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Contents

1. Introduction	1
2. Immigration in Austria: A historical Introduction	4
2.1. Historical Framework of Austrian Immigration	5
2.2. Immigration and Participation rates	8
2.3. Development in regard of the EU-Enlargement 2004	10
3. The Economics of Discrimination	14
3.1. The Emergence of Economic Discrimination	15
3.2. The Economics of Discrimination	17
3.3. Job stability and poverty risks of immigrants	23
3.4. European Studies on the Immigrant Wage Gap	28
4. Segregation and Assimilation	31
4.1. Educational Imbalances in Austria	31
4.2. Measurement of Occupational Segregation	35
4.3. The Process of Assimilation	39
5. Data and Variables in EU-SILC 2005	42
5.1. Description of the Dataset EU-SILC 2005	43
5.2. An Outline of the Dependent Variable	45
5.3. The Exogenous Variables of the Model	49
5.3.1. Origin of birth	49
5.3.2. Education level and labor market experience	49
5.3.3. Other individual characteristics	50
5.3.4. Structural characteristics	51
6. The Decomposition Model	53
6.1. The Mincer Type Wage Equation	53
6.2. Structural Wage Decomposition by Blinder	57

6.3. The Statistical Approach of Oaxaca	59
6.4. The Index-Number Problem	61
7. Empirical Results with EU-SILC 2005	64
7.1. Distribution of Incomes	64
7.2. Basic analysis of the Income Data	65
7.3. The unexplained part of the differential	66
7.4. The Income Distribution	71
7.5. The Austrian Tax System and Equality	74
7.6. Citizenship or origin of birth?	77
7.7. Do Immigrants face a higher Unemployment risk?	78
7.8. The twofold Burden of Immigrant Women	80
7.9. Firm Size and Wages	80
8. Conclusions and Policy Implications	83
A. Appendix - Tables	87
B. Appendix - Figures	92

List of Tables

2.1. Census by Nationality from 1951 to 2007	7
2.2. Annual growth rates of population by nationalities from 1951-2001	8
2.3. Overall Labor-force Participation Rates for Austria 1961-2001	10
2.4. Migration Balance around the EU-Enlargement 2004	13
4.1. Institutional Standards for Education in Selected EU Countries	32
4.2. Educational Distribution by ISCED 97 and Nationality in 2005	34
4.3. Educational Distribution by nationalities in EU-SILC 2005	34
5.1. Components of the EU-SILC Variable Gross Cash Income	46
5.2. Summary Statistics of the Hourly Wages in EU-SILC 2005	48
5.3. Job change and workers' characteristics	50
5.4. Summary Statistics of the Individual and Structural Characteristics	51
6.1. Education and Number of Years employed	54
6.2. Components of the Decomposition Model by Blinder	58
6.3. Wage Decomposition by Nationality with Statistical Software R	59
7.1. Mean and Median of hourly Wages in Austria	65
7.2. Regression Results	67
7.3. Regression Results by Nationality	68
7.4. Decomposition of the Wage Regression	69
7.5. Detailed Decomposition Results	70
7.6. Inequality Measures	74
7.7. Gini coefficients of Incomes before and after Taxation	75
7.8. Mean Hourly Wages by Austrian Citizenship	77
7.9. Actual Employment Status by Origin of Birth	78
7.10. Enterprise Size and Nationality Concentration	81
7.11. Wage Regression on Sex, Age and Firm size	82
A.1. Balance of Trade with the new EU10 in Million Euro	87
A.2. Datasets for the Analysis of Income Inequality	87

A.3. Robustness Check	88
A.4. Coefficients, Means and Predictions of the Decomposition	88
A.5. Sectors, Median and Foreigner Share	89
A.6. The Index-Number Problem	90
A.7. R-Code for the Computation of the Decomposition-Model	90
A.8. Correlation Statistics	91

List of Figures

2.1. GDP-Growth and Immigration in Austria (1971=100)	5
2.2. Immigrant Population of the four most-contributing Countries in 2001	9
3.1. The effect of Discrimination on Incomes	22
3.2. Difference of Monthly Median Income between Immigrants and Austrians	24
3.3. The Risk of Poverty among Migrants	27
4.1. Occupation Segregation model by Bergmann	36
4.2. Bergmann model after shift in Labor Force	37
5.1. History of Pan-European Surveys	44
5.2. Comparison of Annual Gross Income in EU-SILC 2005 and Income Tax Data 2004	48
7.1. Frequency Distribution of Austrian and Immigrant Gross Income . .	65
7.2. Mean wages and Wage gap by Deciles	72
7.3. Comparison of Lorenz curves for Gross Annual Incomes	75
7.4. Frequency Distribution of Gross and Net Annual Incomes	76
7.5. Unemployment Rates of Immigrants and Natives	79
7.6. Ethnic and Gender Median Wage Gaps	81
8.1. Public awareness about legal anti-discrimination provisions	85
B.1. Share of Women within the Group of Unemployed	92
B.2. Share of Persons with University degree or higher graduation	93

Abstract - English

For a couple of years the subject of income (in)equality has moved into the focus of numerous scientific articles. Most empiric studies confirm, that income disparities have grown considerably in the past decades in industrial states. Many newspaper articles are as well dealing with the widening of income gaps, as for example a contribution of the Economist: "[O]ver the past quarter century, those at the top have done better than those in the middle, who in turn have outpaced those at the bottom. The gains of productivity growth have been increasingly skewed." (The Economist: Inequality in America – The rich, the poor and the growing gap between them, 25.07.2006). The results of several empiric studies support these statements (cp. PIKETTY/SAEZ 2004, BACH/CORNEO/STEINER 2007 or GUGER/MARTERBAUER 2007). Besides, it seems hardly surprising that this development particularly affects migrants, since this layer of society could often not enforce its economic interests.

The intention of this thesis is to determine the causes of the persistently high income differences between migrants and Austrians and to fathom the reasons for different payment. The income gap will be split up in its single components by means of the decomposition model which was developed by BLINDER (1973) and OAXACA (1973). Starting point for the earnings model is a regression on a row of variables from the data set EU-SILC (*European Statistics on Income and Living Conditions*) of 2005. Typical characteristics for the determination of wage levels are amongst others the level of education, labor market experience, gender, firm size, industrial sector, etc.

A remarkable fact which is observable is, that migrants with similar or even the same level of education as Austrians still do not receive the same payments of wages. In the calculations, this can be shown by differences in the coefficients despite similar or the same endowments and is familiar as *discrimination* in common economic literature.

In this paper, theoretical perceptions of different economic schools are underlying the econometric calculations. Beside the popular approach of Gary S. Becker (cp. BECKER 1971), a historical approach to the origin of economic discrimination is introduced, concerning the central question under which economic and social conditions inequality generally may appear. The sociological concept of the *industrial*

reserve army (cp. MARX 1977) is as well picked up for the characterization of the migrant working population. According to BIFFL (2002) migrants in low wage sectors are primarily concerned by job layoffs in times of economic downturn, which leads to a decrease in wage differentials, since those workers are omitted from the statistics who previously marked the bottom of the income distribution. The likelihood to be occupied for one additional year is clearly lower for migrants than for Austrians.

The disproportionate frequency of migrants employed in low wage sectors has its roots in the Austrian education system. Migrants often do not even possess a graduation in compulsory education (5.1% from fm. Yugoslavia, 5.9% from Turkey and 0.6% from Austrian), on the other hand they more often own a university degree (5.5% of all alien residents in Austria aged older 15, compared to only 4.2% of Austrians). However, these are basically migrants from the *old* EU-15 states, who represent the top in the educational system.

In 1999, two thirds of all workers with migration background were concentrated on six industrial branches: Building and construction industry, tourism, wholesale and retail trade, corporate-orientated services, production and processing of metals and finally traffic and communication (cp. BIFFL 2002). This concentration on low wage branches explains a large part of the income disparities between migrants and Austrians. Therefore, full time workers from former Yugoslavia, Turkey and the ten new EU members only earn about 78.9% of the incomes of their Austrian counterparts. In this thesis, about 39% of the wage differential can be explained by different endowments (education, labor market experience, etc.). The unexplained part of the income differential amounts therefore to 61% and can be assigned partly to lacking information in the model and partly to pure discrimination in the labor market.

Moreover, the twofold economic burden of female migrants is picked out, since female foreigners are affected on the one hand by the *gender wage gap* and, on the other hand, by the *ethnic wage gap*. Accordingly, female workers from Yugoslavia, Turkey and the new EU states form the bottom of the income distribution. Finally, some widespread policy measures for the containment of discrimination are discussed. However, problems of insufficiency of these proposals are highlighted as well.

Abstract - Deutsch

Seit einigen Jahren rückt das Thema der Einkommens(ungleich)verteilung wieder in den Fokus zahlreicher wissenschaftlicher Studien. Die meisten empirischen Arbeiten bestätigen, dass sich die Einkommensunterschiede in den Industriestaaten in den vergangenen Jahrzehnten vergrößert haben. Der Öffnung der Einkommensschere wird auch auf medialer Ebene verstärkt Raum gewidmet, wie zum Beispiel in einem Beitrag des Economist: *"[O]ver the past quarter century, those at the top have done better than those in the middle, who in turn have outpaced those at the bottom. The gains of productivity growth have been increasingly skewed."* (The Economist: Inequality in America – The rich, the poor and the growing gap between them, 25.07.2006). Die Ergebnisse zahlreicher empirischer Studien belegen diese Aussagen (vgl. PIKETTY/SAEZ 2004, BACH/CORNEO/STEINER 2007 oder GUGER/MARTERBAUER 2007). Dabei erscheint es kaum verwunderlich, dass sich diese Entwicklung ganz besonders auf MigrantInnen negativ auswirkt, insofern als diese Gesellschaftsgruppe ihre Interessen besonders schwer durchsetzen konnte.

Ziel dieser Diplomarbeit ist es, die Ursachen der anhaltend hohen Einkommensunterschiede zwischen MigrantInnen und ÖsterreicherInnen zu ermitteln und der Frage nachzugehen, welche Gründe für die unterschiedliche Bezahlung zu nennen sind. Dabei sollen die Einkommensunterschiede mit Hilfe des Dekompositionsmodells von BLINDER (1973) und OAXACA (1973) in ihre einzelnen Komponenten zerlegt werden. Ausgangspunkt für das ist eine Regression über eine Reihe von Variablen aus dem sogenannten EU-SILC (*European Statistics on Income and Living Conditions*) des Jahres 2005. Die typischen Charakteristika für die Bestimmung der Lohnhöhe sind unter anderem Ausbildungsniveau, Berufserfahrung, Geschlecht, Betriebsgröße, Branche und einige mehr.

Es ist beobachtbar, dass MigrantInnen mit ähnlichen oder denselben Ausbildungsmerkmalen wie ÖsterreicherInnen dennoch nicht dieselben Lohnauszahlungen erhalten. Dies drückt sich in der Regression durch Unterschiede in den Koeffizienten bei gleichen Eigenschaftsmatrizen aus und wird in der ökonomischen Literatur gemeinhin als Diskriminierung verstanden.

Den ökonometrischen Berechnungen liegen in dieser Arbeit theoretische Konzepte verschiedener wirtschaftswissenschaftlicher Denkschulen zu Grunde. Neben dem weithin bekannten und verbreiteten Ansatz von Gary S. Becker (vgl. BECKER 1971)

wird auch ein historischer Ansatz über die Entstehung von ökonomischer Diskriminierung versucht, mit der zentralen Frage unter welchen Bedingungen Diskriminierung überhaupt auftreten kann. Auch der soziologische Begriff der *industriellen Reservearmee* (vgl. MARX 1977) wird für die Charakterisierung der migrantischen Arbeitsbevölkerung herangezogen. Laut BIFFL (2002) sind in Zeiten der konjunkturellen Abkühlung primär MigrantInnen aus Niedriglohnbranchen von Arbeitsplatzabbau betroffen, was dazu führt dass das Lohndifferential zu Einheimischen schrumpft, da jene Personen aus der Statistik fallen, die zuvor das untere Ende der Einkommensverteilung markiert haben. Die Wahrscheinlichkeit, ein weiteres Jahr beschäftigt zu sein, ist für MigrantInnen ohnedies deutlich geringer.

Die überproportionale Beschäftigung in Niedriglohnbranchen hat ihre Wurzeln im österreichischen Bildungssystem. ZuwanderInnen haben häufiger keinen Pflichtschulabschluss (5,1% aus dem ehem. Jugoslawien, 5,9% aus der Türkei und 0,6% der ÖsterreicherInnen), dafür aber häufiger einen Hochschulabschluss (5,5% aller in Österreich wohnhaften AusländerInnen über 15 Jahren gegenüber 4,2% der ÖsterreicherInnen). Vor allem sind es aber MigrantInnen aus den *alten* EU-15-Staaten, die am oberen Ende der Bildungsspanne zu finden sind.

1999 waren zwei Drittel aller Arbeitskräfte mit Migrationshintergrund auf sechs Branchen konzentriert: Bauwirtschaft, Tourismus, Handel einschließlich Reparaturwesen, unternehmensorientierte Dienstleistungen, Erzeugung und Verarbeitung von Metallen sowie Verkehr und Nachrichtenübermittlung (vgl. BIFFL 2002). Diese Konzentration auf Niedriglohnbranchen erklärt einen Großteil der Einkommensschere zwischen MigrantInnen und ÖsterreicherInnen. Demnach verdienen Menschen aus dem ehemaligen Jugoslawien, der Türkei und der zehn neuen EU-Staaten im Median nur rund 78,9% der Einkommen von ÖsterreicherInnen. In dieser Arbeit können rund 39% des Lohndifferentials durch unterschiedliche Ausprägungen (Ausbildung, Berufserfahrung, usw.) erklärt werden. Der unerklärte Teil der Einkommensunterschiede beträgt somit 61% und kann teils mangelnden Informationen im Modell und teils reiner Diskriminierung am Arbeitsmarkt zugerechnet werden.

Darüberhinaus wird die doppelte ökonomische Belastung von Migrantinnen thematisiert, die einerseits vom *gender wage gap* und andererseits vom *ethnic wage gap* betroffen sind. Dementsprechend finden sich Arbeiterinnen aus Jugoslawien, der Türkei und den neuen EU-Staaten am unteren Ende der Einkommensspanne. Am Ende der Arbeit werden einige verbreitete Maßnahmen zur Eindämmung der Diskriminierung diskutiert, jedoch auch Probleme der Unzulänglichkeit aufgezeigt.

1. Introduction

Since wage disparities are steadily growing, the analysis of income distributions has gained in importance in the last decades. There are several studies and expert groups (such as CANBERRA GROUP 2001) that observe a continuously increase of income inequality. PIKETTY/SAEZ (2004) analyze the evolution of top incomes in the course of the whole past century in the USA. In a very interesting article the authors show that the pattern of the top decile share is U-shaped. This means that the share of the top ten percent fluctuated around 40 to 45% of total income before the Second World War ended, declined substantially to some 30% in the post-war period and finally increased dramatically in the last 25 years close to the pre-war level. The top percentile in the US income distribution accounted for nearly 17% of all incomes in 2000. Further, they show similar developments in the United Kingdom and in Canada. According to Piketty and Saez, income concentration has definitely risen in the last decades.

BACH/CORNEO/STEINER (2007) explore the personal as well as the functional income distribution in Germany between 1992 and 2001. According to the authors all equality measures point out, that the situation is worsening. Looking at the 0.001% top fractile of the distribution - which could be denoted as the *economic elite* in Germany - a triplication of the group's share in overall incomes can be noticed in these nine years. GUGER/MARTERBAUER (2007) describe the long-term evolution of the Austrian income distribution. The authors observe growing inequality in the employed population. While the income share of the lowest quintile decreased from 4.5% in 1976 to 2.2% in 2005, the top quintile could extend its share from 41.2% to 46.5%.

All of the referred research indicate an increasing wage inclination especially since the 1980ies. The process of reallocation of incomes reflects a heightened exploitation of labor force while top incomes are still boosting. Moreover, growing unemployment rates weaken the bargaining position of unions in wage negotiations (cp. GUGER/

MARTERBAUER 2007, p. 17). Women and immigrants are seen as particularly affected by growing income disparity, since their bargaining position was especially weak.

Studies on wages and immigration haven't really been of interest over a long period of economic history. There are some exceptions especially in the United States, for example some early state labor surveys that resulted in the Dillingham Immigration Commission Report¹ or a couple of early articles like that of DOUGLAS (1919). However, as CHISWICK (1978) observes, the field was primarily of interest to sociologists and historians.

On the 17th of October 2007 the Austrian newspaper *Kurier*² published an article on wage differentials between immigrant and native workers in Austria, based on a study of the *Arbeiterkammer* Austria. It stated that the average gross income of a male Austrian worker amounts to 1,900 Euros monthly (14 times p.a.) followed by workers from former Yugoslavia (1,750), Germany and Turkey (1,650), Hungary (1,540), Czech Republic and Slovakia (1,460). Hence, the average wage of Slovaks only reaches 78% of the Austrian wage. The analysis indicated that foreign workers are over-represented in low paid jobs, partly because they are misjudged in skills. Another newspaper report from *Die Presse*³ stated that immigrants are rarely well educated, more often unemployed and hardly have any opportunities for advancement.

The topicality of this debate is unbroken and undoubtedly immigration played an important role in Austrian history. The objective of this work is to deepen the analysis of wage differentials in Austria, as has been done for a few other European countries, like in Germany by LANG (2000), Switzerland by GOLDER (2000), Sweden by NORDIN/ROOTH (2007) or Great Britain by DENNY/HARMON/ROCHE (1997). The special attention is paid to the different forms of economic discrimination which cause large parts of the disparities in monetary labor compensation.

In Chapter 2, a historical framework of immigration in Austria should offer a proper introduction into the topic. Further, various theories on economic discrim-

¹The Dillingham Immigration Commission was formed in the light of growing political concern about immigration in the United States. In 1911 the Commission published a 41-volume report, that can be viewed at <http://ocp.hul.harvard.edu/immigration/themes-dillingham.html> [last visit: May 2009]

²*Kurier*: Ausländische Arbeiter verdienen weniger, online published on 17.10.2007

³*Die Presse*: EU scheitert bei Migrant-Integration, published on 13.09.2008

ination are elaborated in Chapter 3, followed by Section 4 on segregation and assimilation. Next, the dataset and the statistical methods which are used, will be explained in Chapters 5 and 6. Thereafter the whole theoretical structure will be applied on the data provided by the EU-SILC 2005 in Section 7. Finally, various anti-discrimination policies and perspectives for the future are briefly presented in Chapter 8.

2. Immigration in Austria: A historical Introduction

Ich bin grundsätzlich der Meinung, dass die Ökonomie ohne Geschichte ein steuerloses Schiff ist und Ökonomen ohne Geschichte keine genaue Vorstellung davon haben, wo dieses Schiff hinfährt. (Eric Hobsbawm, cited in MATIS/SENF 2007, p. 45)

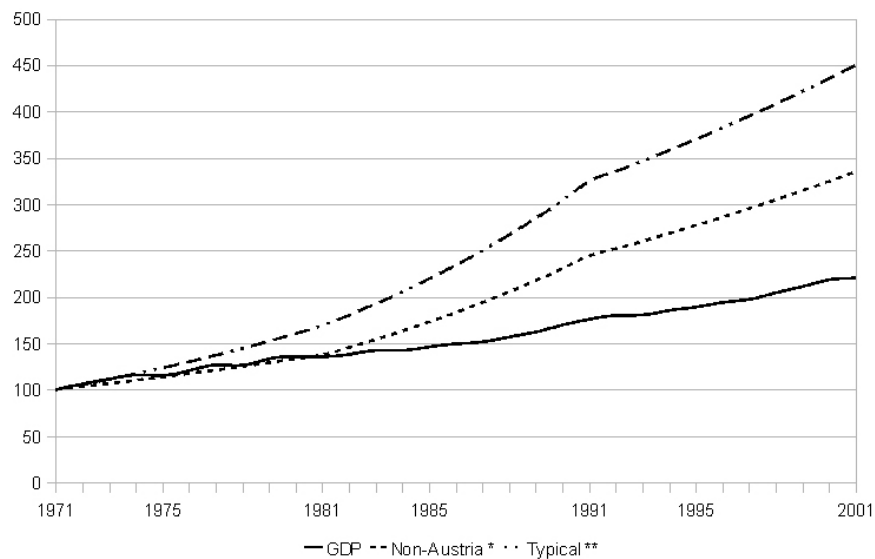
This chapter intends to offer a short history of working immigration in Austria, actual demographic figures and an overview on the labor market performance of foreigners. Moreover the development of migration after the EU-enlargement of 2004 is analyzed. The focus is especially on the typical immigration countries, like former Yugoslavia and Turkey.

Like most European countries, Austria participated in the huge economic boom after the second world war, when annual real GDP growth reached 4.7 percent between 1960 and 1970 and the unemployment rate dropped below two percent (cp. SCHULMEISTER 2005, p. 5). These developments, combined with low birth-rates of the early 1950ies and the emigration of Austrians towards western states created a huge demand for workers which exceeded the domestic supply. Therefore workers from countries with weak economic performance, like former Yugoslavia or Turkey, were hired to leave their countries for a couple of months. This was the beginning of a very peculiar form of migration in Post-War-Europe, which soon differed from the original vision which was to recruit foreign workers by demand and replace them arbitrarily⁴.

Figure 2.1 illustrates the relation between economic growth and immigration in Austria since 1971. The variance, beginning in the 1980ies, shows evidence that eco-

⁴For a detailed history of immigration in Austria, see BAUER (2008) or HERZOG-PUNZENBERGER (2003).

FIGURE 2.1.: GDP-GROWTH AND IMMIGRATION IN AUSTRIA (1971=100)



* Total growth of Non-Austrian population

** Growth of Austrian population contributed by Eastern countries: Bulgaria, former Yugoslavia, former Soviet Union, Czech Republic, Poland, Romania, Turkey and Hungary

(Source: Statistik Austria: Census 1951-2001, OECD Factbook 2007, own calculations)

conomic performance and immigration grew apart, indicating the discrepancy between vision and reality. Before analyzing the labor market disparities among immigrant and indigenous workers it seems useful to sum up the history of Austrian working immigration just to get a perception of the topicality of this debate.

2.1. Historical Framework of Austrian Immigration

On the 19th of December 1925 the conservative government passed article 457 which should guarantee domestic workers to receive jobs by complicating statutorily the offer of jobs to immigrants.

§2. (1) Kein Arbeitgeber darf ohne behördliche Bewilligung einen Arbeiter, Angestellten, Hausgehilfen oder Lehrling beschäftigen, der nicht österreichischer Bundesbürger ist oder sich nicht seit mindestens 1. Jänner 1923 im Bundesgebiet aufhält.(BUNDESGESETZBLATT 1925, p. 1964)

§7. (1) Die Bewilligung darf nur erteilt werden, wenn es die Lage des Arbeitsmarktes zulässt, wenn wichtige Interessen der Volkswirtschaft es er-

fordern oder wenn sonstige triftige Gründe, insbesondere wichtige Familienrücksichten oder Gründe der Menschlichkeit dafür sprechen.
(BUNDESGESETZBLATT 1925, p. 1965)

The notable fact is that this discriminating law was obtained until 1961 even though the first migration wave started in 1960. From 1960 to 1968 the annual average immigration can be amounted to 6,393 persons. At the end of the year 1961 the president of the Chamber of Commerce of Austria, Julius Raab and the chairman of the Austrian Federation of Trade Unions, Franz Olah, concluded their famous "Raab-Olah-Agreement". They fixed the number of immigrants on 47,000, for whom companies had not to prove that there existed indigenous supply for these working places, according to article 457.

Needless to say that in the case of economic downturn they could be sent back to their home countries. The Chamber of Commerce built up recruitment centers in foreign countries to find labor force especially for this purpose. In 1962 the first bilateral immigration-agreement between Austria and Spain was passed, followed by contracts with Turkey in 1964 and Yugoslavia in 1966. The first peak of immigration was reached between 1969 and 1973 when on average 23,498 people moved in per year based on excellent economic conditions in this boom phase. Due to the economic stagnation after the oil price shock in 1973 the recruitment of foreign labor force was stopped but the failure of the concept of working "guests" was noticeable, since most of the immigrant workers stayed in Austria. As a consequence, a law regulating the permission of immigrant workers to the Austrian labor market was passed in 1976. The quintessence of this law was that foreign workers were just allowed to work, if the situation in the labor market as well as the public agenda were in favor of these activities. Since then, the size of immigration was determined annually.

