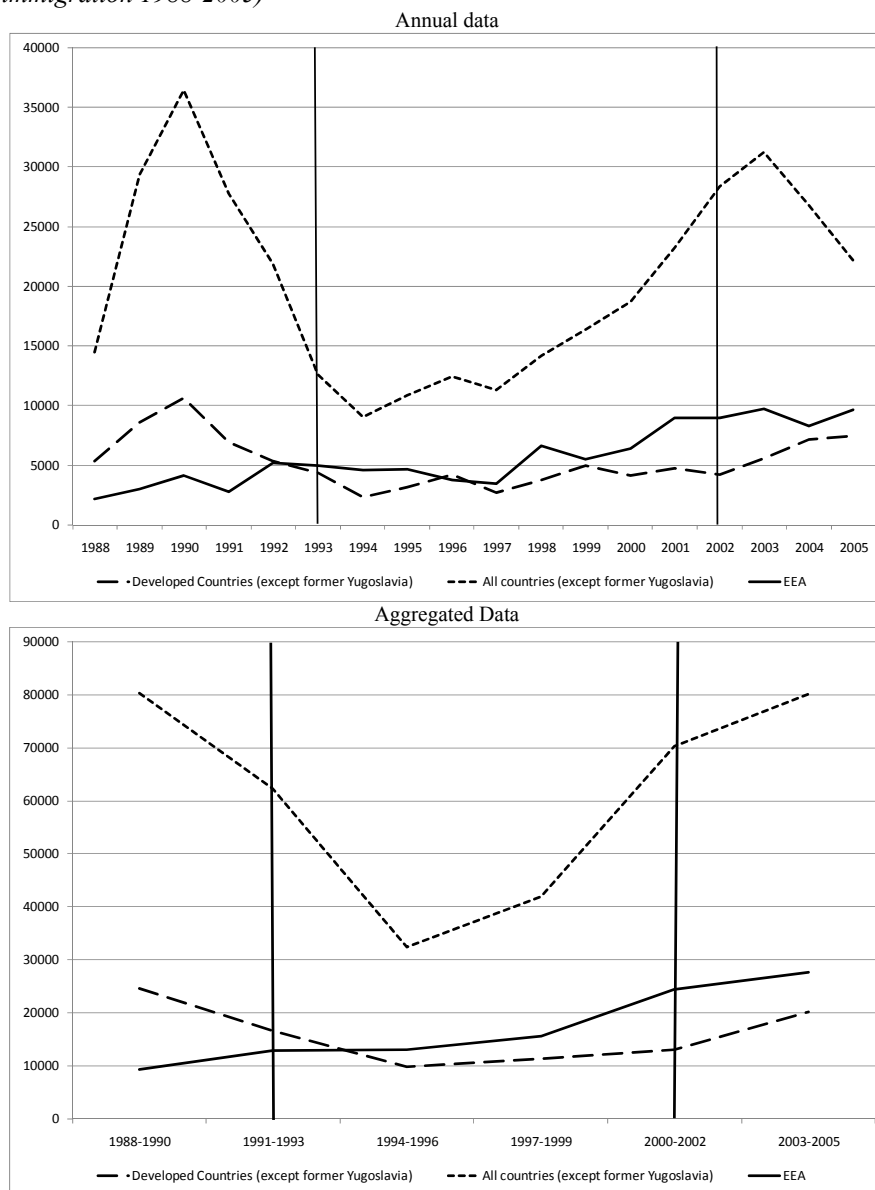

Source: Austrian Labor Force Survey (pooled values 2004-2007). Note: Figure displays the average annual number of foreigners residing in Austria in the period 2004 to 2007 by year of migration to Austria, horizontal axis= year of migration to Austria. Vertical lines indicate the last period before reforms

Finally, the data are also subject to sampling error. This is important in our context, since the number of migrants from some countries is too small to allow for reliable estimates of the structure of migration. To minimize this problem, aside from focusing on pooled data from 2004 to 2007, for descriptive purposes we consider both data on an annual frequency from 1988 to 2005 as well as data on three year averages (i.e. 1991-1993, 1994-1996, 1997-1999, 2000-2002 and 2003-2005

respectively), which are likely to be less prone to such error. Furthermore, we gauge the potential impact of measurement error in our econometric analysis by also estimating models in which we exclude migrants from all sending countries for which we have less than 200 observations in our data, when considering the robustness of results.

Figure 3 displays the average number of migrants by year of settlement and region of origin (EEA-countries, other developed countries except former Yugoslavia and all other countries except former Yugoslavia) for the entry years 1988 to 2005. As can be seen, migration from all countries oscillated substantially in the time period considered and was procyclical with peaks of about 35,000 migrants in the years 1990 and 2003 or respectively the time periods 1988-1990 and 2003-2005. These peaks are both associated with beginning economic booms and increased demands for foreign labor at the end of the 1980's, and the beginning economic upswing in 2002-2003. The trough between 1993 to 1997 is associated with slow economic growth in combination with an increasingly restrictive migration policy. Migration from the EEA-countries to Austria, by contrast, was much more stable with a slight upward trend in the time period considered and started at around 5,300 persons who migrated to Austria in 1988, reached a trough in 1997 (with around 3,000 persons) and amounted to 7,500 persons by 2005.

