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## How well does education travel? Education and occupation with and without Migration

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### Abstract

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Using the Labour Force Survey (LFS) we explore the difference international migration makes for the distribution of occupational levels for any given level of education in the two countries of interest: Austria and Germany. Migrant outcomes are also being compared with home country outcomes, i.e. Serbia and Turkey.

We find that education is imperfectly portable across national borders. Austrian employers treat schooling from certain countries of origin differently from the way they treat schooling from natives. Educational levels completed in Western European countries are obviously more transferable across national borders than educational levels completed elsewhere.

Workers in their home country all have similar occupational returns to education but migrants in Austria or Germany lag considerably behind. Middle and higher education in particular are not equally rewarded if from abroad.

The low value of foreign-acquired education may reflect discrimination, differences in school quality across continents of origin, imperfect knowledge of the evaluation of foreign credentials on the side of the employer or the low compatibility of the foreign-acquired education with the requirements and the specific orientation of the host country labour market.

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**How well does education travel?  
Education and occupation with and without  
migration**

**Final report**

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## Wie gut reist Bildung? Ausbildung und Beruf mit und ohne Migration: Zusammenfassung auf Deutsch

### Absicht und Datengrundlage

Bis Mitte der 1980er Jahre war die Arbeitsmigration nach Österreich im Wesentlichen wenig gebildet. In den 25 Jahren seither hat sich das geändert und 60% der Einwanderung seit den späten 1990er Jahren sind mittel oder höher gebildet. Österreich hat nun täglich Einwanderung dieser Art, sowohl am Asylweg als auch durch Familienzusammenführung und durch Arbeitsmigration. Die Frage, wie dieses Können und Wissen in der österreichischen Wirtschaft genutzt wird, wird drängend, nicht zuletzt, weil adäquate Verwendung ein Anreiz für höher Qualifizierte in anderen Ländern sein könnte, nach Österreich zu ziehen.

Zu diesem Zweck errechneten wir das Ausmaß, zu dem der Beruf durch das Ausbildungsniveau der Beschäftigten bestimmt wird. Wir wählten drei wichtige Herkunftsländer, nämlich Deutschland, Serbien und Türkei, und verglichen, wie österreichische Ausbildungen in Österreich eingesetzt werden, deutsche in Deutschland, deutsche in Österreich und österreichische in Deutschland. Auf die gleiche Weise verglichen wir den Einsatz serbischer Ausbildungen in Serbien, in Österreich und in Deutschland sowie türkischer Ausbildungen in der Türkei, in Österreich und in Deutschland. Dabei unterschieden wir zwischen Frauen und Männern.

Die Daten für die Untersuchung entstammen der Europäischen Arbeitskräfteerhebung. Sie wird in Österreich von der Bundesanstalt Statistik Österreich durchgeführt, in Deutschland vom Bundesamt für Statistik und in der Türkei vom Türkischen Statistischen Institut. Die Serbische Arbeitskräfteerhebung wird vom Statistischen Amt der Republik durchgeführt und lehnt sich eng an die von Eurostat erlassenen Regeln an.

### Schwacher Zusammenhang zwischen Bildung und Beruf bei Migrantinnen und Migranten aus Serbien und der Türkei und auch bei ihren Kindern, besonders den weiblichen

Naiv würde man bei Beschäftigten einen hundertprozentigen Zusammenhang zwischen der persönlichen Bildung und den Bildungserfordernissen des Berufs erwarten. Dem ist nicht so. Die persönliche Bildung erklärt je nach Geschlecht und Herkunft der Bildung zwischen sechs und etwa sechzig Prozent des erreichten beruflichen Niveaus. Mit anderen Worten, es gibt Gruppen von Beschäftigten, bei denen es so gut wie gar keinen Zusammenhang zwischen ihrer Bildung und dem Beruf gibt, den sie ausüben, und es gibt andere Gruppen, bei denen ein deutlicher Zusammenhang besteht. Zu den ersteren zählen vor allem Einwanderinnen und Einwanderer aus Serbien und der Türkei, teils auch aus den neueren EU Mitgliedsländern, zu den letzteren vor allem die Nichtmigranten und die Migrantinnen und Migranten aus wohlhabenden Staaten.

Konkret erklären die persönliche Bildung und das Alter zwischen 50% und 57% der Bildungserfordernisse des ausgeübten Berufs von:

- Beschäftigten beiderlei Geschlechts in Österreich und in Deutschland, deren Eltern im jeweiligen Land geboren wurden
- Beschäftigten in Österreich beiderlei Geschlechts mit Bildung aus Deutschland
- Männlichen Beschäftigten in Deutschland, die in Österreich ausgebildet wurden
- Männlichen Beschäftigten in Serbien, die in Serbien ausgebildet wurden
- Weiblichen Beschäftigten in Österreich mit Bildung aus der Türkei. Das deshalb, weil rund die Hälfte dieser Frauen nur geringe Bildung haben und auch in gering qualifizierten Tätigkeiten beschäftigt sind.

Zwischen 40% und 50% des beruflichen Ergebnisses erklären sich aus der Bildung und dem Alter bei:

- Weiblichen Beschäftigten in Serbien, die in Serbien ausgebildet wurden
- Weiblichen Beschäftigten in Deutschland, die in Österreich ausgebildet wurden
- Beschäftigten in Deutschland beiderlei Geschlechts mit Bildung aus einem Staat der „übrigen Welt“ (also nicht Deutschland, Österreich, Serbien, Türkei, neuere Mitgliedsländer der EU)
- Männlichen Beschäftigten in Österreich mit Bildung aus einem der neueren Mitgliedsländer der EU oder einem Staat der „übrigen Welt“.

In der bisherigen Aufzählung kamen Migrantinnen oder Migranten mit Bildung aus Serbien und der Türkei nur einmal vor. Auch im nächsten Segment kommen sie nur einmal vor:

- Bei den weiblichen Beschäftigten in Österreich, die in Serbien ausgebildet wurden, werden 39% des beruflichen Ergebnisses durch Bildung und Alter erklärt.

Ansonsten findet man im Bereich unter 40% bis 24% die

- Weiblichen Beschäftigten in Deutschland mit Bildung aus einem Staat der „übrigen Welt“ (37%)
- Weiblichen Beschäftigten in Deutschland mit Bildung aus einem der neueren Mitgliedsländer der EU (30%)
- Weiblichen Beschäftigten in Deutschland mit Bildung aus einem unbekanntem Staat (28%)
- Männlichen Beschäftigten in Deutschland mit Bildung aus einem unbekanntem Staat (27%)
- Weiblichen Beschäftigten in Österreich mit Bildung aus einem der neueren Mitgliedsländer der EU (27%)
- Weiblichen Beschäftigten in Österreich mit Bildung aus einem Staat der „übrigen Welt“ (24%).

Unter 24% durch Bildung und Alter erklärtem Bildungsgehalt des Berufs finden sich nur mehr die nach den beiden genannten Ausnahmen verbleibenden Fälle von Migrantinnen und Migranten mit Bildung aus Serbien und der Türkei:

- 21% bei den männlichen Beschäftigten in Deutschland mit Bildung aus der Türkei
- 20% bei den weiblichen Beschäftigten in Deutschland mit Bildung aus Serbien
- 18% bei den männlichen Beschäftigten in Deutschland mit Bildung aus Serbien
- 16% bei den weiblichen Beschäftigten in Deutschland mit Bildung aus der Türkei
- 14% bei den männlichen Beschäftigten in Österreich mit Bildung aus der Türkei
- 6% bei den männlichen Beschäftigten in Österreich mit Bildung aus Serbien.

In Österreich erklärt sich das berufliche Ergebnis männlicher Einwanderer aus Serbien und der Türkei mehr aus anderen Einflüssen als der eigenen Bildung.

Der Beitrag des Alters ist in fast allen Fällen sehr gering, besonders bei den Frauen.



Die sogenannte „zweite Generation“ ist für uns jene Bevölkerung, die den Bildungsabschluss in dem Land gemacht hat, in dem sie lebt, deren Eltern aber beide eingewandert sind. Obwohl in Deutschland wie in Österreich die Bildung und das Alter den Beruf zu 25% bis 55% erklären, mit jeweils einer Ausnahme, die darüber liegt, gibt es bedeutende Unterschiede zwischen den beiden Ländern. Zudem gibt es einen höchst auffälligen Unterschied zwischen den Geschlechtern.

- Die beiden Ausnahmen mit besonders engem Zusammenhang zwischen Bildung und Beruf finden sich bei den Männern, nämlich in Deutschland bei jenen mit Eltern aus einem unbekanntem Staat und in Österreich bei jenen mit Eltern aus Deutschland.

Im Bereich zwischen 50% und 55%, also in unmittelbarer Nähe vor allem der Beschäftigten, die weder selbst noch deren Eltern migriert sind, finden sich in Deutschland die Frauen mit Eltern aus einem unbekanntem Staat sowie die Männer mit Eltern aus Österreich, den neueren EU Mitgliedsländern und den Staaten der „übrigen Welt“ und in Österreich die Männer mit Eltern aus den neueren EU Mitgliedsländern, den Staaten der „übrigen Welt“ und aus Serbien. Es kam jetzt hier ein einziger weiblicher Bevölkerungsteil vor und auch nur einer mit Eltern aus Serbien oder der Türkei.

Zwischen 40% und 50% findet man bei der „zweiten Generation“ nur Fälle in Deutschland, alle weiblich, nämlich mit Eltern aus der Türkei, den neueren EU Mitgliedsländern, Serbien, der „übrigen Welt“ und Österreich. Zwischen 30% und 40% finden sich in Deutschland die Männer mit Eltern aus der Türkei und eine Reihe weiblicher Bevölkerungsteile in Österreich, nämlich mit Eltern aus den neueren EU Mitgliedsländern, der „übrigen Welt“, Deutschland, der Türkei und Serbien. Unter 30% gibt es nur mehr zwei Fälle, nämlich in Deutschland den der Männer mit Eltern aus Serbien und in Österreich den der Männer mit Eltern aus der Türkei. In Österreich sind sechs der zehn Fälle unter 40%, in Deutschland nur zwei der zwölf. In Österreich lässt sich bei den Frauen der Bildungsgehalt des Berufs schlechter aus der persönlichen Bildung ableiten als in Deutschland.

Die Ergebnisse zeigen, dass Bildung, die in Deutschland beruflich wertvoll ist, es auch in Österreich ist und umgekehrt, dass aber Bildung, die in Serbien und in der Türkei beruflich wertvoll ist, in Deutschland und Österreich wenig Wert hat. Ähnlich, wenn auch weniger dramatisch zeigt sich das Muster auch bei der „zweiten Generation“, obwohl sie ihre Bildung in Deutschland bzw. Österreich erworben hat. Bei der „zweiten Generation“ ist vor allem auffällig, dass ihre Bildung in Deutschland besser beruflich umgesetzt wird als in Österreich, und die der Männer besser als die der Frauen. Weder das eine noch das andere trat bei den Migrantinnen und Migranten auf. Die Ergebnisse zeigen, dass die berufliche Verwertung der Bildung, auch wenn sie im Inland erworben wurde, ein Problem ist, das Migrantinnen, Migranten und ihre Kinder sehr stark betrifft. Es genügt also keinesfalls, die Bildungsfrage zu diskutieren. Es geht um die Nutzung der Bildung.

### Selbständige Erwerbstätigkeit verbessert das Ergebnis

In selbständiger Erwerbstätigkeit ist für Einwanderinnen und Einwanderer bei gleicher Bildung die Wahrscheinlichkeit größer, in einem Beruf mit höheren Bildungsanforderungen tätig zu sein. Das trifft in Österreich stärker zu als in Deutschland. Die beiden Bevölkerungsteile mit dem größten beruflichen Nutzen aus selbständiger Beschäftigung sind weiblich, nämlich in Österreich die Frauen mit Bildung aus der Türkei und in Deutschland die Frauen mit Bildung aus der „übrigen Welt“. Auf einer Skala des Bildungsgehalts der Berufe, die von 0 bis 100 geht, gewinnen sie 23 bzw. 21 Punkte dazu. Andere große Zuwächse verbuchen in Österreich die Männer mit Bildung aus Deutschland (20), Türkei (16) und Serbien (15) sowie die Frauen mit Bildung aus der „übrigen Welt“ (16). Wesentliche Zugewinne in Deutschland zeigen sich bei den Männern mit Bildung aus einem unbekanntem Staat (15), der „übrigen Welt“ (14) und Serbien (13) sowie bei den Frauen mit Bildung aus Österreich (17) und aus den neueren EU Mitgliedsländern (11). In Deutschland bringt Selbständigkeit den Einwanderinnen und Einwanderern mit türkischer Bildung beiderlei Geschlechts nur 7 bis 8 Punkte, ebenso wie den Männern mit Bildung aus den neueren EU Mitgliedsländern und in Österreich den Frauen mit Bildung aus Serbien und beiden Geschlechtern mit Bil-

derung aus den neueren EU Mitgliedsländern. Die männlichen Bevölkerungen, die weder selbst noch deren Eltern zugezogen sind, können in beiden Staaten den Bildungsgehalt des Berufs durch Selbständigkeit ebenfalls um 7 Punkte steigern, die Frauen aber nur um 4. In Serbien dagegen geht Selbständigkeit mit geringerem Bildungsgehalt des Berufs einher, und zwar bei beiden Geschlechtern um etwa 12 Punkte.

In Österreich wirkt sich Selbständigkeit bei der „zweiten Generation“ noch günstiger als bei den Einwanderinnen und Einwanderern aus. Wiederum sind die Spitzen weiblich. In Österreich steigert sich der Bildungsgehalt des Berufs bei Frauen mit Eltern aus den neueren EU Mitgliedsländern um 25, mit Eltern aus Deutschland um 24 und mit Eltern aus der Türkei um 18 sowie bei Männern mit Eltern aus der Türkei um 14 Punkte. In Deutschland dagegen beträgt der größte Zugewinn nicht mehr als 11 Punkte. Eine krasse Ausnahme stellt Selbständigkeit bei den Frauen in Österreich mit Eltern aus Serbien dar, bei denen die Wirkung um schätzungsweise 31 Punkte negativ ist, wobei das Ergebnis statistisch allerdings eher unsicher ist und die Wahrheit in einem breiten Bereich liegen könnte, der auch noch positive Werte umfasst.

Dass selbständige Beschäftigung sich so stark und positiv auswirkt gibt zu denken. Nur Selbständige entscheiden selbst über den Beruf, alle anderen sind dafür von der Zustimmung der Arbeitgeberinnen bzw Arbeitgeber abhängig. Offenkundig dürften diese in ganz erheblichem Umfang die beruflichen Potentiale ihrer eingewanderten und „zweite Generation“ Beschäftigten ungenutzt lassen mit allen Folgen, die das haben kann.

### Erfahrung in der Firma, am Arbeitsmarkt und im Land wirken sich selten positiv auf den Beruf aus

Die Beschäftigungsdauer beim aktuellen Arbeitgeber bzw in der aktuellen selbständigen Tätigkeit steht nur bei Beschäftigten mit im Land geborenen Eltern in einem nachweislich positiven Zusammenhang mit der Nutzung der Bildung. Je bildungsintensiver die Tätigkeit desto länger sind sie beim aktuellen Arbeitgeber. Das trifft zum Teil auch auf eingewanderte Beschäftigte zu, nicht aber auf jene aus Serbien oder der Türkei.

Die seit dem höchsten Bildungsabschluss verstrichene Zeit wirkt sich tendenziell negativ auf den Beruf aus. Sichtbar ist das in Österreich vor allem bei den Frauen mit Bildung aus Serbien und aus den neueren EU Mitgliedsländern, in Deutschland bei den Frauen mit Eltern aus der Türkei sowie bei beiden Geschlechtern mit Eltern aus der Türkei und den neueren EU Mitgliedsländern.

Die Aufenthaltsdauer in Deutschland oder in Österreich hat keinen nennenswerten, meist auch keinen nachweisbaren Einfluss auf den Bildungsgehalt des Berufs.

### Weitere Variablen haben kaum Einfluss

Die Beschäftigtenzahl des Betriebs steht eher in Deutschland als in Österreich in Zusammenhang mit der Nutzung der Bildung der eingewanderten Beschäftigten oder der „zweiten Generation“. Die Wirkungen sind durchwegs schwach und häufig statistisch unsicher.

Das Alter hat nur selten einen erkennbaren Einfluss auf die berufliche Nutzung der Bildung, bei den Frauen noch weniger als bei den Männern.

Die Berücksichtigung weiterer Variablen, wie etwa Staatsbürgerschaft, die Einwanderungsfolge im Haushalt, die Zusammensetzung des Haushalts oder den Familienstand trägt nichts zur Erklärung des beruflichen Niveaus der Beschäftigten bei.

### Bei mehr als Grundbildung zwei bis drei Bildungsjahre Verlust durch Migration

Betrachtet man einen Einwanderer im Alter von 40 Jahren, ausgebildet in Serbien oder der Türkei, unselbständig beschäftigt, seit 10 Jahren bei der gleichen Firma mit heute 20 Beschäftigten, seit 15 Jahren im Land, so zeigt sich, dass er, wenn er mehr Bildung als neun Jahre hat, davon durch die Migration zwei bis drei Jahre verloren hat. Auch Einwanderinnen aus Serbien in Österreich

haben unter den gleichen Umständen etwa drei Jahre verloren, jene aus der Türkei aber nur auf dem Niveau von Matura oder Akademie etwa zwei Jahre.

### Schlussfolgerungen

Migration zwischen Deutschland und Österreich wirkt sich nicht in einem beruflichen Pönale aus. Auch die Migration von gering gebildeten Arbeitskräften aus anderen Staaten ist davon wenig bedroht. Bei mittel und höher gebildeten Einwanderinnen und Einwanderern mit Bildung von außerhalb der EU15 und EFTA Staaten gibt es offenbar Einflüsse, die gegen die adäquate berufliche Nutzung ihrer Bildung arbeiten. Das betrifft in geringerem Maß auch ihre Kinder, und unter ihnen vor allem die Frauen. Gleiche Ausbildung, aber schlechtere Noten, und unzulängliche Deutschbeherrschung werden häufig als Erklärungen angeboten. Man muss dem mit Skepsis begegnen. Forschungen der ILO und anderer in Europa zeigen deutlich, dass die Ausbildung und die perfekte Sprachbeherrschung nicht gewürdigt werden, wenn sie mit einem Hauch von Akzent verbunden sind oder auch nur mit einem Vornamen, der auf eine niedrigere soziale Schicht schließen lässt.

## 1. Introduction

### ***1.1 The dependence of the occupation on the education***

Globalization has been fostering the flow of capital and trade – and also of labour across borders. Therefore the portability of education and occupational training across national borders is of growing importance for the European Union and for each of its member countries. On the one hand this applies to migration within the EU and, on the other, to migration into the EU. If the EU economy wants to be efficient and competitive in the global market, the development of knowledge and skills of the Union's citizens together with the processes for educational recognition and transferability across national borders are factors of some importance.

The literature analysing these issues indicates that the portability of education is in fact limited. Borjas (1985, 1995) analysing the US labour market found that human capital of immigrants, measured in education and experience completed abroad is significantly less valued than human capital of natives. Friedberg (2000) studying immigration to Israel found that the portability of education varies significantly with its level. Whereas elementary school education is perfectly transferable no matter where it was completed, the case of high school education presents a completely different picture: the returns to postsecondary schooling vary greatly with the place of origin with domestic high schooling receiving the highest returns. Chiswick & Miller (2007) analysing the problem of over-education among immigrants in the US found that immigrants with much work experience in their country of origin are highly at risk to be employed in a job for which they are over-educated indicating the very low portability of education and work experience across borders.

Research on the mobility of education both within and into the EU is surprisingly scant but shows a similar picture. In the Danish labour market Nielsen (2007) found over-education to affect immigrants with studies from abroad more than natives and also more than immigrants who had studied in Denmark, clearly revealing that education is imperfectly portable across borders.

The focus of this paper is to explore the difference international migration makes for the distribution of occupational levels for any given level of education. In particular our research question is, what levels of employment and what kinds of occupations are the likely consequence of a particular level of education for

- a) non-migrants in the origin country,
- b) non-migrants in the receiving country, and
- c) migrants from the origin to the destination country.

Using the Labour Force Survey (LFS) we compare the occupational outcomes of a given level of education for migrants from Germany, Serbia, and Turkey to Austria, and from Austria, Serbia and Turkey to Germany with the outcomes for non-migrants in both the origin and the receiving countries.

In this way we will be able to compare the occupational outcomes in Serbia and in Austria for any level of Serbian education, likewise the occupational outcome for any Austrian education in Austria. The innovation of this paper is that this comparison of how migrants of a given education are being placed occupationally relative to non-migrants in the origin and in one or two receiving countries will enable us to assess the occupational risks and opportunities associated with migration.

## 2. Education and occupational levels

### 2.1 Occupational levels

In order to show in a simple way how much occupational attainments for any given level of education differ depending on where the education was obtained we rely on the hierarchical intent of the ten ISCO-88 and ISCO-08 major groups of occupations (see appendix A1). This is ISCO's one-digit level. It goes from political and economic leadership positions (value 1) via highly qualified occupations (value 2) all the way down to unskilled occupations (value 9). We leave out military occupations (value 0) and aggregate farm occupations (value 6) and semi-skilled occupations (value 8) with unskilled (value 9) into one group. This results in seven occupational levels (1 to 5, 7, and 6-8-9). ISCO is the ILO's International Standard Classification of Occupations.

### 2.2 Explanatory variables

#### Education

We distinguish three broad levels of education: up to 9 years of schooling, 10 to 14 years of schooling and training, 15 and more years roughly corresponding to ISCED levels 1 & 2, 3 & 4, and 5 & 6. Only the Austrian Labour Force Survey is ISCED coded while those of Germany, Serbia, and Turkey are not. The Austrian coding, moreover, maximizes, if not exaggerates the ISCED codes of the given educational certificates. Classifying education into the three categories of duration is a viable alternative and provides for sufficient comparability.

#### Sections of the population

In order to compare the explained share of the variance in Hauser-Warren scores and the slope on the personal education variable we run separate regressions for each sex and each of several populations.

Employed in Austria:

1. Austrian-educated with at least one parent born in Austria (AT in AT)
2. German-educated with both parents born outside Austria (DE in AT)
3. Serbian-educated with both parents born outside Austria (SC in AT)
4. Turkish-educated with both parents born outside Austria (TR in AT).

Employed in Germany:

5. German-educated with at least one parent born in Germany (DE in DE)
6. Austrian-educated with both parents born outside Germany (AT in DE)
7. Serbian-educated with both parents born outside Germany (SC in DE)
8. Turkish-educated with both parents born outside Germany (TR in DE).

Employed in Serbia:

9. Serbian-educated with at least one parent born in Serbia or elsewhere in the former Yugoslavia (RS in RS).

Employed in Turkey:

10. Turkish-educated with at least one parent born in Turkey (TR in TR).

The abbreviation SC indicates the inclusion of Kosovo, Montenegro, and Macedonia, while RS pertains to Serbia in its current borders not including Kosovo.

The populations are harder to identify in the German Labour Force Survey than in the Austrian because there is neither a direct question for the country of birth nor the parents' countries of birth.

## 2.3 Results

### Employment and occupation by education

We show, first, levels of employment versus non-employment, and, second, among the employed the outcome in terms of seven occupational levels. The latter we do in three separate ways. First we show the share of employment in the lowest of the seven occupational levels. Secondly, in order to compute an average occupational outcome for each level of education each of the seven occupational levels is attributed a corresponding number of required years of education and training (see the note on this below). The occupational outcome is then expressed as the average number of years of education and training that would have been required in order to reach it. This can contrast remarkably with actual education. There is a regression to the middle as those with the lowest level of education cannot be employed below their level but are in part employed above it while those with the highest levels of education cannot be employed above them but are in part employed below them. Finally, our third way of assessing the occupational outcomes is to use correlation analysis to quantify the differences in occupational attainment of the employed populations with the same level of education. We present a number of correlation coefficients and the corresponding r-squares. For each of the three levels of personal education they relate the distribution of employment across the seven ISCO levels of the ten populations to each other.

A note on the attribution of education years to occupational levels is required. We set 12.5 years for the leadership level because it is a mixed bag and most leadership positions in politics or business are not much dependent on education, 17 for the high skilled level because access to most positions is dependent on high formal educational requirements, 13 for the technical level, 11.5 for the clerical level, 10.5 for the sales level, 10 for the skilled manual level, 9 for the unskilled level, and zero for non-employment. Changing these education weights within the bounds of reason makes little difference for the results and in particular does not change their core message at all. An alternative we considered was to use the actual average native education of the seven occupational levels. We dropped it because of its serious drawbacks. It results in the upper occupational levels getting downweighted and the lower levels upweighted by the limits on the range of education possibilities. It would also, at least implicitly, have amounted to attributing a weight other than zero to non-employment. Moreover this weight would have been larger than those for the lowest occupational levels because the non-employed have all sorts of education. Finally, the education weights from the procedure would not have changed the results.

### Emigration from Serbia

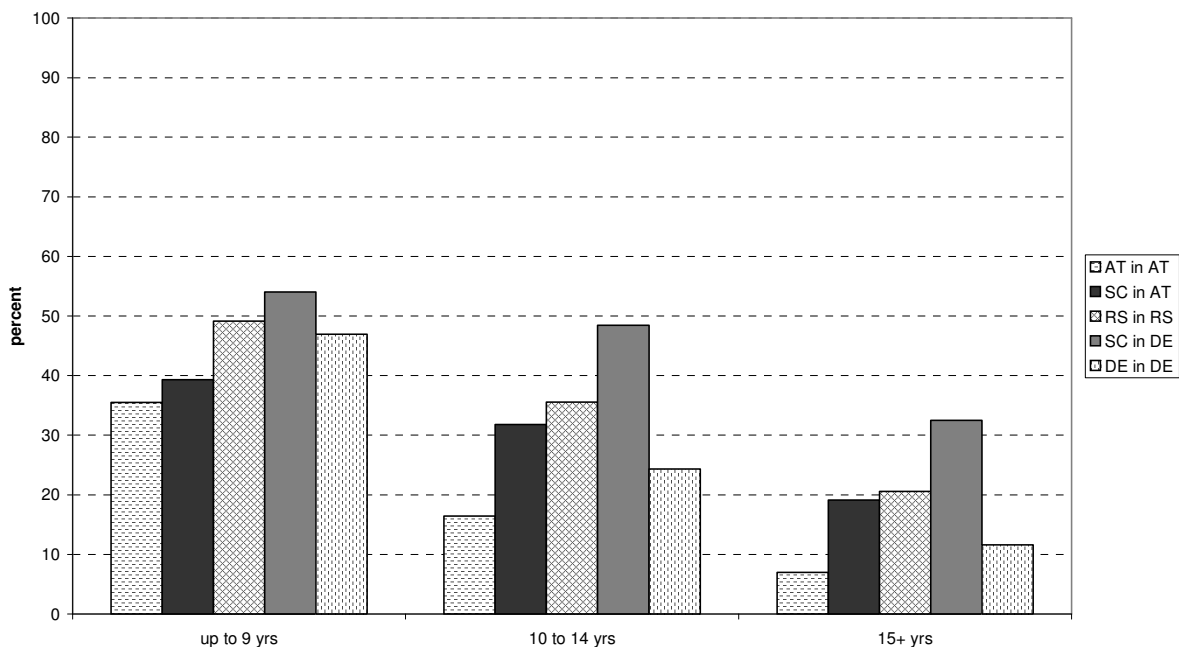
At all levels of education emigrants from Serbia living in Germany are particularly prone not to be employed. Of the low-educated that are of working age and not in formal education 54±6% are not employed and only 46±6% are employed. Likewise, at a middle level of education 48±6% and with higher education 32±20% are not employed. The comparable figures of non-employment in Austria are 39±5%, 32±5%, and 19±21%. As can be seen, the number of respondents with higher education is so low in both countries that serious statistical trouble arises. Nonetheless it is evident that at all three levels of education the employment rate in Austria is about 15 percentage points greater than in Germany. In Austria the employment rate of the Serbian-educated with middle level education is approximately the same as the employment rate of non-migrants with low education. The same is also true in Germany. The employment rates of migrants with high education are sta-



tistically speaking too uncertain to tell but the signs are that both in Austria and in Germany they are no better than those of non-migrants with middle education. The pattern appears to be that in terms of employability migrants from Serbia lose one notch on the three-part education scale.