The second peak of immigration between 1989 and 1993 topped the first one with approximately triple figures. In these years the average annual growth was 67,610 immigrants. In contrast to the first waves of immigration, which were stimulated by pull-factors of the demand side (i.e. Austria), this wave was rather incited by pushing factors as the opening of Eastern Europe, the collapse of Yugoslavia or the reunion of Germany. These political incidents in the *supply countries* were followed by the desire for higher wages and more stable political conditions and pushed immigration. While in the 1960ies and 70ies demand was regulating the foreign labor force potential in Austria, in the 80ies and 90ies increasing supply created demand, especially for cheap and highly flexible labor force.

As a consequence, in 1993 two further laws were passed, again regulating the quota of immigration but two years later Austria joined the European Union and the European Community. Thenceforward equal residence and employment regulations were applied for Austrian citizens and employees from member-states of the EU. However the limitations of workers beyond EU-borders were still defined by the law of 1976 and -for example- amounted to 267,586 in the year 2002 which were about 8 per cent of the Austrian employment potential. In addition up to 8,000 immigrants for seasonal employment (6 months) and further 7,000 for harvesting in the agricultural sector were admitted. Since 2003 seasonal workers may be employed in the same service two times in series for six months and every economic sector is permitted to hire seasonal labor force.

TABLE 2.1.: CENSUS BY NATIONALITY FROM 1951 TO 2007

Nationality	1951	1961	1971	1981	1991	2001	2007
Germany	23,667	43,944	47,087	40,987	57,310	72,218	113,668
fm. Yugosl.	14,948	4,565	93,337	125,890	197,886	322,261	303,999
Czech Rep. ¹	4,754	741	2,991	2,032	11,318	7,313	8,277
Poland	3,705	539	774	5,911	18,321	21,841	34,676
Romania	2,798	262	397	1,253	18,536	17,470	23,048
Turkey	112	217	16,423	59,900	118,579	127,226	108,808
Hungary	5,985	4,956	2,691	2,526	10,556	12,729	18,135
Europe, other	19,455	19,925	23,099	22,209	34,507	54,172	***
Europe, total	75,424	75,149	186,799	260,708	467,013	642,969	717,894
Africa	29	626	1,279	3,127	8,515	14,223	20,897
Asia	294	1,630	4,254	12,304	25,677	34,978	54,855
America	788	2,717	6,000	6,305	9,516	12,313	16,898
Australia	9	99	570	555	738	1,026	1,310
unknown	246,054	21,938	12,994	8,449	6,231	5,417	4,674
Austrian	6,611,307	6,971,648	7,279,630	7,263,890	7,278,096	7,322,000	7,472,910
Non-Austrian	322,598	102,159	211,896	291,448	517,690	710,926	826,013
Total	6,933,905	7,073,807	7,491,526	7,555,338	7,795,786	8,032,926	8,298,923
% Immigrant	4.70	1.40	2.80	3.90	6.60	8.90	9.95

¹ Figures between 1951 and 1991 for Czechoslovakia; since 2001 only Czech Republic (without Slovakia)
(Source: Statistik Austria, Census 1951- 2001; Population data 2007)

PRSKAWETZ (1997) defines seven waves of immigration since 1960. The working migration in the 60ies and 70ies can be divided in (1) the early stage from 1961-68 (annual immigration balance of +6,393 persons), (2) the peak from 1969-73 (+23,498) and (3) the later stage from 1974-76, where there was a downsizing of immigration (-11,109). After a (4) transitional period between 1977 and 1984 (+3,678) the next big wave of the 80ies started with the (5) early stage from 1985-

1988 (+12,392). The (6) peak was between 1989 and 1993 (+67,610) and ended with the (7) later stage from 1994 to 1995 (+10,273).

2.2. Immigration and Participation rates

If we just want to get a rough perception of working migration in Austria, we take a look at the Austrian census from 1951 to 2001 in Table 2.1. Out of these figures the growth rates of the Austrian population can be calculated as about 0.2 percent per year whereas the Non-Austrian population grew annually approximately 1.6 percent from 1951 to 2001.

TABLE 2.2.: ANNUAL GROWTH RATES OF POPULATION BY NATIONALITIES FROM 1951-2001

Nationality	1951-2001	1951-1981	1981-2001
Germany	2.2563	1.8474	2.8727
fm. Yugoslavia	6.3341	7.3611	4.8120
Czech Rep.	2.3318	-2.7935	10.5309
Poland	3.6119	1.5693	6.7531
Romania	3.7311	-2.6423	14.0820
Turkey	15.1084	23.2935	3.8383
Hungary	1.5207	-2.8345	8.4222

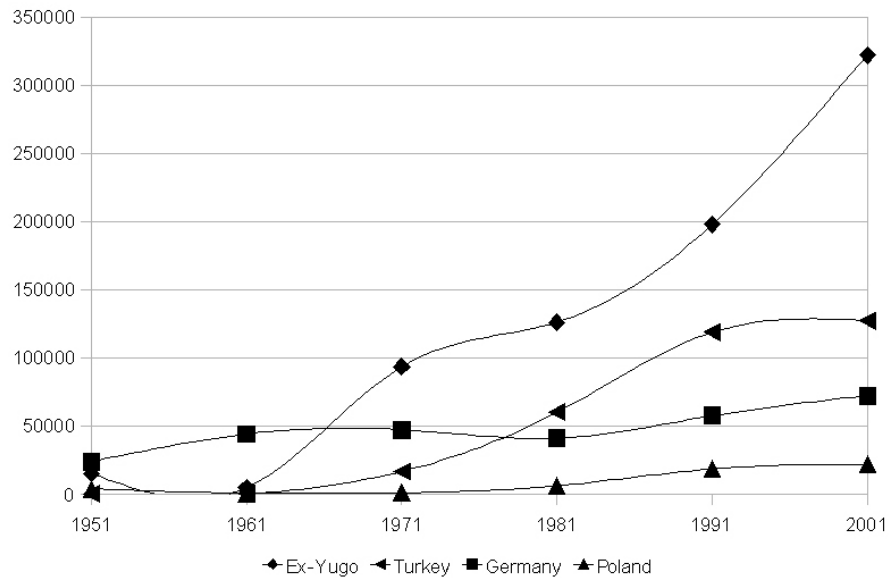
(Source: Statistik Austria, Census 1951-2001, own calculations)

To reveal where this population growth is derived from, one may take a closer look at the growth rates of the typical immigration nationalities in Austria, as shown in Table 2.2. The figures for Poland and Romania from 1971-2001 seem somewhat biased because these countries started their growth from a very low level. Anyway the growth rates for Turkey (15.1% annual growth between 1951 and 2001) and former Yugoslavia (6.3% respectively) are remarkable, representing the two biggest nationalities since the 1980ies, as can be seen in Figure 2.2.

BIFFL (2002) states that not the whole immigration growth can be explained by working migration and quite an important role was played by family reunions or political and war refugees especially in the 1990ies and due to increasing economic integration between Austria and the European Union as well as Central and Eastern Europe (CEE). But while the share of the foreign labor force supplied by EU (or

EEC respectively) countries rose from 7% to 11% between 1980 and 2001, the share of employees from CEE increased from 2% to 12%.

FIGURE 2.2.: IMMIGRANT POPULATION OF THE FOUR MOST-CONTRIBUTING COUNTRIES IN 2001



(Source: Statistik Austria: Census 1951-2001)

Migration is not influencing the work potential in a direct way but rather through the rate of participation in the labor market, which includes the employed as well as the unemployed. If we take a look at Austria's overall labor-force participation rate⁵ in Table 2.3 we may notice, that the rate for foreigners is much higher than that for natives since the census of 1971.

Following PRSKAWETZ (1997, p. 7) the very high participation rate of foreigners in 1971 (65%) can be traced back to the early stage of immigration in the 60ies when mainly young and single foreigners -both men and women- entered the Austrian labor market. On the other hand, the participation rates for natives shrank between the years 1961 to 1971 due to the baby-boom of the 1960ies and the transition of the baby-boom generation of 1900 into retirement. Between 1971 and 1981 the rate of participation in the labor market decreased for foreigners, since this period is considered to be the transitional period when many family reunions were taking place. Hence the share of non-employed foreigners increased. In the 1980ies merely younger people migrated to Austria increasing the participation rates from 48.8%

⁵Labor-force participation rates are accounted for all participants in the labor market as a share of *total* population

(1981) to 59% (1991) for 15-20 year old and from 65.7% (1981) to 74.2% (1991) for 20-25 year old workers. The overall participation rates reached 58,1% for immigrants in 1991, which was the second highest rate since 1961. While 57.8% of the foreigners were employed in 2001, this was only true for 48.8% of the Austrians, as is shown in 2.3.

TABLE 2.3.: OVERALL LABOR-FORCE PARTICIPATION RATES FOR AUSTRIA
1961-2001

	Total			domestic			foreign		
	Total	male	female	Total	male	female	Total	male	female
1961	47.6	61.0	36.0	47.7	61.0	36.1	46.3	58.9	31.2
1971	41.8	54.6	30.4	41.2	53.9	30.0	65.0	75.0	49.6
1981	45.2	57.0	34.6	44.7	56.5	34.2	56.9	66.2	45.1
1991	47.3	57.5	37.7	46.5	56.6	37.3	58.1	67.8	45.4
2001	49.6	57.0	42.7	48.8	56.0	42.2	57.8	66.2	48.5

(Source: Prskawetz (1997), Statistik Austria: Census 1951-2001, own calculations)

Hence, not only the absolute number of citizens of other nationalities rose since the beginning of working migration but also the participation rates compared to the Austrian population. A glance at the female participation rates indicates that foreign women show higher labor market presence than Austrian women. It is mentionable that the difference declined but the participation rate of immigrant women is still about 15,5% higher than that of Austrian women in 2001. According to Prskawetz, this is because of missing employment discontinuation of foreign women due to marriage, births and parenting in the age above 25 years.

2.3. Development in regard of the EU-Enlargement 2004

In 2004 ten new member states joined the European Union which are Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia, including four countries conterminous with Austria. The Federal Ministry of Economics and Labor of Austria conducted several studies on the long-term economic performance with regard to the eastern enlargement of the EU and published them on a homepage⁶. These studies analyze effects in trade (abolition of the remaining tariffs), domestic market processes (efficiency gains and increasing price

⁶<http://euost.bmwa.gv.at/>

competition), factor shifts (foreign direct investments from West to East, working migration from East to West) and further costs and transfers.

The studies detect a Win-Win-situation because the eastern enlargement creates wealth benefits as well for the old EU15 as for the new EU10 which actually means GDP growth for both. In the case of the EU10 these effects will be ten times as big as for the EU15, since economists calculate the GDP growth caused by economic integration in the EU10 on 3-8% between 2005 and 2010, compared to 0.5% additive growth in the EU15. If we are talking about a Win-Win-situation of course the question arises, to which extend the majority of the population will benefit from this growth. It seems obviously that competitive enterprises gain from the abolition of the last trade limitations (in the new member states as well as in Austria) but there is no evidence that the situation has significantly changed for the population.

As an example one could take Poland with its almost 39 million inhabitants, which is bigger than all other new member countries together. Poland's exports of goods rose from 53.53 billion US dollars in 2003 to 89,37 billion USD in 2005 (about 67%) while the state's tax revenues on income and profits fell from 9.95% (2002) to 6.13% (2004) as a percentage of GDP. This indicates high corporate profitability. On the other hand unemployment could not really be decreased (19.6% in 2003 to 17.7% in 2005⁷), taxes for the average workers as well as inflation grew⁸ and according to the World Bank seven million Poles still live in poverty. This indicates that the benefits of the EU-enlargement are distributed unequally and occur in two different tempi for company owners and for the working population. These are definitely *push factors* to leave the country, hoping to be able to partake in the benefits of the enlargement and to improve the own existential situation. It would be canting to say that the living conditions of millions of people in Eastern and Central Europe were the reason for the enlargement. In reality the liberalization of the goods and service sectors is a profitable deal especially for financial business and the goods-producing industry of the "old" European Union, like for Austria (cp. ALTZINGER 2008 and ONARAN 2008).

Since Austria has ever been gaining from the downsizing of the eastern borders, this situation has even improved due to the EU-enlargement. According to a study of BREUSS (2006) real GDP will experience annual growth impulses of 0.15% between

⁷Even though the Federal Ministry of Economics and Labor published actual figures, in which Poland has lowered the unemployment rate on 13.8% in 2006

⁸All data from the OECD database on <http://stats.oecd.org/>

2004 and 2014 caused by several positive aspects as falling prices in the domestic market through increased competition or rising trade capacities. However, the objectives of the masterminds of the EU-enlargement seem to be reached: The growth of the Austrian trade surplus with EU10 between 2003 and 2007 reached 33 percent p.a. or numerical from 1.3 billion euros in 2003 to 4.1 billion in 2007 (cp. Table A.1 in Appendix).

This development is only curbed by the outflow of FDI into the new member states but all in all the enlargement imposes positive effects on the economic performance of Austria. As far as the Austrian labor market is concerned, the intensification of migration has worsened the situation of the low skilled and immobile labor force. Their risk of job loss increases while the wage development will lag behind qualified workers. The FEDERAL MINISTRY OF LABOR (2007, p. 4) calculates that a slightly rise of the immigrant share by 1% would reduce wages by 0.26% and increase individual dismissal risk by 0.8%, mainly in economic sectors where the supply of foreign labor force is substitutive to the domestic workers. Also KEUSCHNIGG/KOHLER (2002) calculate the impact of the eastern enlargement in Austria. The authors assume the growth of unskilled labor force on 10.5% and an increase of the number of skilled workers of 2.1%. As a consequence their model yields a drop in the wages of low skilled workers by 5% while wages of skilled workers rise by 2.7%. (cp. BRÜCKNER/FRICK/WAGNER 2006, p. 118).

The question of outsourcing employment from Austria into the new EU members is not easy to handle. Breuss estimates, that one billion euros of investment into the private sector would create 3,000 additional jobs. In 2003 Austria's FDI equaled 44 billion euros (or 19.5 percent of GDP) whereof 16 billion were invested in CEE countries. With regard to a share of some 60 percent, that are sole cash flow investments and 40 percent, that are real productive investments, the number of "lost" workplaces accounts to a total of 53,000 abroad and approximately 20,000 thereof in CEE countries. In 2005 total FDI stocks amounted to 55 billion whereof 24 billion were invested in the CEE region⁹. This would mean a total of 66,000 lost jobs whereof 29,000 were created in CEE.

In 2005, Austria's migration balance with the (enlarged) European Union amounted to +20,465, whereof 9,141 persons are Germans, followed by Poland (+4,575.), Slovakia (+1,792) and Hungary (+1,305), as can be seen in Table 2.4. Even though

⁹Source of all figures on FDI: Österreichische Nationalbank (OeNB), www.oenb.at

immigration of persons from the new member states rose from 3,040 to 8,842 in the year of the border opening, this was not the expected overflow. In the following year the EU10 immigration was constant with Poland contributing more than half of all foreigners (54.4%), followed by Slovakia (21.3%) and Hungary (15.5%). Moreover the figures of Yugoslavian and Turkish immigrants stagnated at +11,383 (2005) and +5,038 (2005) respectively. After the peak of 2005 immigration from the new EU members has declined substantially to +5,647 in 2007.

TABLE 2.4.: MIGRATION BALANCE AROUND THE EU-ENLARGEMENT 2004

	2007	2006	2005	2004	2003	2002
EU-10	5,647	6,425	8,416	8,842	3,040	2,852
Estonia	20	16	29	35	19	15
Latvia	23	23	28	80	43	45
Lithuania	46	66	108	84	44	33
Malta	2	2	5	2	0	0
Poland	2,022	3,136	4,575	4,997	1,071	856
Slovakia	1,254	1,384	1,792	1,897	977	998
Slovenia	228	151	123	217	-15	-53
Czech Republic	242	310	442	448	293	345
Hungary	1,796	1,333	1,305	1,078	604	613
Cyprus	14	4	9	4	4	0
EU-14	12,583	11,320	12,049	9,534	8,182	6,142
Germany	10,242	9,076	9,414	7,598	6,040	4,286

(Source: Statistik Austria)

Statistik Austria assumes that the economic progress in the eastern countries will lead to a slow-down in total immigration and even halve the number of foreigners crossing the Austrian border from 40,000 in 2002 to 20,000 in 2010¹⁰.

Summing up the effects of the EU-enlargement 2004 it can be stated, that the predicted overflow of immigrants on the domestic labor market has not taken place, although the opening of the borders could not eliminate all the push-factors in the eastern countries yet.

¹⁰The same development is stated to be true for the whole European Union, for which the number of 335,000 in the first year of the enlargement will decline on 150,000 immigrants in only one decade.

3. The Economics of Discrimination

Discrimination and Prejudice are not usually said to occur when someone prefers looking at a glamorous Hollywood actress rather than at some other woman; yet they are said to occur when he prefers living next to whites rather than next to Negroes. (BECKER 1971, p. 13)

The present chapter intends to offer a theoretical approach to the matter of economic discrimination by means of an interdisciplinary analysis of political economy and social as well as historical science. Moreover, not only the monetary conception of discrimination will be discussed, but also other consequences of discrimination like differences in unemployment and poverty risks. Finally, this chapter gives a review of the existing literature on economic discrimination concentrating on the immigrant-native wage gap in Europe.

Every scientific discipline tries to handle with phenomena, like discrimination, with its own methods and theoretic approaches. Psychologists will tend to describe an individual's behavior as a consequence of different personality types, whereas sociologists may have the perspective of a wider scale of society. In sociological perceptions of minorities, the view is concentrated on the interaction between the majority, which attitudes are based on consensus creating prejudices and unites itself in animosity against nonmembers of that group, and an alien group which is characterized by insecurity, fear and the feeling of being out of place (cp. KÖNIG 1958).

Of course an economic approach to discrimination may not ignore the results achieved by other disciplines, far from it, they should be used to develop economic theories. But applied economics has the decisive advantage that fields of research like inequality can be quantified and expressed in numbers. CAIN (1986, p. 698)

states, that "[t]astes are fundamentally taken as given, and explaining their sources or how they may be changed tends to be left to other social sciences. Instead, the economist's main objective is to determine certain behavioral outcomes that are the consequences of these tastes [...]"

In this work, the tracks of Cain will be left for a second. Before carrying out calculations on the consequences of discrimination, a theoretical perception of inequality will be introduced. This is not trivial since many papers tend to neglect the roots of discrimination, and just analyze the consequences. The following section centers on the fundamentals on which discrimination is taking place and which shapes inequality may adopt.

3.1. The Emergence of Economic Discrimination

To examine economic discrimination, the processes of production in a society should be in the center of notice. Of course discrimination¹¹ may only unfold if there is more than one person involved in the production process. How could there exist economic discrimination in a subsistence economy? Correspondingly MANDEL (1998) finds no necessity for slavery –as a form of discrimination- in primitive agriculture with no surplus because the economic fundament is missing and a slave could just produce as much as to reproduce himself. *"Unter primitiven Bedingungen gibt es keine Sklaverei. In einer Zeit, in der zwei Hände nicht mehr erzeugen, als ein Mund verzehrt, fehlt hierfür einfach die ökonomische Grundlage"*, MANDEL (1998, p. 41) states.

Only with the development and the improvement of production processes¹² and consequently the possibility to create surplus, a part of society may be able to abandon productive work and to live at the cost of the other part's production. While the one part just receives as much as to reproduce its labor force, the other part lives by expropriating the surplus produced by the first ones. This form of economic discrimination is perhaps one of the most decisive points in human history - the split into classes. In Marxian view working women and immigrants suffer a dou-

¹¹Discrimination may also occur in the form of heightened exploitation of a special layer of society. CAIN (1986, p. 709) states, that neoclassical and institutional theories on discrimination have adopted Marxian theory on exploitation.

¹²For example the role of the metallurgic revolution in the invention of new tools or artificial irrigation were crucial for the improvement of agricultural production.

ble inequality, first the exploitation as workers, second the heightened exploitation through discrimination. This first sort of economic inequality which is most evidently in the capitalist system is hardly noticed as discrimination in any standard economic textbook¹³.

Doubtlessly these crude forms of discrimination were cruel and barbarous but as history developed from simple to complex forms of cooperation of human beings, also social interrelations complicated. The volatility of capitalist production with sudden expansions and reductions in industrial output, required (and still requires) a similarly volatile working potential (cp. MANDEL 1998, p. 66). Hence, big migration waves took place in the whole era of capitalism: the Irish migrated to England and Scotland; the Polish to Germany; Italians and later North Africans, Spaniards and Portuguese to France; Koreans to Japan and so on. All these immigrant groups suffered from increased exploitation and oppression. They received the lowest salaries, lived under degrading housing conditions and had to face several discriminating laws.

Man führte tausend diskriminierende Maßnahmen ein (vor allem, was die Gewährung gleicher bürgerlicher, politischer und gewerkschaftlicher Rechte anbelangte), um ihre intellektuelle und moralische Entwicklung zu unterbinden und sie in dauernder Einschüchterung und verstärkter Ausbeutung zu halten. (MANDEL 1998, p. 67)

Economic discrimination in the modern capitalist state can barely be compared with these circumstances in history. The production process is much more complex due to the collaboration of several workers in the same fabrication limited in space and time¹⁴.

According to that, the focus of an analysis of the interaction between indigenous and immigrants should be aimed at the sphere of production. In his study "Die Bundesrepublik: Ein Einwanderungsland?", Friedrich Heckmann (cited in KERBER/SCHMIEDER 1991, p. 389-390) states that working immigrants generally receive

¹³SHAHRIARI (2005) analyses the connectivity between class societies and discrimination, as was developed by Max Weber and Karl Marx.

¹⁴i.e. the historic and conceptual beginning of capitalist production: "*Das Wirken einer größeren Arbeiterzahl zur selben Zeit, in demselben Raum (oder, wenn man will, auf demselben Arbeitsfeld), zur Produktion derselben Warensorte, unter dem Kommando desselben Kapitalisten, bildet historisch und begrifflich den Ausgangspunkt der kapitalistischen Produktion.*" (MARX 1977, p. 341)

lower industrial employment, that they have to face discriminating reproduction conditions and - most important - that only the production process links these minorities to the majority. The fact that social interaction between natives and foreigners is more or less reduced to the production process emphasizes the outstanding role of the economic sphere in analyzing discrimination of minority groups. Probably the most famous economist who dealt with this subject is Gary S. Becker.

3.2. The Economics of Discrimination

Theoretical Framework of Gary S. Becker

In his seminal work "The Economics of Discrimination", which was first published in 1957 and republished in a second edition in 1971, Gary Becker concentrates on wage inequality. Becker points out that money is a common benchmark in economic systems and should therefore also serve as a measure of discrimination. CAIN (1986, p.695) puts this concept in a nut shell: "*Under what conditions will essentially identical goods have different prices in competitive markets? [...] Discrimination in the labor market takes labor services as the good in question and the wage rate as the price.*"

Becker therefore uses a conceptual *discrimination coefficient* to distinguish the money cost and the net costs to employ someone. If an employer is faced with a money wage rate Π of a certain factor, the net wage rate should be $\Pi(1 + d_i)$, where d_i is the discrimination coefficient (further DC) for this factor. According to Becker the DC can take on any value between zero and plus infinity.

If an individual has a "taste for discrimination," he must act as if he were willing to pay something, either directly or in the form of a reduced income, to be associated with some persons instead of others. When actual discrimination occurs, he must, either pay or forfeit income for this privilege. (BECKER 1971, p. 14)

Becker distinguishes between ignorance and prejudice. An employer who refuses to hire members of a certain group erroneously underestimates their economic efficiency. This ignorance may be quickly eliminated by the spread of knowledge, he

states. A prejudice, however, is relatively independent of knowledge.

In his analysis Becker starts with two groups of laborers (whites [W] and non-whites [N] respectively) which are perfect substitutes¹⁵ in production. In a perfectly competitive labor market the equilibrium wage rate would be the same for both groups. Becker introduces a *market discrimination coefficient* (MDC) which is defined as the proportional difference between the wage rates (cp. BECKER 1971, p. 17). The MDC is shown in Equation 3.1 with Π_w and Π_n as wage rates of W and N.

$$MDC = \frac{\Pi_w - \Pi_n}{\Pi_n} \quad (3.1)$$

For simplicity two societies consisting each only of W or N and confined to two factors of production -capital and labor- are shaped. Each unit of the factors labor or capital of N is a perfect substitute in production for each counterpart of W, and each society benefits from exporting its relatively abundant factors: W exports capital, and N labor. In a full equilibrium without discrimination, Becker compiles the following three conditions (cp. BECKER 1971, p. 20):

- payment to each factor would be independent of whether it was employed with N or W
- the price of each product would be independent of whether it was produced by N or W
- the unit payment to each factor would equal its marginal value product.