Figure 4: Share of low educated migrants by country of birth in Austria (years of immigration 1991-2002)
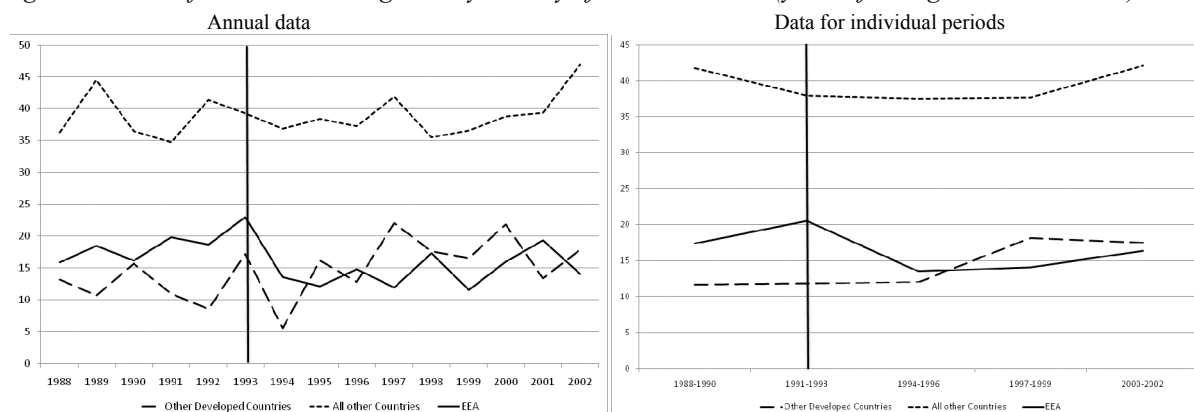
Source: Austrian Labor Force Survey (pooled values 2004-2007), excluding migrants from former Yugoslavia, developed countries= countries with an average HDI in excess of 0.8 for the years 1985-2005 (see Appendix for details). Figure displays the average share of less educated (ISCED 2 or lower) foreigners residing in Austria in the period 2004 to 2007 by year of migration to Austria, horizontal axis= year of migration to Austria. Vertical line marks the last period before reforms

Thus the rather different development of permanent migration from all over the world and the EEA-countries suggests that comparing the EEA to the rest of the world may not provide the best comparison group. Permanent migration flows from other developed countries were much more in line with that of migration from the EEA in the time period considered. Here the opening of Central and Eastern Europe caused a substantial increase of migrants (from around 5.000 persons to over 10.000) from these countries in the time period from 1988 to 1990, but from the early 1990's onward migration trends in these two regions by and large accord with each other.

4.2   Stylized facts: Development of the education structure of migrants to Austria

Figure 4 thus compares the education structure of permanent migrants from the EEA-countries to Austria to that from other developed countries as well as the rest of the world in the years from 1988 to 2002, by displaying the development of the share of permanent migrants with low (ISCED 2 or lower) educational attainment[9] from the EEA and the other developed countries as well as all other countries both for annual data and for data aggregated over three year periods. Before 1994 (i.e. before EEA-accession) in each year the share of low educated migrants from the EEA to Austria was higher than the share of low educated migrants from other developed countries, while after 1994 (i.e. after EEA-accession) this share was lower among the migrants from EEA-countries than among migrants from other developed countries in every year except for 1996 and 2001. The share of low educated permanent migrants from the rest of the world, by contrast, was substantially higher than among both the permanent migrants from the EEA and the permanent migrants from other industrialized countries both before and after EEA-accession.

Figure 5 repeats Figure 4 for the time period 1997 to 2005. It thus focuses on the integration agreement legislation in 2003. According to data aggregated for sub-periods the gap in the share of permanent migrants with low educational attainment levels among other developed countries and the

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[9] We limit our analysis to a differentiation of qualified and unqualified migrants to avoid excessive measurement error, due to the small number of highly (i.e. tertiary) educated migrants in Austria.

EEA-countries narrowed slightly after 2003. Relative to permanent migrants from all other countries, by contrast, the share of less educated permanent migrants from the EEA moved in parallel. The impact of the reforms of residence law in 2003 on the education structure of permanent migration to Austria therefore seems to have been mild. This conclusion is reconfirmed when considering annual data (see: left hand side of Figure 5): the share of the less educated permanent migrants from the EEA and other developed countries as well as all other countries oscillated substantially both over the period before and after 2003. Here the share of low educated foreign born from the EEA was lower than from other developed countries for most of the pre- and post reform period.

