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### The effect of immigration on wages in three European countries

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# THE EFFECT OF IMMIGRATION ON WAGES IN THREE EUROPEAN COUNTRIES\*

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## **Abstract**

We extend the Altonji and Card (1991) framework for analysing the impact of immigrants on natives' wages from two to three labour types and estimate reduced form wage equations for The Netherlands, United Kingdom and Norway. We find very small effects on natives' wages and no dominant robust patterns of substitution and complementarity. Effects on wages of earlier immigrants are larger but less reliable. Further work should focus on these own effects.

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# 1 Introduction

Since the paper of Grossman (1982), several studies have been conducted on the impact of immigration on the host country labour market. Most of these studies concern traditional immigration countries like the United States, Canada and Australia (see surveys: Friedberg and Hunt, 1995; Borjas, 1994). In Europe, the number of studies is still limited, although increasing in the last few years (Winkelmann and Zimmermann, 1993; De New and Zimmermann, 1994; Gang and Rivera-Batiz, 1994; Pischke and Velling, 1997; Venturini, 1999). In this paper, we study the effect of immigration on natives' wages in three European countries. In the next section, we extend the Altonji-Card (1991) model from two to three production factors, to obtain a richer model for predicting wage effects. We then present estimates for The Netherlands, the United Kingdom and Norway and we conclude by comparing and assessing the results from these three countries. The countries were selected for data availability and for interesting contrasts in their immigrant population, as we spell out in the concluding section.

## 2 A System of Connected Local Labour Markets

Altonji and Card (1991) analyse the effect of immigration with a partial equilibrium model for local labour markets. A local economy is assumed to produce one good that is consumed both locally and exported to other cities and to import another good. The quantity  $Y$  of the local good is produced by a single competitive industry with constant returns to scale using labour inputs and other inputs with exogenously fixed prices.

Extending the two-factor model of Altonji and Card, we consider low, medium and high skilled labour as production factors in local labour markets. The technology is characterised by constant returns to scale. The total labour force,  $L$ , consists of low skilled  $L_U$ , medium or 'centrally' skilled,  $L_C$  and high skilled,  $L_H$ ;  $L = L_U + L_C + L_H$ . The respective proportions of low, medium and high skilled labour are  $U_N = L_U/L$ ,  $C_N = L_C/L$ , and  $H_N = L_H/L$ , with  $U_N + C_N + H_N = 1$ .

In an initial equilibrium, the skill distribution is given as low skilled,  $U_N$ , medium skilled  $C_N$  and high skilled workers  $H_N$ . Suppose that an immigrant flow of size  $\Delta I$  occurs: a fraction of immigrants,  $U_I$ , is low skilled,  $C_I$ , is medium skilled and the rest is high skilled workers,  $H_I$ . The proportional changes in wage rates of each labour type must satisfy equality of wage-induced demand shifts and supply shifts due to immigration adjusted for skill composition and product demand composition:

$$\lambda_U \left( \frac{U_I}{U_N} \right) \frac{\Delta I}{L} = (\eta_{UU} - \varepsilon_U) \Delta \log w_U + \eta_{UC} \Delta \log w_C + \eta_{UH} \Delta \log w_H \quad (1)$$

$$\lambda_C \left( \frac{C_I}{C_N} \right) \frac{\Delta I}{L} = \eta_{CU} \Delta \log w_U + (\eta_{CC} - \varepsilon_C) \Delta \log w_C + \eta_{CH} \Delta \log w_H \quad (2)$$

$$\lambda_H \left( \frac{1-U_I - C_I}{1-U_N - C_N} \right) \frac{\Delta I}{L} = \eta_{HU} \Delta \log w_U + \eta_{HC} \Delta \log w_C + (\eta_{HH} - \varepsilon_H) \Delta \log w_H \quad (3)$$

where  $\Delta \log w_i$  is the log wage change for skill group  $i$ ,  $\eta_{ij}$  is the elasticity of labour demand for skill group  $i$  with respect to the wage of group  $j$ ,  $\varepsilon_i$  indicates the elasticity of labour supply of skill group  $i$  and  $\lambda_i$  are adjustment coefficients<sup>1</sup>,  $0 < \lambda_i < 1$ , defined as

$$\lambda_U = (1-k_1) \frac{Y_C + Y_H}{Y} + \frac{Y_e}{Y}, \text{ where } k_1 = \frac{U_N(1-U_I) + C_I H_I}{U_I(1-U_N) + C_I H_I} \quad (4)$$

$$\lambda_C = (1-k_2) \frac{Y_U + Y_H}{Y} + \frac{Y_e}{Y}, \text{ where } k_2 = \frac{C_N(1-C_I) + U_I H_I}{C_I(1-C_N) + U_I H_I} \quad (5)$$

$$\lambda_H = (1-k_3) \frac{Y_U + Y_C}{Y} + \frac{Y_e}{Y}, \text{ where } k_3 = \frac{H_N(1-H_I) + U_I C_I}{H_I(1-H_N) + U_I C_I} \quad (6)$$