Strikingly, with low education the chances of employment of post-education emigrants from Serbia are not much lower than for natives of the destination country while with middle or higher education they definitely are. With middle education 16±0% of the natives of Austria are not in employment but 32±5% of the immigrants from Serbia. This is double the rate of the natives. The same obtains in Germany where it is 24±0% versus 48±6%. With higher education the multiple gets larger. In Austria the non-employment rates are 7±1% versus 19±21%, and in Germany 12±0% versus 32±20%. Non-employment of immigrants from Serbia approaches three times the level among natives.

The share of the non-employed in the working age population that is not in formal education



Computed from the Austrian, German, and Serbian Labour Force Surveys.

The share of the non-employed in the working age population that is not in formal education by level of education, country of education, and country of residence

	Share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	36	16	7	1	0	1
SC in AT	39	32	19	5	5	21
RS in RS	49	36	21	1	1	1
SC in DE	54	48	32	6	6	20
DE in DE	47	24	12	1	0	0

Computed from the Austrian Labour Force Survey (Statistics Austria), Serbian Labour Force Survey (Republic Office of Statistics), and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

In comparison to non-migrants in Serbia the employment chances of migrants are better in Austria and poorer in Germany. In both countries the low educated benefit more or suffer less than the middle and the highly educated.

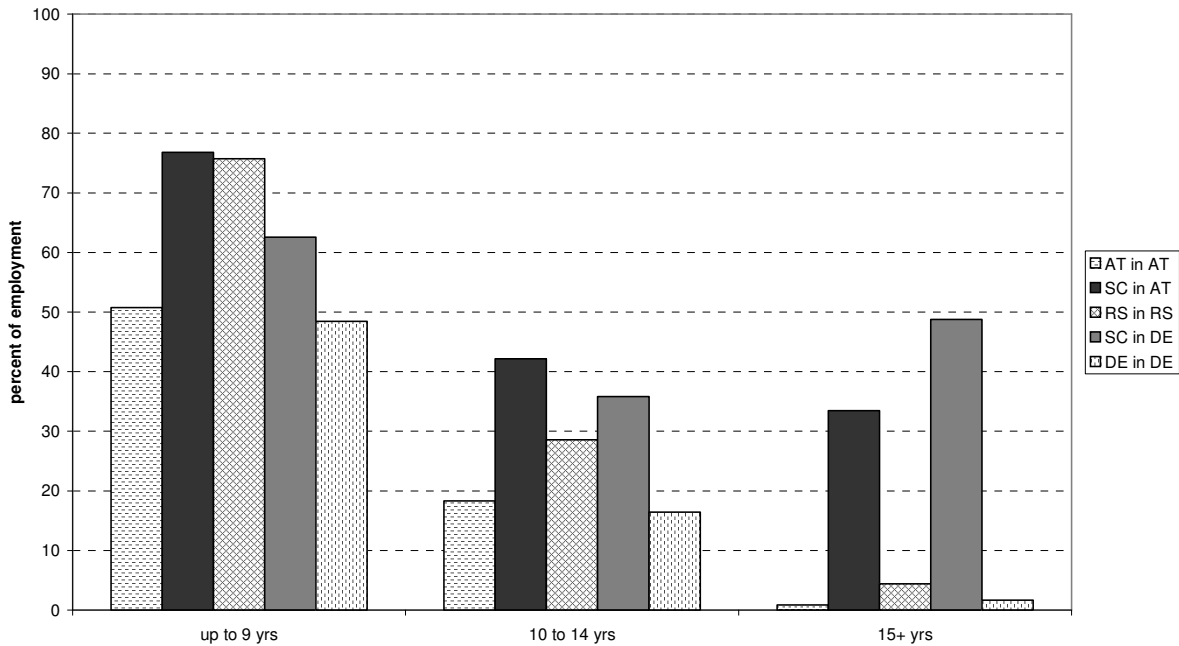
We now turn to the occupations of the employed. First we look at the risk of being employed in unskilled occupations. The first thing to note is that it is much greater for non-migrants in Serbia than in the other two countries. This is true at all three levels of education. The second thing to note is that the risk is still greater for emigrants from Serbia. This is true especially for the middle and the higher levels of education.

In Germany and in Austria only roughly half the workers with low education are employed in unskilled occupations. The other half is in skilled occupations. In Serbia employment in unskilled occupations is true of roughly three quarters of the workers with low education. Low educated emigrants from Serbia employed in Austria are also three quarters in unskilled occupations ( $76\pm 6\%$ ) while the same is true of only five eighths ( $63\pm 9\%$ ) in Germany. This is, respectively, 26 and 15 percentage points more than the non-migrants in the two countries. Both of these gaps are statistically significant well above the 95 percent level of certainty. In comparison to Serbia emigration to Germany on the one hand involves a greater risk of unemployment for the low educated but has on the other hand resulted in less unskilled employment. The difference is large enough to be statistically significant at above 95 percent certainty. In Austria the reverse is true. The employment chances of the low educated migrants have been better than in Serbia but the risk of employment in unskilled occupations has also been greater.

No such apparent trade offs exist at the middle and higher level of education. In Germany and in Austria about one sixth of the employment of non-migrants with middle education has been resulting in unskilled occupations. The same is true of about 29 percent in Serbia. However, of the employed migrants with middle level education  $36\pm 8\%$  are in unskilled occupations in Germany and  $42\pm 7\%$  in Austria. The gap is 20 and 24 percentage points, respectively, large enough to be statistically significant. The 7 percentage point gap between migrants in Germany and non-migrants in Serbia is not statistically significant, while the analogous 13 percentage points in Austria are. With higher education  $49\pm 26\%$  of the employed migrants are in unskilled occupations in Germany and  $33\pm 28\%$  in Austria. Due to the large statistical uncertainty the gap cannot be stated precisely, though obviously it is in the range of 30 to 50 percentage points, i.e. very large indeed. There clearly is no tendency for the gap to narrow as education increases. The middle educated do run a smaller risk than the low educated migrants to be employed in low skill occupations but the difference between them and the non-migrants remains fixed or may even increase.



Employment share in low-skill occupations



Computed from the Austrian, German, and Serbian Labour Force Surveys.

The share of employment in ISCO major groups 6, 8, and 9 (percent of employment) by level of education, country of education, and country of residence

	share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	51	18	1	2	0	0
SC in AT	77	42	33	6	7	28
RS in RS	76	29	4	2	1	1
SC in DE	63	36	49	9	8	26
DE in DE	48	16	2	1	0	0

Computed from the Austrian Labour Force Survey (Statistics Austria), Serbian Labour Force Survey (Republic Office of Statistics), and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

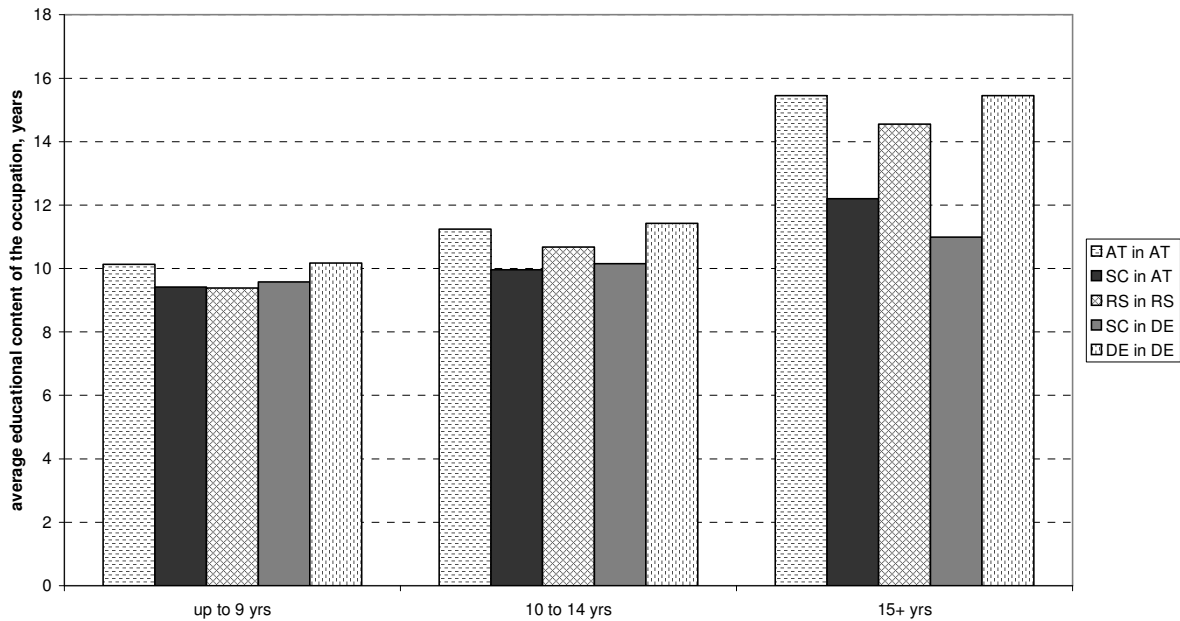
If the entire distribution across skill levels is taken into account rather than merely the share in the lowest skill layer the picture that emerges is not quite as stark, although the migrants' average occupation does clearly have less educational content than the non-migrants'.

The difference is not great for employees with little education. The jobs of low educated migrants from Serbia in Austria on average demand 9.4 years of education and in Germany 9.6 years. This compares with 9.4 years for the jobs of non-migrants in Serbia, and 10.1 or 10.2 years for non-migrants in both Austria and Germany. The difference between migrants and non-migrants is 0.8 years or less.

Workers from Serbia with middle education are on average employed in jobs demanding 10.0 years in Austria, and 10.2 years in Germany. The jobs of equally educated non-migrants demand between 11.2 and 11.4 years of education and 10.7 years in Serbia. The difference is now 1.4 years or less.

Migrants with higher education in Germany work in jobs that on average demand 11.0 years of education, and in Austria 12.2 years, while non-migrants' jobs in both countries demand 15.5 years and 14.5 year in Serbia. The difference is between 3.4 and 4.6 years of education or training, which is substantial indeed (but statistically uncertain). Clearly, the higher the education of migrants from Serbia the more of it, on average, they lose in the process of migrating.

Educational level and average educational content of the occupation, migration from Serbia to Austria and Germany



Computed from the Austrian, German, and Serbian Labour Force Surveys.

Another way of looking at the entire distribution of employment across occupational levels is to correlate the distribution of one population with the distribution of another population. Given that we are correlating across no more than seven occupational levels it takes fairly large correlations in order to attain statistical significance at the 95 percent level. Correlation coefficients below 0.76 and r-squares below 0.57 cannot safely be regarded as different from zero. On the other hand, if we were totally naïve, we would expect coefficients considerably larger than that only. The main drawback of a correlation analysis is that it merely shows similarity and dissimilarity but not which of two dissimilar populations is better of. For this we have to go back to the analysis above.

The correlation analysis shows once again that with low education migrating or not migrating makes little difference in terms of occupational levels. For all five correlations between the occupational distributions between migrants in Germany, migrants in Austria, and non-migrants in the origin and the destination countries the r-squares are between 0.96 and 0.99. In other words, staying or migrating does not really matter for the occupational outcome.

The picture changes at the middle level of education. There is identity between the occupational distribution of the emigrants to Austria and to Germany (r-square = .99), and there is considerable similarity between the occupational distribution in Serbia and among emigrants from Serbia (r-squares are .77 and .76), but there is very little similarity, if any, between the occupational distribution of migrants from Serbia and non-migrants in Austria and in Germany (both r-squares are 0.14). Instead the occupational distribution of the middle educated migrants from Serbia correlates to a

noticeable degree with that of the low educated non-migrants in Austria and in Germany (r-squares are .62 and .70, respectively).

The occupations of highly educated migrants from Serbia to Austria and to Germany are similarly distributed (r-square of .70) but not as closely similar as at middle or low levels of education. Otherwise there are no correlations. The r-squares of the correlations between the occupational distribution of the migrants in Germany and the non-migrants in both Serbia and Germany are zero. In Austria they are .15 and .12 which is hardly better. However, as with the middle educated migrants, there is more similarity to the occupational distribution of the low educated migrants. The r-square is .73 in Germany and .33 in Austria. There is no correlation with the middle educated non-migrants.

Correlations between the percentage distributions of migrant and non-migrant employment across ISCO-88 major groups (with major groups 6, 8, and 9 aggregated into one) by level of education, country of education, and country of residence

	correlations (r)			r-square		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
RS in RS with SC in AT	0.99	0.87	0.39	0.99	0.77	0.15
RS in RS with SC in DE	0.98	0.87	-0.05	0.97	0.76	0.00
SC in AT with SC in DE	0.97	0.99	0.84	0.95	0.98	0.70
AT in AT with SC in AT	0.96	0.38	0.35	0.92	0.14	0.12
DE in DE with SC in DE	0.97	0.37	-0.02	0.95	0.14	0.00

Computed from the Austrian Labour Force Survey (Statistics Austria), Serbian Labour Force Survey (Republic Office of Statistics), and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

Other analyses could be added, including, for instance, skewness and kurtosis of the occupational distributions, but would only underline the results obtained so far.

Overall these results show, firstly, migrants from Serbia to have relatively poor employment chances in Germany in comparison to equally educated non-migrants in both Germany and Serbia. In Austria they are also poorer than those of non-migrants but better than those of non-migrants in Serbia. Notably, the occupational gap between receiving country non-migrants and immigrants is wider if the education is greater. While more education is clearly beneficial for employment chances, this is considerably more true for the non-migrants than for immigrants from Serbia. Secondly, the more education migrants bring from Serbia the less of it are they on average able to make use of in employment. Even the highly educated have a high risk of being employed in unskilled occupations. While more education does have occupational benefits the gap between migrants and non-migrants is minimal at low education and widens through middle and higher education. The occupational distributions of the middle and highly educated migrants from Serbia resemble far more those of low educated than of equally educated non-migrants, especially in Germany. Any education beyond the basics obviously suffers a large discount and the discount is greater for higher education. All in all, therefore, in occupational terms migration to Germany and to Austria is a sensible strategy for the low-educated but not for the middle or highly educated.

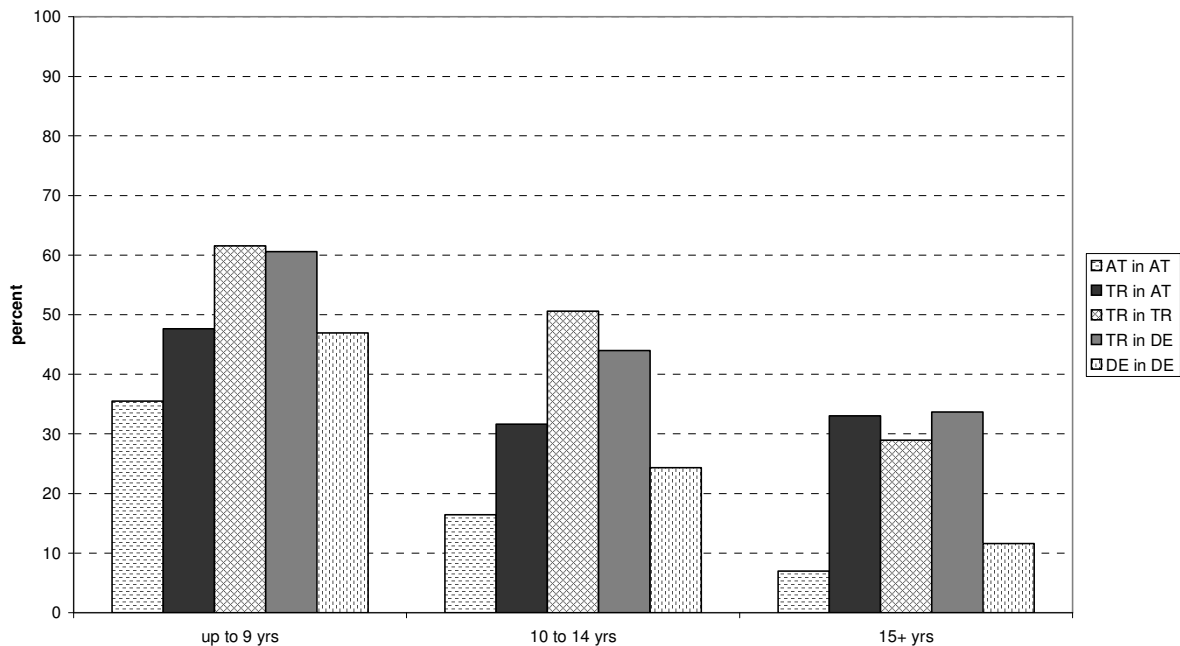
We will leave open for the moment the question how much these results depend on the duration of stay, on age, and on gender. We will return to this in the next chapter where the occupational outcomes are modelled for individuals using a more comprehensive set of variables.

### Emigration from Turkey

The results for emigration from Turkey largely resemble the Serbian ones. They corroborate the findings of the previous section.

Non-employment of migrants with low education from Turkey stands at 48±4% in Austria and at 61±2% in Germany. This is larger than observed among migrants from Serbia and is focused on the women. The 32±7% and 44±4% at a middle level of education and the 33±21% and 34±11% at a higher level of education are similar to the outcome for the migrants from Serbia. The contrasts with the non-migrants are therefore basically the same.

The share of the non-employed in the working age population that is not in formal education



Computed from the Austrian Labour Force Survey (Statistics Austria), the German Labour Force Survey, and data provided by Turkstat.

The share of the non-employed in the working age population that is not in formal education by level of education, country of education, and country of residence

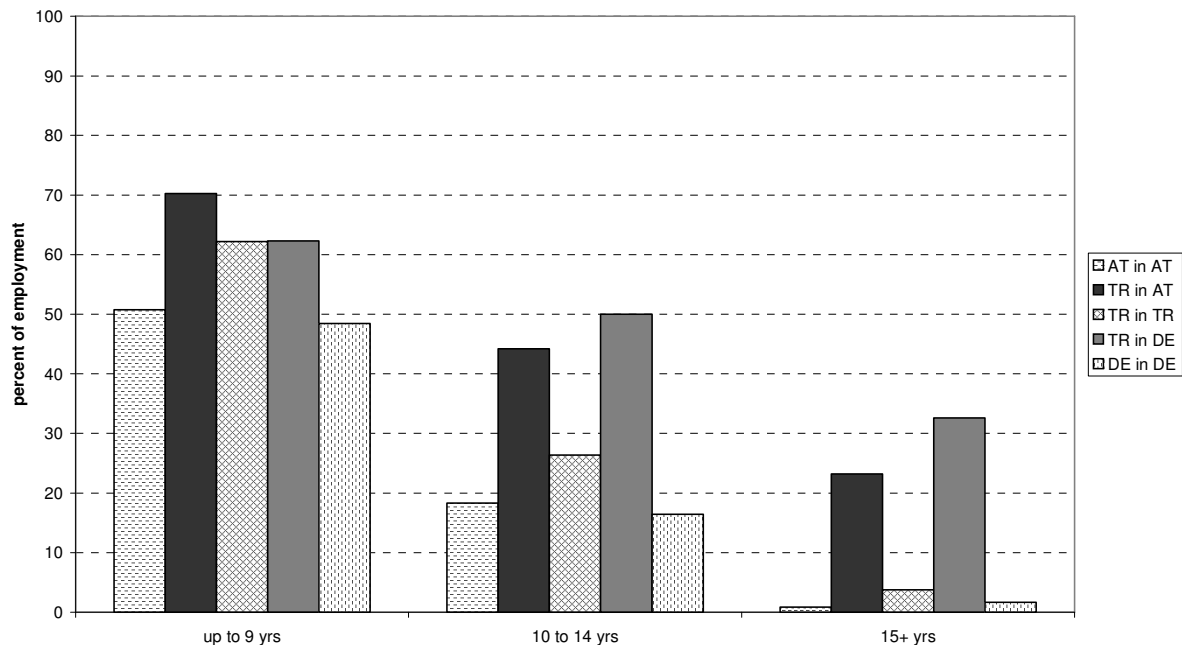
	Share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	36	16	7	1	0	1
TR in AT	48	32	33	4	7	21
TR in TR						
TR in DE	61	44	34	2	4	11
DE in DE	47	24	12	1	0	0

Computed from the Austrian Labour Force Survey (Statistics Austria), aggregate data provided by Turkstat and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

The share of employment in unskilled occupations in Austria is 70±4% with low education, 44±9% with middle education, and 23±22% with high education. This is in line with the results for the migrants from Serbia. In Germany the respective observations are 62±3%, 50±6%, and 33±13%. At middle level this is more than the 36±8% result for migrants from Serbia. Occupational outcomes in Turkey are also similar to Serbia. The 62% unskilled occupations among the low educated employees is somewhat lower than the 70% in Serbia while the 26% at middle level compare with 29% and the 4% at higher level are identical with Serbia. Given similar conditions in the origin country results in each destination country also appear to be similar. It would be helpful to have

data from a migrant origin country with substantially different conditions in order to see if the outcome in each destination country would still remain the same.

Employment share in low-skill occupations



Computed from the Austrian Labour Force Survey (Statistics Austria), the German Labour Force Survey, and data provided by Turkstat.

The share of employment in ISCO major groups 6, 8, and 9 (percent of employment) by level of education, country of education, and country of residence

	share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	51	18	1	2	0	0
TR in AT	70	44	23	4	9	22
TR in TR	62	26	4	1	1	1
TR in DE	62	50	33	3	6	13
DE in DE	48	16	2	1	0	0

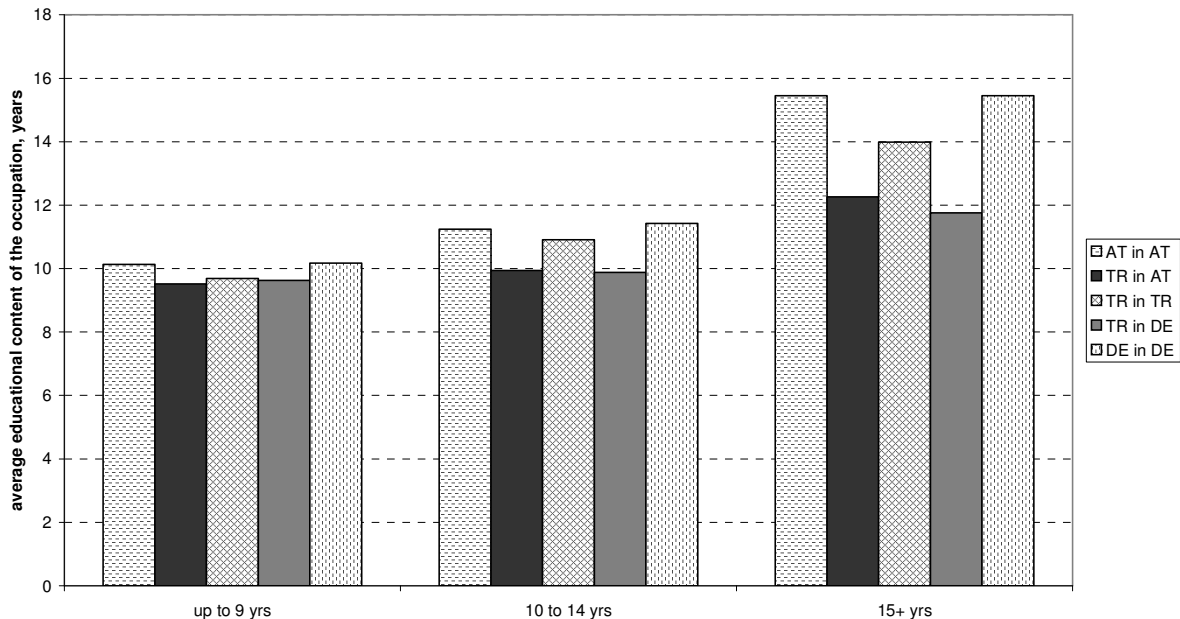
Computed from the Austrian Labour Force Survey (Statistics Austria), aggregate data provided by Turkstat and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

The average educational content of the jobs held by migrants from Turkey with low education in Austria and in Germany is 9.5 and 9.6 years and practically identical with the jobs of migrants from Serbia and non-migrants in all four countries.

With middle level education non-migrants in Turkey, Austria, and Germany on average hold jobs requiring between 10.9 and 11.4 years of education or training. Equally educated migrants from Turkey achieve only 9.9 years in both Germany and Austria. Statistics permitting, this contrasts with the migrants from Serbia who came from a country with currently only 9.7 years required for the average job of a worker with middle level education but in Austria and Germany hold jobs requiring 10.0 and 10.2 years.

With higher education the average job in Turkey requires 14.0 years of education (14.5 in Serbia, 15.5 in both Germany and Austria) while migrants achieve jobs averaging 12.3 years in Austria and 11.8 years in Germany (migrants from Serbia: 12.2 and 11.0 years). The statistical uncertainties here are large.

Educational level and average educational content of the occupation, migration from Turkey to Germany and Austria



Computed from the Austrian Labour Force Survey (Statistics Austria), the German Labour Force Survey, and data provided by Turkstat.

At the lower level of education emigrating to Germany or Austria or staying in Turkey produced virtually identical occupational outcomes (all three r-squares are .99). There is also very close similarity to the outcomes of the non-migrants in Germany (.97) but less so with those of non-migrants in Austria where it is also less pronounced than for the Serbian emigrants (r-square of .86 instead of .92).