Figure 5: Share of low educated migrants by country of birth in Austria (1997-2005)
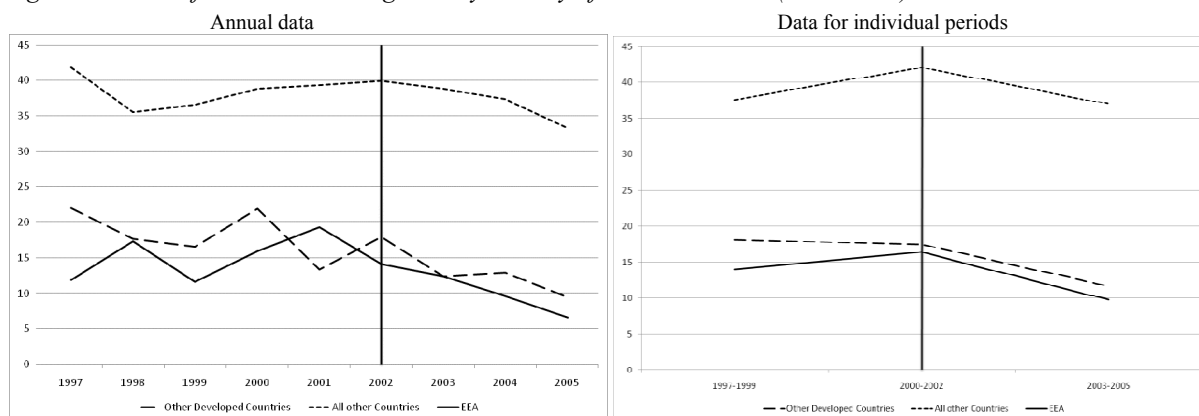
Source: Austrian Labor Force Survey (pooled values 2004-2007) Source: Austrian Labor Force Survey (pooled values 2004-2007), excluding migrants from former Yugoslavia, developed countries = countries with an average HDI in excess of 0.8 for the years 1985-2005 (see Appendix for details). Figure displays the average share of less educated (ISCED 2 or lower) foreigners residing in Austria in the period 2004 to 2007 by year of migration to Austria, horizontal axis= year of migration to Austria. Vertical line marks last period before reforms.

5. Method

Descriptive evidence thus suggests that relative to permanent migration from other developed countries the share of low educated permanent migrants from the EEA reduced after Austria's EEA-accession. More robust empirical evidence on the impact of these two reforms on the education structure of permanent migrants can be obtained by using a difference-in-difference approach. Here we exploit the fact that both Austria's EEA-accession as well as integration agreement regulation affected only certain groups of migrants. In the case of the EEA-accession only migrants from EEA-countries were affected, while migrants from outside the EEA remained unaffected. In the case of the

integration agreement regulation, by contrast, only migrants from outside the EEA were affected, while migrants from EEA-countries remained unaffected. Dividing the data into a subset (denoted by R) of sending countries (j) that were affected by the reform and another subset that was unaffected, and grouping the time periods (t) into a pre-reform and a post reform period (with τ the period of reforms) the impact of a change in migration policy can be identified by the parameter δ in a logit regression of the form:

$$y_{jit}^{*} = \alpha_t D_t + \beta_j D_j + \lambda X_i + \gamma Z_{jt} + \rho_S D_s + \delta D_{t \geq \tau} D_{j \in R} + \xi_{jit} \tag{5}$$

where ξ_{jit} is a logistically distributed random disturbance term and y_{jit}^{*} is a latent variable measuring the probability of a migrant (*i*) migrating to Austria from country (*j*) in time period (*t*) being low educated (i.e. having an educational attainment of ISCED 2 or lower) with the observed variable (educational attainment) taking on the value 1 if the migrant has low educational attainment and 0 otherwise. D_t is a set of dummy variables for each individual time period of migration, which measures changes in the education structure of migrants over time that are common to all sending countries, D_j is a dummy variable for each sending country considered, which measures country specific (but time invariant) influences on the education structure, D_s is a dummy variable for the survey year, X_i is a set of individual characteristics that may impact on the education structure of migrants and Z_{jt} is a set of time varying sending country characteristics that influence the education structure of migration. α_t, β_j, λ, ρ_S and γ are a set of parameter vectors to be estimated.

The central parameter of interest in this regression is δ. This measures the average change in y_{jit}^{*} on the treated relative to the untreated migrant groups since $D_{t \geq \tau}$ is a dummy variable that takes on the value of 1 if the time period under consideration is a post reform period (i.e. $t \geq \tau$) and $D_{j \in R}$ is a dummy variable which takes on the value one if the country under consideration belongs to the EEA-countries. A statistically significant positive value of this parameter implies that (relative to the non EAA-countries) the share of low educated migrants from EEA-countries increased after the reform,

while a statistically significant negative parameter implies that the share of low educated from EEA-countries reduced after reforms. Furthermore, as shown by Puhanyi (2012) the marginal effect on the interaction term $D_{t\geq\tau}D_{j\in R}$ can be interpreted as the treatment effect.