$Y_i$  is consumption by skill group  $I$ ,  $\eta_{ij}$  is the Marshall-Hicks labour demand elasticity

$$\eta_{ij} = \theta_j (\sigma_{ij} - \Psi) \quad (7)$$

Where  $\theta_j$  is the wage bill of group  $j$  relative to output value,  $\sigma_{ij}$  is the partial elasticity of substitution<sup>2</sup> of skill group  $i$  with respect to group  $j$  and  $\psi$  is the demand elasticity of local output to its relative price  $p$  (a weighted average of elasticities of local consumers and export). The left-hand sides of equations (1)-(3) indicate the effective proportional increase in the supply of labour for the respective skill groups as a result of the immigration flow. The right-hand side gives the response of skill groups' local excess demand to the changes in the wage rates. If immigrants have the same skill composition as natives ( $k_i = 1$ , all  $i$ ) and the export share  $Y_e$  is zero, wages are unaffected by immigration, because of constant returns to scale. Only immigration with deviant skill composition has wage effects.

If we reduce the model to homogeneous labour, where immigrant skill composition cannot differ from native skill composition, cross demand elasticities  $\eta_{ij}$  are zero and all output is exported ( $\lambda_i = 1$ ), we have the standard comparative result of an isolated labour market

$$\Delta \log w = \frac{-1}{(\varepsilon - \eta)} \frac{\Delta I}{L} \quad (8)$$

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<sup>1</sup> They are slightly rewritten from Altonji and Card's specification to bring out the role of the export share in demand.

<sup>2</sup> If there are only two inputs, the partial elasticity of substitution between two inputs ( $\sigma$ ) is dual to the Hicksian partial elasticity of complementarity ( $c$ ),  $\sigma = 1/c$  from the duality of production and cost functions. If there are more than two inputs, then  $\sigma \neq 1/c$  (Hamermesh, 1993).

The Altonji-Card model generalises this result to heterogeneous labour and general equilibrium effects of product demand. To solve this system, write equations (1)-(3) as

$$Bd = (N - E)W \quad (9)$$

where

$$d = \frac{\Delta I}{L}, \text{ a scalar}$$

$$B = \lambda_K \frac{K_I}{K_N}, \text{ where } K = U, C, H, \text{ a column vector}$$

$$N = [\eta_{ij}], \text{ a square matrix}$$

$$E = \begin{bmatrix} \varepsilon_U & 0 & 0 \\ 0 & \varepsilon_C & 0 \\ 0 & 0 & \varepsilon_H \end{bmatrix}$$

and  $W$  is a column vector with log wage changes  $\Delta \log w_i$ .

We can solve equation (11) as

$$W = \gamma^* d \quad (10)$$

$$\text{where } \gamma^* = (N - E)^{-1} B.$$

The coefficients in  $\gamma$  are determined by underlying parameters. The vector  $B$  reflects the generalisation from a simple labour market, with the  $k$  ratio for skill mix effects and the  $\lambda$ 's for output demand composition effects ( $B$  would be a unit vector for immigration not affecting the labour skill mix and all output exported). Clearly, relative to Altonji and Card we get a richer menu of potential outcomes, as a two-factor model can only allow q-complements (Hamermesh, 1986, 443). Signs cannot be determined on a priori theoretical considerations, but the model can be used to simulate the impact of immigration and its dependence on parameter values. For example, suppose  $U_I = .4$ ,  $U_N = .2$ ,  $C_I = C_N = .45$ ,  $H_I = .15$ ,  $H_N = .35$ , labour supply elasticities are  $\varepsilon_i = .1$ , own demand elasticities  $\sigma_{ii} = .25$ ,  $\theta_U = .1$ ,  $\theta_C = .4$  and  $\theta_H = .2$ ,  $\Psi = -2$  and  $Y_e/Y = .3$ , substitution elasticities  $\sigma_{ij} = \sigma_{ji} = .75$ . Then,  $\gamma_U = -7.83$ ,  $\gamma_C = 5.34$  and  $\gamma_H = 4.76$ . However, if we make low and high skilled labour complements rather than substitutes ( $\sigma_{UH} = \sigma_{HU} = -.75$ ), and leave all other parameters unchanged, we get  $\gamma_U = 27.11$ ,  $\gamma_C = 5.66$  and  $\gamma_H = -6.17$ . One may survey empirical magnitudes of the parameters and predict likely outcomes, for different circumstances in different countries. In this paper, we will not do that, but rather focus on estimating reduced form wage equations (10).