Becker argues that the desire to discriminate against labor and capital of N means for W to forfeit monetary income. Further, discrimination reduces the net return that W capital could receive by employing it with N labor, and this leads to a decrease of W capital exported. Since less exported capital to N reduces the income N labor can generate by combining with W capital, also less N labor is exported. To sum up, less labor and less capital are exported by N and W, respectively. Hence, discrimination hurts *W as well as N*.

¹⁵If they were imperfect substitutes, they could receive different wage rates even without discrimination.

This can be shown in some calculations (cp. BECKER 1971, p. 32-34). Let the net money return to domestic labor and capital in W be $\Pi_l(W)$ and $\Pi_c(W)$ then the return equals its marginal productivity as follows

$$\Pi_c(W) = \frac{\partial f}{\partial c}(c = c_w - c_t; l = l_w) = \frac{\partial f}{\partial c}(c_w - c_t; l_w), \quad (3.2)$$

$$\Pi_l(W) = \frac{\partial f}{\partial l}(c = c_w - c_t; l = l_w) = \frac{\partial f}{\partial l}(c_w - c_t; l_w),$$

where f is the production function, c_w and l_w denote the total supply of labor and capital by W and c_t is the amount of capital exported. Further the equilibrium net income of W is

$$Y(W) = c_w \Pi_c(W) + l_w \Pi_l(W) = c_w \frac{\partial f}{\partial c}(c_w - c_t; l_w) + l_w \frac{\partial f}{\partial l}(c_w - c_t; l_w) \quad (3.3)$$

The labor force of N is allocated between imported W capital (c_t) and domestic N capital (c_n). The equilibrium net income of N therefore is

$$Y(N) = c_n \Pi_c(N) + l_n \Pi_l(N) = c_n \frac{\partial f'}{\partial c}(c_n + c_t; l_n) + l_n \frac{\partial f'}{\partial l}(c_n + c_t; l_n), \quad (3.4)$$

where f' is the production function of N. An increase in discrimination by W would mean a reduction of the amount of capital exported to N. Therefore the latter is a monotonic function of W's taste for discrimination. Becker shows that if f and f' are homogeneous functions of the first degree,

$$\frac{\partial Y(W)}{\partial c_t} > 0, \quad (3.5)$$

$$\frac{\partial Y(N)}{\partial c_t} > 0, \quad (3.6)$$

and thus discrimination by W (meaning less W capital exported) drops the net incomes of both N and W. To prove the inequalities 3.5 and 3.5 Becker applies Euler's theorem for homogeneous functions, yielding

$$c \cdot \frac{\partial(\partial f/\partial c)}{\partial c} + l \cdot \frac{\partial(\partial f/\partial c)}{\partial l} \equiv 0, \quad \text{or} \quad (3.7)$$

$$c \cdot \frac{\partial^2 f}{\partial c^2} + l \cdot \frac{\partial^2 f}{\partial l \partial c} \equiv 0.$$

Since

$$\frac{\partial f}{\partial c_t} \equiv \frac{\partial f}{\partial c} \frac{\partial c}{\partial c_t} \quad (3.8)$$

and $\partial c/\partial c_t = -1$ as a consequence of $c = c_w - c_t$, then finally

$$\frac{\partial f}{\partial c_t} \equiv -\frac{\partial f}{\partial c}. \quad (3.9)$$

Out of equations 3.7 and 3.9 it is easy to show that

$$c \cdot \frac{\partial^2 f}{\partial c_t^2} \equiv l \cdot \frac{\partial^2 f}{\partial l \partial c_t}. \quad (3.10)$$

Further we are able to derive by using equation 3.9

$$\frac{\partial Y(W)}{\partial c_t} \equiv l \cdot \frac{\partial^2 f}{\partial l \partial c_t} - c_w \cdot \frac{\partial^2 f}{\partial c_t^2}, \quad (3.11)$$

and by substituting equation 3.10 in 3.11 we finally may denote

$$\frac{\partial Y(W)}{\partial c_t} \equiv -c_t \frac{\partial^2 f}{\partial c_t^2}. \quad (3.12)$$

Becker states, that if there is diminishing marginal productivity $\partial^2 f/\partial c_t^2 < 0$ and

since $c_t \geq 0$ it must follow the proof that

$$\frac{\partial Y(W)}{\partial c_t} \geq 0 \quad Q.E.D. \quad (3.13)$$

With this proof, Becker shows that changes in resource allocation driven by a taste for discrimination reduce the equilibrium net incomes of both N and W. However not all factors are affected in the same way. While the return to W capital and N labor falls, the return to W labor and N capital actually augments. Thus, Becker wonders:

There is a remarkable agreement in the literature on the proposition that capitalists from the dominant group are the major beneficiaries of prejudice and discrimination in a competitive capitalistic economy. (BECKER 1971, p. 21)

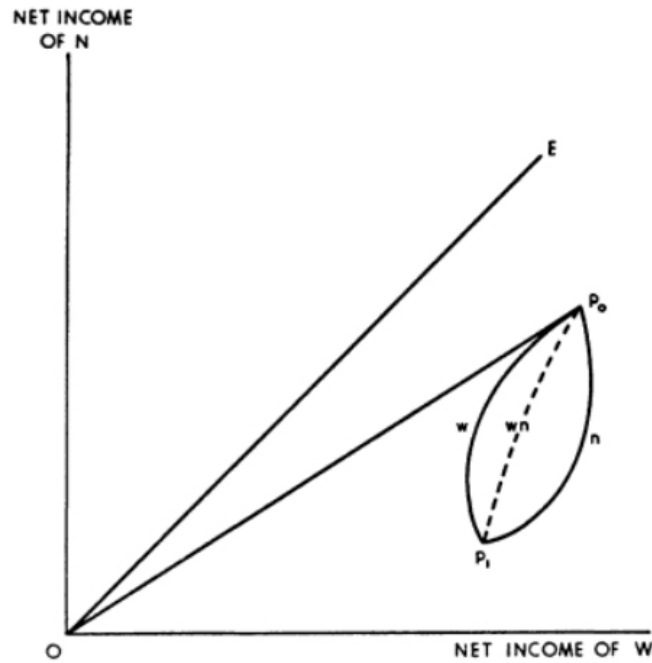
According to Becker this does not fit together with his results, that the returns to W capital shrinks. There would be a misleading conclusion that if the equilibrium wage rate for N labor decreases compared to the one of W labor, the difference of these wage rates must be realized in higher profits to W capitalists. However, these profits would exist only if the wage differential resulted from price discrimination due to monopsony power, Becker concludes.

Theoretically trade between two societies is maximized with the absence of discrimination, and trade decreases with the increase in discrimination. As discrimination might increase so much that trade would no longer pay out, this could lead to complete economic segregation. In Figure 3.1 p_0 represents the income of W and N with no discrimination, p_1 with complete segregation. The curve p_0wp_1 represents the different amounts of discrimination by W. Hence, incomes reach a minimum in p_1 where trade between N and W is precluded due to discrimination¹⁶. To sum up, according to Becker complete segregation *does not avoid* economic disadvantages¹⁷ as a result of discrimination, but *only intensifies them*.

¹⁶Line p_0np_1 represents discrimination by N. If both N and W discriminate, the representation of their incomes must be in the area confined by p_0np_1w . The curve p_0wnp_1 summarizes a set of situations in which W discriminates more than N does.

¹⁷Becker cites a movement in the 1920's under the leadership of Marcus Garvey, which wanted to take Afroamericans back to Africa to escape from discrimination in the USA and to completely segregate themselves economically.

FIGURE 3.1.: THE EFFECT OF DISCRIMINATION ON INCOMES



(Source: BECKER 1971, p. 23)

Employer Discrimination

In accordance with neoclassical economic theory, Becker states that objective behavior is based on considerations of productivity alone. If an employer refuses to hire a person with a higher marginal value than his marginal costs, it is called discrimination. Unlike, if the employer does not hire a person with a marginal value that is below the marginal costs. Again, in this case an employer confronted with a wage rate Π acts as if the net wage rate would be $\Pi(1 + d)$, where d is the discrimination coefficient. The costs of discrimination on the other hand are forfeited profits, writes Becker. So if Π_w is less than $\Pi_n(1 + d)$, an employer would only hire W , and vice versa.

The larger the number of prejudiced employers, or the stronger the intensity of their preference respectively, the greater are the wage and employment gaps between native and immigrant workers. Even if there exist enough unprejudiced employers to hire all minority workers, wage disparities may persist. Hence, *"in the present of any labor market imperfection that makes job search costly, unprejudiced employers will take advantage of the fact that minority workers have less attractive labor market alternatives to offer them lower wages"* (OECD 2008, p. 151).

In competitive industries, employers with a taste for discrimination against N would hire fewer N workers than the profit-maximizing number. They would employ more higher paid but equally skilled W labor. In a competitive market, Becker's theory states, that non-discriminating firms could displace discriminating employers due to their higher costs. Hence the market discrimination coefficient (MDC) would equal zero.

[...] If the production functions of each firm were linear and homogeneous, the MDC would equal zero if at least one employer had a zero DC. Conventional theory usually "assumes" that all employers endeavor to maximize money income. (BECKER 1971, p. 45)

Hence, Becker links the degree of employer discrimination to the degree of market or monopolistic power. The wage gap should therefore be smaller in more competitive markets. For example, Ashenfelter and Hannan¹⁸ proof this for gender discrimination and the banking sector.

CAIN (1986, p. 710) discusses the advantages and disadvantages of Becker's theory. One advantage is that discrimination is potentially measurable and monetary units have a meaning to experts as well as laypersons, contrary to certain attitudinal scales that may not be expressed numerically. However, this could be seen as a disadvantage as well, since no attention is paid to any pain or stigma felt by the victim of discrimination.

Another critics arises in an article by ARROW (1972). He suggests that employer's discriminatory tastes may not be seen as a constant which is independent of the ethnic composition in an enterprise. It rather could be described as an increasing function of the ratio of foreigners-to-natives employees. ARROW (1972, p. 89) states, that distaste may depend on "social distance" rather than "physical distance".

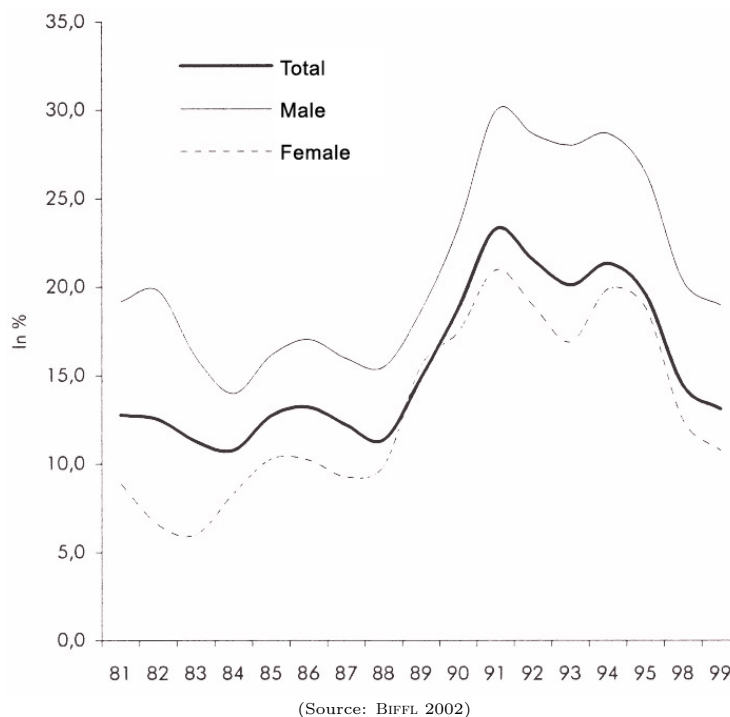
3.3. Job stability and poverty risks of immigrants

Another question that arises besides wage discrimination is the stability of employment for immigrants. BIFFL (2002) states that the wage differential between immi-

¹⁸Ashenfelter, O./Hannan, T.: Sex Discrimination and Product Market Competition: The Case of the Banking Industry. Quarterly Journal of Economics 101, 1986, 149-173

grants and Austrians depends on the business cycle. According to the author, wage inequality diminishes in an economic downturn and widens in a boom. Low skilled workers with small wages lose their jobs first in a slump, since low skilled industrial sectors are underlying stronger fluctuations in demand than high wage sectors (cp. BIFFL 2002, p. 544). Hence, the average wage especially of immigrant workers rise due to the omission of lower wages. With an average annual GDP growth of 1.8 percent¹⁹, the median income of immigrants employed in Austria between 1981 and 1988 was 11 to 14 percent below the corresponding value of Austrians. In the period of 1989 to 1995 when the economic upswing generated a GDP growth of 2.6 percent, the wage differential was much wider, as Figure 3.2 shows. With data from the Austrian social insurance system the peak can be dated to 1991 with a median wage gap of 23%, when real GDP grew 4.6% in 1990 and 3.6% in 1991. So the theory of Biffel turns out to be consistent with the data.

FIGURE 3.2.: DIFFERENCE OF MONTHLY MEDIAN INCOME BETWEEN IMMIGRANTS AND AUSTRIANS



Naturally, the chance to be employed for one additional year is higher in times of economic prosperity than in times of recession. However BIFFL (2002, p. 546) explains, that the probability for foreigners to be employed one additional year is considerably smaller than the likelihood for natives. A similar analysis is given by

¹⁹Data from OECD Factbook 2009

PRETTNER/STIGLBAUER (2007). According to them, the wage differential reflects the fact, that immigrants are hired to cover the peaks in labor force demand and are laid off in times of a drop in demand, a sort of fluctuation labor force.

An expression used by sociologists could be taken as apposite for the immigrant workers pool: the industrial reserve army of labor. This concept was developed by MARX (1977) in an economic debate on the perception of overpopulation with the political economist Thomas Robert Malthus²⁰ (cp. BERGER 2004, p. 143 and ROSDOLSKY 1968, p. 289-301). Marx states that with the development of modern economy the share of constant capital in the production process increases in relation to the variable capital, which means an extended use of machinery compared to human labor force. With increasing productivity the *absolute* number of employed may rise but by trend the demand for workers shrinks with the implementation of new machinery. Thus there exists a surplus labor force which is not needed for the production process, the so-called industrial reserve army. But besides this long-run tendency the short-term economic cycle and consequently the level of investments influences the size of employed and unemployed workers, as Marx states.

Der charakteristische Lebenslauf der modernen Industrie, die Form eines durch kleinere Schwankungen unterbrochenen zehnjährigen Zyklus von Perioden mittlerer Lebendigkeit, Produktion unter Hochdruck, Krise und Stagnation, beruht auf der beständigen Bildung, größern oder geringern Absorption und Weiterbildung der industriellen Reservearmee [...]
(MARX 1977, p. 661)

So if a capital owner expects that his supplied capital receives an appropriate realization in the production sphere, investments as well as the demand for labor will increase. At that point a capital owner will hire workers out of the reserve pool until the time of prosperity comes to an end and these workers are dismissed again.

In his theory on the industrial reserve army, Marx classifies three forms of industrial reserve army: floating, latent and stagnant. Probably a mixture of the first and the last type is the most appropriate expression for immigrants. Marx describes the latter category as inexhaustible pool of workers with very unstable and irregular employment. Their living standard is below that of an average worker and exactly this turns them into dangerous rivals in the wage competition on the labor market.

²⁰Meek, Ronald (Ed.): Marx und Engels über Malthus. Dietz Verlag Berlin, 1956

This is exactly what is described in a paper by ARAI/VILHELMSSON (2001). The main purpose of their work was to examine whether individual productivity measures can eliminate differences in unemployment risk between immigrants and natives in Sweden. Hence, the impact of various individual characteristics on the unemployment risk was estimated with a large sample of employees aged 18 to 60 in 1991. The authors calculate the risk of becoming unemployed for a sample of employees, that is employed at a certain point of time.

The message of the results of Arai and Vilhelmsson is unambiguous: There are significant and huge differences in risk of ending up in unemployment in 1995, if the individual was employed in 1991. The unemployment risk for non-Europeans is almost twice as large compared to natives. Europeans and Nordic workers have between 25 and 10% higher risks than natives. According to the study this is not due to differences in the age structure of immigrants, far from it, differences increase if an age dummy is included into the regression. One explanation therefore is that immigrants tend to be on temporary contracts more often than natives, which raises the risk of becoming jobless.

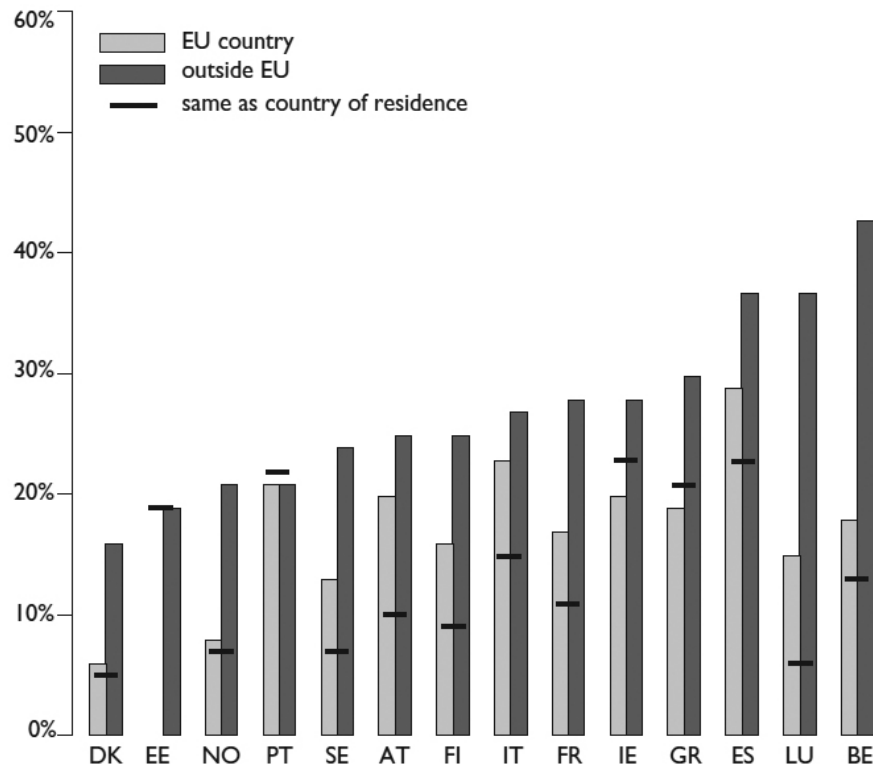
The results suggest that the major part of the estimated differences in unemployment risks between natives and immigrants remain after controlling for individual characteristics, like age, gender, marital status, educational level, and so on. The conclusion of the authors is, that an explanation for the observed pattern is discriminatory behavior and stereotype beliefs in the Swedish labor market.

To sum up, it can be stated that working immigrants could be seen as a industrial reserve army due to three main characteristics: Most immigrants form a fluctuating labor force depending on the economic cycle, they often are employed under unstable and irregular conditions and native workers tend to see them as rivals in the wage competition.

LELKES (2007) analyzes the level of poverty of migrants in 14 European countries. The author states, that EU and non-EU migrants are two very distinct groups as far as their exposure to poverty is concerned. The study is based on the first wave of EU-SILC in the year 2004 which included 13 European Union countries and Norway. One result of the analysis is, that migrants from non-EU countries are exposed to a multiple times higher risk of poverty than natives²¹.

²¹The indicator of poverty is the so-called "at-risk-of-poverty rate", which is part of the portfolio of indicators adopted by the Laeken European Council. It shows the share of persons with an

FIGURE 3.3.: THE RISK OF POVERTY AMONG MIGRANTS



(Source: LELKES 2007)

The poverty risk of migrants from European Union countries varies greatly by country, but it is clearly favorable to other migrants, or at times even to non-migrants. The “EU/non-EU” gap among migrants is particularly marked in Belgium, France, Luxembourg, and Norway. [...] Austria seems to have a specific situation, as poverty among people born in the EU tends to be also nearly twice as high as among non-migrants. (LELKES 2007, p. 2)

The author states, that the existing gap between EU and non-EU migrants to a large extent is attributable to their characteristics, like schooling or labor market experience. In Figure 3.3 the risks of poverty for EU and non-EU migrants is shown for several countries. As can be seen, Austria is in the middle of the sample. HERZOG-PUNZENBERGER (2003, p. 1125) gives an example of poverty among foreigners in Austria. According to her, 40% of all Turkish and Yugoslav households in Vienna live in substandard flats, which are relatively cheap because of their poor

equivalised disposable income below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income after social transfers.

quality, often with water and toilets outside of their flats.

3.4. European Studies on the Immigrant Wage Gap

While in the United States scientific publications have been dealing with income inequality by ethnicity or origin for quite a long time (like the Dillingham Immigration Commission Reports), research in Europe is slowly emerging²². However, there are some papers that highlight the earnings situation of immigrants in European countries and show varying results on the effect of discrimination.

One of these exceptions is a paper by LANG (2000), who analyzes the native-immigrant wage differentials in Germany²³. The population of immigrants in Germany is quite high. After several immigration waves, especially since the beginning of the 1980s, currently more than 12% of the German population is foreign-born. There are large wage disparities, for example income of Turks are 24% below the average of natives. Even after correcting for working time, a differential of 17% remains. The statistical method adapted in this study is that of a frontier earnings function.

[T]he earnings frontier gives the highest potential income associated with varying amounts of human capital inputs. All individuals are below this curve. In a second step, the individual-specific distance from the frontier are explained by a bundle of possible sources, with assimilation and ethnic discrimination at the core of interest [...] (LANG 2000, p. 2)

Of course also the reference group is suffering from earnings inefficiency, hence only the difference between the inefficiency levels of natives and immigrants is possibly influenced by discrimination. Other sources for observed income inefficiency could be regional or occupational immobility of employees, information deficiencies, or market power of firms. The author uses the German Socio-Economic Panel for his calculations, confined to a sample of males between 18 and 64 years of age. All part-time employees below 20 working-hours a week were excluded.

With a human capital earnings function the potential income curve is computed,

²²There is some research on immigration in Europe in general, like PARSONS/SMEEDING (2006) or BAUER (2008) for the case of Austria.

²³An update of his analysis is presented by LANG (2004).

where every year of schooling rises the potential earnings by roughly 3.5% and each year of unemployment decreases the wage frontier by about 2.5%. At average, employees could realize 88% of their potential earnings as actual earnings. Quite a high share of the observed wage differential between the groups could be explained by different positions on the frontier earnings curve. For example the low wage of Turks was explained by more than 94% by their modest human capital endowment (cp. LANG 2000, p. 10).

GOLDER (2000) analyzes the wage gap in Switzerland. Between 1945 and 1998 the share of foreigners in Switzerland has almost quadrupled from 5 to nearly 20%. Golder calculates a wage gap of 15.5 percent for immigrant males compared to natives. In this study, the discrimination effect bears a larger weight than the endowment effect on the wage differential. For males and females, schooling and experience explain the most of the earnings differential, although the shift coefficient has a large effect in the earnings decomposition. As far as the ethnic wage gap among males is concerned, 10.5 percentage points of 15,5% are due to the discrimination effect and 5 percentage points due to endowments²⁴. Within females, 14.1 percentage points of the wage differences are due to discrimination, erasing a 1% advantage for immigrants attributed to endowments. The wage gap between immigrant and native females accounts to 13.2% in Switzerland.

NIELSEN et al. (2004) examine wage gaps between immigrants and natives in Denmark. The fraction of immigrants in the Danish population has risen from 2.7 to 5.6% in the years between 1980 and 2000 and reached approximately 300,000 individuals. Like in Austria, the fundamental reasons for migration changed by time. While in the 1960s and early 1970s the dominant part were labor migrants, refugee immigration grew rapidly after the mid 1980s. The empirical analysis was carried out with two register-based data sets for the period of 1984 to 1995. The sample is restricted to the age of 20 to 59 in order to reduce selection problems due to retirement and schooling. The authors find out, that spending time working in Denmark increases immigrant wages for at least the first five years. Afterwards the experience profile is getting flatter, but the returns are still positive. For natives, the experience profile has the usual concave shape.

As far as the immigrant wage gap is concerned, male Nordic foreigners earn more than Danish males due to their specific skills. Immigrants from Turkey, Africa and

²⁴The portion of discrimination varies between 7.3 and 10.5 percentage points depending on the weights. The portion of endowments varies between 8.2 and 5.0 percentage points, respectively.

Pakistan are faced with the biggest ethnic wage gaps of 22 to 26%. The female wage gap is smaller than that of males, ranging from 9% for immigrants from India and Sri Lanka to 17-18% for females from Turkey, Africa and Pakistan. Considering the gender wage gap within all the ethnic groups, immigrant women are considerably disadvantaged in Denmark. As far as the decomposition is concerned an interesting result occurs within the group of Nordic immigrants. There is a significant wage gap of 15% due to lower qualifications but on the other hand a negative discrimination of 17% which could be denoted as favoritism. For other countries like Turkey, Africa and Pakistan there is a large qualification gap compared to natives.