At middle level the occupational distribution attained by migrants in Germany is similar to that in Austria (r-square .95). The outcome for migrants in Austria and Germany is weakly related to the outcomes of non-migrants in Turkey (.60 and .50) and not at all to those of equally educated non-migrants in Austria and Germany (.06 both times). At the same time there is a significant correlation with the occupational distribution of the low educated non-migrants with r-square being .90 in Germany and .59 in Austria.

Not much can be said about correlations at the high level of education because the sample size is too small. The signs are that there is no similarity either between the migrants in Germany and in Austria or with any of the equally educated non-migrant populations. If there is any correlation in Germany it is with the occupational distribution of the low educated non-migrants (r-square is .60).

Correlations between the percentage distributions of migrant and non-migrant employment across ISCO-88 major groups (with major groups 6, 8, and 9 aggregated into one) by level of education, country of education, and country of residence

	correlations (r)			r-square		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
TR in TR with TR in AT	0.99	0.71	0.29	0.99	0.50	0.08
TR in TR with TR in DE	1.00	0.78	0.04	0.99	0.60	0.00
TR in AT with TR in DE	0.99	0.98	0.39	0.99	0.95	0.15
AT in AT with TR in AT	0.93	0.24	0.39	0.86	0.06	0.15
DE in DE with TR in DE	0.98	0.25	0.17	0.97	0.06	0.03

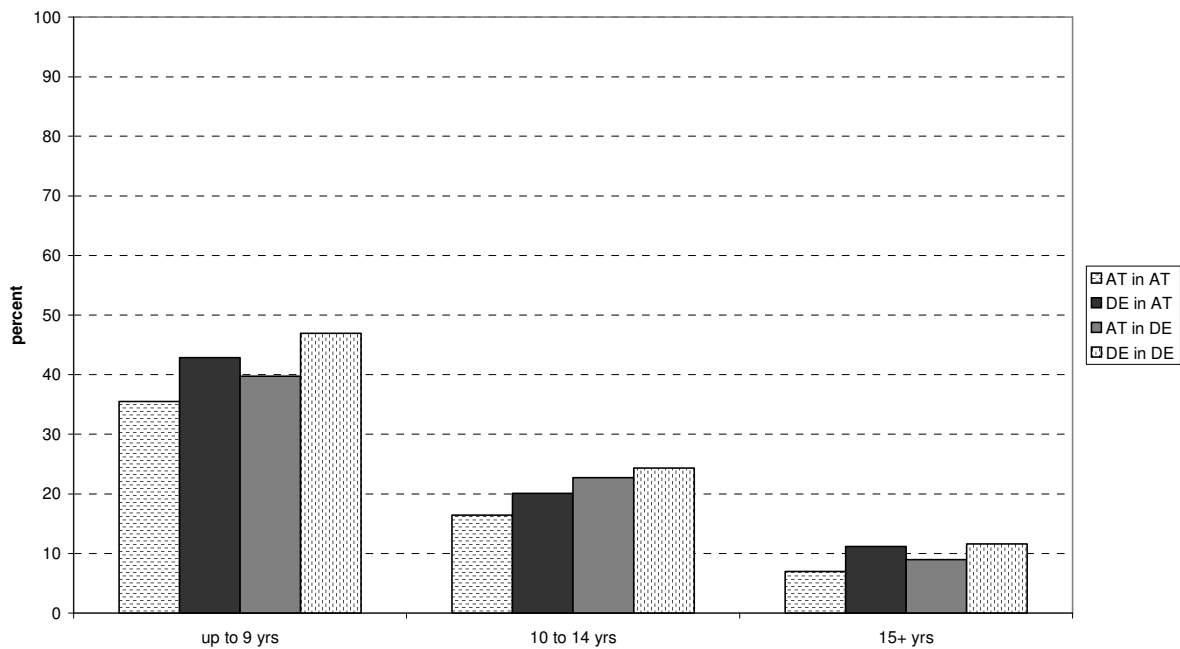
Computed from the Austrian Labour Force Survey (Statistics Austria), aggregate data provided by Turkstat and from aggregate data from the German Labour Force Survey provided by Holger Seibert (IAB Berlin).

All in all the occupational results of migration from Turkey have been very similar to those of the migration from Serbia. In neither case is there a pronounced difference between Germany and Austria. In both countries there is a consistent pattern of employing migrants from Serbia and from Turkey as if they were low educated regardless of their actual education and training. Migration to both countries makes some sense with low education but little with middle or higher education, unless it were for non-occupational reasons.

### Migration between Austria and Germany

Post-education migrants from Austria to Germany and from Germany to Austria have very similar levels of non-employment. With low education it is about 40% but with large statistical uncertainty. With middle level education 20% to 25% are non-employed and with high education around 10 percent. All of these are similar to non-employment prevailing among the non-migrants with the same level of education. In comparison to migrants from Serbia and Turkey the non-employment of the low educated is similar, but among the middle and highly educated it is far lower.

The share of the non-employed in the working age population that is not in formal education



Computed from the Austrian and the German Labour Force Surveys.

The share of the non-employed in the working age population that is not in formal education by level of education, country of education, and country of residence

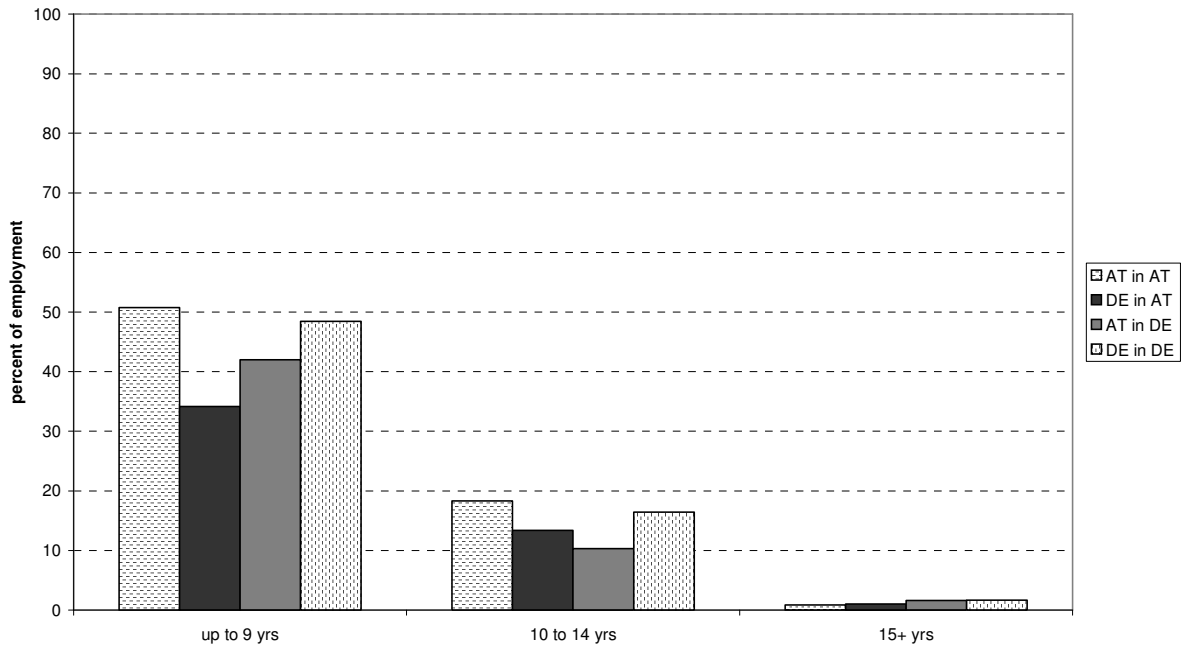
	share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	36	16	7	1	0	1
DE in AT	43	20	11	13	4	5
AT in DE	40	23	9	14	5	8
DE in DE	47	24	12	1	0	0

Computed from the Austrian Labour Force Survey (Statistics Austria) and from aggregate data from the German LFS provided by Holger Seibert (IAB Berlin).

There are signs that the risk of employment being in unskilled jobs is lower for low educated migrants than for low educated non-migrants but statistically this is far from certain. At middle level, however, there is a very large degree of certainty that migrants are in fact less likely to be employed in unskilled jobs than non-migrants in either the origin or the destination country. Among the highly educated unskilled jobs are rare regardless of whether they migrated or not.



Employment share in low-skill occupations



Computed from the Austrian and the German Labour Force Surveys.

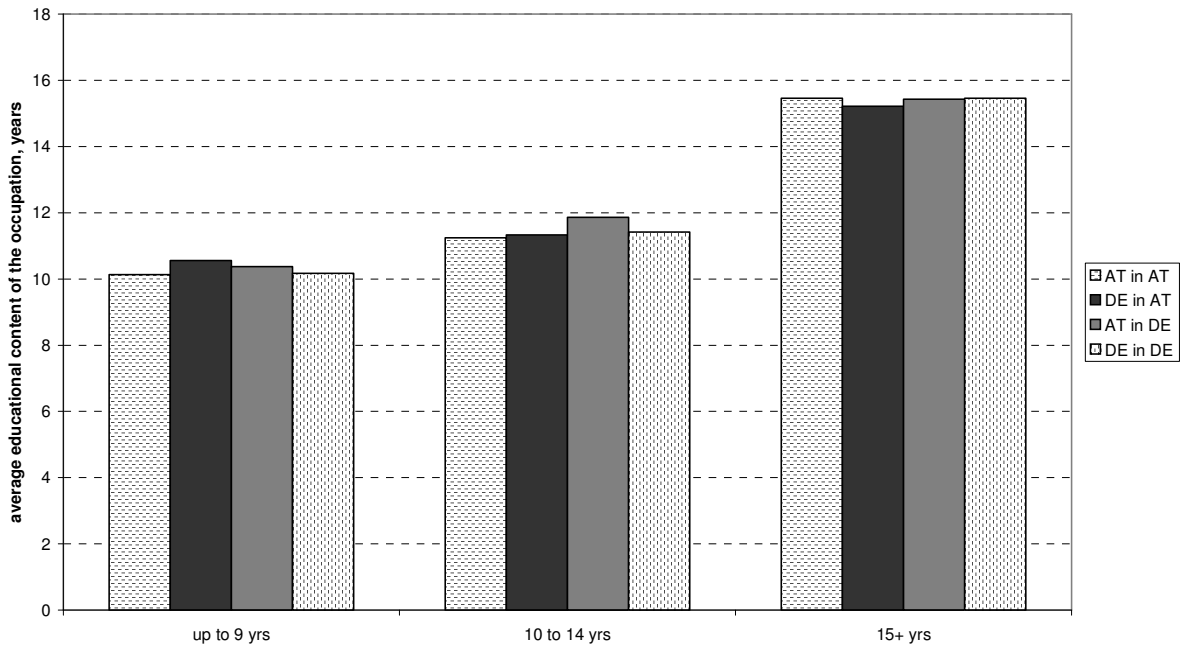
The share of employment in ISCO major groups 6, 8, and 9 (percent of employment) by level of education, country of education, and country of residence

	share			+/-		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT	51	18	1	2	0	0
DE in AT	34	13	1	17	4	2
AT in DE	42	10	2	18	5	4
DE in DE	48	16	2	1	0	0

Computed from the Austrian Labour Force Survey (Statistics Austria) and from aggregate data from the German LFS provided by Holger Seibert (IAB Berlin).

The pattern that prevailed in the employment of post-education migrants from Serbia and Turkey does not appear in the employment of migrants between Austria and Germany. At each of the three educational levels differences in occupational outcome between migrants and non-migrants are tiny. If anything, migrants with low education may be doing a shade better than natives, and at middle and higher levels of education emigrants from Austria may be doing a shade better than emigrants from Germany. Noticeable migration from Germany to Austria is a more recent phenomenon than from Austria to Germany. If occupationally successful migrants have better chances and also a greater incentive to stay longer, while the less successful may tend to return, whether voluntarily or not, the selection process would have had more time to play out among the emigrants from Austria than among those from Germany.

Educational level and average educational content of the occupation, Germany and Austria



Computed from the Austrian and the German Labour Force Surveys.

In sharp contrast to Serbia and Turkey migration between Austria and Germany has resulted in very high positive correlations with the occupational outcomes of non-migrants for the highly educated, considerable ones for the low educated and poorer ones for the middle educated.

- R-squares for the correlations between the occupational outcomes of the highly educated migrants in both countries with the highly educated migrants in both origin and destination country are all between .97 and .98, i.e. near perfect.
- At middle level the occupational outcomes of emigrants from Germany correlate reasonably well with those of non-migrants in both Germany and Austria. The r-squares are .70 and .71, respectively. The same is not true for emigrants from Austria where r-squares are a feeble .47 and .37. The middle-educated emigrants from Austria that remained in Germany are unusually well placed in their occupations. Nearly one quarter is in leadership (ISCO major group 1) or in highly qualified (ISCO major group 2) occupations and another quarter at a skilled technical level (ISCO major group 3).
- The occupational distributions of low level migrants and non-migrants correlate with r-squares ranging between .67 and .83. Both emigrants from Austria and from Germany find their occupations more closely aligned with non-migrants in Austria than with non-migrants in Germany. This could be mere coincidence.

Correlations between the percentage distributions of migrants and non-migrants across ISCO-88 major groups (with major groups 6, 8, and 9 aggregated into one) by level of education, country of education, and country of residence

	correlations (r)			r-square		
	up to 9 yrs	10-14 yrs	15+ yrs	up to 9 yrs	10-14 yrs	15+ yrs
AT in AT with DE in AT	0.88	0.84	0.98	0.77	0.70	0.97
AT in AT with AT in DE	0.91	0.61	0.99	0.83	0.37	0.98
DE in DE with DE in AT	0.82	0.84	0.98	0.67	0.71	0.97
DE in DE with AT in DE	0.83	0.69	0.99	0.69	0.47	0.98

Computed from the Austrian Labour Force Survey (Statistics Austria) and from aggregate data from the German LFS provided by Holger Seibert (IAB Berlin).

## Summary

The chapter served to pinpoint the issues and to clarify the questions to be posed in the individual level analysis in the next chapter. The main message is quite clear. The comparison between emigrants from Serbia and from Turkey with non-migrants shows an employment disadvantage but no occupational disadvantage for those with low education. At the middle and the higher level of education the comparison is far more unfavourable. Grave occupational disadvantages are plainly visible. The same is not true for migrants between Austria and Germany. On the contrary, they tend to be better placed in the labour market than natives in either of the countries. Obviously there is a disconnect between the educational and occupational attainments of migrants from some countries more than from others. To quantify its size is one of the aims of the next chapter.

Williams & Baláž (2005) suggest the occupational downward mobility while abroad may be learning cost incurred knowingly that pays an occupational dividend after return. They studied a non-random sample of returnees from the UK to Slovakia. Their sojourn had, however, only lasted a few months or a year. This is a category of migrant the Labour Force Survey is very unlikely to capture at all. Our results pertain to migrants with a settled presence in the country of residence. Although they may still harbour the desire to return to the country or the town in which they grew up, they are in reality unlikely to do so. Whatever benefit they wish to draw from their migration has to be realized in the country they migrated to. At the same time it is also the society in which they now live, and not the one they would return to, if they did, that cannot afford to keep postponing the day when it will make an effort to raise the potential migrants brought to it, or to acknowledge the benefit it has drawn from the immigration.

We left open the question how much the results depend on the experience of migrants in the country of residence, in the labour market, and in the current occupation, and how much they might depend on age and gender. Also at issue is the influence employers have on occupational outcomes. All of this the next chapter is meant to address. There the occupational outcomes are modelled for individuals using a more comprehensive set of variables.

Obviously the elephant in the room is language. The results so far invite the hypothesis that migrants between Austria and Germany do well because they are not crossing a language border while migrants from Serbia and Turkey to Germany or to Austria did. We have no way of testing this hypothesis because there is no information on German capability in the Labour Force Survey. It may be tempting to assume that duration of residence in the country could proxy for German skills and should therefore have a beneficial impact on the connection between education and occupation at the individual level. One might also argue that the duration of labour market experience, and the duration of employment in the current job would hone specific language skills that might enable occupational upgrading. This we can test. There are results from other research leading us to expect only minor if any occupational benefits from experience. In a ring of countries around southern, western and northern Europe considerable percentages of employers have been

shown to be sensitive to even a minute migration-related accent (Allasino et al 2004; Colectivo IOE / Pérez Molina 1996; Fibbi et al 2003; Arriijn et al 1998; Bovenkerk et al 1995; Hjarnø/Jensen 1997) or even to first names (Attström 2007; Cediey/Foroni 2007). There is uncertainty if this is a special migration sensitivity or rather a social one. Sinnreich (2007) made a small experiment in Vienna indicating that first names are read as signalling social class, and that employers tend to avoid otherwise perfectly equal applicants with names to which they attribute lower class origins. Kube (2009) showed the same behaviour to exist among teachers in Germany. Consequently, we need to be careful not to confuse the use the migrants make of German with the use the employers (or others in the receiving society) make of the migrants' German or their names. This needs to inform our interpretation of the data. Unfortunately, given the data at hand, there is no way in which it could enter into the construction of the model.

### **3. Modelling occupational outcomes at the micro-level**

#### ***3.1 The basic modelling strategy***

In the switch from analysis at the aggregate to the individual level we will also change strategy. Continuation with a dependent variable consisting of seven more or less ordinal categories would have implied the choice of a multinomial or an ordered logit model. Instead we will here be employing a time-honoured technique of interval-scaling occupations. This will be much more finely grained than the seven categories as we will be able to make use of the three-digit ISCO coding of occupations in both the Austrian and the German Labour Force Survey and the four-digit coding in the Serbian LFS. Only the Turkish LFS does not offer this facility and will need to be excluded from the further analysis. This switch will allow us to use OLS regression the results from which can be interpreted more straightforwardly.

Our basic modelling strategy was to find a measure of the educational content of jobs and to see how well the personal education of the employed matched with it. The chief measure for this match is the R-square as obtained from an OLS regression. The utterly naïve expectation would have been to find a nearly perfect consonance of the two education variables, i.e. an R-square approaching unity. Partly for methodological and partly for labour market reasons the match must be expected to be less than perfect. Methodologically, because occupations tend towards idiosyncrasy, any coding of occupations must always be expected to be imperfect. This can be evaded, as in the current research, by coding individual occupations into larger categories. The consequence is a loss of precision in the measure of educational content as it averages across all the occupations in a category. The broader the categories the greater the imprecision. R-square will also be less than unity because the quality and availability of education varies so that seemingly identical educational outcomes are not transposed identically in the labour market. Further, because demand in the labour market varies identical education does not at all times result in the same occupations.

In as far as the naïve expectation turns out not to be true we try to find variables that can account for the gap. They will partly be connected with the individual employee, partly with the enterprise or the establishment, partly with time and place, partly with the workings of the labour market as provided for by law and custom, and partly with the characteristics and quantities of jobs available in the given economy.

Our micro-level analysis is restricted to the employed including the self-employed.

All regressions were computed separately with and without population weights. We report the results from the weighted data. At times we refer to significance levels obtained from the unweighted data. The results from the unweighted data can be found in appendix A4.

### 3.2 The dependent variable

Our approach requires of the dependent variable to be some kind of measure of the appropriate education for a given occupation. This measure should preferably be interval scaled.

Much of the existing literature uses either occupational earnings (Nielsen 2008; Messinis 2008; Chiswick/Miller 2009) or occupational prestige as the preferred measure of occupational success. These approaches allow for the estimation of the monetary or prestige returns to education. Our interest, however, is in the differential utilisation of education. This is best done by relating the education of a given work force to the educational requirements of the occupations they work in.

Although the long-running debate about how to measure or at least to rank occupations does not really concern us here, we will briefly rehearse some of its main lines of argument:

- Firstly, although researchers have to rely on retrospective questions to obtain descriptive data on occupations, people are willing to answer these questions and provide the researcher with reliable and valid information. In addition, it is possible to confidently trace occupational trajectories across the adult years. The same cannot be said of earnings. Questions concerning the amount of personal or household income often provoke non-response, as people do not want to share any information on their earnings. Research shows that the validity of income data is questionable. Low-income people tend to inflate their income, whereas high-income people tend to understatement. Furthermore the quality of information on earnings has the tendency to decay with time – as people do not remember how much they have been earning some years ago. In summary, the measurement of jobs and occupations does not entail the same problems of refusal, recall, reliability, and stability as occur in the measurement of income or wealth (Hauser/Warren 1997: 179, 198).
- Secondly, occupations determine an individual's life chances to a large part. Occupations reveal how individuals spend much of their time and under which circumstances. When using data on employment we get information on specific professional and social skills that people bring to the labour market. For people who currently do not work, information on past jobs or jobs held by other family members tell us about a person's economic and social standing.

It is likely that earnings are correlated with occupational choices and socioeconomic standing. But given the fact that occupations entail more reliable information and provide us with a more complete picture of the social and economic standing of individuals we decided to map jobs into a scale that allows us to rank them according to the average percentage of people who hold a university entrance diploma or higher. This way of transforming the nominal variable "occupation" into a metric scale was first suggested by Hauser & Warren (1997). They criticized the utilization of composite indices, such as the US Socio-Economic Index (SEI), first developed in the 1960s (Duncan 1961), or the International Socio-Economic Index (ISEI) developed in the 1980s (Ganzeboom et al 1992), as scientifically obsolete, since they combine two or more dimensions that measure different things and therefore necessarily hide more than they reveal (Hauser/Warren 1997: 200). Using data from the Wisconsin Longitudinal Study Hauser & Warren show that the effects of occupational education on prestige are larger than those of occupational income and that intergenerational and intragenerational correlations are as large or larger when the educational level alone is used to index occupational standing, as when a composite socio-economic index is used (Hauser/Warren 1997: 224).

Instead, they suggested to index occupations by education alone (Hauser/Warren 1997: 177, 224, 251). Given the US educational system they chose the percentage of employees with one or more years of college as the appropriate measure. As European school-systems are different we found the percentage of employees in an occupation who hold a university entrance diploma or higher to be more suitable. In Austria this is the "Matura", in Germany the "Abitur". We compute a Hauser-Warren value for each group of ISCO three-digit occupations. In Austria, in 2008-2009, there were 105 such groups.

Alternatively we could have used the rank scaling of occupations provided for by the 1988 and 2008 ISCO versions. At one-digit level (major groups of occupations) ISCO means to rank occupations by their educational requirements and their social prestige. We used Hauser-Warren values because they are interval scaled rather than merely ordinal, and because they allow us to achieve scaling at the ISCO three-digit level rather than the much more aggregated one-digit level.

### ***3.3 The basic independent variables***

#### Personal education

The key independent variable to explain the educational level of an occupation is the education of the employees, not least because this is what the educational level of the occupation was made from. Obviously, if we lacked any other information, we would have expected a close correlation. The variance reported above shows that the link is not as close as might have been expected.

Education was measured by asking respondents about their highest level of completed education. We include education into the regression model in a linear way using the number of years of schooling that make up the minimum requirement for completing a particular type of education. Any repetitions or incomplete schooling at the secondary or tertiary level is not taken into account. The list gives the types of school available in the Austrian and German datasets and the number of years attributed to their completion:

- 1) no school leaving certificate (actual number of completed years in school, up to 7 years)
- 2) lower secondary education (8 years)
- 3) vocational school (9 years)
- 4) vocational training (10 years)
- 5) vocational secondary school (11 years)
- 6) general secondary school with university entitlement (12 years in Austria, 13 in Germany)
- 7) vocational secondary school with university entitlement (13 years)
- 8) vocational secondary school with university entitlement in the former GDR (14 years)
- 9) training college (15 years)
- 10) college of higher education (16 years)
- 11) University Master diploma (17 years)
- 12) University PhD (19 years).

From human capital theory there is an important injunction against the use of years of education as an explanatory variable: "... regression studies typically use years of education as a control variable in explaining wage discrimination. But this is an extremely crude control, ignoring as it does differences in educational quality and performance between workers with the same numbers of years of education" (Heckman/Siegelman 1993:193). This is certainly true and more comprehensive data would be desirable but are not currently being produced in Europe. For the time being we can only either assume that unobservables do not systematically differ between migrant and non-migrant populations or take the possibility they might differ into account in interpreting the results.



## Sections of the population

We distinguish between the same ten populations and sections of population as in the previous chapter. The analysis is of the employed only. There is a small difference in that those simultaneously in education are here included but were not in the previous chapter.

Since the data invited doing so, we further investigated the issue for two additional sections of the population, i.e. migrants with education completed in continental countries that joined the EU in 2004 and 2007 (EU<sub>n</sub>), and all the remaining countries of the world (Else).

In addition we will also be looking at the education-occupation nexus of the so-called “second generation” defined by having completed their education in the country of residence and employment while both of their parents were born elsewhere.

## ***3.4 Independent variables reflecting experience***

### Introduction

There are various labour market theories, partly in conflict with each other, that try to explain differential occupational success. They include Human Capital Theory, Social Capital Theory and Discrimination Theory. Each of them stresses different explanatory factors. Human Capital Theory posits individual factors as the most important determinants of occupational success. Social Capital Theory emphasizes the role of social relations in determining occupational outcomes. Discrimination Theories focus on structural and potential discrimination factors. In this section the main ideas of the three theories will be presented including the options available to us for operationalising them and the results we obtained.

The main interest is still in the relationship between personal education and the educational level of the occupation. Our attention will therefore focus on whether and how much the regression coefficient on the education variable changes by adding further variables. As will be seen, these changes are limited.

Secondly the coefficients on the other variables and the change in R-square are of interest. This will help us to understand the conditions that lead to a better link between personal educational and the occupation’s educational level.

### Theory

Human capital theory reminds us that ability could vary from education so that the link between education and occupation would be less than perfect. Education, in other words, is a more or less useful proxy for ability, a variable that is not easy to measure in a quick and simple way. If, for instance, Austrian education proxied true ability better than, say, German education, Austrian education should be more closely related to the occupational outcome regardless of where Austrian-educated workers are employed. If so, adding further human capital variables should improve R-square for populations with German education but not with Austrian education.

Human Capital Theory (Becker 1975) follows a remarkably simple logic: people enhance their skill and knowledge base, called human capital, by investing in education, on the job training, labour market experience and other investments like migration, medical care, vitamin consumption and acquiring information about the economic system. These investments provide a competitive advantage to people that have made human capital investments compared to those who have not (Hayes 2000).

If individuals are allocated to jobs according to their amount of human capital, partly visible in human capital investments being made, people with a large amount of human capital are more valuable to employers and will be rewarded with higher incomes and better, more secure jobs (Becker

1964; Bowman 1966; Mincer 1958, 1989). Of course, the many forms of investment differ in their effects on earnings and occupational outcomes, in the amounts invested, in the size of returns and in the extent to which the connection between investment and return is perceived (Becker 1975: 9). In short, Human Capital Theory posits that the healthier, talented, skilled and capable people are the better is their position on the labour market (Becker 1975). This approach fits the concept of the so-called knowledge economy, which stresses the importance of knowledge, information and life long learning for future success.