6. Results

6.1. The accession to the European Economic Area (EEA)

Table 4 presents marginal effects of two alternative logit models, which differ with respect to the comparison group. In model 1 (on the left hand side panel of table 4) we compare migrants from EEA-countries and other developed countries (excluding former Yugoslavia) in the time period 1988 to 2002. As already stated, we consider this comparison our benchmark, because of the higher comparability of the developed countries to the EEA. In model 2 (right hand side panel) we compare migrants from EEA-countries to all other countries (including the less developed countries, but excluding former Yugoslavia). This comparison has the advantage of a larger number of observations than in the first case, but the disadvantage that migration from less developed countries may be influenced by a number of factors (e.g. refugee migration) for which we cannot properly control. In addition the table presents coefficients for both the specification in equation (5) as well for a specification in which we allow treatment effects to vary over post-treatment time periods. Table 5 further augments this by presenting results with time varying treatment effects on an annual basis. In each of these specifications the dependent variable is the probability of a migrant having low educational attainment (i.e. ISCED 2 or less), respectively.

Aside from controlling for a full set of time, wave and sending country dummies (which are not reported in the tables), in all regressions we also include (the log of) age and age squared as well as dummy variables for females, married persons and persons with children as controls for individual characteristics (i.e. our X_j variables). We do this because previous research on Austria by Bock-Schappelwein et al. (2008) as well as other countries (Chiswick and DebBurman, 2004) shows that educational attainment of migrants is nonlinearly related to age, that migrant women in general have

lower educational attainment than migrant men and because there is also some evidence (Bock-Schappelwein et al. 2008) in Austria that, due to the impact of family reunion on the skill-structure of migrants, married migrants and migrants with children have lower educational attainment than others. Thus these variables control for any potential shifts in the structure of migrants with respect to gender, age, and family status before and after EEA-accession.

Table 4: Marginal effects of a logit regression on the probability for a migrant being low educated (EEA-accession)

	Model 1: Relative to migrants from other developed countries		Model 2: Relative to migrants from all other countries	
	(1)	(2)	(1)	(2)
1994-03 X EEA	-0.082 ***		-0.090 ***	
	(0.027)		(0.029)	
1994-96 X EEA		-0.080 ***		-0.115 ***
		(0.023)		(0.033)
1997-99 X EEA		-0.068 **		-0.084 **
		(0.034)		(0.033)
2000-02 X EEA		-0.082 ***		-0.096 ***
		(0.028)		(0.036)
Ln(age)	-3.867 ***	-3.763 ***	-5.731 ***	-5.786 ***
	(0.261)	(0.277)	(0.351)	(0.379)
Ln(age)^2	0.521 ***	0.507 ***	0.780 ***	0.788 ***
	(0.037)	(0.039)	(0.049)	(0.053)
Female	0.014	0.018	0.078 ***	0.088 ***
	(0.016)	(0.016)	(0.019)	(0.020)
Married	-0.007	-0.019	0.006	0.001
	(0.021)	(0.021)	(0.026)	(0.028)
Children	0.045 **	0.050 ***	0.063 ***	0.067 ***
	(0.019)	(0.021)	(0.020)	(0.021)
ln(gdp)	0.046	0.037	0.048	0.067
	(0.039)	(0.038)	(0.041)	(0.044)
ln(share low educated)	-0.012	0.032	-0.035	-0.009
	(0.062)	(0.069)	(0.088)	(0.100)
ln(gini)	-0.291 **	-0.216 *	-0.365 ***	-0.370 ***
	(0.104)	(0.119)	(0.140)	(0.152)
ln(infant mortality)	0.002	-0.121	0.031	-0.057
	(0.107)	(0.119)	(0.106)	(0.124)
Number of Obsevations	12004	12004	17527	17527
Pseudo R2	0.211	0.215	0.299	0.296
Log Likelihood	-63721371	-54300712	-10701735	-95572064

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; Model 1= reference group are migrants from developed countries (excluding former Yugoslavia), Model 2 = reference group are all countries (excluding former Yugoslavia), table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and [10%] level, respectively. Country, wave and time fixed effects not reported

The marginal effects of these controls are in line with expectations and previous results. The probability of a migrant having low educational attainment decreases with age but increases with age squared. This is consistent with the results of Chiswick and DebBurman (2004), who also find a non-linear relationship between age and educational attainment of migrants. Female migrants have a significantly (8 to 9 percentage points) higher probability of having low educational attainment, when all countries are considered, while no significant effects can be found when considering only developed countries. This is primarily due to a particularly high share of less educated females among the foreign born from Turkey in Austria (Bock Schappelwein et al, 2008). Migrants with children on average have a 5 to 7 percentage point higher probability to have low educational attainment. The only variable that remains insignificant throughout is the dummy for married migrants.