A study by NORDIN/ROOTH (2007) intends to explain the ethnic income gap in Sweden. The group of second generation immigrants in 2002 was as large as some ten percent of total Swedish population. The analysis is based on a data set provided by the Statistics Sweden and the Swedish National Service Administration which contain every single individual living in Sweden. Hence the sample is large, with 500,965 native men and 77,267 second generation immigrant men, aged 28 to 38.

The authors discover that the income gap differs a great deal with family origin and with whether one or both parents are born abroad. The wage gap is especially large (between 6 and 12%) for male second generation immigrants with one or both parents born in Southern Europe or outside Europe. Contrary to former Swedish studies, the authors find that the income gap depends strongly on a skill gap and less on discrimination.

Another paper was written by DENNY/HARMON/ROCHE (1997) on the long-term earnings differentials in Great Britain. The investigation period ranges from 1974 to 1993 and the subject of matter is the distribution of discrimination. For example, if the average wage gap between 1974 and 1993 is 5% in favour of natives, it could be that in 1974 all immigrants earn 5% less than natives and in 1993 half of immigrants earn the same amounts as natives, and the other half earns 10% less. The data used is provided by the General Household Survey (GHS). The results of the study show that discrimination in Great Britain may rather be ethnic than due to migrant status alone. Across the split between migrants and natives, the migrant sample is discriminated against, but comparing white natives to white immigrants does not show any strong presence of discrimination practices, the paper shows.

4. Segregation and Assimilation

In most countries immigrants have lower wage rates compared to natives. This phenomenon may have several causes; it can be caused by differences in "standard" human capital, also denoted qualifications; it can be due to differences in host country specific human capital - a hopefully transitory component, whose gradual disappearance is called "assimilation". Finally, the differences in wages between immigrants and natives may be a result of discrimination, that is, differences in returns to the variables determining wages. (NIELSEN et al. 2004, p. 855)

This chapter addresses to the issue, what may, besides discrimination, influence the level of earnings of immigrants. There are several factors that are often discussed in the literature. Beginning with educational imbalances and occupational segregation, the reverse flow of assimilation is also mentioned. This section therefore discusses the origins of segregation on the labor market and outlines the effects of assimilation on the wage levels of immigrants.

4.1. Educational Imbalances in Austria

For a big part individual positioning in social systems results from origin and education status. The question arises, if there are any disparities in prospects about the educational level between natives and immigrants. CRUL/VERMEULEN (2006) analyzed the participation of second-generation Turkish immigrants in the educational systems in five European nations: Germany, the Netherlands, Belgium, France and Austria. The authors chose Turks for their study because -numbering up to four million- they are the largest immigrant group in Europe and are represented in several European countries. The study focuses on second-generation immigrants as they are almost entirely children of labor migrants and rarely refugees who fled

political persecution or the conflict between Kurds and Turks.

In their analysis, relevant indicators for educational status are school attendance rates, educational performance of pupils and students, highest educational attainments of graduates and dropouts as well as dropout percentages and repeater rates (CRUL/VERMEULEN 2006, p. 239). There are some interesting outcomes about the transition from the education system to the labor market. First of all, in France, Belgium and the Netherlands, between one-third and one-half of Turkish children begin their secondary school careers in lower vocational tracks, which are the lowest secondary school types. This is true for at least between two-thirds and three-quarters of second-generation pupils in Austria and Germany. On the other side far more Turks pursue preparatory tracks for higher education in Belgium and France.²⁵

TABLE 4.1.: INSTITUTIONAL STANDARDS FOR EDUCATION IN SELECTED EU COUNTRIES

Countries	School Starting age	Primary school	Selection age
Austria	6	Half day	10
Belgium	2.5	Full day	14
France	2.5	Full day	15
Germany	6	Half day	10 or 12
The Netherlands	4	Full day	12

(Source: CRUL 2007)

In Table 4.1 some institutional education standards are listed to highlight some crucial characteristics pertaining to the development of native and immigrant children in the various school systems. According to CRUL (2007), Turkish (as well as all) children in Belgium and France start school at the age of two or three while in Austria and Germany they attend school at the age of six.

Therefore, this cohort of children in France and Belgium has about three to four more years of schooling during a crucial developmental phase in which they begin learning the language of the host nation. (CRUL 2007)

²⁵Even though it seems that second-generation Turks have more opportunities to track a higher school career in France and Belgium, they more often fail to gain a secondary school diploma and have problems to take place in the labor market without diploma. Hence the apprenticeship system in Austria and Germany enables immigrant children to perform the transition between education and labor market in a more efficient way. Unemployment among second-generation Turks in Austria or Germany is three to four times lower than in Belgium, France and The Netherlands.

Referring to the second column it can be stated, that for example nine-year-olds in the Netherlands have a total of 1,019 hours tuition with teachers compared to only 661 hours in German schools, which are about 10 hours less per week. To compensate the fewer pupil-teacher contacts, Austrian and German pupils are assigned more homework, which is a disadvantage for second-generation children since they won't receive any substantial support from their parents who are often unable to understand the domestic language. Moreover the selection age for further education is very low in Austria (at the age of 10) and Germany (10 or 12 years of age depending on the federal states of Germany). According to Crul immigrant children have too little time to overcome their disadvantaged starting position. That's why most immigrant pupils end up in the lowest track of secondary school which is the *Hauptschule*.

To sum up, Crul and Vermeulen state that the French system is more effective in guiding second-generation Turks towards higher educational levels, like university, but the Austrian and German models rather assure success in the transfer to the labor market²⁶.

BIFFL (2002) analyses the situation of immigrants in the Austrian education system. She states for 1997, that immigrants report higher rates of lack of compulsory education as well as higher rates of university graduates than Austrians. About 4.1% of foreigners do not own a graduate in compulsory schooling compared to only 0.6% of the Austrian population. On the other hand 5.5% of all foreigners, who are living in Austria, are alumni of universities while this is only true for 4.2% of the Austrians²⁷. Moreover 4.8% of Turkish children attend special schools (*Sonderschule*) compared to 1.1% of Austrian children. The labor force survey of the Statistik Austria draws a similar picture by analyzing the educational levels with the International Standard Classification of Education (ISCED 97)²⁸ as presented in Table 4.2.

²⁶Another detailed analysis of immigrants in the Austrian school system is given by HERZOG-PUNZENBERGER (2003).

²⁷In Appendix B.2 the shares of natives and immigrants with a university degree in several OECD nations are illustrated. According to the numbers, eleven percent of natives and immigrants have are graduates of a university - hence, slightly different to the figures of Biffl.

²⁸0 = nursery school, 1-2 = compulsory school, 3-4 = secondary school, 5-6 = university and doctorates

TABLE 4.2.: EDUCATIONAL DISTRIBUTION BY ISCED 97 AND NATIONALITY IN 2005

	Total	ISCED 97		
		0-2	3-4	5-6
	In 1,000s			
Austria	4,914.1	1,103.4	3,063.3	747.5
Non-Austrians	601.5	234.4	281.8	85.4
EU 25	177.6	24.2	105.0	48.5
therefrom EU 15	106.0	14.5	57.1	34.4
fm. Yugoslavia	226.1	110.0	106.5	9.6
Turkey	86.5	63.8	20.9	1.8
Others	111.3	36.5	49.3	25.4

(Source: Statistik Austria: Arbeitskräftenerhebung 2005)

Roughly 22.4% of the Austrian labor force are located in the lowest education level, including nursery and compulsory school while 62.3% attended secondary school. Within Turks it is just the opposite distribution: 73.8% completed compulsory school and only 24.1% conducted further education. It is to mention that an outstanding presence in the highest level of education (university and doctorates) is contributed by immigrants from the EU15. Almost one third of these countries' labor force is provided with university skills. The dataset EU-SILC 2005 supports this fact for 2005 as can be seen in Table 4.3.

TABLE 4.3.: EDUCATIONAL DISTRIBUTION BY NATIONALITIES IN EU-SILC 2005

	1)	%	2)	%	3)	%	4)	%	5)	%	6)	%
Austria	55	65.5	2,214	84.12	3,351	92.19	626	82.26	97	82.2	9,200	88.3
EU15	0	0	31	1.18	57	1.57	57	7.49	13	11.02	235	2.26
new EU10	0	0	34	1.29	42	1.16	27	3.55	2	1.69	194	1.86
fm. YUG	16	19.5	213	8.09	134	3.69	9	1.18	1	0.85	447	4.29
Turkey	10	11.9	96	3.65	26	0.72	3	0.39	0	0	148	1.42
Others	3	3.57	44	1.67	25	0.69	39	5.12	5	4.24	188	1.8

1.) No compulsory schooling, 2.) Compulsory schooling, 3.) Apprenticeship, 4.) University degree, 5.) Doctorate, 6.) Sample in EU-SILC 2005

(Source: EU-SILC 2005, own calculations)

It is noticeable that Turkish citizens, compared to their share in the whole sample (1.42%), are represented disproportionately often in the lower education levels. 11.9% of all individuals without any graduate and 3.65% of those who solely finished compulsory schooling are Turkish immigrants. The same thing is true for

immigrants from former Yugoslavia (19.5% and 8.09% respectively). At the other end of the education scale we find an over-representation of people especially from the EU15. While they only account for 2.26% of the sample, they supply 7.49% of all alumni of universities and even 11.02% of all doctorates.

Hence immigrants are present on both poles of the education scale, but while people from Turkey and former Yugoslavia are exceptionally often represented in the lower education levels, citizens from EU and EEC are equipped with high qualifications. It is not deniable that these inequalities in skills are influencing income realities for major parts of immigrant workers. However segregation is not just a matter of the education systems but also pervades employment sectors. Occupational segregation was basically analyzed in a paper by Bergmann in 1974.

4.2. Measurement of Occupational Segregation

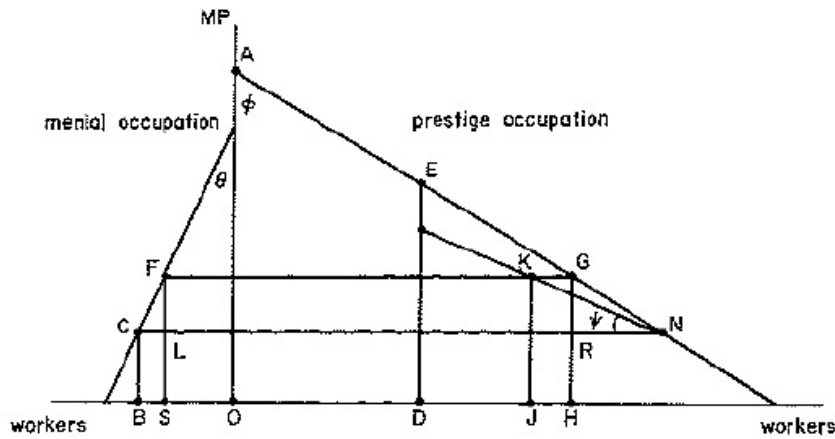
The analysis of BERGMANN (1974) is initially based on a labor market with two occupations and in which all employees have the same skills. In addition, a simplifying assumption is implemented, so that the marginal productivity of labor is a linear function that is just influenced by the number of workers occupied in each sector or firm. There are two groups of labor force specified, a minority group and a majority group. Even though some employers would only hire the minority as far as they accept to be paid worse than the majority in certain situations, it is assumed that generally all workers will be paid equal to their marginal productivity.

This amounts to saying that once an employer allows the low wages of Negroes to overcome his aversion to hiring them for a given occupation, he will not deny himself the extra profit he can get by utilizing the labor-intensive methods their low wages makes sensible. (BERGMANN 1974, p. 103)

The model is built on total segregation by occupation with two different marginal productivities, meaning that one additional employed worker, creates different additional values in the two occupations. This is illustrated in Figure 4.1 by the unequal steepness of the marginal productivity curves in the two occupations (AE and FC respectively). Total segregation means that all workers of one group (named majority) working in one occupation (OD) and the rest of workers (called minority)

is employed in the other one (OB). Their wages are determined by their marginal productivity which is DE and BC respectively. Obviously the minority sector is overcrowded because marginal productivity is lower than in the other sector and a shift from the menial occupation to the prestige one could increase total output.

FIGURE 4.1.: OCCUPATION SEGREGATION MODEL BY BERGMANN



(Source: BERGMANN 1974, p. 104)

There is a crucial monetary differential in wages between the two occupations which makes the employers indifferent in employing minority or majority workers. This amount of money which regulates the access of the two groups of labor force into the other occupation, is assumed to be high in prestige occupations and low in menial ones. The whole model of segregation is stable as long as the difference in the marginal productivities is between the crucial monetary differentials in the menial occupation d_m and in the prestige occupation d_p .

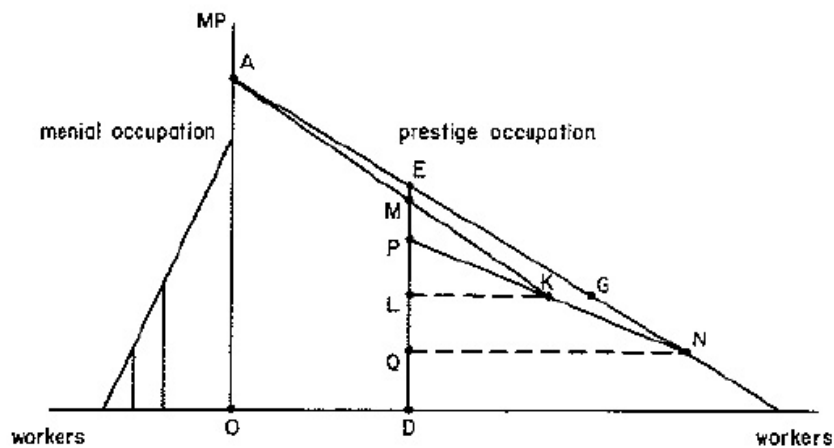
$$d_m \leq (\text{prestige marginal productivity}) - (\text{menial marginal productivity}) \leq d_p$$

A difference in the marginal productivity that is bigger than d_p means, that one additive minority worker in the prestige occupation would create more value than the employer's aversion to employ minorities, expressed in money. In this case there would be a shift of minority workers into the prestige sector ($BS = JH$). As a result of this shift, marginal productivity and wages respectively will rise in the menial sector (SF) and the minority labor force in the prestige sector would earn equal wages, as this is the opportunity cost for leaving the menial sector. Normally an additional worker in the prestige occupation would almost earn DE but JHKG shows the size of the shift and the real wage. Drawing all possible sizes of shifts we

get a linear curve through K and N, since N is the wage below which no minority worker would change the sector because this is exactly the wage level they may achieve if they would stay in their crowded occupation.

It is easy to find out what the minority's wage in the prestige sector is, but how will the shift affect the majority's wages? General marginal productivity curves are derived as a sum of the marginal productivity curves of each firm for this kind of labor. So if some firms shift from hiring majority labor force to the minority one, the marginal productivity curve will be the sum of all remaining firms. So if KG minority workers entered the prestige occupation the new marginal productivity curve will be AK as can be seen in Figure 4.2. This causes a decrease of the wage of majority workers from DE to DM. As before, the supply curve of minority workers in the prestige occupation is drawn through N and K and arrives at point P which is the total supply of the majority labor force²⁹. In this case both wage levels realize DP and segregation would be erased. But in regard of a shift KG, the growth of the minorities' wages will be QL and the fall of the majorities' wages would equal EM. Hence a shift from the menial to the prestige occupation would cause a bigger rise of the minority wage than the fall of the majority wage, which is quite a crucial statement for this analysis.

FIGURE 4.2.: BERGMANN MODEL AFTER SHIFT IN LABOR FORCE



(Source: BERGMANN 1974, p. 105)

Most previous debates on discrimination concentrated on the inefficiency of prejudices for a discriminator who is not willing to employ laborers of a certain group. The discriminator was presumed to forgo the cheapness of these employees – for

²⁹This point can of course only be reached, if d_p equals zero.

example blacks or women -, a cheapness which he was producing by his own behavior. So the real gainers of discrimination were those employers who were thought to be the least prejudiced because they could raise their profits by the low wages of the minority group (cp. BERGMANN 1974, pp.107 et sqq.). However, in regard of occupational segregation it can be shown that discriminators do hire blacks and women - but preferential in menial occupations.

Bergmann adds, that the restriction of blacks and women to certain employment sectors may have nothing to do with Becker's "taste for discrimination", but is rather a gentlemen's agreement among employers searching for the maximization of their profits. She argues that it is easier to have such an agreement on "*Thou shalt hire them only as janitors*" than "*Thou shalt pay them 80 cent less*".

Even though this statement sounds like a conspiracy theory, in which a mysterious class of employers is discussing in secret halls to ban foreigners in high-paid employment, there is evidence for such behavior in Western Europe, as OTTAVIANO/PERI (2008) show.

Ottaviano and Peri report three important developments on the Western European labor markets. An aging working class, women who are increasingly participating in the labor force and the youth that is consequently advancing its level of education. Due to rising educational and age levels, rich countries are specializing into high-skilled services, which is exemplified by the shift away from agricultural and industrial labor toward the service sector. Hence there will be a tendency of increasing demand for jobs and services which previously were provided by women and low-educated young workers and on the other hand a lacking supply of workers who are willing to carry them out. Such services are care of children and elderly, cleaning, cooking, building, etc.

In many countries neighboring Western Europe, like in North Africa or in Eastern Europe, there exists a big labor force of unskilled young workers, which could be attracted by higher productivity and wages in Western Europe. OTTAVIANO/PERI (2008) refer to the benefits of specialization and trade, which would mean that educated Western Europeans should concentrate on human capital intensive services (business services, finance, education, research, etc.) and immigrants should specialize in manual-intensive services (personal care, construction, transportation, etc.).

Facing the differences in qualifications as pointed out shortly in 4.1 it seems plausible that certain nationality groups are concentrated in few industrial sectors, which require low levels of education and experience. Biffel gives evidence that Yugoslavs mainly work in typically seasonal employments like agriculture and forestry, construction and tourism, which neither require high education levels nor long-term experience. Turkish employees are often hired in textile, wood-working, construction, chemical and metal industry while people from the EEC are represented in the finance sector, in science and education (cp. BIFFEL 2002, pp. 540 et sqq.). 1999 two-thirds of the whole foreign labor force in Austria were concentrated on 6 industrial sectors: construction, tourism, trade, corporate-assisting services, metal industry and communications, mainly with low average incomes. MANOLAKOS (2006, p. 14) explains, that the foreigner status (*AusländerInnenstatus*) linked with the sector regimentation usual is the cause for occupational placement in certain sectors and employment segments, which often are at the bottom of the earning pyramid.

In Appendix A.5 a list of the industrial sectors and the shares of immigrants in the corresponding sector are presented. Moreover the sector median wages compared to the total median wage are listed. The highlighted rows show some distinctive correlations between the share of foreigners and the median wages. Obviously immigrants are rather crowded in sectors with low pay, such as agriculture (especially farmhands), tourism (hotels), textiles and leather production.

4.3. The Process of Assimilation

However, there is a certain counterpart of segregation, which is assimilation. This means that newly arrived immigrants earn less than comparable natives, but after some years of residence, earnings reach the level of native incomes. The most common paper on this issue was published by CHISWICK (1978). Chiswick analyzes the effect of "americanization" on the earning of foreign-born men in the United States³⁰.

Chiswick states, that besides productivity there are some important factors which have an impact on the wage level, like an occupational license to apply the skills acquired in the country of origin, a school degree or a union card. It's likely, that

³⁰Chiswick only analyzes whites to avoid a confounding of the effects of ethnicity and foreign origin on earnings.

new immigrants often cannot fulfill these characteristics due to lack of knowledge of the customs and language problems. But as time passes, immigrants gain more knowledge of the host country and so they may receive all these important characteristics.

As times passes, however, the immigrant gains knowledge of the United States, acquires job-specific training, and either acquires the union card or modifies his skills accordingly. Thus, because of knowledge and skills are not perfectly mobile across countries, other things the same, immigrants initially would have earnings significantly lower than native-born persons, but the gap would narrow the longer they are in the United States. The initial earnings deficiency, and the steepness of the subsequent rise in earnings, would be smaller the grater the similarity between the country of origin and the United States. (CHISWICK 1978, p. 899)

Thus, the amount of years passed since migration would be less important for Canadians than for Germans, Chiswick adds. Another problem that occurs is that employers are often not familiar to foreign education systems. Hence, they have less information about the productivity of a job applicant who recently immigrated compared with a native person with similar general statistics. It is difficult to investigate schooling and previous employment references of foreigners and combine them with the actual productivity expectancy for a worker.

Further Chiswick states, that the effect of citizenship could be a parameter of considerable interest. Wage effects of occupational segregation or direct discrimination in wages could lower the income of foreigners compared to naturalized citizens. However, this should not be a decisive earnings disadvantage.

Based on these considerations Chiswick defines several hypotheses which could be tested. (1) As far as some aspects of schooling are country specific, a year of schooling prior to immigration has a smaller effect on earnings than a year of schooling for a native. (2) The same issue turns out to be true for the matter of labor market experience. (3) As immigrants initially have less human capital specific to the host country than natives, their earnings are smaller. (4) After the arrival, their earnings rise at a faster rate than the wages of natives, since immigrants acquire experience in the host country and make investments in post-school training. (5) For the same number of years in the host country, whether a foreign-born person is an alien or a naturalized citizen has no effect on earnings.

In his analysis Chiswick works with the *1970 Census of Population*, 5 percent questionnaire. The sample contains white men, aged 25-64 in 1970 who worked at least one week in 1969 and who reported earnings from wages, salary or self-employment. The analysis indicates that white male immigrants do initially have lower earnings, but they rise rapidly, particularly during their first few years in the host country. Chiswick calculates, that after 10 to 15 years, immigrant earnings equal and then even exceed wages of natives. Moreover the effect of citizenship turns out to be just a matter of the amount of years since migration. Naturalized citizens have generally spent more years in the host country than aliens.

ARAI/VILHELMSSON (2001) investigate the assimilation theory for unemployment risks in Sweden. The authors state, that the gap in unemployment risks between immigrants and natives narrows quite fast in the first years after immigration, but is rather constant after seven or eight years of residence in Sweden. Hence, the convergence pattern for unemployment risks is similar to the pattern for income gaps. Once more, mostly non-Europeans are substantially affected by this gap. Non-Europeans may be able to reduce their unemployment risk to the level of natives, however only those who stay in Sweden for more than 20 years.

5. Data and Variables in EU-SILC 2005

The analysis of labor market inequalities by ethnic origin is more difficult due to the fact that explicit collection of data on race is illegal in many OECD countries, which restrains enormously the number of countries for which racial disparities can be observed and racial gaps computed. (OECD 2008, p. 147)

This chapter describes the data set in detail and intends to highlight the problems of availability of information on the discrimination issue. In general, research often is confined by the limited existence of data and variables, this turns out to be true for labor market analysis as well. Further, this section introduces the endogenous and all exogenous variables of the model.

Due to scarce availability of income data by assets and investments the analysis of inequality is often based on wages and salaries, which still account on some 70 percent of aggregate income. Unfortunately the best source of wage data in Austria - the income tax dataset - does not provide various social variables, like nationality, origin of birth or any information on educational careers. If one compares the data basis of the studies cited in Chapter 3.4, where most economists could use official data records, the supply in Austria is very poor. Appendix A.2 gives a short overview on the different datasets which offer information on personal incomes (cp. ZWICKL 2008). Moreover, for the research on the descendants of immigrants there is no data available. As HERZOG-PUNZENBERGER (2003, p. 1126) states, *"there is no statistical information in Austria on the parents' first language, former citizenship, or place of birth. It is thus very difficult to make any reliable statement about the size of the second generation in Austria."*³¹. For reasons of availability and the plenty

³¹The OECD does some research on the second generation in countries, where data is available,

of variables, the EU-SILC 2005 offers a good base for further research.