Singalling Theory (Spence 1973) and Screening Theory (Stiglitz 1975, Chiswick 1973) were derived from Human Capital Theory. Education as well as other personal characteristics (e.g. age, gender, ethnicity, experience, the quality of education) signal inherent productivity of an individual to an employer. Screening complements signalling in so far as the employer, when hiring a job applicant, observes the employee to find indicators that the employer believes to be associated with productivity. Again these indicators include age, gender, ethnicity, experience, the origin of the education (country, university etc).

- We therefore hypothesize that the more human capital in the form of education, the better the occupational position regardless of where the occupation was obtained (H1).

This is borne out by the findings in section 2.

The question that has to be addressed in this context is why qualified immigrants cannot – according to several international studies (Friedberg 2000; Mattoo et al 2005; Nielsen 2007; San Romá et al 2008; Chiswick/Miller 2009; Granato 2009) – make full use of their human capital when living in the host country.

From a human capital point of view inequalities are initially experienced by immigrants when they enter the labour market of the host country. According to the convergence concept of integration introduced by Chiswick (1978) these inequalities erode over time as the immigrants invest in their human capital, e.g. learn the language and acquire knowledge about the functioning of the labour market. Some of the research on the U.S. and the Canadian labour markets (Baker/Benjamin 1994; Chiswick/Hurst 2000) supports convergence. With the years of residence in the host country, immigrant occupational outcomes tend to approach those of the native-born. But research on Denmark, Germany, Great Britain, the Netherlands, and Sweden (Husted et al 1999; Schmidt 1994; Penninx et al 1993; Kee 1994; Shields/Wheatley Price 1996; Bevelander/Nielsen 2001, Bevelander 1998) contradicts these findings. Explanations for these divergent findings are scarce but may lie in the different structural conditions of the countries' labour markets. Other explanations for the lower achievement of immigrants on the labour market target the "quality dimension" of migrants' human capital. On the one hand, not speaking a country's dominant language devalues migrants' human capital because many jobs require knowledge of the dominant language. Chiswick & Hurst (2000) showed that migrants with profound skills of the dominant language are more likely to be employed and have higher incomes than migrants with only limited skills. On the other hand, there may be the possibility that migrants are selected negatively in terms of their amount of human capital.

Mattoo et al (2005) found in their research on educated immigrants in the U.S. labour market that a large part of the variation of occupational outcomes of highly skilled immigrants can be explained by the educational quality of the country of origin that influenced the quality of immigrant's human capital. They used the level of tertiary education expenditure per student and the use of English as a medium of transaction in the origin country as indicators of educational quality of the origin country. Additionally their research is also consistent with the convergence hypothesis.

In addition, Friedberg (2000) and San Romá et al (2008) found differing degrees of transferability of immigrant's human capital into the host country's labour market according to the distance in terms of language and culture and different levels of economic and technological development of the origin country. Both studies find evidence that the greater the difference of the language and



culture as well as the level of economic and technological development between the origin country and the host country the less portable is human capital.

Among the countries in our study Germany and Austria are far richer than Turkey which in turn is about 50 percent richer than Serbia in terms of GDP per capita. Serbia and Turkey are both still fairly agricultural, and both have a past in the Osmanic Empire, although the majority of the population of Serbia adheres to a variety of Christianity while the population of Turkey is largely Muslim, though not all of the same denomination. More importantly, perhaps, Germany and Austria are dominated by German while Serbian, being a Slavic language, has some grammatical similarities to German but virtually none in terms of vocabulary. Turkish grammar is very different. In the urban language there is a fair share of French vocabulary but this would not be true of rural languages. Furthermore, there is a substantial number of minority languages many of which have never been written.

- Given the differences in economic structure and in language we expect skills to be of limited transferability from Serbia and Turkey to Germany and Austria. We do not expect similar obstacles between Germany and Austria (H2).

The findings of sections 2 and 3 support the hypothesis.

Like Friedman (2000) Kanas & Tubergen (2006) found in their research on the impact of human and social capital on immigrants' employment and occupational status that "the returns to host-country specific human capital are much larger than to origin specific human capital" (Kanas/Tubergen 2006: 8). Educational qualifications and work experience obtained in the country of origin are not equally valued as qualifications and experience acquired in the host country.

- We expect host-country specific human capital (domestically obtained education) to result in higher occupational success than origin-specific human capital (foreign-acquired education) (H3).

On the one hand there is the possibility that employers when hiring applicants look for specific skills for which they know that they are taught in the host country. Specifically in the tertiary education sector this might be of relevance, when employers try to protect academic standards by not recognizing foreign educational credentials.

San Romá et al (2008) for example showed that academic studies increase the probability of intense over-education.

- Following these findings we hypothesize that higher education is less transferable than lower and medium education (H4).

The results in section 2 support this notion.

Likewise, when taking labour market experience or on the job training into account, the context-specific dimension is important. Labour market experience may be useful especially when acquired on the labour market of the host country. The same refers to on-the-job training.

Another possibility is that there is limited information on foreign credentials and employers in the host country do not know how to evaluate foreign certificates. In order to avoid risky decisions they may decide not to fully recognize foreign educational credentials.

Given that human capital obtained in the origin country has been shown to be rewarded differently than human capital acquired in the host country, it makes sense to divide human capital for immigrants into "origin-specific human capital" and "destination-specific human capital".

One of the major weaknesses of Human Capital Theory lies in the measurement of its core concept: ability (see Rosenbaum 1986: 444).

Human capital theory does not provide a general approach to define and operationalize human capital. In most of the literature human capital is in fact proxied by the amount of education and

labour market experience. So do we. But many other variables are interesting and important to consider when trying to measure the effect of human capital on occupational outcomes.

Individual ability and genetically inherited traits for example are factors that influence occupational success. Findings on the omission of ability variables are conflicting. On the one hand research published by Miller et al (1995) and Ashenfelter & Krueger (1994) indicates that incomplete knowledge of the ability of a person can be seen as a minor limitation, since they found in their twins study on the economic returns to schooling that individual abilities have only a modest effect on differences in income. On the other hand research done by Carneiro et al (2005) found that the major source of economic disparity by race and ethnicity in the U.S. labour markets is in endowment. They also show that ability gaps open up very early in life (measured already at the age of three) and then widen.

It is also known that the family background and the socioeconomic status of parents have an impact on occupational success. Again, when estimating this impact research is controversial. Miller et al (1995) and Ashenfelter/Krueger (1994) find in their studies on the economic returns to schooling from a sample of twins that family background has only a modest effect on differences in income. Contrary to these findings, Carneiro et al (2005) show that family background variables play an important role in the formation of abilities and skills and have thus a big influence on future occupational outcomes. But if so this should also be expected to be result in lower educational achievement so that education, especially in a school system that is more segmented than that in the US, should still proxy ability reasonably well. In fact, true ability is not the real issue because perceived ability could vary widely from the truth even in a situation where data on true ability are readily available (Quillian 2006). This is perhaps the largest lacuna in human capital theory.

Findings from the human capital literature show that labour market experience as well as job specific experience (Chiswick/Miller 2009) are important factors in explaining occupational outcomes. Labour market experience refers to the amount of time spent in employment. The more time people spend on the labour market, the more they will be able to establish professional contacts and develop labour market specific skills and knowledge. In general, experience is acquired that may be useful in getting qualified and well paid jobs.

Job specific experience refers to the amount of time a person works for a specific employer. It is of substantial value within the company, as it shows how much practical experience a person has in a specific field of activity. The assumption could be made that the longer people work at a specific company, the better they know what qualifications, methods and skills the job demands and can in this way better respond to specific tasks than a newcomer.

Another important variable we want to look at is self-employment. We pose the hypothesis, that generally for people, self-employment results in higher occupational outcomes. We can explain this by stating that self-employed people place themselves into occupational positions that best fit their personal qualities and competencies. Contrary to the self-employed, employees depend on the opinion of their superiors in the allocation process to qualified jobs.

The next variable we introduce describes the size of the firm in which a person works.

In accordance with the literature on firm size and employment stability (see Winter-Ebmer 1995), we hypothesize that the larger the number of people working in a firm, the better their occupational outcomes. There could be several reasons for this. Larger firms would have a more professional and more bureaucratic personnel function that would therefore be less likely to discriminate. Larger firms would also have a broader spectrum of occupational grades and, given ability, offer the opportunity to gradually rise through the hierarchy. In contrast, smaller firms may be more likely to keep their employees' occupational status low for their own financial benefits. It is not easy to do so in larger firms where employees may be in a better position to demand and control the equal treatment of all employees.

## Operationalisation

### ▫ Self employment

Respondents are asked to classify themselves into various kinds of dependent employment and self-employment. We created a dummy variable with 1 for all kinds of self-employment and 0 otherwise.

### ▫ Size of the company

The variable is problematic to use. In the LFS respondents are asked to categorize the establishment where they work. In Austria they are asked to give an exact number when there are no more than ten workers, and are otherwise offered the categories 11 to 19, 20 to 49, 50 to 499, 500 or more. We took the mid-values of each range and set the top category at 750. There is also a category “unknown but no more than 10” which we set to 5 and a category “unknown but more than 10” which we set to 15. Further there is an “unknown” category coded 99 which we left as is. In Germany the top category is 50+ which we set to 100 and the two “unknown” categories separated by the size of 10 are not on offer. In Serbia the categories are the same as in Austria except that the 50 to 499 category is broken up into 50 to 99 and 100 to 499. The two “unkowns” do not separate at 10 but at 11. In practice average firm size appeared as substantially larger in Austria and in Serbia than in Germany. Setting the top category at 100 in Germany may be too low. It seemed problematic, though, to raise the code, since it needs to reflect the median firm in the top category rather than the average. We experimented with lowering the code for the 50 to 499 category in the Austrian data to 100 but discovered that the regression results are not influenced in any meaningful way.

### ▫ Firm tenure

The LFS provides a direct measure of the duration of employment with the current employer. A question asks respondents to report the year and the month in which they started working for the current employer or as self-employed. Using this information we calculated the number of years and months respondents have been working for their current employer.

### ▫ Potential labour market experience

The dataset contains no information on the years of experience in employment or in the labour market. We compute the variable by subtracting the survey year from the year when the highest educational degree was obtained.

### ▫ Years of residence in the country

The respondents were asked to report the year and the month in which they arrived in the host country. Using this information we calculated a variable that tells us the number of years and months a person has spent in the host country.

## **3.5 Data**

### The Labour Force Survey

We use data from the Labour Force Surveys (LFS) of Austria, Germany, Serbia, and Turkey. Being coordinated by Eurostat the LFS provides for reasonably comparable data on detailed labour market and socio-demographic information for individuals living in private households aged 15 and over from all Member States of the European Union, Candidate Countries, and EFTA countries. Serbia does not belong to this group of countries but its LFS, too, is closely aligned with international practice.

Comparability between countries is being approached by the use of very similar national questionnaires as well as the same definitions and common classifications but is of course never perfect (see [http://circa.europa.eu/irc/dsis/employment/info/data/eu\\_lfs/index.htm](http://circa.europa.eu/irc/dsis/employment/info/data/eu_lfs/index.htm) for more information on the EU-LFS).

In Austria the LFS is a quarterly rotating sample survey that obtains information by means of personal or telephone interviews. The sample is random at provincial level but a quota sample between provinces. In Serbia the sample is nationally random and interviews are carried out face-to-face. In Germany the sample is annual and interviews are carried out face-to-face in the course of the year.

The Austrian data used here are the pooled second quarters 2008 and 2009 to match as best as possible with the Serbian data that are the pooled April 2008 and April 2009 surveys. In Serbia the two samples being pooled result in about 13,000 employed respondents aged 15 to below 65. In Austria first time respondents from the second quarter 2008 would have been last-time respondents in the second quarter 2009 but were eliminated from the 2009 sample. The pooling thus resulted in a sample of about 38,500 different employed individuals of working age. The German 2005 LFS includes a publicly accessible sample of about 172,000 employed respondents of working age. Military personnel was excluded as were apprentices.

As with any survey, our dataset has some limitations too. Firstly, the results of the Labour Force Survey are subject to sampling errors, as it observes a sample and not the whole population. But the LFS provides for a large random sample from the population in order to control sampling errors and to allow for representativeness. Secondly, again as in any other survey, non-sampling errors (e.g. non-response, miscoding, etc) may affect the results. Thirdly, as the data we use are cross-sectional we are not able to examine the direction of the effects, say the causality between variables. Lastly, our research focuses on data of the employed population, as we are interested in different occupational outcomes. We therefore may have a problem of self-selection into employment. If we do, it will be age-specific, affecting the young because of the legitimate choice between education and work and those over 50 because of the choice between early retirement and work, and it will be education-specific affecting the low educated far more than the highly educated. It is now less gender-specific than it used to be but it may affect low educated women more than low educated men. This needs to be borne in mind when interpreting the results.

### The employed population

All the employed among Austria's resident population aged 15 to 64 years on average achieve a Hauser-Warren occupation score (hauser) of 0.28. In Germany the average is 0.31. These averages vary considerably between parts of the employed population.

- The largest Hauser-Warren occupational score is observed among the women educated and working in Serbia: 0.59. This is followed by the 0.47 of their male counterparts.
- In Austria the highest average scores are the 0.41 of the men educated in Germany and the 0.34 of their female counterparts. Next come the 0.32 of the women with parents born in Austria while the men with parents born in Austria show up with 0.27. Men belonging to the category "educated in the rest of the world" achieve an average of 0.29, and women 0.27.
- The highest average occupational scores in Germany are those of the men educated in Austria (.38), of both sexes with parents born in Germany (.33), and of the women educated in Austria (.31). The employed population of both sexes educated in the rest of the world achieves 0.22.
- In both Austria and Germany all other parts of the immigrant population, i.e. educated in Serbia, Turkey, or the newer EU member countries, on average achieve occupational scores of less than 0.2. While the migrants educated in the newer EU member countries range between 0.14 and 0.19, the Serbian-educated achieve between 0.10 and 0.13, and those educated in Turkey between 0.09 and 0.12.

Men in Germany: population data of the employed by country of education (population weights are applied)

	DE	AT	SC	TR	EUn	Else	NN
Respondents	89,368	150	164	776	1.136	2,718	192
Population	15,671,079	34,611	41,459	161,077	234,984	609,072	34,155
Mean							
Hauser	0.33	0.38	0.11	0.12	0.18	0.22	0.12
Education	11.76	12.19	10.05	9.53	11.14	11.31	10.45
Age	42.17	45.89	43.32	41.13	45.73	42.58	42.77
Self-employ	0.15	0.27	0.10	0.10	0.10	0.13	0.03
Firm size	60.21	55.02	56.29	62.54	62.62	56.18	68.17
Firm tenure	12.17	11.33	8.84	9.99	10.73	7.48	9.34
Time in LM	20.34	25.93	25.79	25.12	26.76	23.82	24.17
Residence	-	18.59	17.51	18.22	17.31	13.61	15.08
Standard deviation							
Hauser	0.30	0.30	0.13	0.13	0.23	0.25	0.13
Education	2.78	2.99	1.92	2.13	2.47	3.05	1.74
Age	10.95	10.23	11.02	9.82	8.92	9.76	8.63
Self-employ	0.36	0.44	0.30	0.29	0.30	0.34	0.16
Firm size	43.97	46.27	43.98	43.73	43.34	44.41	41.72
Firm tenure	10.71	9.94	9.59	9.80	8.46	8.00	6.89
Time in LM	11.76	11.75	11.57	10.21	9.20	10.36	8.31
Residence	-	12.26	11.14	10.12	8.64	9.60	7.07

Computed from the German Labour Force Survey.

Women in Germany: population data of the employed by country of education (population weights are applied)

	DE	AT	SC	TR	EUn	Else	NN
Respondents	73,767	101	105	423	1,182	2,109	106
Population	12,721,226	20,724	23,707	87,044	234,605	428,039	20,035
Mean							
Hauser	0.33	0.31	0.13	0.10	0.19	0.22	0.17
Education	11.47	11.25	9.90	8.91	11.36	11.30	10.87
Age	40.74	45.85	44.04	42.30	43.92	42.43	42.76
Self-employ	0.07	0.13	0.02	0.04	0.06	0.08	0.01
Firm size	51.00	46.04	56.53	57.73	55.39	53.45	60.58
Firm tenure	9.93	9.73	8.99	7.26	8.38	5.86	7.12
Time in LM	20.10	27.53	27.44	27.44	25.42	23.63	24.34
Residence	-	20.39	19.18	20.51	16.55	12.87	13.94
Standard deviation							
Hauser	0.25	0.24	0.10	0.07	0.18	0.24	0.15
Education	2.58	2.48	2.05	1.50	2.66	2.99	2.28
Age	10.33	9.54	9.50	9.29	9.10	9.03	7.70
Self-employ	0.26	0.34	0.14	0.20	0.23	0.27	0.10
Firm size	44.09	44.67	43.88	44.23	44.42	44.68	41.69
Firm tenure	9.23	8.85	9.02	7.61	7.38	6.39	6.33
Time in LM	11.56	11.00	10.56	9.49	9.70	9.72	8.18
Residence	-	11.59	10.86	9.21	8.75	8.82	7.13

Computed from the German Labour Force Survey.

Men in Austria and Serbia: population data of the employed by country of education (population weights are applied)

	AT	DE	SC	TR	EUn	Else	RS in RS
Respondents	18,889	267	220	354	664	396	7,466
Population	3,247,094	52,744	52,632	67,554	151,768	103,579	2,635,550
Mean							
Hauser	0.27	0.41	0.10	0.09	0.14	0.29	0.47
Education	11.20	12.97	10.01	9.49	10.90	12.40	11.88
Age	39.87	40.50	43.56	39.89	44.05	41.37	42.05
Self-employ	0.11	0.13	0.05	0.05	0.08	0.15	0.29
Firm size	161.75	183.34	162.75	197.75	159.50	152.76	52.62
Firm tenure	11.99	5.35	8.08	6.37	8.11	6.21	19.47
Time in LM	19.83	17.88	26.42	24.47	25.64	21.16	23.71
Residence	-	7.13	16.97	15.75	16.39	12.22	-
Standard deviation							
Hauser	0.27	0.35	0.14	0.10	0.22	0.30	0.31
Education	2.36	3.26	1.59	1.65	2.28	3.44	3.55
Age	11.89	10.29	10.56	9.45	9.22	10.37	11.57
Self-employ	0.32	0.33	0.23	0.23	0.26	0.36	0.45
Firm size	199.65	223.44	190.61	206.57	187.53	200.71	119.84
Firm tenure	10.79	6.82	8.89	7.19	8.08	6.82	11.92
Time in LM	12.03	10.77	11.01	10.07	9.57	10.04	12.22
Residence	-	6.92	10.19	8.75	8.53	8.73	-

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Women in Austria and Serbia: population data of the employed by country of education (population weights are applied)

	AT	DE	SC	TR	EUn	Else	RS in RS
Respondents	16,036	256	200	174	735	326	5,563
Population	2,731,480	45,398	49,707	29,964	162,710	77,039	2,015,103
Mean							
Hauser	0.32	0.34	0.13	0.12	0.17	0.27	0.59
Education	11.33	11.94	9.96	9.06	11.01	12.43	12.48
Age	39.03	39.64	43.08	39.36	41.74	39.79	41.88
Self-employ	0.06	0.12	0.02	0.01	0.05	0.08	0.15
Firm size	115.44	110.59	173.96	150.97	133.47	126.71	47.73
Firm tenure	9.58	5.91	8.19	5.05	6.26	5.65	17.77
Time in LM	19.83	19.17	26.94	24.71	24.09	19.82	23.12
Residence	-	10.64	18.33	16.61	15.49	11.86	-
Standard deviation							
Hauser	0.26	0.27	0.15	0.14	0.17	0.25	0.35
Education	2.34	2.78	1.99	1.71	2.35	3.28	4.27
Age	11.03	10.28	10.19	9.05	8.73	9.82	10.94
Self-employ	0.24	0.33	0.12	0.11	0.22	0.28	0.35
Firm size	178.21	167.52	202.00	185.08	184.52	183.56	113.47
Firm tenure	9.30	6.98	8.81	6.64	6.85	6.65	11.76
Time in LM	11.81	11.11	11.25	9.57	9.27	10.41	12.55
Residence	-	9.95	10.31	8.75	8.71	8.89	-

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.



The average scores thus span a wide range from as low as 0.09 to as high as 0.59.

To some degree the average level of education correlates with the Hauser-Warren scores. The same sequence of population groups occurs again. Frequently the men have slightly more education than the women. The highest average education is observed among men educated in Germany and living in Austria (13.0 years) followed by the women educated in the rest of the world (Else) living in Austria (12.4 years), their male counterparts (12.4 years), and the men educated in Austria and living in Germany (12.2 years). The lowest average education appears among the women educated in Turkey and living in Germany (8.9 years) and in Austria (9.0 years). The average education of migrants from Serbia is highly uniform between sexes and countries ranging between 9.9 and 10.1 years.

### **3.6 Results**

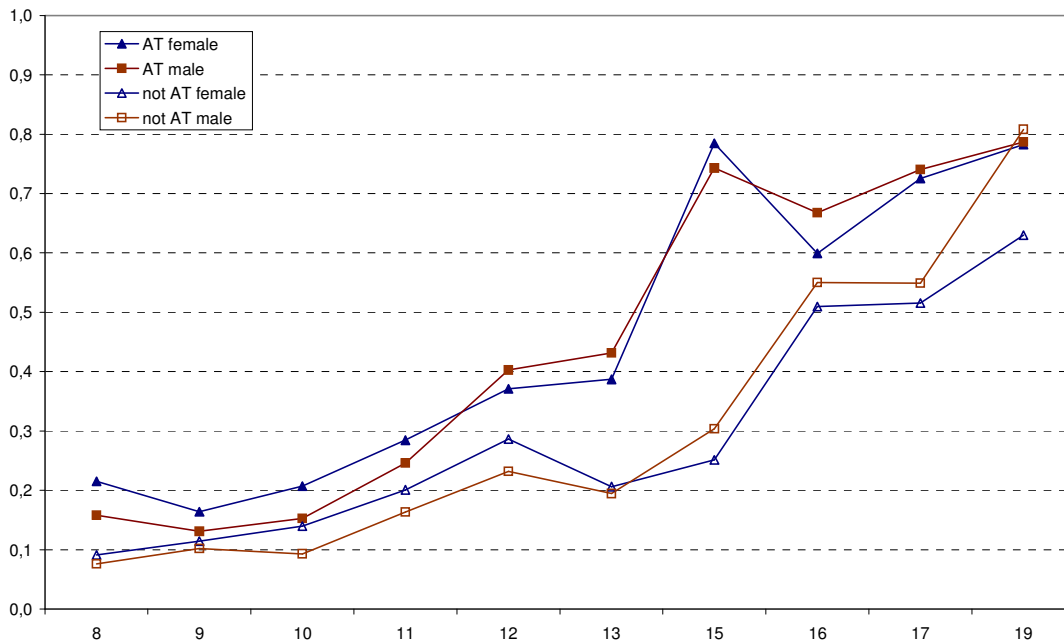
#### Education, country of education, and gender

We are looking for differences in the strength of the link between individual education and the occupation's educational level. We expect such differences between categories of individuals based on whether they obtained their education in the country of employment or in another country. We also suspect that if they obtained their education in the country of employment the link may be weaker if their parents were educated elsewhere.

In the most basic analysis, as displayed in the two figures below, we relate personal years of education to the average Hauser-Warren score of the occupations in which people with a given number of years of personal education are employed, and we merely distinguish between the sexes and between having completed the education in the country of residence or elsewhere. The figures make a number of unmistakable points about the link between personal education and occupational attainment:

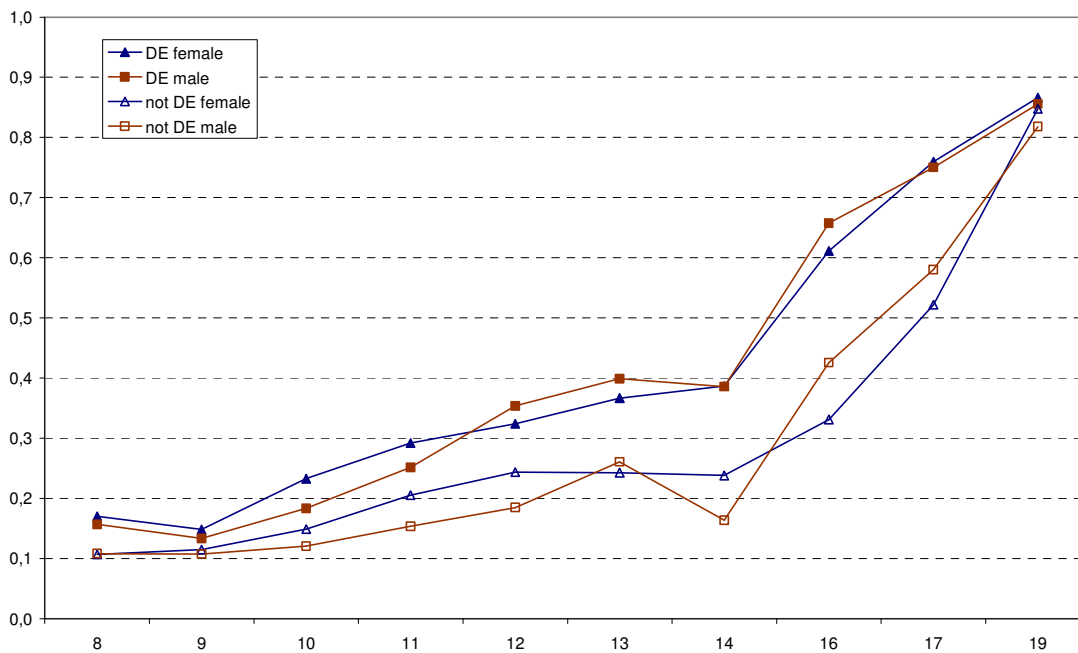
- In both countries for all four sections of the population there is a basic tendency towards more educationally intensive occupations as personal education increases. However, there are differences in how occupational gains are spread across the educational spectrum. For men with in-country education in Austria and for both sexes with in-country education in Germany the average occupational benefit to expect from one more year at secondary level is not very different from one more year at tertiary level (linear r-square between years of education and average Hauser-Warren score for each of the three population parts is between 0.91 and 0.93). The distribution of gains across the educational spectrum is slightly less even for employed women with in-country education in Austria and both sexes with imported education in Austria (r-squares of 0.88 and 0.89), and decidedly less even for both sexes with imported education in Germany (0.77 each time). Imported years at secondary level seem to bring little occupational benefit in Germany while tertiary years do. Although there are these differences, it is also clear there is a marked degree of linearity in all eight cases.
- The similarities in the distribution of the gains cannot hide the fact that they are occurring at different levels. In the middle of the educational spectrum Hauser-Warren scores for imported education are about 15 percentage points less than for in-country education in Austria and likewise in Germany. This is true for both sexes. The gap is smaller at the lower end and widens toward the upper end of the educational scale. Common tertiary and secondary levels of education imported from abroad carry fairly heavy occupational penalties.

Average Hauser-Warren scores of the occupations of the employed for education years by place of education and sex, Austria 2008-2009



Computed from the Austrian Labour Force Survey (Statistics Austria).