In addition we also control for a number of time varying sending country characteristics (the Z_{jt} variables). These are the (logs of) annual US-Dollar GDP per capita taken from United Nations Statistical Database, the infant mortality rate taken from UNICEF (www.childmortality.org), the share of low educated in the total population in five year intervals (taken from Cohen and Soto, 2001), as well as the five year average of the Gini-coefficient of the income distribution (taken from the UNU-WIDER - World Income Inequality Database (WIID) - http://www.wider.unu.edu/research/Database/en_GB/database/). We include these variables because previous research (Beine et al. 2008) finds that the structure of emigration from a country depends on its level of economic development (proxied by GDP per capita and infant mortality) and the educational structure of the native population, (proxied by the share of low educated among the resident population). The Gini-coefficient is included to control for effects of the income distribution in the sending country on the structure of migration as suggested in the literature on migrant selectivity (e.g. Brücker and Defoort 2009). The marginal effects of these variables are often statistically insignificant. This is indication that they provide too little variance to identify their effect on the education structure of migration after controlling for time and sending country fixed effects. The only

exception is the Gini–coefficient which has a significant negative impact on the probability of a migrant being low educated.

Table 5: Marginal effects of a logit regression on the probability for a migrant being low educated (EEA-accession)

	Model 1		Model 2	
1994*EEA	-0.035		-0.079	*
	(0.075)		(0.042)	
1995*EEA	-0.089	***	-0.117	***
	(0.023)		(0.042)	
1996*EEA	-0.076	***	-0.095	**
	(0.025)		(0.045)	
1997*EEA	-0.077	**	-0.126	***
	(0.034)		(0.031)	
1998*EEA	-0.074	**	-0.013	**
	(0.039)		(0.050)	
1999*EEA	-0.059	*	-0.103	***
	(0.032)		(0.033)	
2000*EEA	-0.082	***	-0.090	**
	(0.020)		(0.036)	
2001*EEA	-0.049		-0.005	
	(0.044)		(0.085)	
2002*EEA	-0.097	***	-0.137	***
	(0.022)		(0.034)	
Number of observations	12004		17527	
Pseudo R2	0.214		0.296	
Log Likelihood	-63503603		-106800000	

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; Model 1= reference group are migrants from developed countries (excluding former Yugoslavia), Model 2 = reference group are all countries (excluding former Yugoslavia), table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and [10%] level, respectively. Country, wave and time fixed effects as well as effects of age, age squared, married, children and macro-economic variables not reported.

The central variables of interest are, however, the time-EEA interactions reported in the top rows of table 4. Here results imply that the probability of a permanent migrant from the EEA-countries having low educational attainment relative to that of a permanent migrant from other countries decreased significantly after Austria's EEA-accession. The δ coefficients are statistically significant and negative for all post accession periods both when allowing for time invariant effects as well as when allowing for time varying treatment effects. The size of the marginal effects suggest that after EEA-accession the probability of a permanent EEA-migrant being low educated reduced by 8.2 percentage points relative to permanent migrants from other developed countries and by 9.0 percentage points relative to permanent migrants from all other countries. These effects are robust across time periods

with marginal effects in the period 1994-1996 slightly higher and in the time period 1997-1999 slightly lower than average. In addition when allowing effects to vary by years, marginal effects are significantly negative for each year except for the EEA-accession year (1994) and 2001 (table 5). In sum this implies robust evidence that after Austria's EEA-accession the share of low educated permanent migrants from the EEA reduced relative to the share of low educated migrants from other countries. This in turn suggests a positive impact of the EEA-accession on the education structure of migrants, which is consistent with our theoretical expectations for a country where migrants are negatively selected on education.

6.2 The reform of Austrian residence law in 2003

The marginal effects when estimating a similar logit model as above for permanent migrants that moved to Austria in the time period 1997 to 2005 (i.e. before and after the integration agreement legislation in 2003) are reported in table 6. Once more we present results for both the specification in equation (5) as well for a specification which allows for time varying treatment effects by year[10] for two comparison groups (other developed countries and all other countries). The marginal effects of the control variables accord closely both in sign and magnitude with those already found for the time period 1988 to 2002. As above the probability of a permanent migrant being low educated increases with age and decreases with age squared, female migrants have a significantly (around 9 percentage points) higher probability of having low educational attainment only when the full sample is considered and migrants with children have an 8 to 11 percentage point higher probability to have low educational attainment. Also, as before, the marginal effects of variables measuring time varying sending country characteristics tend to remain insignificant even for the Gini-coefficient.[11] The only exception is GDP per capita, which, however, is only on the margin of significance for the sample of developed countries.

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[10] Note that in this case due to the short post-treatment period, we cannot consider the effects for individual time periods.
[11] This loss of significance is due to the fewer observation periods provided in the data when considering the period from 1997 to 2005.