5.1. Description of the Dataset EU-SILC 2005

The European Union Statistics on Income and Living Conditions (further EU-SILC) is a survey carried out in private households with its central focuses on income, employment, living, health and financial conditions (cp. STATISTIK AUSTRIA 2007a, p. 21). The population of the survey are private households with at least one household member aged 16 or older. EU-SILC replaced the European Community Household Panel (ECHP) which was conceived as a sole panel survey. Since the last panel wave of the ECHP in 2001, no data on income and living conditions was collected on a European scale (cp. STATISTIK AUSTRIA 2007b, p. 5). The EU-SILC project was started with a regulation of the European Parliament in June 2003, pursuing the objective of a standardized survey for comparable analysis of economic conditions in European households. In its regulation the European Parliament states:

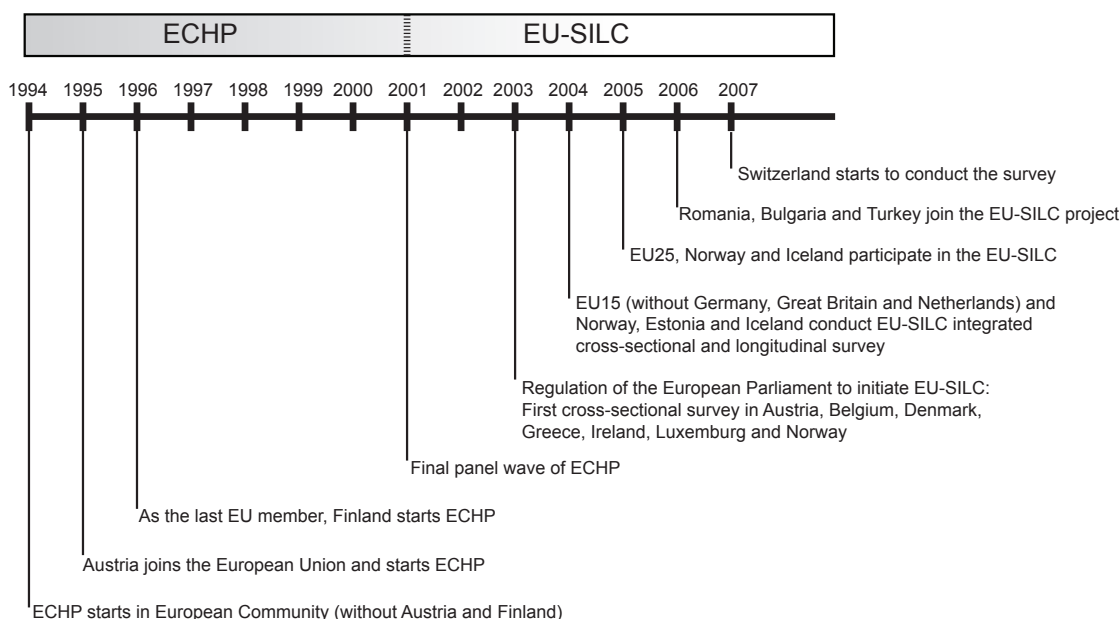
Comparability of data between Member States shall be a fundamental objective and shall be pursued through the development of methodological studies from the outset of EU-SILC data collection, carried out in close cooperation between the Member States and Eurostat. (EUROPEAN PARLIAMENT 2003a, p. 2)

The implementation of the survey is statutorily compulsive for all members of the European Union since 2004. Only Germany, Great Britain and the Netherlands were allowed to start the procedure in 2005. Since this point of time, all countries within the European Union carry out these statistics on income and living conditions (cp. Figure 5.1). The survey should cover 80,000 households throughout Europe for the cross-sectional and 60,000 households for the longitudinal inquiry. This represents 156,000 individuals and 116,500 respectively. For Austria the prescribed number of households is 4,500 (8,750 individuals) for the cross-sectional and 3,250 (6,250 individuals) for the longitudinal survey with a response rate of 60 percent (cp. EUROPEAN PARLIAMENT 2003a, p. 9).

In 2004 the first integrated cross-sectional and longitudinal survey period was started in Austria with a rotation principle, which means that each year one fourth

cp. OECD 2008, p. 149

FIGURE 5.1.: HISTORY OF PAN-EUROPEAN SURVEYS



(Source: STATISTIK AUSTRIA 2007b, own illustration)

of the sample is selected newly, the other three fourths remain the same. Thus, out of the 5,624 households that formed the original sample of EU-SILC 2004, exactly 3,498 were chosen for the second time and 2,126 were debut-households. All new households were selected randomly out of the Austrian register of residence. The response rate of the first inquiry wave in 2005 was lower than 60 percent so that the rotation group of 2004 was again included into the sample, adding up to 8,494 households in the gross sample. Thereof 111 addresses didn't exist any more and 147 couldn't be contacted successfully. Finally 5,148 households were interrogated out of the remaining sample, representing 13,043 persons whereof 10,419 aged 16 or older (cp. STATISTIK AUSTRIA 2007a, pp. 66 et sqq.).

There are two kinds of errors that are almost inevitable in any survey: sampling errors and measurement errors. A sampling error marks the difference in the value given by the survey sample and the according real value for the whole population. Obviously these errors decrease as the sample size grows. A measurement error is the difference between the measured value and the real -but unknown- value of one and the same variable. These errors may be caused by the questionnaire, the interviewer or the respondent.

To minimize such measurement errors, the data ascertainment was conducted via the Computer Assisted Personal Interviewing (CAPI), which made it possible to avoid inconsistency of answers right during the interviews. CAPI announces errors and warnings. Errors occur, if the input value is absolutely impossible in regard of previous specifications, for example if more children than the total number of household members are declared. Warnings are announced, if the input seems implausible, like 3,000 euros in unemployment compensation (cp. STATISTIK AUSTRIA 2007b, p. 11). Other implausible and inconsistent answers were checked with telephone calls after tests on extreme values and densities. Moreover 2,550 of the 10,419 household members were never interviewed personally. The information source for these 24 percent were so-called proxy interviews with other household members.

5.2. An Outline of the Dependent Variable

Even though information about the disposable income was collected on a household as well as on an individual level, this work concentrates on the latter issue. There are several variables on an individual's income collected in the EU-SILC 2005 (cp. EUROPEAN PARLIAMENT 2003b, p. 3). Reference period for the declaration of all income components was the calendar year 2004, thus all income variables are annual data.

As it is defined by the European Parliament, the components of an employee gross income can be broken down to gross cash or near-cash employee income (variable *py010g*), gross non-cash employee income (variable *py020g*) and employers' social insurance contributions (variable *py030g*). It is important for the computation of wage regressions to know what kind of income is taken into account on the left side of the equation. The second type of income mentioned above can be seen as non-monetary transfers which are provided for free or cheaper to employees, like company cars, free or subsidized meals and so on. The third component of gross income includes the employer's contributions into the social security of the employee such as retirement, health and life insurance.

Without doubt employers who may discriminate workers of a minority group could perform their preferential treatment in form of paying out non-monetary assets. They could offer company cars only to members of the majority group while the other group would have to pay for petrol to get to work. But in case of measuring

discrimination this is hard to quantify. In the legislation there does not exist any kind of juristic claim on company cars and it just depends on the arbitrariness of the employer's will to supply employees with vehicles. No judge would support a punishment against an employer who is not willing to supply a car to get to the workplace. We will stick to the concept of equal pay for equal work and thus require the first type of income.

Even though it can not be rejected that the latter two definitions are clearly a source of income (or discrimination) to employees we are concentrating our analysis on the first type of income which predominantly is wages and salaries paid in cash for time worked. The following definition of included components in gross cash employee income is given by the European Parliament:

TABLE 5.1.: COMPONENTS OF THE EU-SILC VARIABLE GROSS CASH INCOME

wages and salaries paid in cash for time worked or work done in main and any secondary or casual job(s)	enhanced rates of pay for overtime
remuneration for time not worked (e.g. holiday payments)	piece rate payments
payments for fostering children	commissions, tips and gratuities
supplementary payments (e.g. 13th month payment)	profit-sharing and bonuses paid in cash
additional payments based on productivity	allowances paid for working in remote locations (regarded as part of the conditions of the job)
allowances for transport to or from work	fees paid to directors of incorporated enterprises
additional payments made by employers to their employees or former employees and other eligible persons to supplement the sick, disability, maternity leave or survivors' pay entitlement from social insurance schemes, where such payments cannot be separately and clearly identified as social benefits	payments made by employers to an employee in lieu of wages and salaries through a social insurance scheme when unable to work through sickness, disability or maternity leave where such payment cannot be separately and clearly identified as social benefits

(Source: EUROPEAN PARLIAMENT 2003b, p. 4)

All the income data was demanded on an annual or on a monthly basis. If respondents could not or were not willing to reveal their exact income, they were asked to point on a certain level on an income range chart. The monthly gross income could be categorized into 15 classes ranging from "1-600" to "8,001 and more" euros.

For instance, 47 percent seized the possibility to declare their income out of investments (dividends, savings book, building loan contract, stocks and bonds, etc.) in form of classification in categories. The alternative to such charts would be an increasing probability of non-response and missing important information on income.

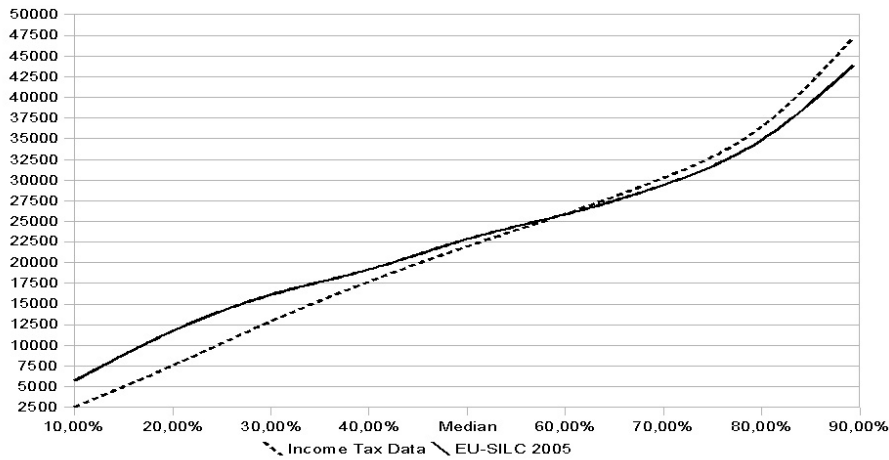
As there are many variables on income, several values were missing in the raw data. Missing net income values are imputed in EU-SILC, missing gross income values are computed using net-gross-conversion. A detailed description about the imputation of income data into EU-SILC is given by STATISTIK AUSTRIA (2007b, pp. 13 et sqq.). While in EU-SILC 2004 approximately 20 percent of employee income were imputed, in 2005 this value could be reduced to 3 percent, especially due to some changes in the questionnaire, which is again documented by STATISTIK AUSTRIA (2007a, pp. 77 et sqq.) and STATISTIK AUSTRIA (2007b, pp. 25 et sqq.). Among other things these changes led to an increase of the disposable household income of about 8 percent compared to EU-SILC 2004, which is definitely not reflecting real income growth in Austria. A second reason for this issue is that households with lower income had a lower probability to continue their participation in the longitudinal survey.

A comparison of the Austrian income tax dataset with the income data of EU-SILC may reveal if the survey is representative for the earnings of the population. The income tax dataset contains the earnings of all employees and retirees and is therefore the most important source for individuals' income in Austria. Figure 5.2 shows a comparison by means of the annual gross income at the decile points. It can be seen that EU-SILC overrates earnings below the median and undervalues high incomes. One reason for this could be, that people with very low as well as people with very high incomes are not willing to give an insight into their financial situation. Especially poor people could be embarrassed to reveal their real level of poverty and often there is the prevailing opinion that poverty is just a temporary state. Altogether the EU-SILC data offer a good coverage of the real earnings.

In most literature, wage regressions are carried out with the logarithmic hourly earnings, as it is suggested by the standard Mincer earnings equation³². As in EU-SILC only gross annual payroll is available, the hourly wage is computed by dividing gross annual payroll (*py010g*) by 52 weeks and then by the amount of working hours per week (*p037010*). To be able to compare wages, we are only interested in full

³²The Mincer model will be discussed in Chapter 6.

FIGURE 5.2.: COMPARISON OF ANNUAL GROSS INCOME IN EU-SILC 2005 AND INCOME TAX DATA 2004



Number of Persons, who draw an Income below the Decile Points. Both data sources correspond to the income in 2004. (Source: ZWICKL 2008)

time workers, that were employed in each month between January and December 2004 (*p040010* to *p040120*). Finally there are 3,414 workers with an income beyond zero and who declare themselves as full time workers (*p001010*). Thereof 3,001 are Austrians, 350 are foreigners from EU10 and Third States and 63 are from the EU15, as is shown in Table 5.2. We separate the EU15 from all other foreign countries due to their special role on the labor market, as discussed in Chapter 4. Finally we derive the natural logarithm of the wages to get our endogenous variable.

TABLE 5.2.: SUMMARY STATISTICS OF THE HOURLY WAGES IN EU-SILC 2005

	Observations	Mean	Standard Dev.	Minimum	Maximum
Austrians	3,001	14.61449	9.023429	0.1057837	128.7046
Foreigners	350	11.47068	5.792587	0.6730769	59.02367
EU15	63	20.3935	12.03541	3.076923	71.63572

(Source: EU-SILC 2005, own calculations)

5.3. The Exogenous Variables of the Model

5.3.1. *Origin of birth*

For the purpose of this work, another important indicator for the robustness of the EU-SILC is the share of immigrants in the dataset. Contrary to the income data of EU-SILC, which can be compared with data of the same year, the available census data is only on-hand for the year 2001 or 2007. Hence, there could be a bias between the collected data and the real figures but we presume this error to be negligible.

Statistik Austria provides following information for the year 2007: 7,062,641 Austrians (85.1 percent), 240,217 from the EU15 (2.89 percent), 179,800 from the EU10 (2.17 percent), 375,191 Yugoslavs (4.52 percent) and 154,705 Turks (1.86 percent). The weighted EU-SILC dataset contains 5,798,354 Austrians (86.36 percent), 161,825 persons from the EU15 (2.41 percent), 148,562 from the EU10 (2.21 percent), 346,865 Yugoslavs (5.16 percent) and 107,203 Turks (1.60 percent)³³. Hence the shares of the different nationalities in the EU-SILC seem to be more or less representative for the Austrian population, neglecting the slight differences due to an over-representation of Austrians.

5.3.2. *Education level and labor market experience*

A central statement of the human capital theory is that wage payments may depend on individual education level which is supposed to have a positive impact on salaries. Therefore we introduce a variable for testing if education has unequal influences on wages for Austrians and foreigners. Moreover, human capital theory implies that labor market experience has a positive relation with wages. In a comment on Jacob Mincer, ROSENZWEIG/MORGAN (1976) state, that the sole use of age and age squared rather than work experience and experience squared in the structural equation creates a differential bias in the estimated returns to schooling. The authors argue, that "*age is not a good proxy for work experience since people of the same age who have spent a different number of years in school will also have different levels of labor force experience*" (cp. ROSENZWEIG/MORGAN 1976, p.4). In this study, the extend of labor market experience will be measured with the number of years in

³³Note: In both cases, the matter of fact is the country of birth and not the citizenship.

employment. It is assumed that working experience is rather a parabolic function than a linear one, which means that the extend of experience increases a lot at the beginning of the career and flattens with time. This will be discussed in Chapter 6.

EU-SILC 2005 provides data for both variables, education and labor market experience. On the one hand the highest educational level is recorded (*p118000*), on the other hand the number of years in employment is available (*p033000*). EU-SILC offers a detailed list of possible schooling careers, however the most interesting question is, if a degree in secondary school or university has unequal impact on wage of different nationality groups.

5.3.3. Other individual characteristics

Other individual characteristics that are introduced into the model are the sex of a person, a leading or important position in the company and a recent job change. The leading position in the enterprise is difficult to characterize, however in EU-SILC 2005 there was a question whether workers have to follow the participant's orders (*p020010*) which is assumed to be a leading position. Moreover a variable that records a job change in the past twelve months (*p034000*) is available in the questionnaire. To reveal which influence this variable should have on wages, a simple statistics on the most affected layers of workers is offered in Table 5.3.

TABLE 5.3.: JOB CHANGE AND WORKERS' CHARACTERISTICS

	Skilled	Unskilled	Leading Position	No Lead. Pos.	Total
Absolute Numbers	105	235	80	260	340
In Percent	30.88	69.12	23.53	76.47	100

A leading position in an enterprise means to be in charge of a number of employees, to be skilled means at least a graduation in secondary school (Austrian *Matura*).
(Source: EU-SILC 2005, own calculations)

Obviously most job changes are taking place among low-skilled workers who are not in a leading position within their company. 46.7% of the skilled workers say that the reason for the job change was an improvement of the employment, while this is true for 40.0% of the unskilled workers. This could be taken as a case where a job change means an improvement in wages. But whereas only 25.7% of the skilled workers were sacked directly by the employer or due to the end of reprieved employment contracts, some 34.0% of unskilled laborers lost their job this way and

had to change. In these cases a job change hardly is combined with an improvement in income. As mainly unskilled workers are affected by job changes we expect the regression coefficient to have a negative impact on wages. Of course a leading position should have a positive sign, being female should have a negative influence on wages.

5.3.4. *Structural characteristics*

However, the wage level is not only influenced by individual characteristics but also by structural attributes. Therefore a dummy for population agglomeration is introduced. Agglomeration is a contiguous set of local areas, each of which has a density superior to 500 inhabitants per square kilometer, where the total population for the set is at least 50,000 inhabitants.

TABLE 5.4.: SUMMARY STATISTICS OF THE INDIVIDUAL AND STRUCTURAL CHARACTERISTICS

	Austria	EU15	EU10	Fm. Yugoslavia	Turkey
Sex	0.5210	0.6042	0.6443	0.4944	0.4594
Secondary School	0.1567	0.2000	0.2938	0.0939	0.0540
University Degree	0.0785	0.2978	0.1494	0.0223	0.0202
Agglomeration	0.2557	0.4680	0.6134	0.5861	0.5608
Job Change	0.0315	0.0297	0.0154	0.0425	0.0608
Leading Position	0.1882	0.1957	0.1391	0.0917	0.1081
Firm Size	0.2048	0.1744	0.1804	0.2550	0.2635
Labor Market Experience	20.18	18.08	17.42	17.89	16.00
Skilled Job	0.2091	0.2042	0.1494	0.1252	0.0675
Parental Education	0.0680	0.2042	0.1752	0.0201	0.0202

Note: All variables are dummies, apart from labor market experience which is measured in years
(Sources: EU-SILC 2005, own calculations)

To test on the effects of generational mobility the parental education level is included in the calculations. This dummy equals 1 if one parent owns a degree in secondary school (*Matura*) or higher. Another dummy surveys the required skill for the sector in which the participant is employed. High skilled sectors are supposed to be *human capital intensive*, low skilled industries are assumed to be *manual labor intensive*. A list with all branches can be found in Appendix A.5. Finally there is a dummy on firm size included, which equals 1 if more than 50 workers are employed

in the participant's company. All these dummy variables are expected to have a positive influence on the wage levels.

The summary statistics for all the described variables and all nationalities are provided in Table 5.4. In the further calculations the group of foreigners will be sum up apart from the EU15-citizen.

6. The Decomposition Model

[The] analysis of earnings differentials is based on the assumption that in the absence of discrimination, the estimated effects of workers endowments on earnings are identical for immigrants and natives. Discrimination is therefore revealed by differences in the estimated coefficients. (GOLDER 2000, p. 3)

In this section the statistical methods for the measurement of wage discrimination are discussed. Starting with the derivation of the wage regression model by Jacob Mincer the base for a decomposition of income differentials is developed. Furthermore, the two statistical approaches of Alan Blinder and Richard Oaxaca are described and the conceptual framework for the own calculations is defined.

6.1. The Mincer Type Wage Equation

The implication that an individual's schooling may be the explanation of the productivity augmenting effect of education is not as clear as it seems, because schooling and education are not synonymous. As MINCER (1974) points out:

The educational content of time spent at school ranges from superb to miserable. The absorption of learning and marketability of knowledge and of skills acquired through learning also differ a great deal among individuals, places, and times. Moreover, school is neither the only nor necessarily the most important training ground for shaping market productivities. (MINCER 1974, p. 1)

Nevertheless there exists evidence of significant differences in average earnings among groups with varying schooling. Anyway, schooling as a sort of investment

in people is costly in time and money, expressed by the deferral of earnings, the reduction of the span of ones working life and the direct money outlays to consume education. As far as the length of earnings life is concerned, it is normally supposed that each year spent with education reduces earning life by one year. A controversial interpretation is given by MINCER (1974, p.7), who states, that more educated people retire later but the length of earning life is approximately constant among all different levels of education. This hypothesis of Mincer may be compared with Table 6.1, where the retirees in EU-SILC 2005 are listed by education level and working life-span.

TABLE 6.1.: EDUCATION AND NUMBER OF YEARS EMPLOYED

	Observations	Mean
Apprenticeship	1,291	27.357
Advance Training (1)	164	36.420
Secondary School (2)	125	20.008
Vocational School (3)	180	26,600
University Degree	160	23.675
PhD Degree	24	32.666

(1) *Meisterausbildung* (2) *Allgemeinbildende Höhere Schule* (3) *Berufsbildende Höhere Schule*
 (Source: EU-SILC 2005, own calculations)

Hence, according to Mincer, this cost of schooling is not the crucial one not to invest into education. What is more important is the deferral of earnings since the cost of postponing wages for an additional year is higher than the present cost of reducing the wage by one year some decades in the future. This is definitely true for many working class and immigrant families which therefore are forcing their children to start apprenticeship earlier.

The schooling model by Mincer denotes:

$$V_s = Y_s \sum_{t=s+1}^n \left(\frac{1}{1+r}\right)^t \quad (6.1)$$

where s is the amount of schooling years, n is the working life including the length of schooling. V_s is the present value of an individual's lifetime earning at the start of schooling, Y_s are the annual earnings, r is the discount rate and t the time in

years. After the mathematical remodeling of the function it can be derived, that the percentage increase of earnings is strictly proportional to the time spent in schooling with the discounted rate of return as the coefficient, denoted as

$$\ln Y_s = \ln Y_0 + rs \quad (6.2)$$

According to Mincer, this is the most primitive form of a human capital earnings function, if we restrict the investment in human capital to s years of schooling and no further education beyond this age. Many economists estimate the rate of return of investment in schooling on approximately seven per cent for each year of education³⁴ even though MINCER (1974, p.44) shows, that this is controversially discussed. However this very simple model is not able to explain differentials among individuals who derived other forms of investment in human capital.

As we see, Mincer takes the logarithm of earnings instead of the wage levels. Following LEMIEUX (2006), Mincer argued that investments in human capital are only realized if the rate of return, and not the absolute return, of one more unit of education exceeds the discount rate of the money put into it. Hence there is not only an econometric idea backing the use of the logarithm but also a theoretical rationale.

It may be noted, that Mincer developed a more complex model to include several levels of education, going beyond the mere education in school. Hence, in period t the function of the potential earnings E_t denotes

$$E_t = \left[\prod_{j=0}^{t-1} (1 + k_j \cdot p_j) \right] E_0 \quad (6.3)$$

where k_t is the amount of time devoted to training³⁵ and p_t is the return to training or schooling. If life time is divided into two periods, whereof one is schooling years and the other is post school training, the return to education p_t splits up into p_s in school and p_0 in training activities. It is easy to derive the potential earnings function in t as follows:

³⁴see PSACHAROPOULOS/PATRINOS (2004)

³⁵ $k_t = 1$ when person is in school

$$E_t = \left[\prod_{j=s}^{t-1} (1 + k_j \cdot p_0) \right] (1 + p_s)^s \cdot E_0 \quad (6.4)$$

where $(1 + p_s)^s \cdot E_0$ equals E_s which is the potential earnings for s schooling years. By taking the logarithm of (6.4) we get

$$\ln E_t = \ln E_0 + s \cdot p_s + p_0 \cdot \sum_{j=s}^{t-1} k_j. \quad (6.5)$$

Moreover a term for potential experience X , as an exogenous rate of capital accumulation beyond school completion, is introduced with $t = T - s = X$. Equation (6.5) can finally be written as the seminal Mincer wage regression:

$$\ln(w(s, x)) = \alpha_0 + p_s \cdot S + \beta_0 \cdot X + \beta_1 \cdot X^2 \quad (6.6)$$

where α_0 is the rental price of human capital and the level of ability, p_s is the return to schooling, β_0 and β_1 define the return to experience³⁶, S are the years of schooling and X denotes the years of post school training respectively. The involvement of the squared experience term investigates if post-school human capital accumulation is slowing down with time.

The process of investment in human capital is not restricted to schooling and job training. Much of it takes place in the home, particularly during the preschool stage of the life cycle, as well as later. In empirical studies of intergenerational influences on educational attainments it has been found that the education of parents is a significant variable. This may be interpreted as evidence either of the transmission of parental tastes and motivations or of the greater propensity of more educated parents to invest in the education of their children, or both. (MINCER 1974, p. 140)

There is some discussion if the Mincer wage regression of 1958 is still appropriate for actual analysis of earnings. LEMIEUX (2006) proves the actuality of the Mincer model. Hence, as far as the effects of education on earnings are concerned we will

³⁶A negative β_1 reflects the concavity of the age earnings profile

use the traditional Mincer type earnings function.