Average Hauser-Warren scores of the occupations of the employed for education years by place of education and sex, Germany 2005



Computed from the German Labour Force Survey (Federal Office for Statistics).



- The differences between the sexes are not as great as those between in-country education and imported education. In fact, the patterns for the two sexes are intertwined and almost perfectly correlated in both countries. There is a gender issue in the link between education and occupation, but by comparison to immigration it is not impressive.

The question is whether these differences observed in a very simple analysis persist if other influences on occupational opportunities are controlled for.

We estimated two models:

1. A basic model with merely education, age and their squares, and
2. an extended model with four to five additional variables capturing the effects of experience and employment characteristics.

A number of variations on the models were also tried and will be selectively reported.

Each model is estimated separately for each population or population section and each sex.

The discussion of the results focuses on two items. One is the goodness of fit as expressed by the R-square, the other the impact of the education variable on the occupation variable as expressed by education's regression coefficient(s). In reporting the goodness of fit statistic we are concerned especially with the extent to which education more or less by itself explains the occupational outcome and how much difference the addition of control variables makes. This is primarily where the comparison between models is of interest. Regression coefficients will be reported for the extended model. Results will be visualised as much as possible.

### Personal education controlled only by age explains between 6% and 59% of the occupational level

The basic result of importance for the purposes of this study is that the power of personal education to determine the occupational outcome differs very much between parts of the population. After controlling for age it accounts for

1. 52% of the variance of the occupational outcome of both women and men with parents born in Austria and educated in Austria. In Germany it accounts for 50% (women) and 53% (men) in the case of the German-educated with parents born in Germany, and in Serbia for 54% in the case of women. For all practical purposes these five results for the natives in the two countries are identical. In the case of men in Serbia only 47% are explained.
2. In the case of post-education migrants from Germany to Austria 54% (men) and 51% (women) are explained. In the case of men migrating from Austria to Germany 57% are explained but only 46% in the case of women.
3. In Germany the only other cases with more than 40% explained are the post-education migrants from the "Rest of the World" (Else) with 46% (men) and 44% (women).
4. In Austria 52% of the occupational outcome are explained in the case of women educated in Turkey. Also, in the case of men educated in the new EU member states and in the rest of the world, 44% and 45%, respectively, are explained.
5. Below 40% we find the case of Serbian-educated women in Austria (39%) and women educated in the rest of the world employed in Germany (37%).
6. In all other cases education and age explain less than one third of the occupational outcome, and in one case they explain as little as 6%. Above 25% this includes in Germany the cases of women educated in a newer EU member country (30%), women (28%) and men (27%) educated in an unknown country, and in Austria those of the women educated in the newer EU member states (27%) and women educated in the rest of the world (24%).

7. Below 24% in Germany there are the cases of men (21%) and women (16%) educated in Turkey and men (18%) and women (20%) educated in Serbia, and in Austria men educated in Turkey (14%) and in Serbia (6%). In all of these cases there is very little or no connection between people's personal education and the occupational level at which they are employed.

The population educated in the country of residence but with parents born elsewhere, which we have been calling the "second generation", in Germany finds between 25% and 54% and in one case 73% of the occupational outcome explained by education and age, and in Austria between 25% and 55% and 64% in one case. While this sounds as if there were considerable uniformity between the two countries, six of the ten Austrian results are below 40% while the same is true of only two out of twelve cases in Germany. Very remarkably, almost all results above 50% are for men, and most below 50% are for women. The link between education and occupation of employed "second generation" women is considerably weaker than that of men.

8. More than 50% of the occupational outcome are explained by education in the cases of men (73%) and women (54%) in Germany with parents born in an unknown country, men in Germany with parents born in Austria (54%), in the rest of the world (53%), or in the newer EU member countries (52%), and men in Austria with parents born in Germany (64%), in the newer EU member countries (55%), in the rest of the world (54%), and in Serbia (51%). Other than the two exceptionally close links these results are all in the same league as those for the population with parents born in the country of residence.
9. Below 50% there are a number of cases in Germany. They include those of the women with parents born in Turkey (46%), in the newer EU member countries (46%), in Serbia (42%), in the rest of the world (42%), and in Austria (40%).
10. Below 40% there is the case of men in Germany with parents born in Turkey (32%) and a number of cases in Austria, all of them female: parents born in the newer EU member countries (37%), in the rest of the world (36%), in Germany (34%), in Turkey (34%), and in Serbia (31%).
11. Below 30% there are only two cases, namely men employed in Germany with parents born in Serbia (25%) and men employed in Austria with parents born in Turkey (25%).

In Germany the link between education and occupation is stronger for populations with greater average education. The correlation between the average number of years of completed education and the R-square has an r-square of .62 and is highly significant ( $F=30.95$ ,  $df=19$ ). Not leaving out the one very exceptional case with an R-square of 0.73 does not diminish this result to insignificance ( $r\text{-square}=.52$ ,  $F=22.7$ ,  $df=20$ ). If populations educated in Germany are separated from populations educated elsewhere the relationship shows to be true for the latter ( $r\text{-square}=.82$ ) rather than the former ( $r\text{-square}=.34$ ). In Austria the link is much weaker, if it exists at all ( $r\text{-square}=.20$ ,  $F=4.0$ ,  $df=16$ ), and separating the populations by where they were educated does not change this.

Age turns out to be of little influence on the occupational score, especially among the women. In Germany both sexes of the population with parents born in the country experience a positive influence of age, but the same is not true in Austria. In Germany there are non-linear influences on the occupational outcomes of the men educated in Austria (peak), in Turkey (peak), and in the rest of the world (trough), in Austria on those of the men educated in Germany (peak) and of both sexes educated in the newer EU member countries (troughs). In Serbia the male outcomes are influenced (peak).

With one exception we find that the occupational outcomes of migrants from Serbia and from Turkey are explained poorly or not at all by their education while those of non-migrant employees with parents born in the country of residence are explained reasonably well.

The one exception is that of the women educated in Turkey and now employed in Austria. The reason is that an unusual percentage is poorly educated so that about half of the employment is of the poorly educated in low-skill occupations.

Further results are in appendix A2.

### Adding experience to the model produces selective changes

The overall explanatory power of the model is not being enhanced much by the additional variables. In the lower part of the spectrum we see the adjusted R-square increase somewhat over the result from the basic model, more so in Austria than in Germany, but there was also more leeway in Austria given the very low R-square previously obtained in the cases of men educated in Turkey and in Serbia. Thus it is for these two cases that it is especially true that the explanatory power rises, i.e. from 14% to 32% and from 6% to 19%, respectively.

In Austria the occupational position of male immigrants from Serbia and from Turkey depends more on non-educational variables than on education. While the latter explained about 6% and 14%, respectively, of the occupational outcome, the former contribute an additional 12 (rounding error) and 18 percentage points, respectively. Non-education variables contribute 7 percentage points in explained occupational variance in the case of women educated in Austria with parents born in Germany, 6 percentage points in the case of women educated in Austria with parents born in newer EU member countries, and 5 percentage points in the case of men educated in Austria with parents born in Turkey. In all other cases the change in explained variance is even less.

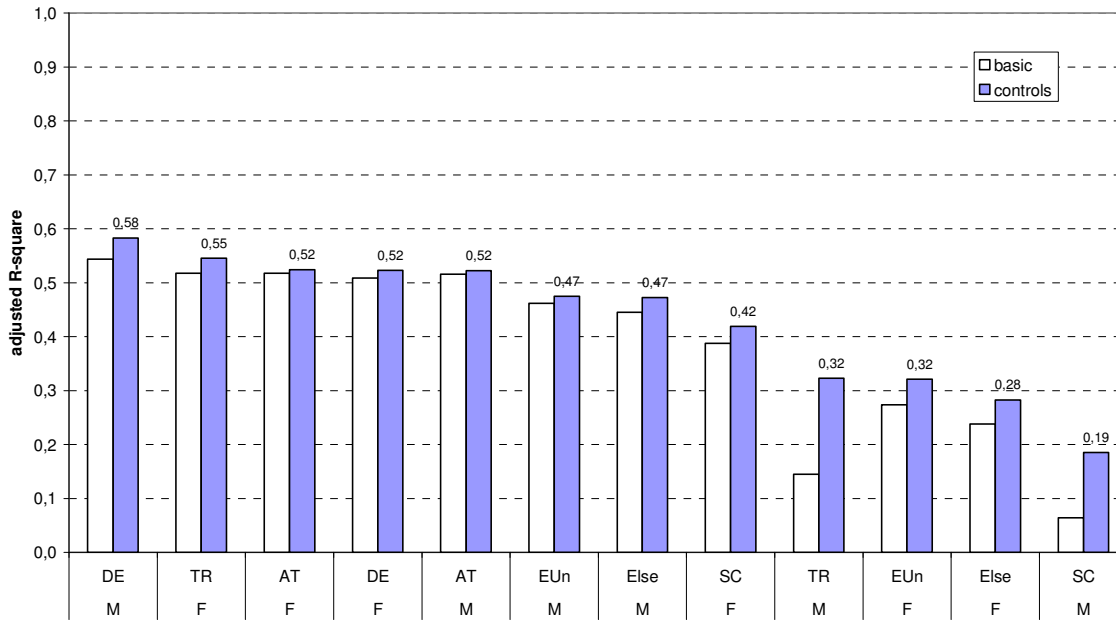
In Germany likewise the largest gains in explanatory power are made in the cases of men educated in Serbia and in Turkey where it rises from 18% to 28% and from 21% to 29%, respectively. There are several cases where the gains are about 6 percentage points including women educated in Turkey and in the rest of the world, men educated in unknown countries, and women educated in Germany with parents born in Serbia. In the case of women educated in Austria non-education variables contribute about 5 percentage points.

The rank order of the population parts changes little relative to the basic results above. The maximum gains and losses are two ranks. None cross from the lower half of r-squares to the upper or vice versa. The overall picture is slightly more level than before with the values in Austria now spread between 19% and 58% rather than between 6% and 54%, and in Germany between 22% and 59% instead of 16% and 57%. The ranges for the “second generation” cases contract less, i.e. in Germany only imperceptibly and in Austria only very slightly as the lowest R-square increases from .25 to .30 (men with parents born in Turkey).

The general finding is that experience and company variables tend to be of greater importance when the education variable fails more resoundingly to explain the occupational outcome. Below we will investigate which of them makes the most difference.

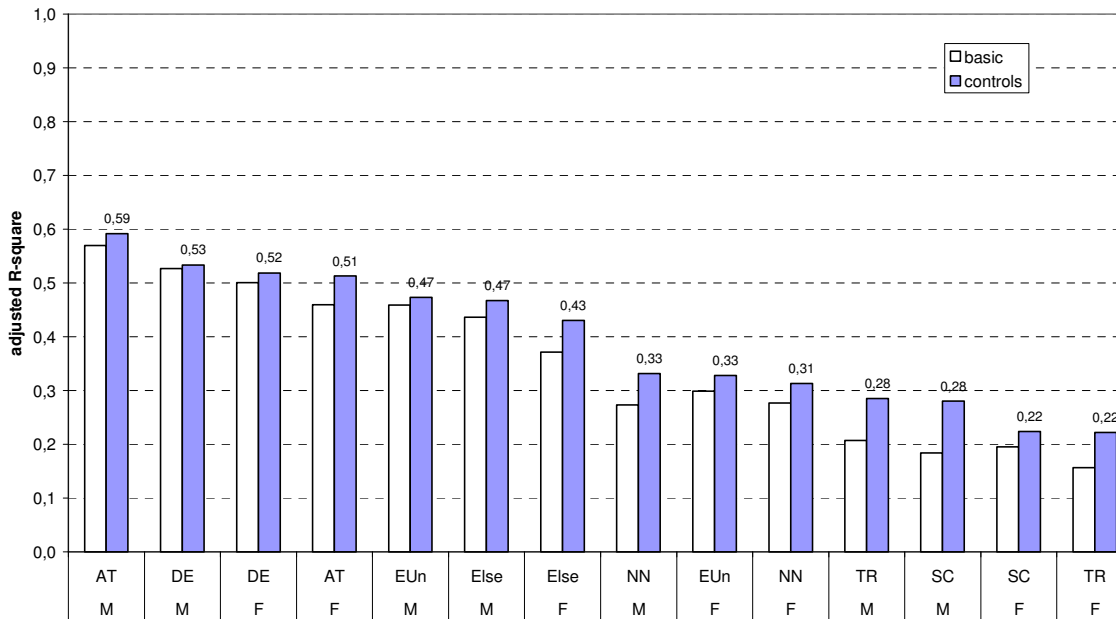
The comparison between Austria, Germany, and Serbia shows occupational outcomes especially of the women with non-migrant parents (“home F” in the figures below) to be explained equally well by the extended model in all three countries. In each of three cases the R-square is 0.52 or 0.54. The outcomes of men with non-migrant parents (“home M”) are not quite as similar ranging between 0.47 and 0.53. For post-education migrant parts of the population is also often very similar in both Austria and Germany. This applies to the occupational outcomes of migrants of both sexes from the other country (“other”, i.e. the Austrian-educated in Germany and the German-educated in Austria) and the newer EU member states, and to those of male migrants from Turkey and from the rest of the world. The explanatory power deviates quite substantially between Austria and Germany in the cases of women educated in Turkey and in the rest of the world, and both sexes educated in Serbia. In two of these four cases the explanatory power is greater in Austria, in two in Germany.

The share of the occupational attainment explained by personal education after controlling for age and other variables, by sex, country of education, and parental country of birth, Austria



Computed from the Austrian Labour Force Survey (Statistics Austria).

The share of the occupational attainment explained by personal education after controlling for age and other variables, by sex, and country of education, Germany



Computed from the German Labour Force Survey.

Men in Germany by country of education: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted) by country of education

	DE	AT	SC	TR	EUn	Else	NN
adj R-sq	0.534	0.591	0.280	0.285	0.473	0.468	0.332
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.269	-1.636	0.772	0.374	0.720	0.726	0.527
Education	0.020	0.162	-0.109	-0.094	-0.134	-0.105	-0.072
Educ-sq	0.002	-0.003	0.005	0.005	0.007	0.006	0.004
Age	0.000	0.022	-0.005	0.011	0.001	-0.008	-0.006
Age-sq	0.000	-0.000	0.000	-0.000	0.000	0.000	0.000
Self-employ	0.044	0.039	0.131	0.084	0.071	0.142	0.154
Firm size	0.001	0.001	-0.000	-0.000	-0.000	0.000	-0.000
Firm tenure	0.001	0.001	0.002	0.000	0.001	0.001	0.001
Time in LM	-0.002	0.007	-0.003	-0.004	-0.004	-0.003	-0.004
Residence	-	-0.000	-0.003	-0.000	-0.002	-0.001	0.002
Significance							
Intercept	0.000	0.005	0.051	0.001	0.000	0.000	0.163
Education	0.000	0.017	0.052	0.000	0.000	0.000	0.198
Educ-sq	0.000	0.184	0.012	0.000	0.000	0.000	0.049
Age	0.314	0.155	0.614	0.029	0.856	0.018	0.665
Age-sq	0.000	0.060	0.385	0.143	0.448	0.001	0.460
Self-employ	0.000	0.467	0.000	0.000	0.000	0.000	0.004
Firm size	0.000	0.064	0.899	0.006	0.465	0.004	0.193
Firm tenure	0.000	0.975	0.082	0.566	0.095	0.038	0.508
Time in LM	0.000	0.390	0.426	0.137	0.153	0.014	0.293
Residence	-	0.829	0.205	0.731	0.261	0.710	0.181

Computed from the German Labour Force Survey.

Women in Germany by country of education: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted) by country of education

	DE	AT	SC	TR	EUn	Else	NN
adj R-sq	0.519	0.513	0.224	0.222	0.328	0.431	0.313
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	0.367	-0.727	-0.617	0.337	0.483	0.548	-0.162
Education	-0.072	0.127	0.134	-0.046	-0.086	-0.075	0.070
Educ-sq	0.005	-0.003	-0.005	0.003	0.005	0.005	-0.001
Age	0.002	0.002	-0.000	-0.003	0.002	-0.005	-0.011
Age-sq	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
Self-employ	0.066	0.165	-0.024	0.072	0.106	0.214	-0.079
Firm size	0.000	0.000	-0.000	-0.000	0.000	0.000	-0.001
Firm tenure	0.003	-0.000	0.002	0.001	0.001	0.001	0.003
Time in LM	-0.004	-0.000	-0.005	0.002	-0.003	-0.004	0.002
Residence	-	-0.003	-0.000	0.000	0.002	0.001	0.001
Significance							
Intercept	0.000	0.215	0.048	0.000	0.000	0.000	0.601
Education	0.000	0.111	0.002	0.001	0.000	0.000	0.278
Educ-sq	0.000	0.331	0.002	0.000	0.000	0.000	0.544
Age	0.000	0.751	0.952	0.260	0.659	0.402	0.547
Age-sq	0.177	0.909	0.834	0.916	0.478	0.233	0.780
Self-employ	0.000	0.009	0.520	0.000	0.000	0.000	0.539
Firm size	0.000	0.223	0.517	0.141	0.014	0.101	0.142
Firm tenure	0.000	0.692	0.175	0.450	0.065	0.066	0.254
Time in LM	0.000	0.721	0.642	0.096	0.100	0.006	0.650
Residence	-	0.179	0.999	0.603	0.012	0.010	0.612

Computed from the German Labour Force Survey.

Men in Austria and Serbia by country of education: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted)

	AT	DE	SC	TR	EUn	Else	RS in RS
adj R-sq	0.522	0.583	0.185	0.323	0.475	0.473	0.469
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.952	-0.915	0.596	0.375	1.175	0.580	-0.122
Education	0.124	0.114	-0.115	-0.064	-0.169	-0.065	0.027
Educ-sq	-0.002	-0.001	0.005	0.004	0.009	0.005	0.001
Age	0.001	0.005	0.007	-0.001	-0.015	-0.012	0.007
Age-sq	-0.000	-0.000	0.000	0.000	0.000	0.000	-0.000
Self-employ	0.069	0.198	0.147	0.164	0.069	0.052	-0.128
Firm size	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000
Firm tenure	0.001	0.003	-0.003	0.001	0.002	0.008	-0.004
Time in LM	0.001	-0.000	-0.008	-0.000	0.002	0.003	-0.001
Residence	-	0.003	0.002	0.001	0.000	-0.006	-
Significance							
Intercept	0.000	0.000	0.004	0.001	0.000	0.055	0.005
Education	0.000	0.003	0.000	0.000	0.000	0.111	0.000
Educ-sq	0.000	0.092	0.000	0.000	0.000	0.001	0.000
Age	0.838	0.029	0.135	0.961	0.018	0.270	0.001
Age-sq	0.887	0.018	0.786	0.976	0.034	0.270	0.499
Self-employ	0.000	0.001	0.000	0.000	0.000	0.038	0.000
Firm size	0.000	0.184	0.577	0.280	0.898	0.454	0.001
Firm tenure	0.000	0.074	0.045	0.297	0.029	0.000	0.000
Time in LM	0.265	0.883	0.000	0.746	0.841	0.548	0.412
Residence	-	0.449	0.029	0.463	0.299	0.002	-

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.



Women in Austria and Serbia by country of education: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted)

	AT	DE	SC	TR	EUn	Else	RS in RS
adj R-sq	0.524	0.523	0.419	0.546	0.321	0.283	0.543
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.557	-0.497	0.648	0.463	0.473	-0.351	-0.250
Education	0.071	0.041	-0.155	-0.083	-0.060	0.035	0.072
Educ-sq	0.000	0.001	0.007	0.006	0.004	-0.000	-0.001
Age	0.001	0.013	0.017	-0.003	-0.003	0.011	0.005
Age-sq	0.000	-0.000	-0.000	0.000	0.000	-0.000	0.000
Self-employ	0.039	0.062	0.068	0.228	0.069	0.162	-0.115
Firm size	0.000	0.000	-0.000	0.000	-0.000	0.000	0.000
Firm tenure	0.003	0.003	-0.000	0.003	0.005	0.001	0.001
Time in LM	-0.001	-0.004	-0.014	-0.004	-0.010	-0.005	-0.007
Residence	-	-0.002	0.000	-0.003	0.000	0.001	-
Significance							
Intercept	0.000	0.279	0.000	0.007	0.004	0.245	0.000
Education	0.000	0.473	0.000	0.000	0.011	0.351	0.000
Educ-sq	0.062	0.769	0.000	0.000	0.000	0.965	0.000
Age	0.835	0.311	0.119	0.890	0.405	0.386	0.221
Age-sq	0.583	0.710	0.623	0.455	0.020	0.492	0.232
Self-employ	0.000	0.017	0.083	0.003	0.003	0.000	0.000
Firm size	0.154	0.356	0.308	0.434	0.420	0.010	0.000
Firm tenure	0.000	0.161	0.974	0.117	0.000	0.949	0.199
Time in LM	0.017	0.113	0.033	0.352	0.001	0.403	0.000
Residence	-	0.361	0.707	0.168	0.966	0.958	-

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Men educated in Germany by parental country of birth: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted) by country of education

	DE	AT2	SC2	TR2	EUn2	Else2	NN2
adj R-sq	0.534	0.551	0.268	0.360	0.531	0.551	0.738
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.269	-0.823	-0.035	0.689	0.225	0.244	-0.332
Education	0.020	0.171	0.001	-0.129	-0.055	-0.044	-0.016
Educ-sq	0.002	-0.004	0.002	0.007	0.005	0.004	0.004
Age	0.000	-0.018	-0.003	0.002	0.000	-0.004	0.011
Age-sq	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Self-employ	0.044	0.003	0.110	0.091	0.063	0.115	0.098
Firm size	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Firm tenure	0.001	0.002	0.001	-0.002	0.000	0.001	0.001
Time in LM	-0.002	0.000	0.001	-0.005	-0.004	-0.001	0.002
Significance							
Intercept	0.000	0.128	0.964	0.000	0.252	0.004	0.263
Education	0.000	0.008	0.999	0.000	0.034	0.000	0.626
Educ-sq	0.000	0.114	0.358	0.000	0.000	0.000	0.007
Age	0.314	0.088	0.625	0.450	0.913	0.140	0.095
Age-sq	0.000	0.073	0.745	0.209	0.431	0.175	0.062
Self-employ	0.000	0.855	0.074	0.000	0.001	0.000	0.006
Firm size	0.000	0.081	0.292	0.513	0.410	0.002	0.484
Firm tenure	0.000	0.455	0.774	0.002	0.486	0.002	0.585
Time in LM	0.000	0.959	0.750	0.000	0.000	0.111	0.373

Computed from the German Labour Force Survey.

Women educated in Germany by parental country of birth: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted) by country of education

	DE	AT2	SC2	TR2	EUn2	Else2	NN2
adj R-sq	0.519	0.433	0.477	0.497	0.485	0.442	0.554
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	0.367	0.196	0.716	0.703	0.693	0.318	0.492
Education	-0.072	-0.056	-0.124	-0.130	-0.131	-0.058	-0.111
Educ-sq	0.005	0.004	0.007	0.007	0.007	0.004	0.007
Age	0.002	0.008	-0.003	0.002	0.006	0.001	0.006
Age-sq	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Self-employ	0.066	0.106	0.062	0.083	0.104	0.112	0.045
Firm size	0.000	0.001	0.001	0.000	0.000	0.000	0.000
Firm tenure	0.003	0.002	0.001	0.002	0.001	0.003	0.003
Time in LM	-0.004	0.003	-0.001	-0.008	-0.004	-0.002	-0.002
Significance							
Intercept	0.000	0.763	0.014	0.000	0.000	0.002	0.133
Education	0.000	0.397	0.014	0.000	0.000	0.000	0.040
Educ-sq	0.000	0.066	0.001	0.000	0.000	0.000	0.000
Age	0.000	0.457	0.513	0.319	0.074	0.398	0.827
Age-sq	0.177	0.268	0.566	0.516	0.111	0.559	0.877
Self-employ	0.000	0.020	0.103	0.000	0.000	0.000	0.292
Firm size	0.000	0.017	0.002	0.052	0.000	0.000	0.461
Firm tenure	0.000	0.393	0.311	0.032	0.214	0.000	0.050
Time in LM	0.000	0.321	0.478	0.000	0.000	0.002	0.578

Computed from the German Labour Force Survey.