Table 6: Marginal effects of a logit regression on the probability for a migrant being low educated (integration agreement legislation)

	Model 1: Relative to migrants from other developed countries		Model 2: Relative to migrants from all other countries	
	(1)	(2)	(1)	(2)
2003-05 X EEA	-0.014 (0.037)		-0.093 ** (0.047)	
2003 X EEA		-0.035 (0.031)		-0.090 ** (0.042)
2004 X EEA		-0.003 (0.045)		-0.095 (0.050)
2005 X EEA		0.019 (0.079)		-0.085 (0.089)
Ln(age)	-3.755 *** (0.312)	-3.752 *** (0.316)	-5.935 *** (0.458)	-5.934 *** (0.460)
Ln(age)^2	0.515 *** (0.044)	0.515 *** (0.045)	0.824 *** (0.065)	0.824 *** (0.065)
Female	0.023 (0.017)	0.023 (0.018)	0.088 *** (0.023)	0.088 *** (0.023)
Married	-0.008 (0.025)	-0.008 (0.025)	-0.016 (0.032)	-0.016 (0.033)
Children	0.077 ** (0.031)	0.076 ** (0.031)	0.106 *** (0.029)	0.106 *** (0.029)
ln(gdp)	0.155 * (0.088)	0.187 * (0.097)	0.107 (0.090)	0.109 (0.094)
ln(share low educated)	-0.076 (0.061)	-0.086 (0.061)	-0.075 (0.080)	-0.076 (0.079)
ln(gini)	0.237 (0.237)	0.230 (0.230)	-0.096 (0.342)	-0.097 (0.343)
ln(infant mortality)	-0.348 (0.243)	-0.350 (0.242)	0.000 (0.191)	0.000 (0.195)
Number of Observations	7735	7735	12168	12168
Pseudo R2	0.178	0.179	0.307	0.307
Log Likelihood	-45004914	-44983881	-80493109	-80492535

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; Model 1= reference group are migrants from developed countries (excluding former Yugoslavia), Model 2 = reference group are all countries (excluding former Yugoslavia), table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and (10%) level, respectively. Country, wave and time fixed effects not reported

The EEA-period interaction terms, however, indicate an improvement of the education structure of migrants from the EEA (i.e. the untreated group) relative to the education structure of migrants from third countries (i.e. the treated group) after the integration agreement regulation.[12] The estimates of the time-EEA interactions imply that after reforms in 2003 the probability of a migrant from all countries outside the EEA being low educated (relative to that of a migrant from EEA-countries being low

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[12] Note that since in the regression results reported in table 6 the other countries are the treated group and the EEA-countries are the untreated group the interpretation of the marginal effects in this regression changes relative to the previous section.

educated) increased significantly (9.3 percentage points). This result is, however, not robust and loses significance when considering the comparison to developed countries.

In sum, we conclude that results with respect to the reform of residence law in 2003 are not very robust, but that the majority of them point to a negative impact of these reforms on the average educational attainment of third country migrants. In terms of our theoretical model this can be interpreted as indication any potential positive impact of reduced skill dependent costs of migration on the education structure of migrants was outweighed by the increase in fixed migration costs caused by the more restrictive migration regime. This seems to be all the more likely given that - as shown above – the reforms of 2003 affected only a relatively small segment of highly skilled migrants.

7.   Robustness

These results could, however, be criticized for a number of reasons. First, with respect to the time period considered – as discussed above – one could argue that the late 1980's may have been a rather special period in Austrian migration history. This raises the question as to how sensitive our results are to a change in the time period of comparison. Second, as also discussed above, focusing on the ALFS induces an element of measurement error to the estimates. Thus one could ask what the potential effects of measurement errors are. Third, as also shown above, most of our results indicate that controls for time varying sending country characteristics remain insignificant. One may thus argue that these variables impact results. Similarly one could ask what the impacts of controlling for individual characteristics are. Fourth, one may object to using the total foreign born population, rather than active age groups.

To address these issues, tables 7 and 8 thus present results for a number of alternative specifications of equation (5) for both the effects of EEA-accession (table 7) and integration agreement legislation (table 8). First, we report marginal effects for the period-EEA interaction terms of specifications in which we limited our sample to migrants that settled in Austria permanently in the time period 1991 to 2002 in order to gauge the potential bias that may result from including migrants from 1988 to 1990.

Second, we present results including only migrants coming from countries for which we have more than 200 observations both for the EEA-accession and integration agreement regulation. Third, we present marginal effects when focusing only on the population aged between 20 and 64. Finally, we present results in which we excluded time varying sending country variables (i.e. GDP per capita, share of low educated population, infant mortality and the Gini-coefficient) from the estimation as well as a specification excluding individual variables (i.e. age, age squared, gender marital status and the dummy for children), to assess the potential impact of co-linearity of these variables with our period-EEA interaction terms.

Table 7: Marginal effects of a logit regression on the probability for a migrant being low educated (alternative specifications- EEA accession)

	1994-96 X EEA	1997-99 X EEA	2000-02 X EEA	Pseudo R2	Log Likelihood
Shorten Period to 1991-2002	-0.083 *** (0.027)	-0.078 ** (0.039)	-0.103 *** (0.035)	0.220	-46524492
Exclude national variables	-0.084 *** 0.026	-0.079 ** 0.036	-0.088 *** 0.024	0.234	-50313377
Focusing only on sending countries with more than 200 observations	-0.132 *** (0.034)	-0.085 ** (0.039)	-0.114 *** (0.043)	0.308	-80930002
Excluding individual variables	-0.081 *** (0.027)	-0.071 ** (0.034)	-0.092 *** (0.030)	0.054	-65477492
Only 20 - 65 year olds	-0.064 ** (0.023)	-0.055 ** (0.027)	-0.079 ** (0.024)	0.093	-46529115

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; reference group are migrants from developed countries excluding former Yugoslavia, table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and [10%] level, respectively. Country, wave and time fixed effects and other control variables are not reported.