6.2. Structural Wage Decomposition by Blinder

The common estimation used by BLINDER (1973) to search for the characteristics of wage differentials denotes

$$Y_i = \beta_0 + \sum_{j=1}^n \beta_j X_{ji} + u_i \quad (6.7)$$

where Y_i are the incomes or earnings and X_{1i} to X_{ni} are the observable characteristics of individual i . Blinder points out that the proper dependent variable Y is the hourly wage rate. As we are interested in computing this equation for two different groups, a high-wage group of natives (N) and a low-wage group of foreigners (F), it is obvious that

$$\sum_j \beta_j^N \bar{X}_j^N - \sum_j \beta_j^F \bar{X}_j^F \quad (6.8)$$

is the part of the equation that defines the wage differential on the basis of the average personal characteristics, which are now represented by the mean value \bar{X}_j . But there is still a term in the differential that cannot be explained by the personal properties denoting $\beta_0^N - \beta_0^F$ which is generally assigned to discrimination. By adding and subtracting $\sum_j \beta_j^N \bar{X}_j^F$ respectively, Phrase 6.8 can easily be converted into

$$\sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F) + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) \quad (6.9)$$

The first term denotes the gain in endowments of Austrians compared to the characteristics of foreigners and it's evaluation by the high-wage group's wage equation. The second term, which could also be considered as discrimination, shows the *"difference between how the high-wage equation would value the characteristics of the low-wage group and how the low-wage equation actually values them"* (BLINDER 1973, p. 438). This measures, if identical endowments and qualifications

are treated different by the labor market, depending on the worker's nationality.

So with this set of equations we are able to decompose wage estimations into a term that is attributable to differing endowments and another term that exists due to varying treatment of members of different demographic groups. In summary Blinder specifies the terms with letters to simplify the model as follows:

TABLE 6.2.: COMPONENTS OF THE DECOMPOSITION MODEL BY BLINDER

Description	Term
R Raw differential	$\beta_0^N + \sum_j \beta_j^N \bar{X}_j^N - (\beta_0^F + \sum_j \beta_j^F \bar{X}_j^F) = E + C + U$
E Portion of differential attributable to differing endowments	$\sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F)$
C Portion of differential attributable to differing coefficients	$\sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F)$
U Unexplained portion of the differential	$\beta_0^N - \beta_0^F$
D Portion of the differential attributable to discrimination	$C + U$

(Source: Blinder 1973 : 439, own illustration)

Besides the statistical computation of the decomposition model, Blinder gives some suggestions for the items in the endowments matrix, as "*correlation does not imply causation*" (BLINDER 1973, p. 441). The proposed framework for the estimation contains age, education, occupation, union membership, job experience, health, geographical mobility and some more. The choice of items that are used in our model are discussed in Chapter 5.

To provide some perception of the concept of wage decomposition we will introduce an example which was computed with the statistical software R³⁷. For the dissection of the regression a dummy variable "foreigner" was created with the values 1 for foreigners and 0 for Austrians. The code can be seen in the Appendix A.7 and describes the decomposition of a wage regression that only depends on one single variable, which is age. The results are illustrated in Table 6.3.

³⁷R is a free software environment for statistical computing and graphics: <http://www.r-project.org>

TABLE 6.3.: WAGE DECOMPOSITION BY NATIONALITY WITH STATISTICAL SOFTWARE R

Endowments	Coefficients	Shift	Raw	Discrimination
0.003933644	-0.04080975	0.2653503	0.2284742	0.2245405

(Source: EU-SILC, own calculation)

The result of this theoretical example would mean a contribution of the endowments to the raw differential (0.2653) of 0.0039 points or approximately 1.7 percent. The rest of the differential can be divided into two portions. First, a lack of explanatory variables which could describe the wage. Second, the differences in the coefficients which is equal to discrimination. Therefore the interpretation of the results of wage decompositions is not easy. The crucial question is, how much of the differential is really caused by discrimination and how much is caused by the incompleteness of the explanatory variables.

6.3. The Statistical Approach of Oaxaca

A similar statistical approach is given by OAXACA (1973). On the basis of the gender wage gap, he introduces the concept of a discrimination coefficient D :

$$D = \frac{W_m/W_f - (W_m/W_f)^0}{(W_m/W_f)^0}, \quad (6.10)$$

where (W_m/W_f) is the observed male-female wage ratio and $(W_m/W_f)^0$ is the wage ratio in the absence of discrimination. The discrimination coefficient in Equation 6.10 is simply Becker's generalized measure for discrimination (cp. Chapter 3) divided by the wage ratio in absence of discrimination. This can also be formulated as a logarithmic function.

$$\ln(D + 1) = \ln(W_m/W_f) - \ln(W_m/W_f)^0. \quad (6.11)$$

In a non-discriminating labor market, employers will minimize their costs and pay out the marginal products of male and females, denoting MP_m and MP_f .

$$\left(\frac{W_m}{W_f}\right)^0 = \frac{MP_m}{MP_f} \quad (6.12)$$

Since $(W_m/W_f)^0$ is unknown, the estimation of the discrimination coefficient D is equivalent to estimating $(W_m/W_f)^0$. Hence, Oaxaca defines a wage equation that is estimated separately for each group, which yields

$$\ln(W_i) = Z'_i\beta + u_i, \quad i = 1, \dots, n \quad (6.13)$$

where W_i is the hourly wage rate of the i -th person, Z'_i is a vector of individual characteristics, β is a vector of coefficients and u_i is a disturbance term. Oaxaca denotes the average hourly wages for males and females \bar{W}_m and \bar{W}_f respectively³⁸ and lets the wage differential denote

$$G = \frac{\bar{W}_m - \bar{W}_f}{\bar{W}_f} \quad (6.14)$$

$$\ln(G + 1) = \ln(\bar{W}_m) - \ln(\bar{W}_f) \quad (6.15)$$

By means of an ordinary least squares estimation we easily derive equations 6.16 and 6.17 which can be substituted in equation 6.15.

$$\ln(\bar{W}_m) = \bar{Z}'_m \hat{\beta}_m \quad (6.16)$$

$$\ln(\bar{W}_f) = \bar{Z}'_f \hat{\beta}_f \quad (6.17)$$

$$\ln(G + 1) = \bar{Z}'_m \hat{\beta}_m - \bar{Z}'_f \hat{\beta}_f. \quad (6.18)$$

Let $\Delta\bar{Z}'$ be the difference between the vectors of mean values of the regressors for males and females

$$\Delta\bar{Z}' = \bar{Z}'_m - \bar{Z}'_f \quad (6.19)$$

and let $\Delta\hat{\beta}$ be the difference between the corresponding vectors of estimated coefficients

$$\Delta\hat{\beta} = \hat{\beta}_f - \hat{\beta}_m \quad (6.20)$$

then it can easily be shown that

$$\ln(G + 1) = \Delta\bar{Z}' \hat{\beta}_f - \bar{Z}'_m \Delta\hat{\beta}. \quad (6.21)$$

Finally Oaxaca ends by yielding the two expressions for the decomposition of the wage differential into the estimated effects of differences in individual characteristics

³⁸which is simply the geometric mean $\bar{W} = \exp \left\{ \left[\sum_{i=1}^n \ln(W_t) \right] / n \right\}$

and the estimated effects of discrimination.

$$\ln \left(\frac{\widehat{W}_m}{\widehat{W}_f} \right)^0 = \Delta \bar{Z}'_m \hat{\beta}_f \quad (6.22)$$

$$\ln(\widehat{D} + 1) = -\bar{Z}'_m \Delta \hat{\beta}. \quad (6.23)$$

Hence the similarities to the considerations of Blinder are obvious. In equation 6.22 the differences between the individual and structural characteristics of the two groups are weighted with the coefficients of the low wage group. These difference should point out the wage gap due to disparities in schooling, experience, etc. and equals of course the wage ratio in the absence of discrimination $(W_m/W_f)^0$. In equation 6.23 the differences in the coefficients are weighted by the characteristics in the high wage group and is therefore denoted as discrimination.

6.4. The Index-Number Problem

It is obvious that a different weighting of Blinders equations leads to varying results, a so-called index-number problem. In equation 6.9 the differences in endowments are evaluated by the non-discriminated high wage structure and the differences in coefficients are weighted by the endowments of the discriminated group. Since an exchange of the weights between discriminated and non-discriminated group apparently does modify the results, the question arises, which group of both is the reference group that is non-discriminated.

Blinder states, that instead of using

$$\sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F)$$

he could equally well have evaluated the differences in endowments by using the low-wage equation, which would yield

$$\sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F). \quad (6.24)$$

The question arises which of the two equations to use in empirical work. In general they will yield different answers, and in some cases they are far apart (cp. NEUMARK 1988, p.281). However, Blinder mentions that there is no *right* and *wrong* answer here. Thus an alternative formulation of equation 6.9 leaves as a residual

$$\begin{aligned}
(\bar{Y}^N - \bar{Y}^F) - \sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F) = \\
\beta_0^N - \beta_0^F + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) + \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j^F) \quad (6.25)
\end{aligned}$$

The first two terms may obviously be attributed to differences in the coefficients, while the latter term has no definite interpretation as long as no reference group is defined³⁹. Several economists had various proposals how to handle this *interaction term*.

REIMERS (1983) proposed to use the mean coefficients between the low and the high model, while COTTON (1988) suggested to weight the coefficients by group size, i.e. the relative proportion of subjects in the high group. Finally, NEUMARK 1988 proposed another solution for the problem. Referring to Oaxaca the two different equations for [n]atives and [f]oreigners yield

$$\ln(\bar{w}_n) - \ln(\bar{w}_f) = \Delta \bar{X}' b_n + \bar{X}'_f \Delta b, \quad (6.26)$$

$$\ln(\bar{w}_n) - \ln(\bar{w}_f) = \Delta \bar{X}' b_f + \bar{X}'_n \Delta b, \quad (6.27)$$

where $\Delta \bar{X}' = \bar{X}'_n - \bar{X}'_f$ and $\Delta b = b_n - b_f$. In equation 6.26 it is assumed that in the absence of discrimination the native wage structure would prevail, since the coefficients of the native wage structure are used to weight the differences in characteristics. In equation 6.27 it is obviously the other way round and the foreigner wage structure is taken as the reference. Hence, Neumark proposed a pooled model over both groups denoting

³⁹See calculations in Appendix A.6.

$$\ln(\bar{w}_n) - \ln(\bar{w}_f) = \Delta \bar{X}' b + [\bar{X}'_n (b_n - b) - \bar{X}'_f (b_f - b)], \quad (6.28)$$

where b is the non-discriminated wage structure⁴⁰. The pooled model approach to the wage rate as is explained in NEUMARK (1988) will be included in the decomposition results in Chapter 7.

⁴⁰As stated before, REIMERS (1983) proposed an equal distribution between both groups, which would mean $b = 0.5 * b_n + 0.5 * b_f$.

7. Empirical Results with EU-SILC 2005

Although inequality has long been topic of intense interest to sociologists, few have bothered to carefully specify what they mean by the term. It is easy, of course, to distinguish perfect equality from a state of inequality. But given two different, unequal distributions of some social reward, how does one decide which distribution is the more unequal?

(ALLISON 1978, p. 865)

In this chapter the results of the empirical study with EU-SILC 2005 are presented. The ethnic wage gap is analyzed with several measures for income inequality. Further the sources and implications of labor market discrimination in Austria are examined.

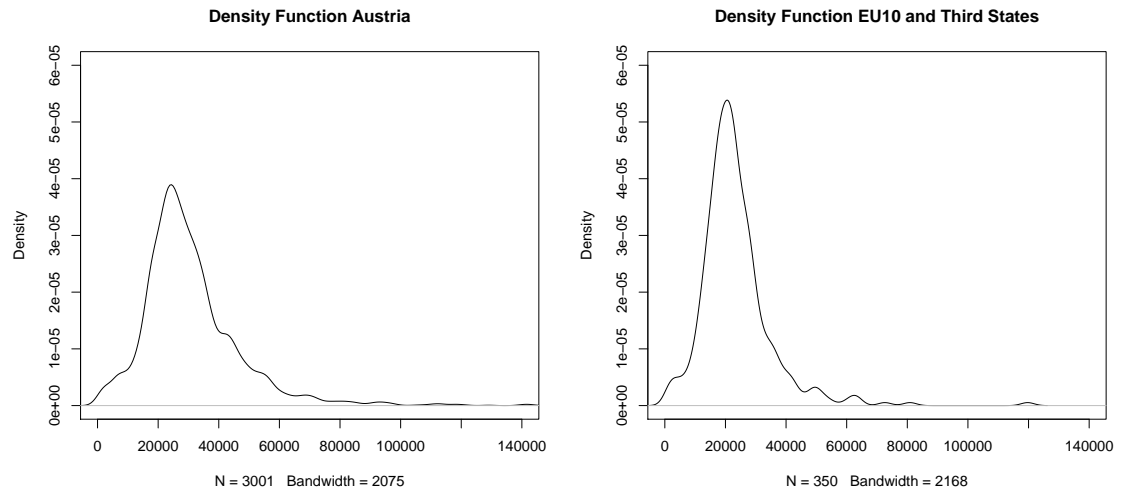
7.1. Distribution of Incomes

In Figure 7.1 the distribution of wages of Austrians and immigrants from EU10 and Third States are shown. Within the group of foreigners a stronger concentration of incomes in the lower wage area especially below the tax free income allowance of 10,000 Euro may be recognized. The small peak on the left side indicates a relatively high number of workers in precarious or marginal employment. This may be attributed to the strong representation in the low wage sectors of the economy, as it was stated in Chapter 3.

The curve of Austrians begins flatter and increases more slowly. All in all the frequency distribution of Austrian wages is more centered than the one of immigrants which leads to a higher mean and median values. Moreover the downturn within Austrians is less steep and lasts as long as to some 80,000 Euro. Immigrants from

EU10 and Third States are not significantly present in this wage group.

FIGURE 7.1.: FREQUENCY DISTRIBUTION OF AUSTRIAN AND IMMIGRANT GROSS INCOME



(Source: EU-SILC 2005, own calculations)

7.2. Basic analysis of the Income Data

The simplest measures of inequality in earnings are comparisons of the median and the mean between different groups. The median represents the wage of the person in the very middle of the sample, the mean shows the average salary. Table 7.1 shows the mean and median wages for three nationality groups.

TABLE 7.1.: MEAN AND MEDIAN OF HOURLY WAGES IN AUSTRIA

	Observations	Mean	Median	(1)	(2)	(3)
Austrians	3,001	15.3067	13.4615	100,0	9.020	0.589
EU15	63	20.3935	18.4211	136,8	12.035	0,590
Immigrants	350	11.4706	10.6275	78.9	5.793	0,505

(1) in % of Austrian Median Wage (2) Standard Deviation (3) Variation Coefficient
 (Sources: EU-SILC 2005, own calculations)

With EU-SILC 2005 a median wage gap for immigrants amounting to 21.1 percent can be calculated. This result goes conform with PRETTNER/STIGLBAUER (2007, p.57) who derive a wage gap of some 23 percent for Austrian immigrants with Eurostat data. This means that full-time working persons, mainly from former

Yugoslavia, Turkey and the new EU10 states, earn approximately 21 percent less than natives. While the median wage gap among men amounts to 21.4 percent (11.21 opposed to 14.26 euros), wages of foreign women are 20.2 percent below the native ones (9.21 opposed to 11.54 euros).

Obviously immigrants from the old European Union earn substantially more (+36%) than Austrians do, even though the sample with 63 observations is very small. If we would take the EU15-wages as reference, the average wage of other immigrants would only amount up to 58 percent. This can be explained by the special role EU15 immigrants play on the Austrian labor market, as described in Chapter 4. The absolute top earners are men from the EU15 with an average hourly wage of 24.13 euros⁴¹. These are mainly graduates from universities working in large companies with more than 50 employees.

Arbeitskräfte aus dem EWR sind vor allem im Kredit- und Bankensektor, in Unterricht und Forschung sowie in unternehmensbezogenen Diensten beschäftigt. Personen aus dem früheren Jugoslawien und der Türkei arbeiten hingegen vor allem in Niedriglohnbranchen. (BIFFL 2002, p. 540)

The coefficient of variation is simply the standard deviation divided by the mean. For data that is closely bunched around the mean, the variation coefficient will be small while the peak of the distribution will be high. Data that is more dispersed will have a shorter peak and a higher variation coefficient. Hence, the smaller the coefficient of variation, the more equitable the distribution (cp. HALE 2003). According to this measure of inequality, the immigrant wage structure is most equitable.

7.3. The unexplained part of the differential

As explained in Chapter 6 we start with a wage equation according to MINCER (1974) and derive an ordinary least squares estimation over the whole sample on a series of variables. As NIELSEN et al. (2004) formulate in accurate words:

The first problem when dealing with wage decompositions is the choice of which variables to include in the regressions. There are arguments for

⁴¹Note: The sample only contains 33 male persons from the EU15

using the "kitchen sink approach" (throwing into the regression everything and its square, cube, etc.), but there are also arguments for using mainly human capital variables. (NIELSEN et al. 2004, p. 868)

The explanatory variables in this model are selected by statistical tests of significance and are described in Section 5.3. The included ones are sex, highest completed schooling career, firm size, residence (city or other agglomeration), labor market experience⁴², working in a skill-intensive sector and the parental education level as well as a dummy for origin of birth. The endogenous variable is the logarithmic hourly wage, the results are presented in Table 7.2.

TABLE 7.2.: REGRESSION RESULTS

Variable	Coefficient	(Std. Err.)
Sex	-0.212***	(0.019)
Secondary School	0.308***	(0.024)
University	0.534***	(0.031)
Agglomeration	0.083***	(0.019)
Leading Position	0.190***	(0.018)
Firm Size	0.054***	(0.017)
Experience	0.041***	(0.003)
Experience, squared	-0.001***	(0.000)
Skilled Job	0.069***	(0.019)
Parental Education	0.078**	(0.032)
Foreigner	-0.190***	(0.029)
Intercept	1.882***	(0.029)
<hr/>		
N		3329
Adj. R ²		0.337
F (12,3317)		154.92
<hr/>		
Significance levels : * : 10% ** : 5% *** : 1%		

Some variables were removed from the calculations due to lack of significance, like marital status. Married males are expected to have higher labor force participation rates, to invest more in human capital and to have better health than singles (cp. CHISWICK 1978, p. 902). For the same age, schooling and place of residence, married persons earn higher incomes. However, in these regressions this parameter was

⁴²Labor market experience equals the number of employed years. The squared term is due to the assumption that experience is a concave function, cp. LEMIEUX 2006

excluded because of inadequate significance statistics. This was also necessary for the job change and the worker's health variables due to lack of explanatory power. The F-Tests on the null hypothesis that the influence of these variables equals zero could not be rejected in all cases.

The measure for the explanatory content $Adj.R^2$ shows a value of 0.34 in Table 7.2. The studies cited in Section 3.4 offer a similar degree of explanation, with adjusted R^2 values that range between 0.30 and 0.38 units. Except for the parental education all variables are significant on a one percent significance level. Foreign origin and female sex have a negative impact on wages, which is indicated by the minus sign. The biggest positive influence on income is given by a university degree, a completed secondary school career or a leading function in an enterprise.

TABLE 7.3.: REGRESSION RESULTS BY NATIONALITY

Variable	Austrians	Immigrants
Sex	-0.206***	-0.258***
Secondary school	0.332***	0.081
University	0.556***	0.286**
Agglomeration	0.072***	0.125**
Leading Position	0.181***	0.286***
Firm size	0.057***	0.042
Experience	0.042***	0.033***
Experience sq.	-0.001***	-0.001***
Skilled Job	0.070***	0.043
Parental education	0.100***	-0.124
Intercept	1.856***	1.900***
<hr/>		
N	2984	345
Adj. R ²	0.348	0.159
F-Statistics	159.22	7.50
<hr/>		
Significance levels : * : 10% ** : 5% *** : 1%		

For checking the robustness of the regression we replace the actual experience (i.e. the number of employed years) with a proxy for potential experience. We calculate this variable simply by subtracting the age at the accomplishment of the highest educational level from the actual age. In contrast to the actual experience level there are no interruptions of the work life, like unemployment or child care, included in the variable. As can be seen in the Appendix A.3 the results remain

similar to our prior calculations. The correlation statistics are presented in Appendix A.8.

On the basis of this regression a decomposition by origin of birth is derived, as was suggested in Chapter 6.2. Due to the extraordinary role of working migrants from the EU15, only the migrants from EU10 and Third States will be compared to the Austrians. In Table 7.3 the regression is calculated for both nationality groups.

There are several differences between the two groups. For instance the gender wage gap among Austrians is significantly smaller than among foreigners. Whereas Austrian women earn 20.6 percent less, the difference in wages between men and women among immigrants accounts up to 25.9 percent. While the graduation in a secondary school does not seem to play a role, a leading position in the firm seems to have a higher impact on wage determination for immigrants than for native workers. The variable for parental education yields a strange result for foreigners, but the variable is anyway below a sensible significance level. Next, the results of the decomposition are illustrated in Table 7.4.

TABLE 7.4.: DECOMPOSITION OF THE WAGE REGRESSION

Mean high (H):	2.579					
Mean low (L):	2.322					
Raw differential (R) H-L:	0.257					
- due to Endowments (E):	0.053					
- due to Coefficients (C):	0.167					
- Interaction term (CE):	0.037					
	D:	0	1	0.5	0.896	Pooled
Unexplained (U)(C+(1-D)CE):	0.204	0.167	0.185	0.171	0.157	
Explained (V) (E+D*CE):	0.053	0.091	0.072	0.087	0.100	
% unexplained (U/R):	79.3	64.8	66.3	68.3	61.0	
% explained (V/R):	20.7	35.2	33.7	31.7	39.0	

D in 4th column = relative frequency of high group; D in the 5th column = Neumark's pooled model
(Source: EU-SILC 2005, own calculations)

On a first glance, the results of the decomposition are kind of sobering. Out of a raw differential of 0.257 units, only 0.053 or 20.7 percent can be explained by the characteristics included in the regression, if the native wage structure is taken as reference group. However, if the immigrant wage structure is taken as the non-discriminated group, the proportions shift to an explained fraction of 35.2 percent. The third and the fourth columns represent the results of the models of REIMERS

(1983) and COTTON (1988), who proposed an equal distribution and a weighted distribution by group size, respectively. In the pooled model of NEUMARK (1988) the explained part of the wage differential can be increased to 39.0 percent and the unexplained fraction shrinks to 61.0 percent respectively. Hence, far more than half of the wage gap between immigrants and natives can not be explained with the exogenous variables in use. It is now up to interpretations which fraction of the unexplained part is due to insufficient information (lack of variables) and which fraction can be referred to as discrimination.

For several reasons it is not plain sailing to equalize the unexplained part of the earnings differential with discrimination, as GOLDER (2000, p. 4) explains. First, productivity cannot entirely be measured by endowment characteristics. Second, endowment disparities could at least partly be generated by pre-market discrimination, e.g. parents promoting more strongly the education of sons than of daughters. Third, earnings discrimination could also be caused by labor market segregation. Hence, the results should be treated cautious and these considerations should always be in mind.

TABLE 7.5.: DETAILED DECOMPOSITION RESULTS

	E(D=0)	C	CE	1	0.5	0.896	Pooled
Sex	0.005	0.017	-0.001	0.004	0.005	0.004	0.004
Secondary School	0.003	0.034	0.007	0.010	0.006	0.009	0.009
University	0.013	0.018	0.012	0.025	0.019	0.024	0.024
Agglomeration	-0.038	-0.022	0.012	-0.025	-0.031	-0.027	-0.019
Leading Position	0.059	-0.023	-0.020	0.040	0.050	0.042	0.044
Firm Size	-0.001	0.011	-0.001	-0.002	-0.001	-0.002	-0.002
Experience	0.009	0.165	0.012	0.021	0.015	0.020	0.020
Skilled Job	0.005	0.013	0.010	0.015	0.010	0.014	0.017
Parental Education	-0.003	0.015	0.006	0.003	-0.000	0.002	0.002
Intercept	0.000	-0.061	0.000	0.000	0.000	0.000	0.000
Total	0.053	0.167	0.037	0.091	0.072	0.087	0.100

Columns 4-8: Explained fraction if D = ...
(Source: EU-SILC 2005, own calculations)

In Appendix A.4 the coefficients, means and predictions are presented. In Table 7.5 the influences of the single variables are divided in an explained and in an unexplained fraction, respectively. As explained, the raw wage differential is the difference between the mean wages of the two groups which amounts to 0.257 units. As can be seen in the last row of Table 7.5, the raw differential may be split into

an explained fraction E (endowments), an unexplained part C (coefficients) and an interaction term CE . If the native wage structure is taken as reference group ($D = 0$), the endowment fraction of the wage differential will be 0.053, the unexplained part will be 0.204 ($0.167 + 0.037 = 0.204$). Of course, both portions should sum up to 0.257. In the Neumark pooled model, the explained fraction amounts to 0.100 units. In the table one can distinguish which variables have a positive, explanatory impact and which ones reduce the portion of the *endowment* factor.