Men educated in Austria and Serbia by parental country of birth: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted)

	AT	DE2	SC2	TR2	EUn2	Else2	RS in RS
adj R-sq	0.522	0.656	0.538	0.300	0.564	0.562	0.469
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.952	-1.075	-0.144	-0.746	-0.156	-0.381	-0.122
Education	0.124	0.208	0.027	0.093	0.037	0.092	0.027
Educ-sq	-0.002	-0.005	0.001	-0.002	0.001	-0.001	0.001
Age	0.001	-0.016	-0.002	0.013	-0.004	-0.010	0.007
Age-sq	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000
Self-employ	0.069	0.239	-0.314	0.182	0.249	0.036	-0.128
Firm size	0.000	0.000	0.000	0.000	0.000	0.000	-0.000
Firm tenure	0.001	-0.003	0.004	-0.002	0.004	0.003	-0.004
Time in LM	0.001	0.003	-0.006	-0.012	-0.001	0.003	-0.001
Significance							
Intercept	0.000	0.953	0.120	0.003	0.609	0.766	0.005
Education	0.000	0.926	0.338	0.027	0.409	0.993	0.000
Educ-sq	0.000	0.310	0.766	0.001	0.003	0.294	0.000
Age	0.838	0.855	0.830	0.011	0.118	0.859	0.001
Age-sq	0.887	0.836	0.571	0.026	0.194	0.936	0.499
Self-employ	0.000	0.445	0.680	0.000	0.079	0.154	0.000
Firm size	0.000	0.886	0.246	0.385	0.590	0.187	0.001
Firm tenure	0.000	0.428	0.519	0.775	0.201	0.791	0.000
Time in LM	0.265	0.246	0.230	0.156	0.087	0.737	0.412

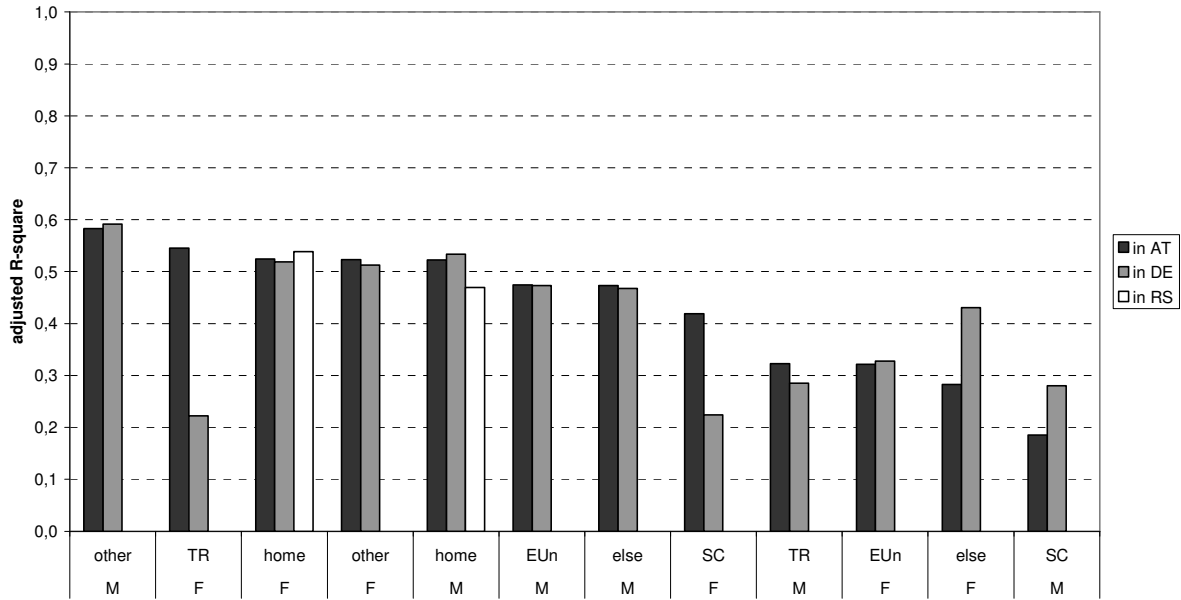
Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Women educated in Austria and Serbia by parental country of birth: OLS regression of occupational outcomes: unstandardized coefficients (population weights applied) and levels of significance (unweighted)

	AT	DE2	SC2	TR2	EUn2	Else2	RS in RS
adj R-sq	0.524	0.413	0.345	0.372	0.427	0.366	0.543
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coefficient							
Intercept	-0.557	-1.075	-0.144	-0.746	-0.156	-0.381	-0.250
Education	0.071	0.208	0.027	0.093	0.037	0.092	0.072
Educ-sq	0.000	-0.005	0.001	-0.002	0.001	-0.001	-0.001
Age	0.001	-0.016	-0.002	0.013	-0.004	-0.010	0.005
Age-sq	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Self-employ	0.039	0.239	-0.314	0.182	0.249	0.036	-0.115
Firm size	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Firm tenure	0.003	-0.003	0.004	-0.002	0.004	0.003	0.001
Time in LM	-0.001	0.003	-0.006	-0.012	-0.001	0.003	-0.007
Significance							
Intercept	0.000	0.338	0.855	0.417	0.368	0.526	0.000
Education	0.000	0.192	0.631	0.950	0.171	0.522	0.000
Educ-sq	0.062	0.506	0.801	0.340	0.856	0.996	0.000
Age	0.835	0.394	0.636	0.209	0.175	0.969	0.221
Age-sq	0.583	0.354	0.108	0.406	0.266	0.773	0.232
Self-employ	0.000	0.003	0.100	0.093	0.000	0.403	0.000
Firm size	0.154	0.241	0.720	0.563	0.237	0.879	0.000
Firm tenure	0.000	0.530	0.455	0.922	0.033	0.015	0.199
Time in LM	0.017	0.932	0.092	0.035	0.875	0.870	0.000

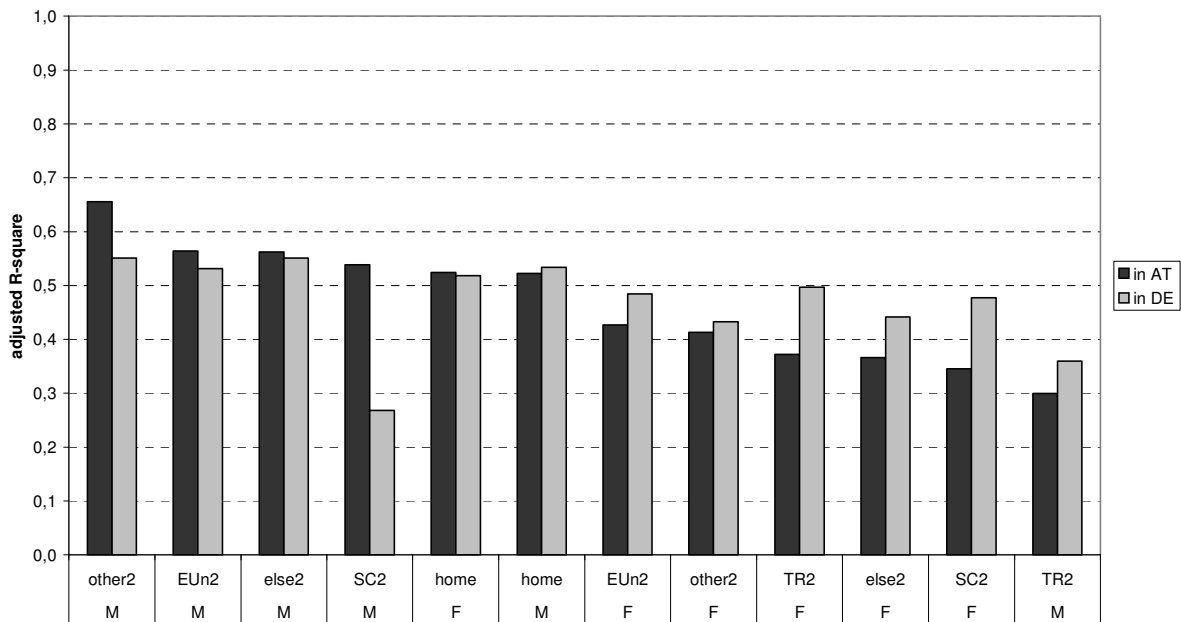
Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

The statistical connex between personal education and the educational intensity of the occupation after controlling for experience & employer, by country of residence, origin of the education, and sex



Computed from the Austrian, the German, and the Serbian Labour Force Survey (Statistics Austria, Federal Office for Statistics, Republic Office of Statistics) microdata.

The connection between personal education and the educational intensity of the occupation after controlling for human capital, by country of residence, parental country of birth, and sex



Computed from the Austrian, the German, and the Serbian Labour Force Survey (Statistics Austria, Federal Office for Statistics, Republic Office of Statistics) microdata.

It is less common for the model to explain the occupational outcomes of the “second generation” equally well in both countries. This is true only of the cases of men with parents born in the newer EU member countries and in the rest of the world and of the women with parents born in the other country. In all other cases there are notable differences in explanatory power. The difference is especially large in the case of men with parents born in Serbia where the model explains twice as much variance in Austria than in Germany. In one other case it performs better in Austria, i.e. men with parents born in the other country but in five other cases it performs somewhat better in Germany than in Austria.

### The effect of education years on the educational intensity of the occupation

The chief result is that the relevance of personal education for the educational intensity of the occupation varies a great deal depending on where the education was obtained or where the parents were born. We report the predicted Hauser-Warren scores for a person with 9, 12, 15, and 18 years of education, if this person is aged 40, which is close to the mean age of employed migrants, not self-employed, works in a company of 20, has been on the job for 10 years, and has been living in the country of residence for 15 years. A number of observations stand out:

1. With only 9 years of education the occupational scores are all close together, regardless of the country of education. The men’s scores range between .08 and .13 in Germany and between .07 and .14 in Austria, the women’s between .11 and .16 and between .10 and .17, respectively. The ranges between the lowest and the highest score are slightly wider in Austria than in Germany.
2. With 12 years of education the ranges are considerably wider. Men can now expect to work in an occupation worth between .10 and .40 on the Hauser-Warren scale in Germany and between .08 and .35 in Austria, and women between .13 or .14 and .36 in both countries. The range is now on the order of .3 for men and .2 for women.
3. With three more years of education men’s occupations range between .22 and .61 in Germany or .19 and .57 in Austria, and women’s between .20 and .51 or .31 and .60. So ranges are now on the order of .4 for men and .3 for women.
4. Finally, with 18 years of education, our 40 year olds can expect to work in an occupation scoring between .44 and .79 or between .37 and .78 for men and between .10 and .82 or between .43 and .83 for women. The gap has remained at about .4 for the men but kept opening wider for the women.
5. Any education from Serbia or Turkey beyond the basic requirement of nine years is discounted heavily. In both Austria and Germany men lose two to three years regardless of their level of education.
6. The predictions for women with high education from Serbia and Turkey are not very robust because there are few cases. The women with education from Turkey employed in Austria lose a couple of years in the 12 to 15 years part of the educational spectrum, and the women with education from Serbia lose about three years at all levels of education from 12 years up. In Germany it is not possible to say anything sensible about the way Serbian education years are transformed into occupational scores. The women’s education years from Turkey lose about one third of their value.



Predicted Hauser-Warren scores for a person aged 40, dependently employed in a firm of 20, with 10 years experience on the job, and resident in the country for 15 years, by number of education years, country of residence, and country in which the education was obtained

Germany	Men				Women			
	9 years	12 years	15 years	18 years	9 years	12 years	15 years	18 years
DE	0.09	0.29	0.52	0.79	0.17	0.29	0.51	0.82
AT	0.13	0.40	0.61	0.76	0.16	0.36	0.51	0.61
SC	0.08	0.10	0.22	0.44	0.12	0.21	0.20	0.10
TR	0.11	0.14	0.25	0.45	0.10	0.13	0.21	0.34
EUn	0.09	0.16	0.36	0.69	0.11	0.16	0.29	0.51
Else	0.08	0.15	0.33	0.61	0.11	0.19	0.35	0.60
Unknown	0.09	0.15	0.29	0.51	0.13	0.25	0.34	0.41
Austria								
AT	0.07	0.33	0.57	0.78	0.14	0.36	0.60	0.83
DE	0.09	0.35	0.57	0.77	0.16	0.35	0.55	0.76
SC	0.07	0.08	0.19	0.39	0.11	0.14	0.31	0.62
TR	0.08	0.11	0.21	0.37	0.11	0.23	0.47	0.80
EUn	0.08	0.13	0.35	0.72	0.12	0.19	0.33	0.52
Else	0.14	0.23	0.39	0.63	0.13	0.23	0.33	0.43

Computed from the German and the Austrian Labour Force Survey.

If the education is in-country and the parents were born in a variety of countries, the gaps are not quite as wide but they do persist. Once again they are fairly narrow at low levels of education.

1. For the men educated in Austria, depending on where their parents were born, occupational scores vary by about .2 with low education and by about .3 with high education. For men in Germany there is next to no variation in the average predicted occupational score at a low level of education, while the range is about .2 at the middle levels of education and about .3 with high education.

Predicted Hauser-Warren scores for a person aged 40, dependently employed in a firm of 20, with 10 years experience on the job, and resident in the country for 15 years, by number of education years, country of residence & education, and country in which the parents were born

Germany	Men				Women			
	9 years	12 years	15 years	18 years	9 years	12 years	15 years	18 years
DE	0.09	0.29	0.52	0.79	0.17	0.29	0.51	0.82
AT	0.07	0.35	0.57	0.72	0.23	0.32	0.48	0.73
SC	0.10	0.24	0.42	0.64	0.10	0.19	0.40	0.75
TR	0.10	0.17	0.36	0.68	0.10	0.19	0.40	0.74
EUn	0.07	0.23	0.47	0.80	0.14	0.21	0.40	0.72
Else	0.10	0.23	0.45	0.74	0.15	0.25	0.43	0.68
Unknown	0.08	0.29	0.56	0.92	0.18	0.29	0.52	0.87
Austria								
AT	0.07	0.33	0.57	0.78	0.14	0.36	0.60	0.83
DE	0.21	0.38	0.61	0.91	0.10	0.38	0.56	0.65
SC	0.04	0.29	0.54	0.80	0.18	0.33	0.49	0.67
TR	0.09	0.16	0.34	0.62	0.13	0.34	0.52	0.67
EUn	0.12	0.28	0.51	0.82	0.17	0.33	0.50	0.68
Else	0.12	0.35	0.56	0.76	0.16	0.34	0.49	0.62

Computed from the German and the Austrian Labour Force Survey.

2. Between the women in Austria there is little difference with 9 years of education, virtually none with 12 years, while after that it widens to about .2. In Germany the gap is narrow and the same across all four levels of education.

### The effect of experience and employment characteristics

As shown above that while severe differences in the occupational returns to education persist there tends to be a positive contribution from the experience and company variables to their diminution. As it turns out, the impact of the experience variables as well as firm size is spotty at best. Self-employment, however, is of major importance, especially in Austria. In fact, virtually all of the improvement in the model's explanatory power stems from the introduction of the self-employment variable. For migrants and their children self-employment emerges as the one way of bringing the occupation closer in line with the education they have received.

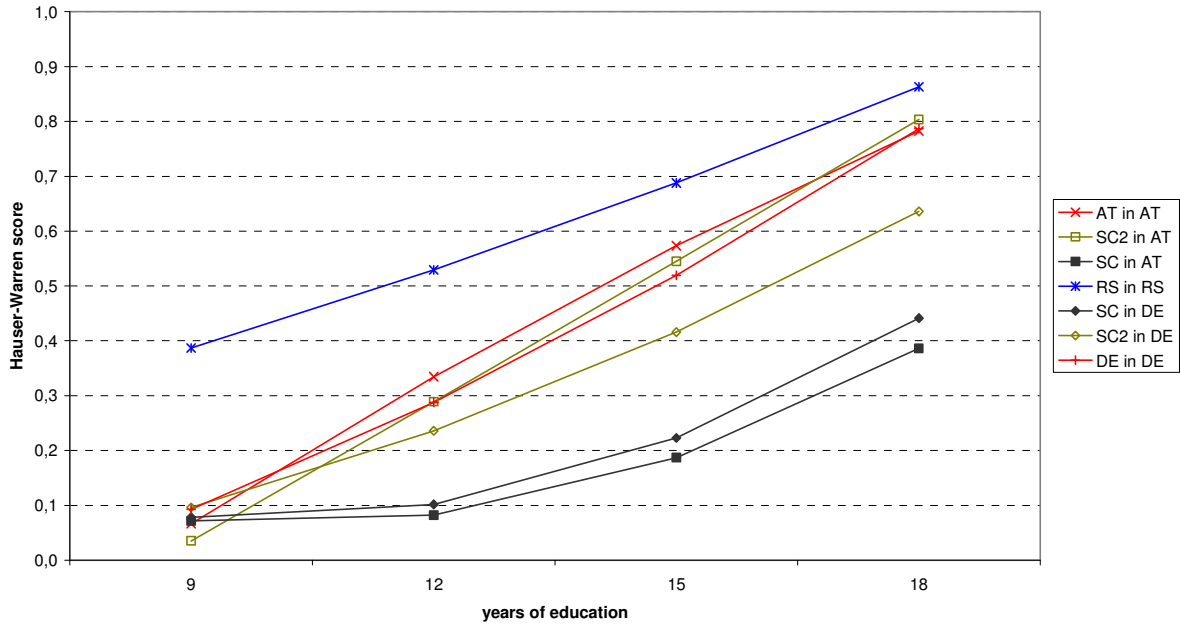
#### ▫ Self-employment

For post-education immigrants as well as for their children self-employment turns out to be an important means of reaching higher occupational levels. Among post-education migrants self-employment involves occupational gains of up to 0.23 points which is considerable on a scale running from zero to one. Largest are those of the women educated in Turkey and employed in Austria (.23) followed by the women from the rest of the world employed in Germany (.21). Other large gains from self-employment in Austria are estimated for the men educated in Germany (.20), in Turkey (.16) and in Serbia (.15), and the women educated in the rest of the world (.16). In Germany men educated in unknown countries gain .15, in the rest of the world .14, and in Serbia .13 while women educated in Austria gain .17 and those educated in the newer EU member countries gain .11 points. There are several others gaining .07 or .08 points including in Germany women educated in Turkey, and men educated in Turkey or in the newer EU member countries, and in Austria women educated in Serbia, and men and women educated in the newer EU member countries. Non-migrants in Austria and in Germany achieve estimated gains from self-employment of .04 (women) and .07 (men) points. This is the same in both countries.

Even larger than the occupational gains of post-education migrants are those of non-migrants with parents born abroad. In Austria the women with parents born in Germany gain .24 points, and the women with parents born in the newer EU member countries .25. The women with parents born in Turkey gain .18 points and their male counterparts .14. In Germany the "second generation's" gains do not exceed .11 points (women and men with parents born in the rest of the world, women with parents born in Austria, men with parents born in Serbia). An exceptional case is that of the women employed in Austria with parents born in Serbia. For them the estimated impact of self-employment is extremely negative (-.31) but statistically significant only at the 90 percent level. The only other negative coefficients on self-employment are being observed for the employed population in Serbia. There self-employment reduces the mean occupational score of both women and men by 0.12 points.

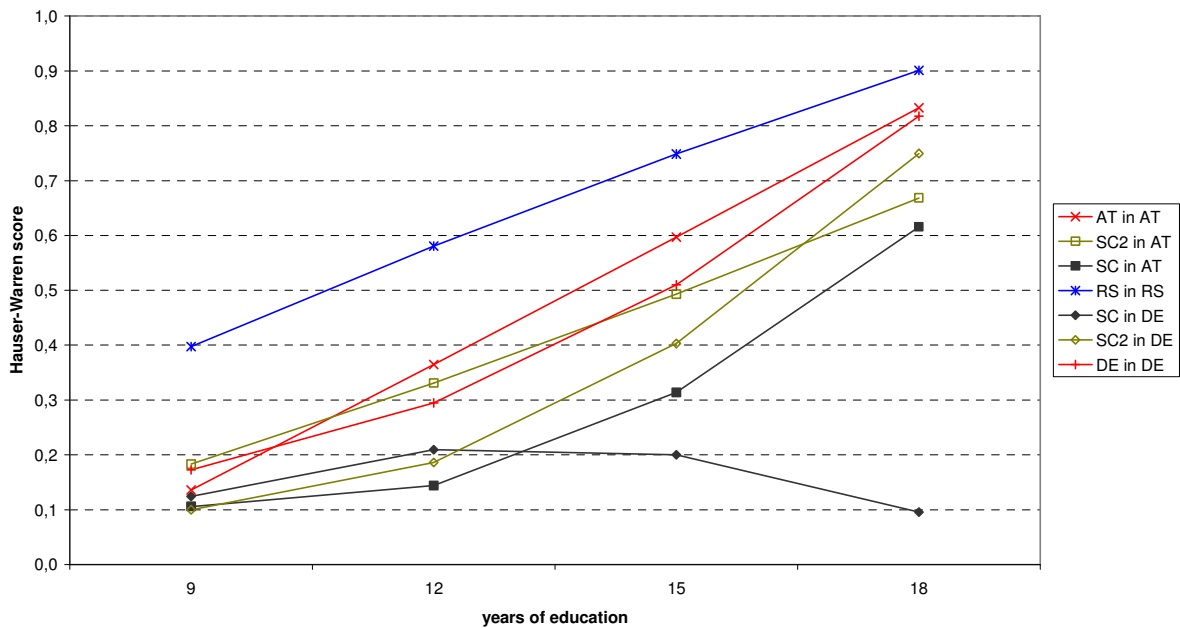
Of all the experience and company variables self-employment has by far the most pervasive and for most parts of the immigrant population also the largest impact. This result is of some importance. Other than dropping out of the labour force self-employment is the one way of becoming independent of the decisions of employers. The large impact associated with self-employment on immigrant occupational attainment may suggest that the dependently employed are being held back not by their educational or other skills but by a lack of recognition for them in their current employment. It is very unlikely that everybody with skills adequate to the occupations held by the self-employed does indeed immediately become self-employed. Much talent must therefore lie dormant in immigrant employees in companies in Austria and Germany.

**Education and educational intensity of the job of the male, 40 year old, dependently employed population originating from Serbia after 10 years with the same employer**



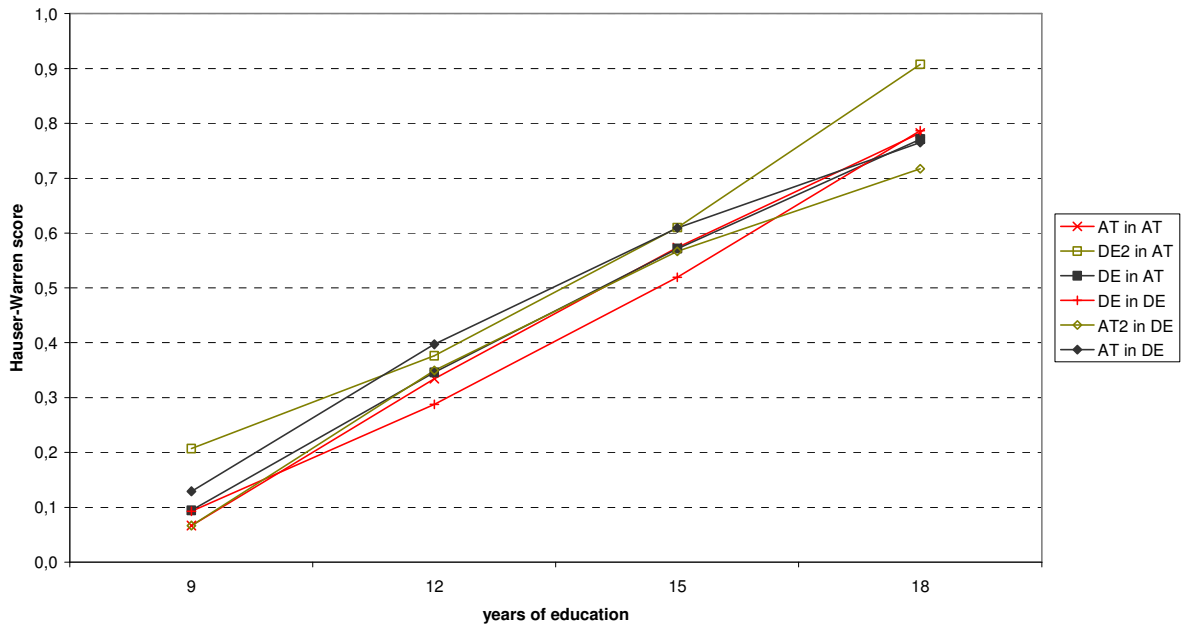
Computed from the Austrian Labour Force Survey (Statistics Austria).

**Education and educational intensity of the job of the female, 40 year old, dependently employed population originating from Serbia after 10 years with the same employer**



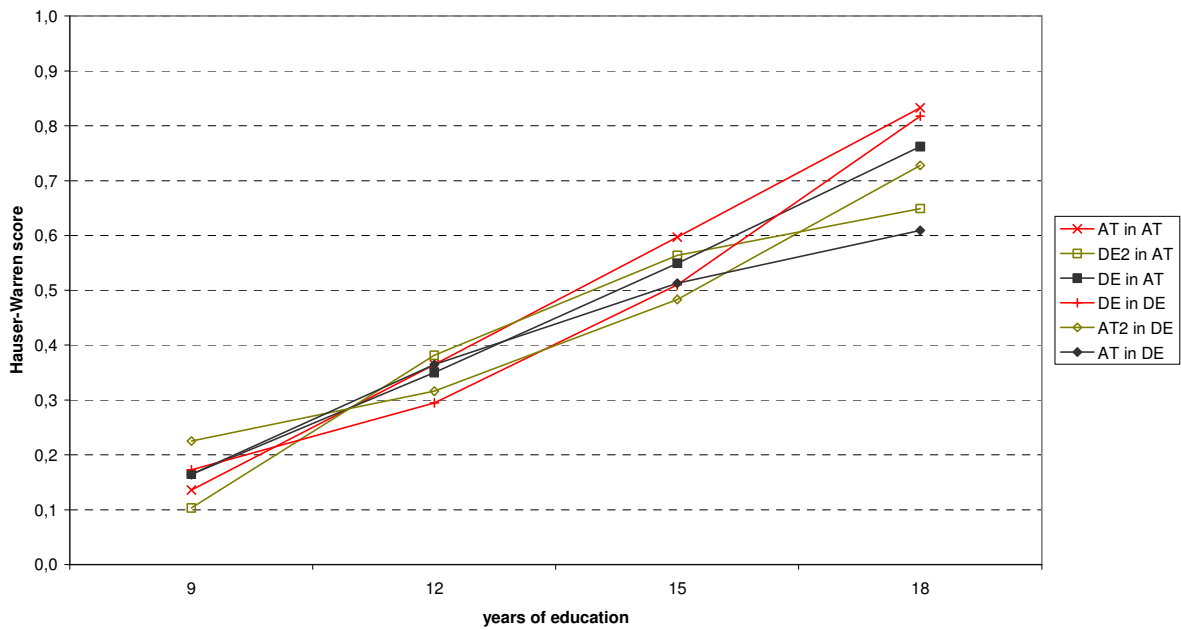
Computed from the Austrian Labour Force Survey (Statistics Austria).

**Education and educational intensity of the job of the male, 40 year old, dependently employed population originating from Austria or Germany after 10 years with the same employer**



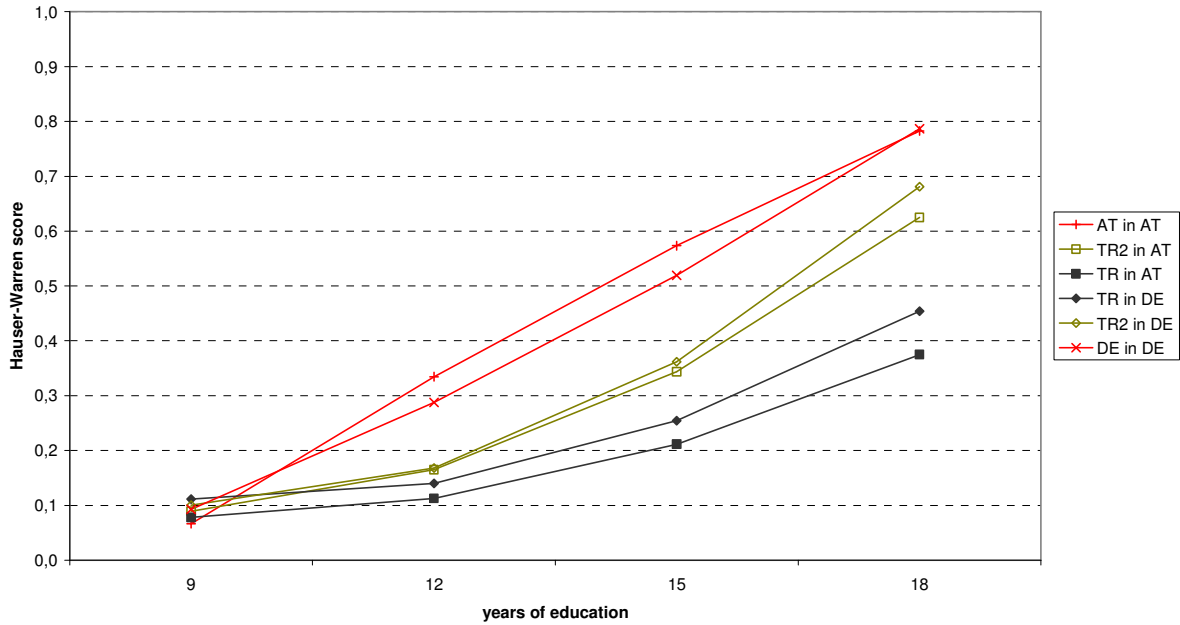
Computed from the Austrian Labour Force Survey (Statistics Austria).