Table 8: Marginal effects of a logit regression on the probability for a migrant being low educated (alternative specifications - integration agreement legislation)

	2003-2005 X EEA	Pseudo R2	Log Likelihood
Excluding national variables	-0.095 *** (0.036)	0.311	-93449110
Focusing only on sending countries with more than 200 observations	-0.128 *** (0.046)	0.307	-76900089
Excluding individual variables	-0.023 (0.041)	0.082	-50825903
only 20 65 year olds	-0.149 (0.371)	0.093	-40083076

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; reference group are migrants from developed countries excluding former Yugoslavia, table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and [10%] level, respectively. Country, wave and time fixed effects and other control variables are not reported.

The impact of these changes is minor and provides few additional insights. As above indicate that after EEA-accession the share of migrants with low educational attainment settling in Austria from the EEA-countries reduced significantly relative to migrants from other countries. The only additional insights here are that this marginal effect increases somewhat (to a 13.2 percentage point reduction) when considering only countries with more than 200 observations, and decreases slightly when focusing only on the 20 to 64 years old migrants. Similarly, also regressions analyzing the impact of the integration agreement regulation in 2003 on the education structure of migrants from third countries reconfirm most of our previous findings. They, however, slightly strengthen the conclusion of a worsening education structure of migrants due to the integration agreement reforms, since both when excluding sending country variables as well as when focusing only on large migrant groups a significant increase in the share of low educated migrants from third countries to Austria after 2003 emerges, and also for all other specifications, coefficients are negative (although insignificant).

Table 4: Marginal Effect of a Logit regression of the probability for a migrant being low educated for alternative "Placebo" treatment periods

	Placebo treatment period				
	τ=1990	τ=1989	τ=1988	τ=1987	τ=1986
EEA * D(τ,τ+3)	-0.045	-0.019	-0.017	0.003	-0.012
	(0.055)	(0.039)	(0.045)	(0.048)	(0.052)
EEA * D(τ)	-0.080	-0.064	-0.010	0.168 **	-0.082
	(0.051)	(0.042)	(0.094)	(0.068)	(0.054)
EEA * D(τ+1)	-0.057	-0.027	-0.063	-0.005	0.153 *
	(0.101)	(0.051)	(0.044)	(0.101)	(0.079)
EEA * D(τ+2)	-0.067	0.061	-0.031	-0.046	-0.004
	(0.086)	(0.070)	(0.049)	(0.048)	(0.104)
EEA * D(τ+3)	0.031	-0.026	0.057	-0.016	-0.049
	(0.099)	(0.045)	(0.072)	(0.050)	(0.047)

S: Austrian Labor Force Survey, own calculations; Note: Table reports marginal effects of logit regressions with a placebo treatment at time τ and a post treatment period of 4 years. (pooled values foe ALFS 2004-2007), reference group are migrants from countries excluding former Yugoslavia, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and [*] signify significance at the 1%, (5%) and [10%] level, respectively. Country, wave and time fixed effects and other control variables are not reported

Finally, a further issue with respect to our results is that we might have identified effects even in the absence of treatment. To address this issue table 9 reports results of a series of "placebo" treatments. For these we estimated equation (5) imposing treatments in time periods where no treatment effects should be found. In particular we used the fact that before 1994 migration law stipulations applied to

both migrants from EEA-countries as well as others and that therefore (irrespective of whether a reform in migration law occurred in that year or not) no treatment effects should be found with our method for the pre EEA-accession period.

We use data on migrants arriving in Austria from 1980 to 1993 (i.e. before EEA-accession) for these "placebo" treatments and impose a treatment in each year from 1986 to 1990, respectively.[13] We thus have one treatment (1990) in which a reform of migration law occurred and 4 in which no reforms occurred. We cannot reject the null hypothesis of no effect for any of the placebo treatments when not allowing for time varying treatment effects, while when allowing for time-varying treatment effects among 20 coefficients estimated one is significant at the 5% level and another at the 10% level. Thus our acceptance rate corresponds exactly to the predictions of statistical theory.

8.   Conclusions

This paper finds robust evidence that the share of low educated permanent migrants from the EEA to Austria reduced relative to the share of low educated permanent migrants from other countries after Austria's EEA-accession. With respect to the integration agreement legislation in 2003, by contrast, results are less robust, with most of them pointing to a (sometimes significant) negative impact of these reforms on the average education structure of permanent migrants. Our interpretation of this is that the implicit positive impact of the reforms on the education structure of migrants was countervailed by an increased restrictiveness of the migration regime in total.