The most propulsive components in the explanatory fraction are a leading position, labor market experience and a university degree. These are the variables that increase the wage gap between natives and immigrants due to differing human capital endowments. Segregation, which is measured by high and low skilled sectors respectively, widens the wage gap as well. Obviously the labor market experience is playing a grave role in the decomposition. It accounts for 0.165 units on the unexplained fraction. The impacts of missing characteristics, like post-school training etc., are mixed up with discrimination in this variable, however, it is not statistically definable to which extend real labor market discrimination affects the wage gap.

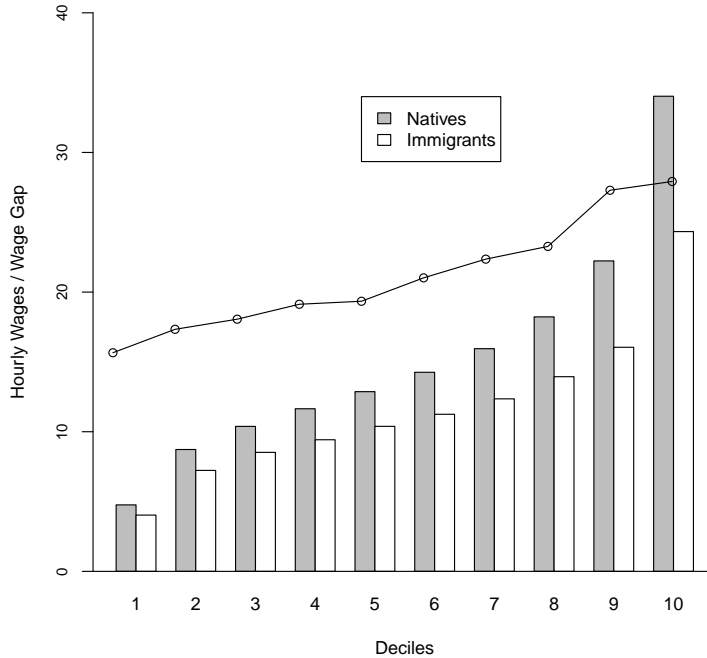
To sum up, it may be stated, that with the pooled decomposition model 39.0 percent of the wage gap between natives and immigrants can be explained by the individual and structural characteristics included in the regression. The biggest explanatory effect are delivered by the variables of a leading position, labor market experience, a university degree and labor market segregation. The other 61.0 percent are attributed to the unexplained portion. This may be due to insufficient information on endowments as well as pure labor market discrimination.

7.4. The Income Distribution

An interesting question is, whether the wage gap is equally distributed over the whole income range. Therefore the earnings of natives and foreigners are split up in deciles and the mean wages for all fractions are calculated. The wage gap measures the difference in mean wages between natives and foreigners in a certain decile. The results are presented in Figure 7.2.

The message of the wage gap curve is unambiguous: The wage gap increases with rising incomes. While the differential amounts to 15.34 percent in the lowest

FIGURE 7.2.: MEAN WAGES AND WAGE GAP BY DECILES



Wage gap in % of native incomes, Immigrants except EU15
 (Source: EU-SILC 2005, own calculations)

decile, where the mean wage of natives is 4.76 euros compared to 4.03 euros for immigrants, the earnings differential surges to 28.49 percent in the top incomes (34.02 euros compared to 24.33 euros). This could be seen as an indicator, that immigrants either never reach high paid jobs or if they are employed in high paid jobs, they receive substantially lower pay. As a side note it may be mentioned, that earnings differentials in executive suits are the largest in the whole income distribution.

There is obviously widespread inequality between natives and immigrants as far as earnings are concerned. But how are earnings distributed within the both groups? There are several measures of inequality that are traditionally promoted in the literature. ALLISON (1978) and HALE (2003) give a good overview on the concepts of measuring inequality. The 90/10 percentile and sum ratios are derived by dividing the salary of the 90th percentile (or the sum of the highest decile respectively) with the wage of the 10th percentile (or the sum of the lowest decile respectively). The Gini coefficient is probably the most famous inequality measure and is given by the formula

$$G = \frac{\sum_{i=1}^n (2i - n - 1)x'_i}{n^2\mu}, \quad (7.1)$$

where i is the individual's rank order number, n is the number of total individuals, x'_i is the individual's variable value, and μ is the population average. The Gini coefficient equals 0 with perfect equality and 1 in complete inequality. The Atkinson index is able to gauge movements in different segments of the income distribution. To weigh different incomes a coefficient ε is introduced. The index becomes more sensitive to changes at the lower end of the income distribution as ε approaches 1. Conversely, as the level of inequality aversion falls (that is, as ε approaches 0) the index is more sensitive to changes in the upper end of the income distribution. Hence, the formula yields

$$A = \begin{cases} 1 - \frac{1}{\mu} \left(\frac{1}{N} \sum_{i=1}^N y_i^{1-\varepsilon} \right)^{1/(1-\varepsilon)} & \text{for } \varepsilon \in [0, 1] \\ 1 - \frac{1}{\mu} \left(\prod_{i=1}^N y_i \right)^{1/N} & \text{for } \varepsilon = 1, \end{cases} \quad (7.2)$$

where y_i is individual income and μ is the mean income⁴³. The Theil index as well equals zero for perfect equality. The particularity of this measure is that it may be larger than 1. For example a Theil value of 2 represents a distribution where some 92% of the sample own 8% of total income and vice versa. A index of 4 means that 98% of the population own 2% of all resources, which of course is less equal than a value of 2. The formula for Theil's index denotes

$$T = \begin{cases} \frac{1}{N} \sum_{i=1}^N \left(\frac{x_i}{\bar{x}} \cdot \ln \frac{x_i}{\bar{x}} \right) & \text{for } T_1 \\ \frac{1}{N} \sum_{i=1}^N \left(\ln \frac{\bar{x}}{x_i} \right) & \text{for } T_0, \end{cases} \quad (7.3)$$

where x_i is the income of person i . Finally, the McLoone Index is derived, which is quite a simple measurement of inequality. It compares how much of a resource is concentrated in the bottom half of a distribution to the median amount. The McLoone index divides the sum of all observations at or below the median by the

⁴³http://en.wikipedia.org/wiki/Atkinson_index

product of the number of observations at or below the median and the value of the median itself. Unlike most inequality measures, a higher value for the McLoone index describes a more equitable distribution. In Table 7.6 the results for the various inequality measures are presented for natives and immigrants.

TABLE 7.6.: INEQUALITY MEASURES

Measure	Natives	Foreigners	More equal
90/10 percentile ratio	3.22579390	2.68058258	F
90/10 sum ratio	7.18065198	5.85118315	F
Gini coefficient	0.27639309	0.24151370	F
Atkinson ($\varepsilon = 0$)	0.06813524	0.05380379	F
Atkinson ($\varepsilon = 1$)	0.13923785	0.11162658	F
Theil (par=0)	0.13946317	0.10749832	F
Theil (par=1)	0.14993707	0.11836311	F
McLoone Index	0.72953225	0.73467795	F

(Source: EU-SILC 2005, own calculations)

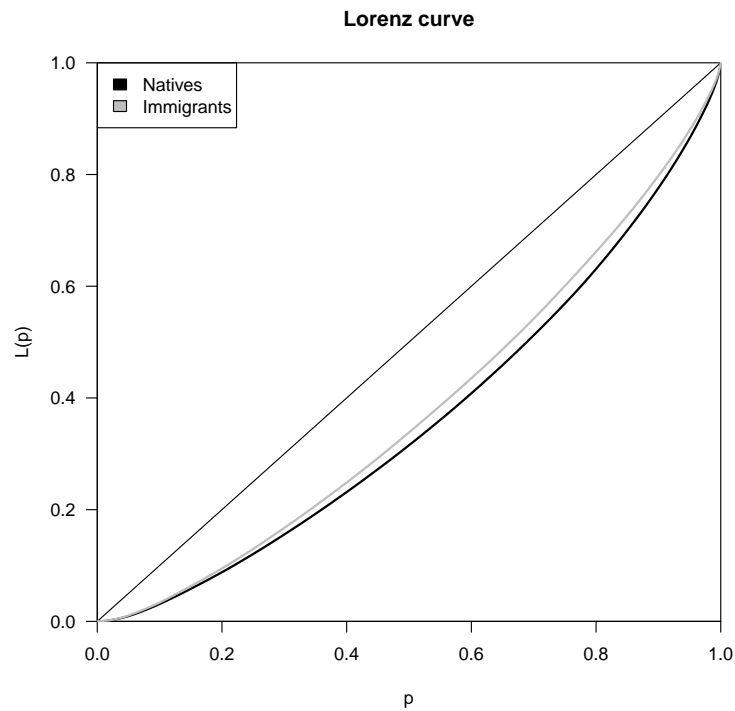
As can be seen, the wage structure of immigrants is more equally distributed in all of the measures, which is not very surprising, considering the range of native incomes is much wider. For a graphical elaboration, the Lorenz curve is regarded as the most proper way to illustrate income inequality. In Figure 7.3 a comparison of the Lorenz curves natives and immigrants are shown.

The diagonal represents the perfectly equal distribution within a group. The more the Lorenz curve approaches the diagonal, the more equality exists. As can be seen, the curve of the immigrants confines a smaller area than the curve of natives. Hence, the earnings of immigrants are distributed more equal.

7.5. The Austrian Tax System and Equality

Another interesting issue is the accuracy of the Austrian tax system on the income distribution of the various nationality groups. The sample is analyzed on equal distribution by means of the Gini coefficient. Table 7.7 lists all Gini coefficients for gross and net annual incomes, as well as the margins.

FIGURE 7.3.: COMPARISON OF LORENZ CURVES FOR GROSS ANNUAL INCOMES



(Source: EU-SILC 2005, own calculations)

TABLE 7.7.: GINI COEFFICIENTS OF INCOMES BEFORE AND AFTER TAXATION

	Gross incomes	Net incomes	Difference in %	Effective Progression
Austria	0.2763931	0.2437114	-11.82	1.045
EU15	0.2951052	0.2566992	-13.01	1.045
EU10	0.2492625	0.2493100	0.02	1.000
Fm. Yugoslavia	0.2418102	0.2103133	-13.03	1.042
Turkey	0.2295329	0.2081017	-9.34	1.028

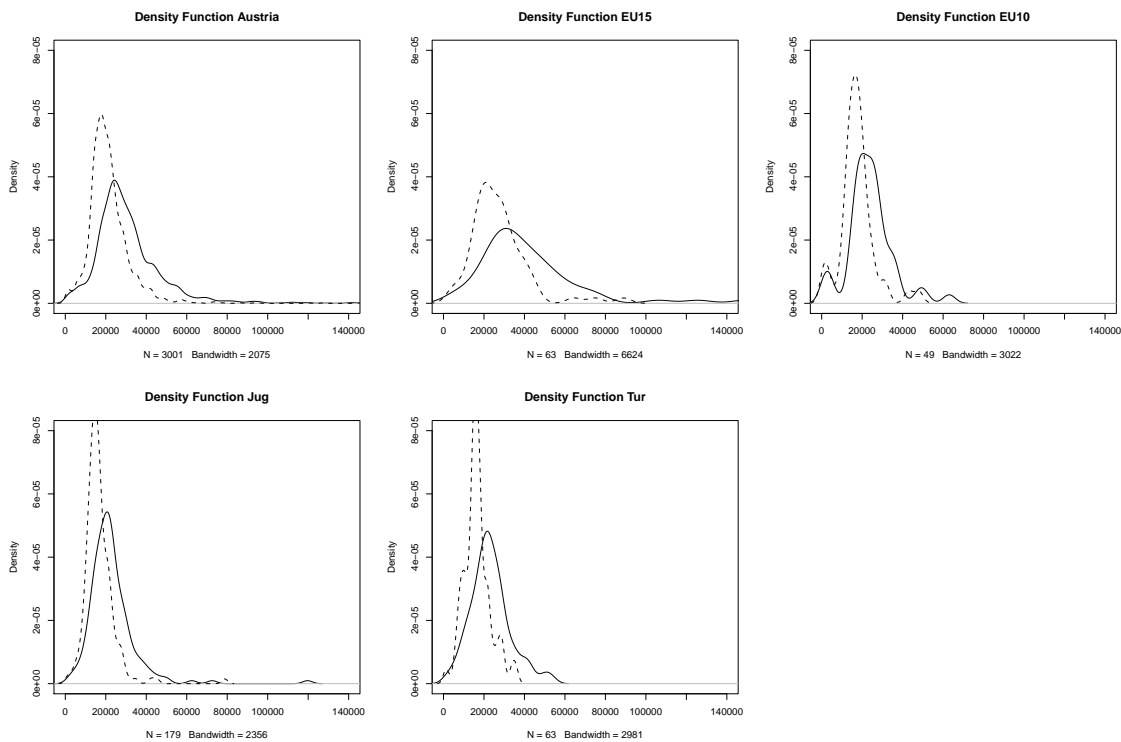
(Source: EU-SILC 2005, own calculations)

The difference of Gini coefficients indicates that within the EU15 the biggest shift in the equal distribution after the effect of taxation is taking place. The Gini coefficient improves by approximately 13 percent. The incomes of EU15 migrants show the biggest degree of inequality before and after taxation however. For immigrants from the EU10, the Austrian tax system offers little accuracy, the Gini coefficient remains without a change. Finally the effective progression of the Austrian taxation system can be calculated. Due to the progressive character of income taxes, inequality will be reduced to a greater or lesser extend (which is curbed by the regressive character of the social insurance contributions). This is what the effective

progression measures by calculating $r_{Gini} = (1 - G_{netto}) / (1 - G_{brutto})$. As can be seen in Table 7.7 the effects of taxation within employees from EU15 and Austria are the largest.

The changes from gross to net earnings can also be illustrated in a frequency distribution as it is shown in Figure 7.4 for Austria, EU15, EU10, former Yugoslavia and Turkey.

FIGURE 7.4.: FREQUENCY DISTRIBUTION OF GROSS AND NET ANNUAL INCOMES



Solid=Gross Annual Income, Dotted=Net Annual Income
 (Source: EU-SILC 2005, own calculations)

The figure shows considerable effects of reallocation via taxation for all nationality groups. Within the EU15 the effect is most obvious. While gross incomes are scattered much more in the high income levels, a big adjustment to the left can be noticed after taxation. The mean hourly wage drops from 20.4 euros pre-tax to 13.5 euros after tax. Furthermore the redistribution is noticeable within the group of Austrians, the mean wage declines from 15.3 to 10.6 euros. The average annual income of Yugoslavs and Turks falls from 11.2 pre-tax to 8.1 euros. The frequency distribution for EU10 migrants has two peaks, whereof the first one indicates the big frequency of people working below the minimum income limit for compulsory social insurance or below the tax limit of 10,000 euros per annum. In general it

may be pointed out that the incomes of migrants from the EU10, Yugoslavia and Turkey are cumulated on the left border of the distribution which is related to a higher representation in low wage sectors of the economy.

In terms of annual incomes, on average immigrants from the EU15 earn some 41,400 euros pre-tax and 27,400 euros after taxation. Salaries of natives are reduced by taxes from 31,100 euros to 21,500 euros. The Austrian tax system also flattens the wage structures of foreigners from EU10 (from 24,000 to 17,600 euros), former Yugoslavia (from 22,800 to 16,700 euros) and Turkey (from 23,200 to 16,600 euros).

7.6. Citizenship or origin of birth?

In the EU-SILC dataset, 534 persons gave up their old citizenship and received the Austrian citizenship. Most of them are from former Yugoslavia (168), EU10 (96), EU15 (95) and Turkey (79). After correcting for retirees, half-time workers, etc. the number of observations is reduced as can be seen in the last column of Table 7.8.

TABLE 7.8.: MEAN HOURLY WAGES BY AUSTRIAN CITIZENSHIP

	without Austrian citizenship	Obs.	with Austrian citizenship	Obs.
EU15	20.3935	63	16.6291	15
EU10	11.6597	49	12.3663	35
Fm. Yugoslavia	11.1934	179	12.7674	71
Turkey	11.1828	63	12.1210	36

(Source: EU-SILC 2005, own calculations)

The mean hourly wages of immigrants from EU10, former Yugoslavia and Turkey are considerably higher if they are in possession of an Austrian citizenship. Turks with the Austrian citizenship almost earn one euro more than their colleagues without the certificate. The hourly mean income within Austro-Yugoslavs is some 1.5 euros above their counterparts' earnings. If the variable of foreign origin is replaced by citizenship in the regressions, the coefficient yields a value of -0.1573 compared to -0.1889 from birthplace. A reason for the better performance of Austrian citizens could be the assimilation thesis which is explained in Chapter 4.3. It is supposed that only workers with long-term residence are willing or rather able to receive the Austrian citizenship. In that period the acquisition of country-specific skills and

knowledge as well as the language may be developed, which could lead to better jobs and higher wages consequentially.

7.7. Do Immigrants face a higher Unemployment risk?

As mentioned in Chapter 3, ARAI/VILHELMSSON (2001) analyzed the unemployment risk of immigrants compared to natives in 1991. They revealed that immigrants from non-European countries run a risk of unemployment that is twice the corresponding risk for native workers. As far as unemployment is concerned, EU-SILC does not offer very detailed statistics. Variable *p001000* surveys the actual state of employment of the participant. The results are presented in Table 7.9.

It may be noticed, that Turkish immigrants face the highest probability of being unemployed in a comparison with the employed population followed by immigrants from former Yugoslavia⁴⁴. Among Yugoslavs the "unemployment rate" measured by EU-SILC is approximately 13.1%, that of Turks some 16.7%. Thus, Turks face more than the triple risk of Austrians of being unemployed in the data set. Using data of the *Statistik Austria*, the unemployment rates for immigrants and native workers can be calculated back to the year 1995. The results are presented in Figure 7.5 and indicate higher unemployment rates for immigrants over the whole period.

TABLE 7.9.: ACTUAL EMPLOYMENT STATUS BY ORIGIN OF BIRTH

	Austria	EU15	EU10	Fm. Yugoslavia	Turkey
Employed	4,333 (94.90)	81 (94.19)	72 (91.14)	259 (86.91)	80 (83.33)
Unemployed	233 (5.10)	5 (5.81)	7 (8.86)	39 (13.09)	16 (16.67)

Percentages in parenthesis
(Source: EU-SILC 2005, own calculations)

In 1995 the total unemployment rate amounted to 6.6%. While native workers were faced with a rate of 6.4%, among immigrants the unemployment was substantially higher with 7.7%. The peak of unemployment was in 2005 when 7.3% of the labor force were without employment. 6.8% of Austrians were disengaged, but this

⁴⁴Note: The percentages decline, when all other forms of activities (retirement, self-employment, education, etc.) are included. The picture, however, remains the same.

was true for 10.6% of immigrants. If the growth rates of unemployment in these 11 years are compared between natives and foreigners, Austrians were able to show a better performance than foreigners eight times, and only three times foreigners received better results. Hence, the volatility in employment of foreigners exceeds that of natives. This was discussed in Chapter 3.3. A fact that is remarkable is that the share of Turks among unemployed foreigners has steadily decreased. While in 1993 the contingent of Turks accounted for 23.5% (6,374 out of 27,086), the share shrank to 18,4% (7,283 out of 39,563) in 2007. The portion of Yugoslavs nearly remained stable. In 1993 42,5% of all unemployed immigrants were Yugoslavs (11,511) and in 2007 their share amounted to 43.5% (17,209) in 2007. Considerably more unemployed foreigners are contributed by Germany. While in 1993 some 1,200 persons were affected (4,43%), the number increased to 3,409 in 2007 (8.62%).

FIGURE 7.5.: UNEMPLOYMENT RATES OF IMMIGRANTS AND NATIVES



(Source: Statistik Austria, own illustration)

In Appendix B.1 the share of women within the group of unemployed is illustrated. While the share of native women remains roughly stable over the whole period between 1987 and 2007, more and more women can be found among the immigrant unemployed. The share increased from 30.17% to 38.65% in these 20 years.

7.8. The twofold Burden of Immigrant Women

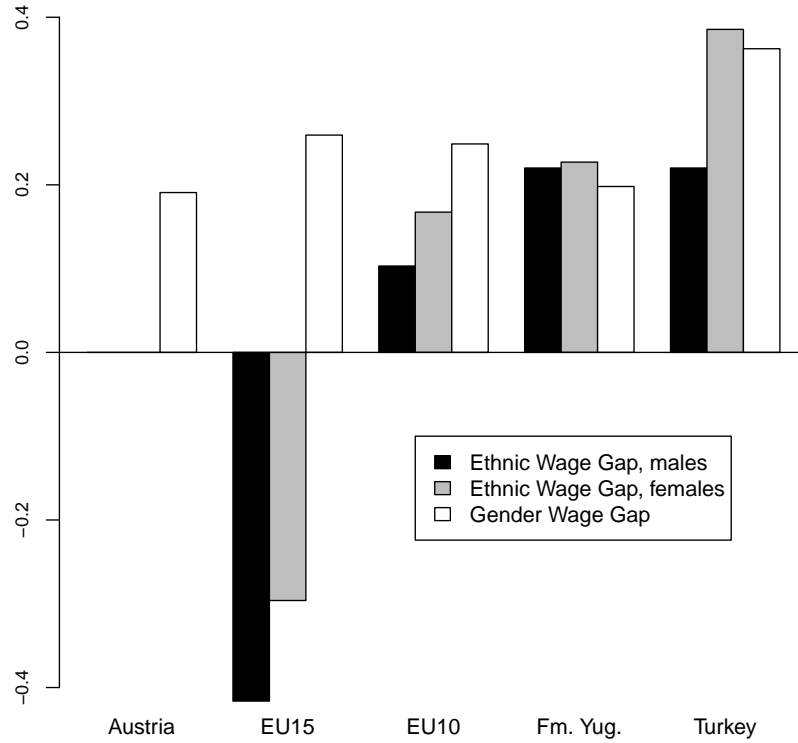
The regression results have shown, that being a female worker reduces income substantially. Taking into account that native women receive lower pay than their male counterparts, immigrant women are affected twice by income inequality - first as women, second as foreigners. In Figure 7.6 the median wage gaps for origin of birth and gender are illustrated. Since immigrants from EU15 earn higher incomes, the ethnic wage gap for women and men are negative. However, the gender wage gap within this group is the second highest of all nationalities with 25.9% less hourly gross pay for women. According to the EU-SILC data, the gender wage differential of Austrians amounts to 19.1% and therefore is the smallest of all groups. The worst situation may be attested for Turkish women. They receive 36.2% lower wages compared to male Turks and 38.5% less than Austrian women. Most of them are employed in low-paid social and personal service activities.

The results are consistent with NIELSEN et al. (2004, p.19), who state *"noting that there is also a considerable gender wage gap among women, the combined effect of gender and ethnicity puts immigrant women in a position, which is clearly worse than their male counterparts"*. If the results of the decomposition are regarded again, 0.022 units from the raw differential of 0.257 resulted from the sex variable. Thereof 0.005 can be explained by differences in endowments but 0.017 units of the portion cannot be explained (cp. Table 7.5). Thus, obviously immigrant women are concerned with heightened labor market discrimination.

7.9. Firm Size and Wages

BIFFL (2002) states that the big part of foreign workers are employed in small and middle-size enterprises. In 1999, 37.3 percent of foreigners and 32.4 percent of natives worked in enterprises below 19 members of staff while only 8.8 percent of the foreign labor force (but 21.6 percent of natives) worked in companies with more than 1,000 workers. In the EU-SILC dataset this concrete hypothesis cannot be confirmed for the year 2005 as can be seen in Table 7.10.

FIGURE 7.6.: ETHNIC AND GENDER MEDIAN WAGE GAPS



(Source: EU-SILC 2005, own illustration)

TABLE 7.10.: ENTERPRISE SIZE AND NATIONALITY CONCENTRATION

	Enterprise Size					
	1-19	20-49	>50	1-19	20-49	>50
	Absolute Numbers			Percentage		
Austrian	2372	784	1885	47	15	37
Turkey	35	9	39	42	11	47
fm. Yugoslavia	114	43	114	42	16	42
EU15	35	20	41	36	21	43

(Source: EU-SILC 2005, own calculations)

Obviously these outcomes don't match with the results of Biffl. Even though it seems right for companies between 11 and 19 workers. In such enterprises we only find 10 percent of the native sample but 18 percent of Yugoslavs and 20 percent of Turks. Nevertheless gaining access to large Austrian firms is a base for higher job

security and smaller wage differentials, as income expectations rise with enterprise size. BIFFL (2002, p. 544) derives a simple wage regression on sex, age and enterprise size which denotes $lnwage = c + \beta_1 \cdot sex + \beta_2 \cdot age + \beta_3 \cdot firmsize$. Enterprise size, to simplify matters, is just given by companies with more or less than 20 employees.