**Education and educational intensity of the job of the female, 40 year old, dependently employed population originating from Austria or Germany after 10 years with the same employer**



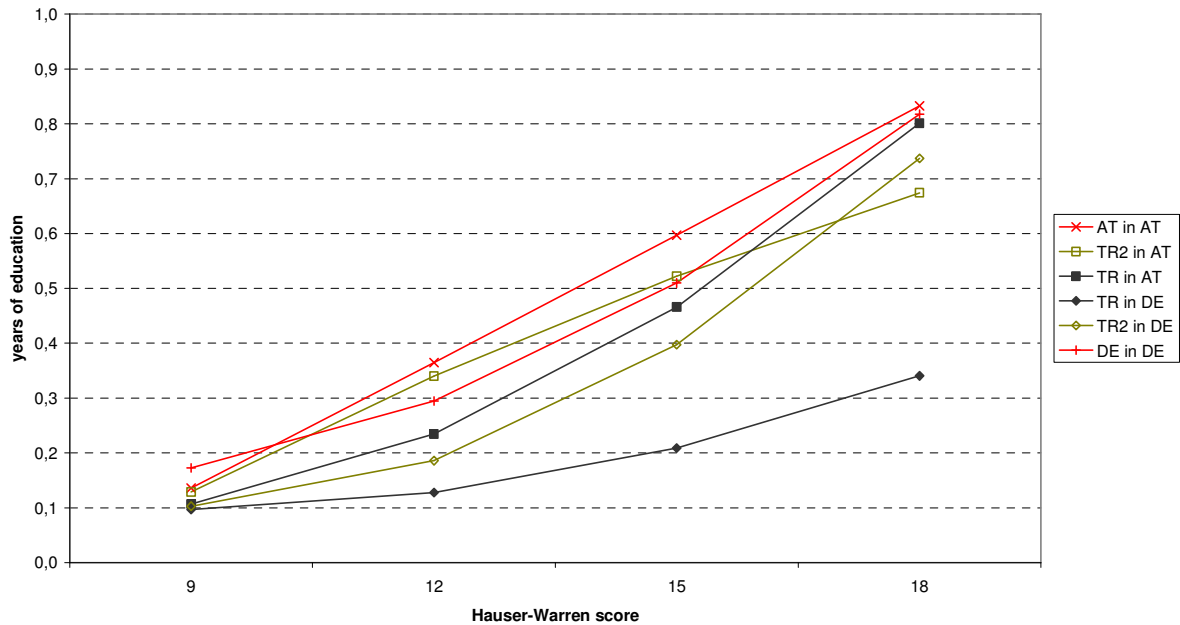
Computed from the Austrian Labour Force Survey (Statistics Austria).

**Education and educational intensity of the job of the male, 40 year old, dependently employed population originating from Turkey after 10 years with the same employer**



Computed from the German Labour Force Survey.

**Education and educational intensity of the job of the female, 40 year old, dependently employed population originating from Turkey after 10 years with the same employer**



Computed from the German Labour Force Survey.

- Size of the company in terms of employment

Negative impacts of firm size on occupational outcome are no rarity. They do not affect employees in Austria and Germany whose parents were born in the country but are focused entirely on migrants and their children.

There are only few cases in which the employment size of the company can unambiguously be shown to be a positive influence on the estimated occupational outcome. In Austria there are only two, i.e. those of the men with parents born in Austria and of the women educated in the rest of the world. In Germany they are more numerous and include those of the women and men with parents born in Germany, the men educated in the rest of the world, and the women educated in the newer EU member countries. They also include the men educated in Turkey where the influence is significantly negative. In all other cases of immigration the variable's statistical significance is low in the unweighted data and the impact may therefore be zero. The sign on the coefficient is repeatedly negative. These cases in Germany include that of the men with parents born in Turkey, and four of six immigrant male and three of six immigrant female cases. In Austria they include the women whose parents were born in Serbia, Turkey and the newer EU member countries, and among migrants the men educated in Turkey, the newer EU member countries and the rest of the world as well as the women educated in Serbia and in the newer EU member countries.

In Serbia the employment size of the company is a weak but significantly positive influence on the occupational level of the employed.

- Tenure with the same employer

For employees in Austria or Germany whose parents were born in the country longer duration of employment with the current employer goes hand in hand with a higher occupational score. They could either be gaining from staying with the employer or, more likely, stay with the employer because the position is advantageous given their level of education, age, and sex or given their preferences. The same also occurs for selected immigrant populations but not including those from Serbia and from Turkey. Not even the children of the immigrants from these two countries enjoy occupational benefits from longer employment duration with the same employer.

A statistically significant positive influence on the occupational outcome occurs both in Germany and in Austria for both sexes of the natives. In Serbia the influence is insignificantly positive for the women and significantly negative for the men. For migrants statistical significance is rare in the unweighted data. In Germany it only occurs for men educated in the rest of the world. In Austria it is somewhat more common including both sexes educated in the newer EU member countries, and men educated in the rest of the world.

In the "second generation" in Germany it is significantly positive for the women with parents born in Turkey or the newer EU member countries, and for both sexes in the rest of the world. For the men with parents born in Turkey it is a significantly negative influence. Otherwise there is one negative sign (men with parents born in the newer EU member states). In Austria there are only two cases of significant influence, both positive, i.e. for women whose parents were born in the newer EU member countries or in the rest of the world. There are cases with a negative sign (women with parents born in Germany, men with parents born in Serbia, both sexes with parents born in Turkey).

- Years since having completed the highest attained educational certificate (potential labour market experience)

The collinearity diagnostics indicate there is a problem in most of the cases so that reported levels of significance may not be correct for this variable.

Most of the time the sign on the coefficient is negative. Most of the exceptions concern men in Austria. Statistical significance at the 95% level is infrequent and only occurs on negative cases. The

two strongest ones concern women in Austria, i.e. those educated in Serbia (-.014) and in the newer EU member countries (-.010).

In Austria the influence is not statistically significant for any of the parts of the “second generation”. In Germany it is significantly negative in the cases of women with parents born in Serbia, both sexes born in Turkey and in the newer EU member countries, and statistically insignificant in all other cases.

The negativity is likely to indicate that earlier entrants into the labour market had an even lower chance of getting into occupations with higher Hauser-Warren scores than later entrants. It could also mean that occupational outcomes deteriorate over time after entering the labour market.

▫ Years of residence in the country

In the case of immigrants there is one further variable, i.e. the duration of residence in the country. In some instances there are signs of a problem with collinearity. It is not statistically significant for any of the male immigrant populations in Germany or any of the female ones in Austria, and for only two each of the five male ones in Austria and of the five female ones in Germany. Of the four significant cases one is negative (men educated in the rest of the world employed in Austria). This is also the most strongly significant one. Only one of the four concerns immigrants from Serbia or Turkey, i.e. men educated in Serbia employed in Austria.

There are some additional results in appendix A3.

## 4. The influence of social capital and discrimination

### 4.1 Social capital

#### Theory

Just like human capital a decade earlier, so has social capital been enjoying a remarkable career since the 1970s. Its value for the current study lies in reminding us that the job requiring certain abilities and the person possessing the abilities may never find each other if the flow of information between them is interrupted by a lack of relay persons.

The concept of social capital is widely used by sociologists, political scientists, and economists for understanding social problems and economic and political outcomes in recent years.

A social capital framework is gaining importance in explaining people’s different amount of relative success in fields like education and health, child well-being, democracy and governance (Jackman/Miller 1998; Portes/Sensenbrenner 1993; and Woolcock 1998) and – of particular interest for our research – the labour market (Granovetter 1974; Montgomery 1992; Lin 2001; Stone et al 2003; Aguilera/Massey 2003). Concerning occupational success relatively little empirical research is available mostly due to a lack of data, which in turn is due to problems of quick and cheap measurement.

Like human capital theory, social capital theory is no single, coherent theory. Definitions of social capital vary widely – depending- firstly on their focus on the substance, the sources or the effects of social capital and, secondly, depending on the type of linkages (Adler/Kwon 2002: 21). Distinctions are made between external and internal ties. External ties link different networks, thus making different resources that are available in one network, accessible to members of another network. This is also called “bridging” (Stone et al 2003) Internal ties, also called “bonding” forms of social capital, focus on the internal structure of a network and the capacity of its members to effectively work together by sharing their own resources. A third form of social relations is known, called “link-



ing". Linking ties provide access to people in authority and are therefore helpful for collecting resources.

Adler & Kwon (2002: 18) define social capital as "the resource available to actors as a function of their location in the structure of their social relations." They highlight three primary sources: opportunity, motivation, and ability. External ties give people the opportunity to effectively use their contact's resources. Internal ties create the opportunity to work together. Social capital is motivated by commitments that bind community. This can best be expressed by the saying, "I'll do this for you knowing that somewhere down the road you will do something for me" (Adler/Kwon 2002: 26). Ability is constitutive of social capital. Social capital is useless if a person wants to gain information and knowledge from a contact that lacks qualifications. This indicates that there is a degree of interplay between human capital and social capital. It is obvious that they are connected, but in which way is not stated clearly in the literature. Coleman says that "human capital in the absence of social capital is not productive, but social capital in the absence of human capital can still be productive" (Adler/Kwon 2002: 34). Kanas & Tubergen (2006) could provide evidence in their research that the social network of immigrants helps them to invest in host-country specific human capital.

Social Capital Theory posits that social relations serve as qualities that are beneficial to the individual. When considering job acquisition, the most important benefit of social capital is its function to facilitate access to information. In this regard, social capital helps workers to find jobs on the labour market and influences career success. In this research we want to investigate to which extent a person's stock of social capital relates to occupational outcomes. A lot of sociological research argues that using job contacts (Granovetter 1974) or having good contact networks (Lin 2001) increases wages or occupational prestige. Aguilera & Massey (2003) found in their research that friends and relatives sort through jobs to reserve the better jobs for people within their network. By this means the relationship a person has with their family and friends helps to find more quickly a job that may in addition, closely match their skills and preferences.

- We therefore hypothesize that migrants who came into an already existing household when they entered the host country have more network access and therefore higher occupational outcomes than those people who were on their own when they arrived in the host country (H5).

From a social capital point of view, ethnic inequalities in occupational outcomes arise because immigrants possess less social capital than natives (Kanas/Tubergen 2006: 2).

Immigrants may be allocated to disadvantaged positions on the labour market because they may have fewer contacts and limited access to networks that provide them with important information on the host country's labour market. As a result, immigrants may only possess limited information on job opportunities.

Fernandez-Kelly (1995) and Aguilera (1999) show in their research that friends and relatives assist migrants in their job search by providing them with useful information: how and where to look for jobs, how to present themselves to employers, what wages to ask for, and which sorts of jobs and worksides to avoid.

Recent research showed that distinctions between ethnic and native based social capital should be made. For example Kanas & Tubergen (2006) present evidence that immigrants who found a job through ethnic ties have a lower prestigious job than those who used formal sources and host-country ties. Sanders et al (2002) as well as Lin (1999) show that the use of impersonal methods (formal channels) to find a job lead to better jobs than if ethnic or personal ties are used. This indicates that ethnic ties may be less valuable than ties with natives, as ethnic peers may be less informed about the situation on the labour market as well as on specific job openings of the host country.

The effects of social capital on occupational success depend on the structure of social relations (size, density, diversity of the backgrounds and social situations of the network members), but also

on the quality of the ties one holds, characterized by norms of trust and reciprocity (Stone et al. 2003).

Adler/Kwon (2002) emphasize that strong internal linkages may overembed the actor in the relationship, reducing innovation and information and resulting in the saying “The ties that bind may also blind” (Adler/Kwon 2002: 30). Strong solidarity with in-group members and only a few external linkages may create a situation where the person’s integration into the broader whole is hindered. But there may also be the possibility that high internal linkages “encourage and help members to reach out to the surrounding world” (Adler/Kwon 2002: 32). Montgomery (1992) found that weak tie networks provide employment offers more frequently and they also provide superior offers than strong tie networks.

Given the nature of our data set we cannot distinguish between host country ties and ethnic ties, nor can we obtain information on the ethnic composition of people’s contacts. Kanas/Tubergen (2006) show that migrants who have many contacts with Dutch natives have higher occupational statuses than migrants who have many contacts with co-ethnics but cause an effect remain unclear. People may be granted more contacts because they have higher occupational status rather than having achieved the occupational status because they had more contacts. In addition, membership in an organization could be of interest when analysing the effect of social capital on occupational outcomes. Kanas & Tubergen (2006) show that generally, membership in an organization is associated with higher status jobs. Membership of a native organization is significantly associated with a better economic position than membership of an ethnic organization (Kanas/Tubergen 2006: 18). The same concern about cause and effect applies here too.

To sum up, social capital in the form of social relations provides access to labour market information and guidance in making the job search more efficient. We should keep in mind that strong ethnic ties and only few ties with natives of the country of residence may hinder the integration into the receiving society. Further, host country ties may be more valuable to immigrants as natives possess important knowledge on the labour market, its institutions and processes of job acquisition.

### Operationalisation

The LFS is not particularly strong on social capital information. We construct an indicator of network access by using information on the household, the date of arrival in the host country, and the position relative to the household reference person. We construct a dummy variable setting off the household member with the earliest year of arrival from those that immigrated later. This is not a particularly good measure of succession in the household, since we have no way of knowing whether people actually immigrated into this household. They might have arrived as part of a family or group that all arrived on the same day and may only later have come into the household surveyed by the LFS. However, joining up with a person with longer duration of residence could also have an impact on occupational success, even if the joining up occurred years after arrival rather than immediately.

The 2008 LFS ad hoc-module contained a question on whether respondents had migrated in order to join their family. This would have been a more direct measure of immigration into a pre-existing network. We did not use module information because being voluntary 38 percent of the immigrants declined to participate. This self-selection out of the sample would have biased the results.

Duration of residence could also be taken as a proxy for social capital in the same way that it is sometimes taken as a proxy for skills in the dominant language. This should not be done without some evidence justifying the assumption that the passage of time contributes positively to relations or skills relevant to the non-migrant population or that stayers are positively selected in this regard.

## Results

It was hypothesized before that migrants who came into an already existing household when they entered the host country, have more network access and therefore higher occupational outcomes than those people who were on their own when they arrived in the host country (H5).

We explore this hypothesis by comparing the occupational outcomes of immigrants with foreign-acquired education, who were not first in their current household in contrast with immigrants who were.

The table below shows the predicted outcomes of having or not having network access for immigrants in general (1<sup>st</sup> column) and Serbs specifically (2<sup>nd</sup> column).

OLS regression of occupational outcomes for women and men, unstandardized coefficients				
	All migrants		From Serbia	
	b	se	b	se
Intercept	-.21	.05	-.10	.10
Education	.05	.00	.02	.00
Sex	.02	.01	.04	.00
Age	-.01	.00	.00	.00
Age-square	.00	.00	.00	.00
Potential LM experience	.00	.00	.00	.00
Job experience	.00	.00	.00	.00
Self employed	.11	.01	.15	.03
Firm size	.00	.00	.00	.00
Network access	-.01	.01	-.02	.01
Adjusted R-square	.43		.19	
Respondents	3713		466	

Computed from the Austrian Labour Force Survey.

The findings indicate three effects deviating from expectations:

- 1) The variable “network access” does not increase the overall amount of explained variance in occupational outcomes in and therefore does not contribute to a higher adjusted R-square. The explained variance for the occupational outcome of Serbian-educated employment is 19% when network access is included and 22% when only human capital variables are included
- 2) The variable network access is not significant in both unweighted models and only shows significant effects when the model refers to the weighted average of the data. In addition, confidence intervals are very large, making it difficult to interpret effects.
- 3) If we try to interpret the impact of network access on occupational outcomes, we can see that the effect is very low, but negative for immigrants in general and Serbs specifically. This indicates that moving into an already existing household seems not to facilitate access to information that is valuable on the Austrian labour market. On the contrary, it may lead to lower qualified jobs and lower career success.

The findings may be on the one hand difficult to discuss, given the large confidence intervals (ranging from slightly negative effects to slightly positive effects), but may be on the other hand, interesting to look at in further investigations. As presented in the theoretical part of this research report, network access is a debatable issue. On the one hand, access to network resources is seen as positive, increasing occupational outcomes and leading to higher paid jobs. On the other hand, there is a lot of recent research on this topic that could not find a positive relationship between network access and occupational success. For example, Kanas & Tubergen (2006) present evidence that immigrants who found a job through ethnic ties have a less prestigious job than those that used formal sources and host-country ties. Likewise, Sanders, Nee & Sernau (2002) as well

as Lin (1999) show that the use of impersonal methods (formal channels) to find a job lead to better jobs than if ethnic or personal ties are used.

Given these findings, there is the possibility that network access may have, if any, a negative effect on occupational outcomes. Following a “labour market segmentation logic” immigrants are forced to work in specific, lower qualified and lower paid segments of the labour market. Entry to highly qualified jobs is only granted or provided to natives. Therefore it is possible, that immigrants are not able to use family or relatives’ job contacts and labour market information to promote their career success, as most of their network resources are themselves working in low qualified jobs and do not have access to equally valuable information and prestigious contacts.

Given the limited information on social capital variables in our data set we cannot analyse this issue further. This definitely should be done to make more accurate statements.

## 4.2 Discrimination

### Theory

Theories of discrimination on the labour market try to explain why some groups of workers do significantly worse than the dominant group in a population. The fact that some groups are doing better or worse than other groups of people does not itself indicate discrimination, but when certain characteristics of workers, like for example gender, race, or age, that an applicant has no control over and that are not correlated with productivity lead employers to an unequal treatment of this person in terms of paying lower wages or offering poorer employment opportunities or any other unfair treatment, then discrimination takes place.

According to Levitin et al (1971) treatment discrimination can be understood “as denials of rewards, resources, or opportunities on the job that one legitimately deserves as a result of his or her subgroup membership e.g. race” (Hayes 2000: 494).

According to Hayes (2000) there are three different levels of labour market discrimination:

- Firstly, discrimination can result at the individual level. Employers have limited information on the skills of job applicants and therefore make their decision on simple observable characteristics such as gender, skin colour, or educational certificates. In this case, discrimination results from personal prejudice.
- Secondly, going back to Max Weber, discrimination can result from “social closure”, a group level phenomenon (Halaby 1979).
- Thirdly, discrimination can result at the organizational level. Hayes (2000) emphasizes that unconscious institutionalized practices and structural barriers are typical for this kind of discrimination.

There is a large body of literature on theories that focus on labour market discrimination, mainly dealing with discrimination in wages and hiring decisions.

In order to provide a general overview of these theories, we will group them into “neoclassical theories”, theories that mainly focus on the supply side of the labour market, and “non-neoclassical theories”, like the labour market segmentation theory that focuses on the limited access of groups of people with specific characteristics to certain segments of the labour market.

The two main theories on discrimination belonging to “neo-classical theories” are the taste-based theory by Gary Becker (1957) and the theory on statistical discrimination following Arrow (1973). The taste-based theory by Gary Becker assumes that employers, native employees or customers have a distaste for working together and/or communicating with minority groups. In order to avoid an interaction with migrant workers of any kind, those people in the workplace are willing to pay a

financial price for it. For example, a situation can be imagined, where a Turkish worker with equivalent productivity is available at a lower wage than a native worker, but is rejected because of the employer's antipathy against Turkish people. In this "taste-model" tastes for or against members of disadvantaged groups are treated the same like preferences or antipathies for certain goods and services. Gary Becker does not give an explanation to why these tastes and preferences may exist on the supply side.

Theories of statistical discrimination assume that employers have incomplete information about applicants' skills and productivity in the hiring process. In order to minimize the costs of information acquisition they screen applicants to find indicators that they believe to be associated with productivity. These indicators range from skin colour and gender via references and educational certificates to address, accent or name.

Thus, individuals from different groups may have different occupational success, although they are observably similar, equally endowed and equally productive.

Coate & Loury (1993) extended the statistical theory of discrimination to include aspects of human capital theory. Researching the wage gap between African-American and Caucasian people they find the skill gap that exists between African-American and Caucasian workers to be the major cause of discrimination. They assume that the causes for this skill gap are of a social and cultural nature. Like Carneiro et al (2005), they highlight the importance of family background and community background variables in determining future occupational outcomes. In this way occupational outcomes arise from discrimination that exists outside the labour market.

Labour-market segmentation theory (Doeringer/Piore 1971) suggests that labour market disadvantage for various groups results from a fragmented labour market. According to this theory, the labour-market is split into different labour markets with different market institutions, different working condition, different job rewards and different career opportunities.

Contrary to human capital theory which posits that labour market differences among groups will decline over time because of a natural competitive mechanism, segmentation theory assumes that inequalities will persist because of the pervasive existence of segmented markets where people are allocated according to different group characteristics. Dual labour-market theory posits that there exist two labour-markets: the primary market, characterized by stable working conditions, high wages and career opportunities (Reich et al 1973) and the secondary market, marked by low-skilled jobs and high underemployment (Doeringer/Piore 1971). Job mobility between the primary and the secondary market, which themselves possess various sub-segments, is highly restricted and only possible if higher educational credentials are obtained. Internal labour-market theory, also developed by Doeringer & Piore (1971) in the United States, assumes that the labour market is split into an internal labour market and an external labour market. The internal labour market exists within an organisation and is shield from the competition going on in the external labour market. Workers, which already have found entry into the internal market, are advantaged because they are selected to be allocated to jobs in this sector. The external labour market allocates workers to jobs simply by external market conditions. The two markets are not entirely separated as there are specified ports of entry allowing some movement between the two sectors (Doeringer/Piore 1971).

Labour-market segmentation theory assumes that there is segmentation by race, sex and various other group characteristics. Minority workers are mainly found in the external labour market as a result of the allocation to jobs according to specific characteristics of workers (Taubmann/Wächter 1986). Minority workers that are allocated to jobs that require only few skills are not able to accumulate a lot of job skills via on-the-job training. Thus, their initial placement results in a lower performance and potential compared to workers that obtained a lot of training. They therefore are not able to overcome their initial skill gap and are forced to take disadvantaged jobs. Reich et al (1973: 360) emphasize that certain jobs are "race-typed", i.e. segregated by prejudice and by labour market institutions.



Segmentation by sex occurs because certain jobs have generally been restricted to men and others to women (Reich et al 1973: 360). Family and schooling institutions still encourage sex specific characteristics in a way that women tend to take over jobs with a serving mentality. These jobs are usually lower paid.

Thus, according to labour-market segmentation theory- occupational outcomes of minority workers are worse than those of natives, due to their restriction to the secondary labour market and their allocation to jobs in the external labour market, due to prejudice and discrimination and due to the fact that minority workers often arrive in the destination country with low skills.

It is well known that racial minorities as well as women tend to perform worse than the dominant population group and men.

Ransom & Oaxaca (2005) and Acosta (2006) present evidence in their research that women are significantly less promoted on the labour market than men with similar observed characteristics and the same job specific performance ratings.

Massey (1981) in giving an overview of the literature on prejudice emphasizes that discrimination reflects social distance. The least prejudices are against those people that belong to the socially nearest groups and the greatest prejudices are against the members of the socially furthest groups where "social" means that there is a recognizable difference in wealth. Immigrants from Serbia and Turkey to Austria and Germany come from poorer societies and are generally poorer.

- Thus, we hypothesize that at the same level of personal education having a family background from Turkey, Serbia or any "EU 2" country (including Hungary, Slovenia, Slovakia, Czech Republic, Bulgaria, Estonia, Latvia, Lithuania, Poland, and Romania, plus also Croatia and Bosnia-Herzegovina) has a negative effect on occupational outcomes (H6).

Immigrants from "EU1" countries come from equally wealthy countries and are close in wealth to the population born in Austria.

- Hence, we hypothesize that coming from a "EU 1" country (including Italy, Switzerland, Liechtenstein, Andorra, Belgium, Finland, France, Greece, Ireland, Iceland, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Sweden, Spain, Vatican, United Kingdom) does not have a negative effect on occupational outcomes (H7).

Measuring discrimination, like measuring human capital and social capital, is an empirical challenge. Self-reported data are not objective in the same sense. Racists may tend to provide a socially desirable answer instead of their real intentions unless the question is very well prepared and worked up to as was done, for instance, in Eurobarometer 47.1.

Nielsen (2007) explains that overeducation can be an indicator of discrimination practices on the labour market. "If immigrants find it more difficult to acquire any job at all, they are more likely to accept a job that does not match their qualifications" (Nielsen 2007: 7).

For our analysis we try to estimate the extent of discrimination by estimating a regression model of occupational outcomes specifying relevant variables like gender, country of birth of parents, source of education, citizenship and age. These variables may incorporate discrimination. We code these variables into dummies and then focus on the regression coefficients of the dummy variables- if they are negative and significant this suggests potential discrimination according to the specific group characteristic.

Of course, for accurately measuring discrimination, information on other variables like skin colour, ethnicity, first name and last name as well as clothes and accent would be interesting. Unfortunately, our data set does not have information on these variables.

### Operationalisation

In order to capture signs of discrimination we specify a number of nominally scaled variables.

Firstly, country of birth of parents: We contrast individuals, whose parents come from

- “EU1” countries: including Germany, Italy, Switzerland, Liechtenstein, Andorra, Belgium, Finland, France, Greece, Ireland, Iceland, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Sweden, Spain, Vatican, United Kingdom, or
- “EU2” countries: including Hungary, Slovenia, Slovakia, Czech Republic, Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania. For simplicity’s sake we also group Croatia, Bosnia and Herzegovina into this category,
- Serbia (including Montenegro, Kosovo, and also Macedonia),
- Turkey,
- any other country (“other”).

Secondly, citizenship: We contrast people not holding the host country’s citizenship with people holding the host country’s citizenship (reference category).

## Results

The table below presents the results for all people born abroad and working in Austria who have completed their highest education in Austria (first column) and all people working in Austria with education acquired abroad (2<sup>nd</sup> column). The lighter entries are not statistically significant at the 95% level when not applying population weights; they are however, if population weights are used.

This analysis reveals the size of the average immigrant disadvantages.

Consistent with many research studies reviewed in the theoretical part of this report, the data provide evidence that immigrants with foreign-acquired education have on average a poorer outcome on the labour market than immigrants who have completed their highest education in the country of residence.

It is a consistent finding of many labour force studies of immigrants’ occupational statuses that there are wide variations in occupational outcomes among immigrant origin groups after taking account of their educational level, human capital variables and other personal characteristics.