The results thus suggest that liberalizing migration can have a positive impact on the education structure of permanent migrants if the previous migration regime was strongly focused on low educated migrants and are consistent with theoretical models derived in Djajic (1989) and Bianchi (2006). The results also present case study evidence to warn that reforms of migration law that provide

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[13] Note that in these "placebo" treatments we consider a post treatment period of four years throughout thus our estimation period runs from1980 to1993 for the 1993 treatment, from 1980 to 1992 for the 1989 treatment and so on.

privileged access to highly educated permanent migrants may not provide the expected results if other elements of the regulation system governing migration counteract these developments.

To what degree can these results be generalized to other countries or time periods? In all likelihood it is too early to draw firm conclusions on this issue. As pointed out in the introduction there is only little evaluation literature that analyses the effects of changes in migration policy on migration outcomes. Any extrapolation of our analysis to other instances of migration policy reform is therefore bound to be speculative in the absence of further research. Nonetheless, based on our results we would argue that for countries with a negative self-selection of migrants such as Austria, liberalizing migration (in particular towards developed economies) may be a more effective means to improve the education structure of migrants, than introducing selective migration policies.

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Appendix

Appendix 1: List of developed countries (based on an average Human development index of 0.8 or

more)

Country	Average HDI (95-02)	Country	Average HDI (95-02)
Luxembourg	0.96	Antigua and Barbuda	0.86
Liechtenstein	0.95	United Arab Emirates	0.86
Norway	0.94	Bahrain	0.86
Hong Kong, China (SAR)	0.94	Slovakia	0.86
Canada	0.94	Bahamas	0.85
United States	0.94	Cuba	0.85
Netherlands	0.94	Poland	0.85
Switzerland	0.93	Estonia	0.85
Andorra	0.93	Hungary	0.85
Sweden	0.93	Croatia	0.84
Japan	0.93	Oman	0.84
Iceland	0.93	Seychelles	0.84
Australia	0.93	Lithuania	0.84
France	0.93	Libyan Arab Jamahiriya	0.84
Belgium	0.92	Chile	0.84
Denmark	0.92	Saint Kitts and Nevis	0.83
Finland	0.92	Argentina	0.83
Austria	0.92	Uruguay	0.83
Spain	0.92	Bulgaria	0.83
United Kingdom	0.92	Latvia	0.83
Germany	0.91	Montenegro	0.83
New Zealand	0.91	Costa Rica	0.82
Ireland	0.91	Saint Lucia	0.82
Italy	0.91	Mexico	0.82
Greece	0.90	Serbia	0.82
Israel	0.90	Dominica	0.81
Qatar	0.90	Trinidad and Tobago	0.81
Slovenia	0.90	Grenada	0.81
Brunei Darussalam	0.90	Romania	0.81
Barbados	0.89	Bosnia and Herzegovina	0.81
Cyprus	0.89	Venezuela (Bolivarian Republic of)	0.81
Singapore	0.89	Albania	0.81
Kuwait	0.88	Russian Federation	0.81
Czech Republic	0.88	Saudi Arabia	0.81
Portugal	0.87	Macedonia (the Former Yugoslav Republic of)	0.80
Malta	0.87	Panama	0.80
Korea (Republic of)	0.87	Lebanon	0.80

Source: UNIDO, WIFO-calculations.

Appendix 2: Logit regression results of the probability for a migrant being low educated using all countries (including former Yugoslav republics) as a comparison group

	EEA-accession		Integration agreement legislation
1994-03 X EEA	-0.068 **		
	(0.032)		
1994-96 X EEA		-0.091 ***	
		(0.039)	
1997-99 X EEA		-0.081 **	
		(0.039)	
2000-02 X EEA		-0.070 **	
		(0.031)	
2003-05 X EEA			0.107 ***
			(0.044)
Ln(age)	-6.026 ***	-6.078 ***	-5.842 ***
	(0.380)	(0.415)	(0.451)
Ln(age)^2	0.823 ***	0.830 ***	0.811 ***
	(0.054)	(0.059)	(0.063)
Female	0.081 ***	0.092 ***	0.087 ***
	(0.018)	(0.019)	(0.022)
Married	0.006	-0.001	-0.017
	(0.025)	(0.027)	(0.031)
Children	0.059 ***	0.063 ***	0.102 ***
	(0.020)	(0.021)	(0.029)
ln(gdp)	0.040	0.059	0.118
	(0.041)	(0.045)	(0.091)
ln(share low educated)	-0.092	-0.093	-0.076
	(0.088)	(0.099)	(0.081)
ln(gini)	-0.292 **	-0.283 *	-0.204
	(0.138)	(0.150)	(0.303)
ln(infant mortality)	0.017	-0.071	0.033
	(0.107)	(0.124)	(0.196)

S: Austrian Labor Force Survey (pooled values 2004-2007), own calculations; reference group are migrants from all countries (including former Yugoslavia table reports marginal effects, values in brackets are (cluster corrected) standard errors of the estimate, ***, (**) and (*) signify significance at the 1%, (5%) and (10%) level, respectively. Country, wave and time fixed effects not reported