TABLE 7.11.: WAGE REGRESSION ON SEX, AGE AND FIRM SIZE

	β_1	β_2	β_3	F-Test	R^2	Adj. R^2
Austria	-0.187 (0.000)	0.018 (0.000)	0.135 (0.000)	201.98	0.170	0.169
EU10 and third states	-0.251 (0.000)	0.007 (0.004)	0.037 (0.527)	8.78	0.071	0.064
EU15	-0.254 (0.069)	0.018 (0.006)	0.296 (0.061)	6.50	0.252	0.213

T-value in parenthesis

(Source: EU-SILC 2005, own calculations)

As can be seen in Table 7.11, the results are not consistent with the outcome of BiffL. While the coefficients for the age variable are negative in the paper of BiffL, the coefficients in Table 7.11 show a positive sign, even though the effects are quite small. Firm size seems to influence wages of natives and immigrants from EU15. However, the value for immigrants from EU10 and Third States is insignificant on all sensible levels. According to the simple regression, EU15-immigrants in enterprises with more than 20 employees earn some 30% higher wages than workers in small firms.

8. Conclusions and Policy Implications

Wie aber "passen" Diskriminierung, Rassismus und Ungleichheit in die Welt der Arbeit? Sind sie nicht notwendiges Übel oder gar bewusst geschaffene Umstände wirtschaftlicher Interessen und Politiken, ohne die die Arbeitswelt gar nicht zu denken wäre? Es stellt sich die Frage, ob es überhaupt einen politischen und wirtschaftlichen Willen gibt, strukturelle Diskriminierungen abzubauen. Denn dort, wo es eine diskriminierte Gruppe gibt, findet sich auch immer eine Gruppe, die durchaus von dieser Diskriminierung profitiert. (MANOLAKOS 2006, p. 15)

The purpose of this work was to highlight the situation of a layer of society, that often is referred to in a negative way in politics and economic debates. The economic and social entity of Austrian immigrants is more or less blurred due to lack of research and information. Many foreigners live under marginalized circumstances and poor living conditions and have to face economic pressure on their wages and employment. The intention of this work was, to reveal some facts about the conditions of immigrants and to offer a contribution for further discussion.

The results of this study are unambiguous: The median wage gap between Austrians and foreigners from the ten new EU members as well as from former Yugoslavia and Turkey accounts to some 21%. This may mainly be explained by differences in education careers and occupational segregation (cp. Chapter 4). Nevertheless, quite a big portion of the earnings differential could not be explained by the included variables. Some 60% of the income disparity could not be explained by the characteristics, and there is the justified assumption that a significant part of this unexplained fraction emerges from labor market discrimination.

Another decisive result is that immigrants face multiple times higher unemploy-

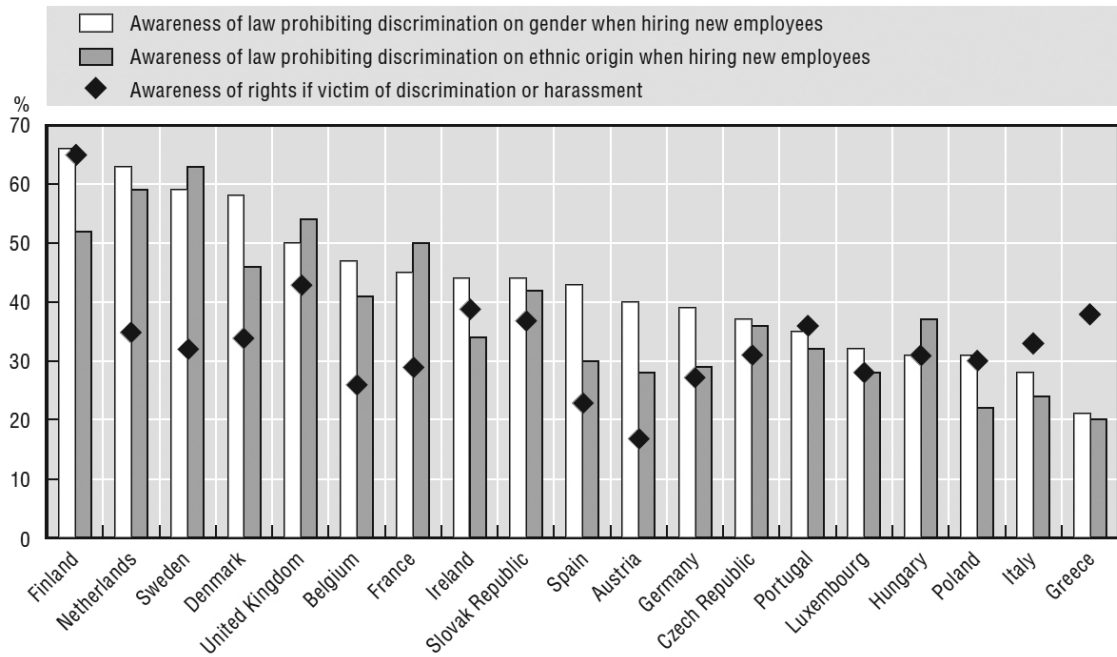
ment risks than natives do. For example Turks are more than three times as much affected by unemployment as natives. Moreover, the employment fluctuation of foreigners combined with the business cycle is much higher than for Austrians. Hence, immigrants from EU10, former Yugoslavia and Turkey form a layer of society that is often referred to as *industrial reserve army* in sociological literature. They are hired in periods of economic growth and dismissed at the first evidence of a cooling-down of the economy. Finally, immigrant women are at the bottom of income distribution. They have to face doubled exploitation on the labor market. First, being women, second being immigrants. They are not only affected by the ethnic wage gap between natives and immigrants, but also by the internal gender wage gap for each nationality.

All in all, immigrants have to face substantial disadvantages in Austria (if they are not born in an *old* EU member state). Some of these disadvantages have structural roots like laws, education systems, sector regimentations, etc. and others develop with discrimination on the labor market and other social structures.

Most authors of studies on discrimination take labor market discrimination as a given fact, solely investigating the consequences of prejudiced behavior. In Chapter 3 an extended perception of the conceptual framework was given. The intention is to show, that economic discrimination has its historical roots in the formation of class societies. The exploitation of one layer of society by another one is a decisive fact in economics. Several authors, who are cited in this work, have stated that the major profiteers of discrimination are employers, who benefit from wage competition among workers and minimal wages for immigrants. Therefore this layer of society will be interested in keeping up discrimination. Anti-discrimination proposals on a political scale thus have always been (and will be) opposed by certain forces on a parliamentary stage or any other policy-making board. Nevertheless these proposals are very important to call public attention on economic discrimination of immigrants and women, however a class society *without* exploitation is not conceivable. This should be upfront in mind, while developing equality policies.

At the very least, workers should know that they have a legal right for equal treatment in most countries, even though anti-discrimination proceedings are often without any consequences. However, evidence suggests that public opinion is often ill-informed about such rights. Aside from Finland, the Netherlands, Sweden, Denmark and the United Kingdom, less than half of the population of European countries knows that discriminating on the basis of gender or ethnic origin when hir-

FIGURE 8.1.: PUBLIC AWARENESS ABOUT LEGAL ANTI-DISCRIMINATION PROVISIONS



(Source: OECD 2008, p. 165)

ing new employees is unlawful, as is shown in Figure 8.1. According to the OECD, public awareness of anti-discrimination provisions concerning ethnic origins tends to be less than for gender (which could simply reflect the fact that the former targets fewer people than the latter).

What are the proposals in regard of equality activities that arise in the literature? MANOLAKOS (2006, p. 17) mentions mainly three approaches of corporate equality policies: *affirmative action*, which emerged in the Afroamerican movement, *equal employment opportunities*, which was developed in the context of gender discrimination and *diversity management*, which is a corporate strategy linked to the consultation of immigrant knowledge to maximize profits. In combination with these strategies, the author mentions six levels of anti-discrimination activities: Training the immigrants, making cultural allowances, challenging racist attitudes, combating discrimination, equal opportunities policies with positive actions (so-called positive discrimination) and diversity management. Other authors, like BRIZIC (2006), state that the knowledge of foreign language should be seen as a chance and resource, but these concepts are quite vague.

Nevertheless there are also some detailed transitional demands in public atten-

tion. For example the creation of a minimum wage to combat low-pay sectors and dumping-wages. The amount which is most often mentioned amounts to 60% of the median wage. This should also be implemented on precarious employment, since in this sector most of the affected workers are active. Another demand to reduce unemployment could be the reduction of working time with entire wage adjustment. This would mean to split up all necessary and existing tasks in a society on all individuals who are capable of work.

But all of these well-intentioned policies leave open the question of feasibility. Which social force may be able to carry out all the proposals and policies? Naturally the only layer of society that is willing to fight discrimination will be the one that is affected by it. Hence, unsurprisingly most of the mentioned demands are traditional postulations of European unions and of the international labor movement.

A. Appendix - Tables

TABLE A.1.: BALANCE OF TRADE WITH THE NEW EU10 IN MILLION EURO

	2003	2004	2005	2006	2007
Estonia	35.770	47.432	208.332	67.741	96.227
Latvia	57.909	66.472	86.791	137.549	166.718
Lithuania	81.591	71.832	115.521	104.568	113.952
Malta	11.756	10.700	20.130	204.183	23.675
Poland	355.389	518.656	401.846	775.687	1.114.030
Slovakia	-234.046	-436.651	-56.278	-20.523	-262.189
Slovenia	672.102	830.272	812.328	853.595	1.236.831
Czech Republic	-220.661	-134.371	-263.755	29.901	364.412
Hungary	547.437	735.224	758.896	920.615	1.170.863
Cyprus	43.310	30.290	32.069	42.326	48.498
EU 10	1.350.557	1.739.856	2.115.880	3.115.642	4.073.017

(Source: Statistik Austria)

TABLE A.2.: DATASETS FOR THE ANALYSIS OF INCOME INEQUALITY

Dataset	Size	Advantage of data	Disadvantage of data
Statistics of the Austria Social Insurance System (Hauptverband der Österreichischen Sozialversicherung)	All persons liable to compulsory insurance deductions	time series up to the 1970ies	No persons neither below minimum income limit for compulsory social insurance nor above the maximum contribution; lack of many important variables
Income Tax Data (Lohnsteuerstatistik)	All income taxpayers (workers, retirees)	long-term times series; better and more detailed coverage of high incomes	Lower income partly overrated (persons who are not continuously employed); lack of many important variables
Austrian Microcensus (Labor Force Survey, etc.)	Sample	Many variables (working time, educational level, overtime work, etc.)	Data collected by poll (sampling- and non-sampling errors); hardly available
EU-SILC 2005 (former ECHP)	Sample	Many variables (working time, educational level, overtime work, etc.); harmonized in the whole European Union; better available than microcensus	Data collected by poll (sampling- and non-sampling errors)

(Source: ZWICKL 2008)

TABLE A.3.: ROBUSTNESS CHECK

Variable	Coefficient	(Std. Err.)
Sex	-0.252***	(0.019)
Secondary School	0.271***	(0.024)
University	0.527***	(0.031)
Agglomeration	0.078***	(0.020)
Leading Position	0.223***	(0.018)
Firm Size	0.067***	(0.017)
Potential Experience	0.011***	(0.001)
Skilled Job	0.082***	(0.019)
Parental Education	0.085***	(0.033)
Foreigner	-0.219***	(0.030)
Intercept	2.144***	(0.022)
<hr/>		
N	3351	
Adj. R ²	0.297	
F (11,3340)	142.58	

Significance levels : * : 10% ** : 5% *** : 1%

TABLE A.4.: COEFFICIENTS, MEANS AND PREDICTIONS OF THE DECOMPOSITION

	High model			Low model			Pooled
	Coef.	Mean	Pred.	Coef.	Mean	Pred.	Coef.
Sex	-0.205	0.318	-0.065	-0.256	0.339	-0.087	-0.211
Secondary School	0.331	0.177	0.059	0.100	0.148	0.015	0.310
University	0.561	0.114	0.064	0.300	0.070	0.021	0.545
Agglomeration	0.074	0.267	0.020	0.110	0.609	0.067	0.055
Leading Position	0.195	0.448	0.087	0.290	0.243	0.071	0.214
Firm Size	0.065	0.471	0.031	0.042	0.496	0.021	0.062
Experience	0.015	19.991	0.307	0.007	18.626	0.121	0.015
Skilled Job	0.077	0.444	0.034	0.028	0.252	0.007	0.087
Parental Education	0.107	0.085	0.009	-0.137	0.061	-0.008	0.087
Intercept	2.034	1.000	2.034	2.094	1.000	2.094	2.034
Total			2.579			2.322	

Prediction = Coefficient * Mean
(Source: EU-SILC 2005, own calculations)

TABLE A.5.: SECTORS, MEDIAN AND FOREIGNER SHARE

ÖNACE	Median Wage in % (1)	Total employees	Foreigners	In %	Skill
Agriculture, hunting and forestry	0.63	28,358	8942	31.53	L
Mining and quarrying	1.38	12,864	860	6.69	L
Manufacture of food products, beverages and tobacco	0.89	72,121	12,948	17.95	L
Manufacture of textiles and textile products	0.87	22,174	5,111	23.05	L
Manufacture of leather and leather products	0.75	4,958	1,215	24.51	L
Manufacture of wood and wood products	1.02	35,217	4,431	12.58	L
Manufacture of pulp, paper and paper products; publishing and printing	1.35	42,162	3,745	8.88	L
Manufacture of coke, refined petroleum products and nuclear fuel	2.10	1,979	128	6.47	H
Manufacture of chemicals, chemical products and man-made fibers	1.39	32,302	3,151	9.75	L
Manufacture of rubber and plastic products	1.14	25,394	4,420	17.41	L
Manufacture of other non-metallic mineral products	1.22	28,945	3,776	13.05	L
Manufacture of basic metals and fabricated metal products	1.25	111,877	15,299	13.67	L
Manufacture of machinery and equipment n.e.c.	1.33	74,502	7,201	9.67	H
Manufacture of electrical and optical equipment	1.32	63,795	5,991	9.39	H
Manufacture of transport equipment	1.31	36,074	4,456	12.35	L
Manufacturing n.e.c.	0.95	37,323	3,992	10.70	L
Electricity, gas and water supply	1.70	23,587	460	1.95	H
Construction	1.11	247,441	47,424	19.17	L
Wholesale and retail trade	0.88	524,463	62,222	11.86	L
Hotels and restaurants	0.68	168,924	57,836	34.24	L
Transport, storage and communication	1.01	219,439	26,611	12.13	H
Financial intermediation	1.47	110,909	5,005	4.51	H
Real estate, renting and business activities	0.92	348,923	67,358	19.30	H
Public administration and defense; compulsory social security	1.03	463,461	14,292	3.08	H
Education	0.92	149,537	8,310	5.56	H
Health and social work	0.84	297,207	30,032	10.10	L
Other community, social and personal service activities	0.80	37,423	6,111	16.33	L
Activities of households	0.48	3,382	778	23.00	L
Extra-territorial organizations and bodies	1.19	2,714	349	12.86	H

(1) Compared to the median wage of overall economy

(Source: Statistik Austria, Bundesministerium für Arbeit, Soziales und Konsumentenschutz: www.dnet.at/bali/, own calculations)

TABLE A.6.: THE INDEX-NUMBER PROBLEM

$$(\bar{Y}^N - \bar{Y}^F) - \sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F) = \beta_0^N - \beta_0^F + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) + \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j)$$

$$\text{if } \beta_j = \beta_j^N \Rightarrow \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j^N) = 0$$

$$(\bar{Y}^N - \bar{Y}^F) = \beta_0^N - \beta_0^F + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) + \sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F)$$

$$\text{if } \beta_j = \beta_j^F \Rightarrow \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j) = \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j^F)$$

$$(\bar{Y}^N - \bar{Y}^F) = \beta_0^N - \beta_0^F + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) + \sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F)$$

$$\text{if } \beta_j = (\beta_j^N \cdot 0.5 + \beta_j^F \cdot 0.5) \Rightarrow \sum_j (\bar{X}_j^N - \bar{X}_j^F) \cdot (\beta_j^N - \beta_j) = \frac{\sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F)}{2} + \frac{\sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F)}{2}$$

$$(\bar{Y}^N - \bar{Y}^F) = \beta_0^N - \beta_0^F + \sum_j \bar{X}_j^F (\beta_j^N - \beta_j^F) + \frac{\sum_j \beta_j^N (\bar{X}_j^N - \bar{X}_j^F)}{2} + \frac{\sum_j \beta_j^F (\bar{X}_j^N - \bar{X}_j^F)}{2}$$

TABLE A.7.: R-CODE FOR THE COMPUTATION OF THE DECOMPOSITION-MODEL

```

daten=read.csv("EU-Silc-foreigner.csv")
attach(daten)
dim(daten)

Generate a subset out of EU-Silc data with items lnwage, age, foreigner
regdata = subset(daten, ,c(lnwage, age, foreigner))

Exclude all the missing values
regdata = na.exclude(regdata)
dim(regdata)

Entitle the items and attach the names to the columns
names(regdata) = c("lohn", "alter", "ausl")
attach(regdata)

Decompose wages and age by the dummy foreigners
lohnausl = lohn[ausl == "1"]; length(lohnausl)
lohnaust = lohn[ausl == "0"]; length(lohnaust)
class(alter)
alter = as.numeric(alter)
alterausl = alter[ausl == "1"]
alteraust = alter[ausl == "0"]

Compute the means of age for both groups
xL = mean(alterausl)
xH = mean(alteraust)

Regression for both groups and entitle the coefficients and the intercepts
regausl = lm(lohnausl ~ alterausl); regausl
b0L = coef(regausl) [1]
bL = coef(regausl) [2]
regaust = lm(lohnaust ~ alteraust); regaust
b0H = coef(regaust) [1]
bH = coef(regaust) [2]

Compute the terms of the Blinder wage decomposition
E = bH*(xH - xL)
C = xL*(bH - bL)
U = b0H-b0L
R = E + C + U
D = C + U

Offer an output of the main results of the wage decomposition
decomp = data.frame(E, C, U, R, D)
names(decomp) = c("Endow.", "Coeff.", "Shift", "Raw", "Discr.")
decomp

```

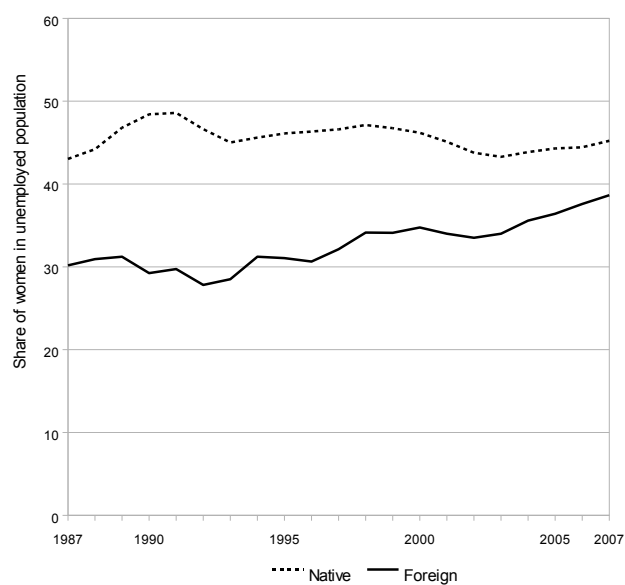

TABLE A.8.: CORRELATION STATISTICS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Wage (1)	1.0000										
Sex (2)	-0.1890	1.0000									
Secondary School (3)	0.1498	0.0701	1.0000								
University (4)	0.2974	0.0621	-0.1612	1.0000							
Agglomeration (5)	0.1077	0.0914	0.0834	0.1538	1.0000						
Leading Pos. (6)	0.3225	-0.1107	0.1208	0.1714	0.0327	1.0000					
Firm Size (7)	0.1007	-0.0984	0.0295	0.0025	0.0983	0.0386	1.0000				
Experience (8)	0.2898	-0.1628	-0.1201	-0.0503	-0.0120	0.1319	0.0458	1.0000			
Skilled Job (9)	0.2051	0.1353	0.1763	0.2747	0.1091	0.1257	0.0170	0.0344	1.0000		
Parental Ed. (10)	0.1784	-0.0009	0.0974	0.2676	0.1219	0.1348	0.0380	0.0085	0.1255	1.0000	
Foreigner (11)	-0.1316	0.0138	-0.0237	-0.0436	0.2264	-0.1261	0.0153	-0.0375	-0.1183	-0.0272	1.0000

(Source: EU-SILC 2005, own calculations)

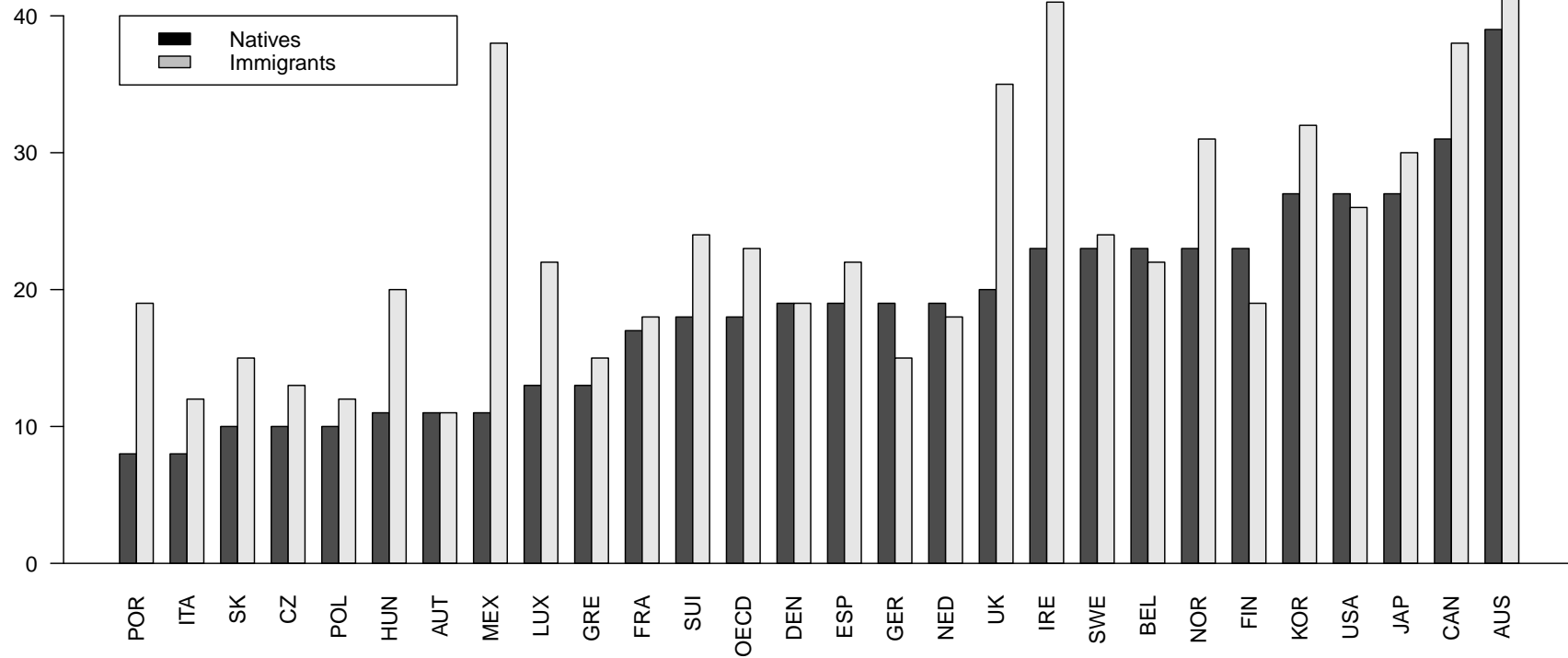
B. Appendix - Figures

FIGURE B.1.: SHARE OF WOMEN WITHIN THE GROUP OF UNEMPLOYED



(Source: Statistik Austria, own illustration)

FIGURE B.2.: SHARE OF PERSONS WITH UNIVERSITY DEGREE OR HIGHER GRADUATION



in % of population aged fifteen or older of each group
 (Source: OECD, own illustration)

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