Our findings show that in general immigrant men and women with foreign-acquired education whose parents come from a EU2 country, have an occupational outcome 0.11 points lower due only to the origin of the family from this specific part of the world. Having family background from Serbia results in 0.1 points lower occupational outcomes compared to immigrants with foreign-acquired education who come from any other country than Serbia but holding the same personal characteristics. Likewise, migrants with a family background from Turkey achieve on average 0.07 lower rewards to their educational qualifications compared to people with the same characteristics but having any other family background than a Turkish one. Finally, for migrants with foreign-acquired education, who work in Austria and have family background from “the rest of the world” (“origin other”) occupational outcomes decrease on average by 0.06 because of their ethnic origin. On the contrary, just the fact of having family background from a EU1 country, results in 0.04 points higher occupational outcomes compared to people whose parents are born in any other country.



OLS regression of occupational outcomes for women and men by place of education, unstandardized coefficients

	Austria		Abroad	
	b	se	b	se
Intercept	-.29	.00	-.17	.05
Education	.06	.00	.05	.00
Sex	.06	.01	.02	.00
Age	.00	.00	.00	.00
Age-square	.00	.00	.00	.00
Potential LM experience	.00	.00	.00	.00
Job experience	.00	.00	.00	.00
Self employed	.09	.02	.10	.01
Firm size	.00	.00	.00	.00
Network access	-.01	.02	.00	.01
Length of stay	.00	.00	.00	.00
AT citizenship	-.02	.01	.01	.01
Family origin EU1	.09	.02	.04	.02
Family origin EU2	-.05	.02	-.11	.02
Family origin RS	-.03	.02	-.10	.02
Family origin TR	-.05	.02	-.07	.02
Family origin Other	-.04	.02	-.06	.02
Adjusted R-square	.51		.47	
Respondents	1482		3713	

Computed from the Austrian Labour Force Survey 2008, 2009.

Therefore, the findings show that some specific origin groups have significantly lower occupational outcomes.

These patterns may reflect discrimination, cultural or racial biases, ingrained prejudices or established bureaucratic practices, but not of necessity- two alternative explanations are possible:

- 1) On the one hand they may reflect differences in school quality across countries of origin or rather the difficulty on the side of the employers to evaluate foreign educational credentials in the absence of information and knowledge about the qualifications.
- 2) On the other hand, the low rewards of educational credentials for people belonging to specific origin groups may reflect a low compatibility of the education acquired abroad with the requirements and the specific orientation of the host country labour market.

From these results we can conclude that Austrian employers treat schooling in certain countries of origin (e.g. Serbia, Turkey and EU2 countries) differently from the way they treat schooling in other countries of origin, for example EU1 countries. This indicates the low mobility of education across borders.

Regarding column 1 of the table above the picture is similar. On average, people who have completed their highest education in Austria but whose parents come from Serbia, Turkey, a EU2 country or "the rest of the world" decrease their occupational outcomes by 0.03 (Serbia), 0.05 (EU2 and Turkey) and 0.04 (other origin) points, respectively.

Again, people whose parents are born in a EU1 country achieve on average 0.09 higher occupational outcomes than their counterparts, whose parents come from any other part of the world, except a EU1 country, holding the same characteristics.

As all the employed in this analysis have completed their highest education in Austria, Austrian employers possess all the knowledge about their formal qualifications, but they still place Serbs,

Turks, migrants from a EU1 country or people belonging to the category “other” into lower qualified jobs than natives or people from other origin groups (e.g. EU1 countries).

Results from the basic model with origin added and using unweighted data are in appendix A4.

## 5. Conclusions

The focus of this paper was on the difference international migration makes for the distribution of occupational levels for any given level of education. We used the Labour Force Survey (LFS) to assess the occupational risks and opportunities associated with migration to Austria from three origin countries, i.e. Germany, Serbia, and Turkey, and from Austria, Serbia and Turkey to Germany.

The data show that occupational returns to education vary significantly with the origin of a person’s education. The portability of education across borders depends very much on the countries involved. It is exceptionally poor from Serbia or Turkey to Austria and Germany. There is evidence in the data to show that the children of immigrants are also affected, though not as much as the immigrants themselves, and more the women, and more in Austria than in Germany.

Significantly, self-employment turns out to be a highly positive influence on occupational attainment for migrants and their children. Self-employment is the one way of evading the influence of employers on one’s occupation. There is reason to suspect, therefore, that the potentials of many immigrant and “second generation” employees are being tapped only very poorly by employers.

Adding variables meant to capture experience such as length of stay in the country of residence, time since obtaining the highest educational qualification, duration of employment in the current firm, and firm size, have a very limited and selective impact on the model’s explanatory power. Other variables including citizenship, household composition, household size, or marital status proved of so little benefit as to exclude them from the model again. The occupational position of male immigrants from Turkey and from Serbia can be accounted for to a greater degree than before but the major part still remains unexplained.

One very clear overall result is that the occupational outcomes of important immigrant populations, and especially of the men educated in Serbia, can hardly be explained with their education, duration of residence, firm tenure, age, etc. The same variables explain the outcome better, but not particularly well, in the case of men educated in Turkey and women educated in Serbia. Their performance in the case of men with parents born in Turkey is in the same mediocre league. They do much better for non-migrant populations and for parts of the population originating from Germany. In other words, there are influences on the occupational attainment of immigrants from countries other than Germany, and their children, that work against the appropriate occupational realisation of their educational attainments. Poorer school grades and insufficient control of the dominant language are often proffered as the missing variables that could explain the observed outcome. However, research performed by the ILO and others throughout Europe suggests fairly strongly that education and full control of the country’s dominant language are not valued by employers when there is a slight accent or merely a name pointing to poorer social beginnings (see among many others Attström 2007; Cediey/Foroni 2007; Allasino et al 2004; Kube 2009; Sinnreich 2006).

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## Appendix

### ***A1. International Standard Classification of Occupations (ISCO) 1988***

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<b>1 Legislators, senior officials</b>	
11	Legislators and senior officials
12	Corporate managers
13	Managers of small enterprises
<b>2 Professionals</b>	
21	Physical, mathematical and engineering science professionals
22	Life science and health professionals
23	Teaching professionals
24	Other professionals
<b>3 Technicians and associate professionals</b>	
31	Physical and engineering science associate professionals
32	Life science and health associate professionals
33	Teaching associate professionals
34	Other associate professionals
<b>4 Clerks</b>	
41	Office clerks
42	Customer services clerks
<b>5 Service workers and shop and market sales workers</b>	
51	Personal and protective services workers
52	Models, salespersons and demonstrators
53	Miscellaneous service workers (ECHP-specific code)
<b>6 Skilled agricultural and fishery workers</b>	
61	Skilled agricultural and fishery workers
<b>7 Craft and related trades workers</b>	
71	Extraction and building trades workers
72	Metal, machinery and related trades workers
73	Precision, handicraft, craft printing and related trades workers
74	Other craft and related trades workers
<b>8 Plant and machine operators and assemblers</b>	
81	Stationary-plant and related operators
82	Machine operators and assemblers
83	Drivers and mobile plant operators
84	Other operators and assemblers
<b>9 Elementary occupations</b>	
91	Sales and services elementary occupations
92	Agricultural, fishery and related labourers
93	Labourers in mining, construction, manufacturing and transport
94	Other elementary occupations
<b>0 Armed forces</b>	
10	Armed forces
-9	Missing

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## ***A2. Further results for the model with the influence of education on occupation controlled only by age***

### **Additional years of education have positive but highly varying effects**

All of the coefficients on education are positive. Thus there is no population category for which additional years of education would be detrimental in terms of the educational level of their employment.

As the school system has largely been based on steps of four years each the text will review the results in terms of four-year steps.

- More education is especially beneficial for men educated in Germany (DE in AT) or their sons with Austrian education (DE2) and for both women and men with parents born in Austria (AT in AT). They all gain about 0.3 in occupational outcome on the Hauser-Warren scale from zero to one, for every four additional years they spend in education. The same is also true of Austrian-educated men with parents born in Serbia (RS2).
- Austrian-educated women with German (DE2) or with Turkish parents (TR2), German-educated (DE in AT) women in Austria, and Serbian-educated women and men in Serbia (RS in RS) gain about 0.25 points.
- Austrian-educated women with parents born in Serbia (RS2) and Turkish-educated women in Austria (TR in AT) gain 0.18 or 0.17 points, and Serbian-educated (RS in AT) women 0.12. Austrian-educated men with parents born in Turkey (TR2) gain about 0.14 points,
- Turkish-educated (TR in AT) men in Austria 0.07 and Serbian-educated (RS in AT) men in Austria 0.03 points.

Very clearly, therefore, additional education obtained in Serbia or Turkey is being rewarded poorly in the Austrian employment system. The same is also true for parts of the second generation.

The large gains of 0.3 points for some parts of the population may seem enormous given that the scale ends at 1. They need to be put in perspective by also taking into account the impact of age and of the regression constant.

In all regressions the effect of personal education on the educational level of employment is significant at the 95 percent level. The results do not exceed critical values on multicollinearity among the independent variables, or on heteroscedasticity, residuals are normally distributed, and relationships are linear.

### **Basic analysis with both sexes combined**

The table presents the main findings of the comparison between people who have completed their highest education inside and outside of Austria. The lighter entries are not statistically significant at the 95% level when not applying population weights; they are however, if population weights are used.

OLS regression of occupational outcomes for women and men, unstandardized coefficients								
	educated in Austria				educated abroad			
	AT		RS		in AT		in RS	
	b	se	b	se	b	se	b	se
Intercept	-.57	.01	-.27	.01	-.12	.10	-.27	.03
Education	.08	.00	.05	.00	.02	.00	.06	.00
Sex	.04	.00	.06	.02	.04	.01	.09	.00
Age	.00	.00	-.01	.01	.00	.00	.00	.00
Age-square	.00	.00	.00	.00	.00	.00	.00	.00
Adjusted R-square	.50	.19	.38	.16	.12	.13	.48	.24
Respondents	32831		276		466		13049	

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Workers educated in Austria with parents born in Serbia gain 0.05 points on the Hauser-Warren score of their occupation for each additional year of schooling if it resulted in a degree and all other variables (age, sex, agesq) are held constant. This increase is about 0.02 less than the increase in occupational outcomes for natives, if they obtain one additional year of schooling and all other factors are controlled for. It is even 0.01 less than the average amount of increase on the occupational scale by one additional year of education completed for all immigrants taken together who work in Austria and have completed their highest education in Austria.

Altogether this model is able to explain 38% of the total variance in occupational outcomes, indicating that Serbs who work in Austria and have completed their highest education in Austria are not equally able as natives to apply their amount of education on the Austrian labour market. On average, their situation is even more problematic than the situation of the general population of immigrants who work in Austria and have completed their highest education in Austria. The education variable together with the other control variables explain 11% percent less of the variance of occupational outcomes than it is able to explain in the regression model for Austrian immigrants in general.

The situation is even worse, when we look at the last column of the table, which presents findings for workers with education obtained in Serbia. If they complete an additional year of schooling and all other variables are held constant, their labour market score raises by 0.02 units, which is 0.06 less than for natives and 0.03 less than for workers with parents born in Serbia. Altogether, this model is only able to explain 12% of the variance in occupational outcomes of workers from Serbia.

What we can see from the data is the difference international migration makes for the distribution of occupational levels for any given level of education. Being an immigrant to Austria and having completed the highest educational level abroad, means to be only partly able to transport one's education across national borders.

We had also hypothesized that the higher the education the less it is transferable across national borders. There is some evidence for this prediction in the table.

The more years of schooling (the higher the education) workers with parents born in Austria have the greater the occupational reward. More precisely, for each additional year of schooling completed they will be employed in an occupation scoring 0.08 units higher. The same is not true for migrants. The more years of education they have, the less of this amount of education is transferable to the Austrian labour market, resulting in a significantly lower reward for each additional year of schooling. The low mobility of education across national borders results on average in a 0.03 points lower occupational return than to workers with parents born in Austria. More adverse yet is the situation for immigrants educated in Serbia. On average, their occupational outcomes increase only by 0.02 units on the Hauser-Warren scale when an additional year of schooling is completed

and all the other variables remain constant. This is about 0.06 less than the returns to more education for workers with parents born in Austria.

### Basic analysis with discrete levels of education

In this section we show that higher education is less transferable to Austria than lower and medium education. For this we use a different education variable, i.e. the ISCED levels, which divide the amount of years of schooling into 6 different categories. For the Austrian data set we transform the ISCED categories into 4 different levels, so that they best fit our data:

- ISCED 0-2: pre-primary education, primary education, lower secondary education
- ISCED 3: upper stage secondary education
- ISCED 4: post secondary education
- ISCED 5/6: higher education, post-graduate.

In Serbian (and Turkish) data there is no ISCED level 4 leaving us with:

- ISCED 0-2: pre-primary education, primary education, lower secondary education
- ISCED 3: Secondary school
- ISCED 5: High, Faculty, academy or higher school, master degree
- ISCED 6: PhD.

ISCED coding of the Serbian LFS had never been done before and was specially done for this study by the Republic Office of Statistics.

Sex is here included as a variable rather than running separate regressions for the sexes. 0 is men, 1 is women.

The estimates of the analyses can be found in the table below. The lighter entries are not statistically significant at the 95% level when not applying population weights; they are however, if population weights are used.

OLS regression of occupational outcomes for women and men, unstandardized coefficients								
	educated in Austria				educated in Serbia			
	AT in AT		RS in AT		RS in AT		RS in RS	
	b	se	b	se	b	se	b	se
Intercept	.05	.01	.10	.10	.07	.10	.01	.03
Sex	.06	.00	.07	.02	.03	.01	.09	.00
Age	.00	.00	.00	.00	.00	.00	.01	.00
Age-square	.00	.00	.00	.00	.00	.00	.00	.00
ISCED3	.08	.00	.05	.02	-.01	.01	.30	.01
ISCED4	.24	.00	.23	.05	.02	.03	-	-
ISCED5	-	-	-	-	-	-	.66	.01
ISCED5/6	.46	.00	.38	.05	.22	.03	-	-
ISCED6	-	-	-	-	-	-	.79	.05
Adjusted R-square	.36		.26		.17		.46	
Respondents	40,931		276		473		13,049	

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

The findings for workers with parents born in Austria (first column) show that the occupational outcomes improve significantly and exponentially with higher educational levels attained. On average, people who have completed pre-primary to upper secondary education, have a 0.08 unit higher occupational outcome than people in all other educational categories. If Austrians have completed post-secondary education, they can expect a 0.24 increase on the occupational scale compared to

all workers with parents born in Austria in other educational categories. Possessing a PhD certificate results in an occupational score 0.46 higher than having completed other educational levels.

Consistent with the results for workers with parents born in Austria workers with parents born in Serbia (second column) also show higher occupational outcomes, the higher their completed educational level. On average, they increase their occupational outcomes by 0.05 if they have completed post-secondary education, compared to other educational categories. At post-secondary and post-graduate educational levels they achieve a 0.23 and 0.38 unit increase on the occupational scale compared to other educational degrees. This is consistently lower than for workers with parents born in Austria holding the same educational degree.

Workers in Serbia also show results that confirm the general thesis: Higher education results in higher occupational outcomes. With a secondary school degree they obtain 0.3 higher occupational outcomes than at other educational levels, with higher school or master degree, occupational outcomes increase by 0.66, and with a PhD the occupational outcomes are 0.79 greater.

Turning to the difference in the returns to foreign-acquired educational qualifications, an interesting picture emerges. Workers in Austria with education acquired in Serbia (third column) decrease their occupational outcomes by 0.01 if they have completed pre-primary to upper secondary education, while with completed post-secondary education they increase their occupational success only by 0.02 points. This is 0.22 less than the increase for workers with parents born in Austria and 0.21 less than Austrian-educated workers with parents born in Serbia could improve their occupational situation. These data provide evidence contrary to our hypothesis that foreign-acquired middle education is not equally valued on the Austrian labour market and therefore is barely portable across national boundaries. Workers with higher education or a post-graduate degree acquired in Serbia increase their occupational outcomes by 0.22 points on the Austrian labour market. This is 0.24 less than workers with parents born in Austria would improve their labour market situation with the same amount of education and 0.16 less than Austrian-educated workers with parents born in Serbia would increase their labour market score with the same amount of education.

Generally, we can conclude from these results, that middle as well as higher education from Serbia is significantly less valued on the Austrian labour market than domestically attained education.

### A3. Human capital analysis with both sexes combined

The table presents the estimated effects of human capital variable on occupational outcomes. The lighter entries are not statistically significant at the 95% level when not applying population weights; they are however, if population weights are used.

OLS regression of occupational outcomes for women and men, unstandardized coefficients, population weights

	educated in Austria				educated abroad			
	AT in AT		RS in AT		RS in AT		RS in RS	
	b	se	b	se	b	se	b	se
Intercept	-.47	.02	-.56	.13	-.52	.14	-.19	.03
Education	.07	.00	.07	.01	.05	.01	.05	.00
Sex	.05	.00	.07	.02	.03	.01	.07	.00
Age	.00	.00	.01	.01	.02	.01	.00	.00
Age-square	.00	.00	.00	.00	.00	.00	.00	.01
Potential LM exp	.00	.00	.00	.00	.00	.00	.00	.00
Job experience	.00	.00	.00	.00	.00	.00	.00	.00
Self employed	.06	.00	-.03	.06	.14	.03	-.12	.01
Firm size	.00	.00	.00	.00	.00	.03	.00	.00
Adjusted R-square	.51	.19	.40	.16	.22	.13	.52	.23
Respondents	32,831		276		473		13,029	

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Firstly and most importantly the results show that if additional human capital variables are included in the model, the impact of education on occupational outcomes persists or does not radically change for Austrians and Serbs who have completed their highest education in Austria and Serbs who work in Serbia and have completed their highest education there. The adjusted  $R^2$ , which tells us about how well the model is able to explain occupational outcomes, stays fairly the same compared to the models in which only education, age, age-square and sex were included. Therefore we can conclude that the additional variables labour market experience, job specific experience and firm size do not contribute a lot for the better explanation of occupational outcomes and in fact do not diminish the great impact of education. Nonetheless, self employment should be looked at separately, as it is one of the new introduced variables, which has a fairly large impact on occupational outcomes compared to the other variables. The fact of being self-employed manifests itself in somewhat different effects for workers with parents born in Austria and parents born in Serbia who both have completed their highest education in Austria. For the former the fact of being self-employed results in about 0.06 higher occupational outcomes compared to people who are not self-employed and all other variables are held constant. On the contrary, for the self-employed with parents born in Serbia occupational outcomes generally decrease by 0.3 compared to dependently employed workers with parents born in Serbia when all other factors stay the same. This is interesting and surprising, showing the different labour market conditions that result for people of different origin who work on the same labour market. Likewise, for workers in Serbia, the fact of being self-employed results in 0.12 lower occupational outcomes, compared to dependently employed workers, if all other variables are held constant. This may be due to the fact that a large part of the self-employed is in farming, an occupation with lesser educational demands.

A closer look at the employed with education from Serbia is warranted, as their results clearly show a different picture to the previously discussed findings. Here we can see that if additional human capital variables are added, the regression model is able to explain 22% of the variance in occupational outcomes. This is about 10% more power of explanation compared to the basic regression model that included only education, sex, age, and age-square (see appendix A2). The data indi-

cate a 0.05 occupational increase for each year of schooling completed, if all other variables are held constant. This equals the increases achieved by the Austrian-educated employed with parents born in Serbia.

Self-employment raises the average occupational outcome of the Serbian-educated in Austria by 0.14 Hauser-Warren points if all other variables stay the same. This is especially large compared to the other effects and may be understood following our hypothesis suggesting that the self-employed place themselves into occupational positions that best fit their personal qualities and competencies. As Austrian employers may not be fully informed about Serbian educational qualifications and competencies, this “decision under uncertainty” may result in a placement in lower qualified jobs. Potential labour market experience contributes positively but only little to occupational outcomes. Contrary to our expectations, firm size and job specific experience both show a negative impact, although with fairly large standard errors that blur the results.

The acquisition of further human capital in the form of labour market experience and job specific experience does not appear to contribute much to the explanation of occupational outcomes in Austria. The same is true of the size of the establishment. Therefore with education explaining little of the occupational outcomes and other variables explaining even less most of the occupational placement of immigrants from Serbia remains unexplained. Self-employment does have an important impact on occupational outcomes, increasing the qualification of jobs for workers with parents born in Austria and workers educated in Serbia, but decreasing occupational outcomes for workers in Serbia and Austrian-educated workers with parents born in Serbia. Generally, self-employment, together with the other human capital variables adds around 0.1 points to the explanation of occupational success for immigrants from Serbia.

## A4. Results from the unweighted data

### Basic results

The tables below present the results from section 2 estimated without applying population weights.

Men: OLS regression of occupational outcomes, unstandardized coefficients, respondents								
	AT in AT	DE2 in AT	RS2 in AT	TR2 in AT	DE in AT	RS in AT	TR in AT	RS in RS
adj R-sq	0,492	0,617	0,452	0,181	0,588	0,036	0,153	0,425
Sig	0,000	0,000	0,000	0,000	0,000	0,006	0,000	0,000
Coefficient								
Intercept	-0,582	-0,257	-0,514	0,116	-0,746	-0,099	-0,138	-0,271
Education	0,078	0,080	0,067	0,038	0,082	0,004	0,022	0,057
Age	-0,002	-0,016	0,001	-0,025	0,006	0,000	0,001	0,003
Age-sq	0,000	0,000	0,000	0,000	0,000	0,014	0,000	0,000
95% standard error								
Intercept	0,015	0,214	0,127	0,103	0,181	0,133	0,075	0,034
Education	0,001	0,008	0,006	0,005	0,004	0,006	0,003	0,001
Age	0,001	0,013	0,007	0,007	0,009	0,000	0,004	0,002
Age-sq	0,000	0,000	0,000	0,000	0,000	0,004	0,000	0,000

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

Women: OLS regression of occupational outcomes, unstandardized coefficients, respondents								
	AT in AT	DE2 in AT	RS2 in AT	TR2 in AT	DE in AT	RS in AT	TR in AT	RS in RS
adj R-sq	0,507	0,435	0,280	0,309	0,398	0,204	0,288	0,513
sig	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Coefficient								
Intercept	-0,500	-0,286	0,060	-0,365	-0,333	0,028	-0,131	-0,169
Education	0,074	0,068	0,041	0,058	0,057	-0,001	0,039	0,059
Age	-0,002	-0,007	-0,018	0,004	-0,001	0,000	-0,005	0,001
Age-sq	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
95% standard error								
Intercept	0,016	0,296	0,137	0,184	0,169	0,004	0,132	0,043
Education	0,001	0,009	0,006	0,007	0,004	0,007	0,005	0,001
Age	0,001	0,017	0,008	0,013	0,008	0,000	0,007	0,002
Age-sq	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

Computed from the Austrian Labour Force Survey and from the Serbian Labour Force Survey.

### Discrimination

In order to see the difference the national origin of an individual's education makes in occupational outcomes, we compare different immigrant-groups: people from a EU1 country, from a EU2 country, from Serbia, Turkey and immigrants coming from any other country.

We had hypothesized that the transferability of education between Austria and Serbia, Turkey and EU2 countries is lower than between Austria and a EU1 country (H2). Our hypothetical reason was the "distance" between Austria and Serbia, Turkey and a EU2 country in terms of language and culture and different levels of economic and technological development. We want to examine this hypothesis by looking at an extension of the previous regression model, where a variable, which



tells us whether a person comes from one of these countries or not and has completed his or her education outside of Austria is included.

OLS regression of occupational outcomes for women and men, unstandardized coefficients, not weighted

	EU1		EU2		TR		RS		Other	
	b	se	b	se	b	se	b	se	b	se
Intercept	-.56	.12	.06	.08	-.16	.07	-.12	.10	-.09	.16
Education	.07	.00	.04	.00	.03	.01	.02	.00	.04	.00
Sex	-.02	.02	.03	.01	.05	.01	.04	.01	.00	.02
Age	.00	.00	-.02	.00	.00	.00	.00	.00	-.01	.01
Age-square	.00	.00	.00	.00	-.01	.01	.30	.01	.00	.01
Adj R-square	.49	.22	.32	.16	.19	.10	.12	.13	.26	.23
Respondents	731		1412		528		466		488	

Computed from the Austrian Labour Force Survey.

The results of this model show substantial support for the hypothesis stated above.

Migrants who come from a EU1 country and have completed their highest education abroad achieve the best occupational outcomes compared to the other groups of immigrants. For any additional year of schooling completed they gain a 0.07 units higher score on the labour market if all other variables are controlled for. Migrants from a EU2 country or migrants who fall into the category “other” obtain a 0.04 units higher score, people from Turkey a 0.03 higher labour market score and migrants from Serbia a 0.02 higher labour market score if they complete one additional year of schooling and all other variables are held constant.

The findings also clearly show, that the regression model for migrants from a EU1 country is able to explain more of the variance in occupational outcomes (49% of the variance in occupational outcomes are explained) than the same regression model for migrants from a EU2 country (32% of the variance in occupational outcomes are explained) or from countries that are put into the category “other” (26% of the variance in occupational outcomes are explained). The explanation power provides a measure of how well occupational outcomes are likely to be predicted by the model consisting of the variables age, agesq, sex and education. The weakest explanation power is observable for the regression model for migrants from Turkey (19% of the variance in occupational outcomes is explained) and Serbia (12% of the variance in occupational outcomes is explained). A low explanation power indicates that education together with age and sex is not able to adequately predict the average occupational outcomes of a person. The lower the explanation power, the stronger are the influences of unobserved factors that may explain occupational outcomes.

From these findings we can draw the conclusion, that the national origin of an individual's education is a powerful predictor of occupational success in Austria.

Educational levels completed in a EU1 country are obviously more transferable across national borders than educational levels completed in a EU2 country, Turkey, Serbia or any other country. This may be explained in the following way. Educational qualifications obtained in a EU1 country are stronger than similar qualifications obtained in a EU2 country, Turkey, Serbia or any other country. The EU1 countries with their educational systems and economic as well as social conditions more closely resemble those in Austria. In addition, many high qualified migrants come from EU1 countries to Austria to work and therefore also have a good reputation among Austrian employees as well as within the Austrian society. Thirdly and most importantly, one has to mention the existence of a law within the EU to recognize educational levels. Therefore it is surprising, that for migrants who come from a EU2 country, it is more problematic to transfer their skills to the Austrian labour market than it is for people coming from a EU1 country. This may be explained by the countries' lower levels of economic and social development.

Serbia and Turkey are both not EU member countries. Therefore there exists no law for Austrian employees to recognize people's educational certificates when they immigrate from one of these countries to Austria. In addition, both countries have sent "guest workers", low qualified workers, to Austria after the Second World War to compensate the labour shortage in Austria. Since then, many Austrian citizens still have the impression that migrants coming from one of these countries are low qualified and lack skills and competence.

So far, it is evident from the results, that foreign acquired education is significantly less valued on the Austrian labour market. Therefore international migration bears the risk to be not rewarded the appropriate occupation one is qualified for. Especially workers from families originating in Serbia achieve a far lower reward in terms of qualified job positions, if they complete their education outside of Austria compared to the native population or Serbs who acquired their education in the Austrian school system having the same amount of education.