### 3 Estimating Wage Elasticities

Equation (10) relates changes in wages to the share of new immigrants in the labour force. However, since we have only single-year observations, we can only estimate in levels:

$$\log w = \gamma \left( \frac{I}{L} \right) \quad (11)$$

which is equivalent to

$$\Delta \log w = \gamma \Delta \left( \frac{I}{L} \right) \quad (12)$$

Using the equality  $\Delta \left( \frac{I}{L} \right) = \left( 1 - \frac{I}{L} \right) \left( \frac{\Delta I}{L} \right)$  (Altonji and Card, 1991), we can write the earnings function as

$$\Delta \log w = \gamma \frac{1}{\left( 1 - \frac{I}{L} \right)} \Delta \left( \frac{I}{L} \right) \quad (13)$$

Hence: by estimating (11) (in levels rather than first differences), our estimate of  $\gamma$  is biased upward, roughly by the share of immigrants in the labour force. With generally small shares, this bias will be negligible. We estimate wage elasticities by the estimation of earnings functions

$$\log w_{ijr} = \beta_j X_{ijr} + \delta_{jk} P_{kr} + u_{ijr} \quad (14)$$

$w_{ijr}$  is earnings of person  $i$  belonging to skill group  $j$  in area  $r$ .  $X_{ijr}$  is a vector of potential explanatory variables such as those related to human capital, relevant individual and family characteristics, and other control variables for city, industry and job characteristics.  $u$  is a random error term.  $P_{kr}$  is a vector of the share of immigrants from group  $k$  in local labour market  $r$ , i.e.  $P_{kr} = \frac{I_{kr}}{L_r} \times 100$ . The coefficients  $\delta$  are approximations of  $\gamma$ . Structural parameters in  $\delta$  cannot be identified by the estimation strategy applied here<sup>3</sup>. A negative sign of  $\gamma$  will be called a substitution relationship (between native workers and immigrants) while a positive sign will be called complementarity.

The estimation of earnings functions by OLS regards all explanatory variables as exogenous, and views the concentration of immigrants in local labour markets as unaffected by wages. In fact, wage differentials across labour markets can generate an incentive for workers to move. If this so-called endogeneity problem is present, OLS will not yield unbiased and consistent parameter estimators. One technique, which can solve this problem and other sorts of measurement problems, is instrumental variable estimation (IV). Since the coefficient of the percentage of immigrants in local labour markets,  $\delta$ , is of particular interest, we need one or

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<sup>3</sup> For structural estimates based on production technology, see Zorlu (2002).

more variables (instruments) that are highly correlated with the concentration of immigrants,  $P$ , but uncorrelated with the error term,  $u$ , to take into account the endogeneity of immigrant-concentration. The problem in practice is that such a variable is hard to find. Moreover, the existence of endogeneity is not always confirmed by the application of IV. De New and Zimmermann (1994) find a clear evidence for endogeneity in the German Household Panel Survey (GSOEP) and validity of IV estimations, while Borjas (1986 and 1987) suggests that the results are not affected by estimation procedures in the US. The presence of mobility costs and imperfect information also suggest that the perfect equalisation of wage differentials cannot be realised in the short-run. We take wage-induced regional mobility as less relevant in the countries we study, but we have nevertheless attempted IV-estimates with the variables available.

## 4 The Netherlands

### 4.1 Immigration history

Major immigration waves from Indonesia occurred directly after the de-colonisation in 1949-1951, in 1952-1957 and in the early 1960s. Migration from Indonesia has caused no economic problems for migrants with Dutch citizenship (which they possessed in case of two Dutch parents, and could choose in case of one). Problematic was the position of Moluccans, mostly former soldiers in the Dutch-Indies Army and their families (Veenman, 1990; Lucassen and Penninx, 1994: 145). Two large immigration flows occurred after the de-colonisation of Surinam in 1975 and in 1979-1980 (Lucassen and Penninx, 1997: 42-44). Immigration from Surinam and Dutch Antilles has not led to smooth economic integration, and these groups are still targets for economic policies. The flow of large numbers of 'guest workers' started in the 1960s (Hartog and Vriend 1989), in later years became dominated by family formation and re-union motives. Additionally, the flow of political refugees and asylum seekers has increased.

Surinamese, Antillians, Turks and Moroccans became the largest ethnic minority groups and this group is gradually growing due to a combination of continuous immigration and a relatively high birth rate. In 2000, the Netherlands had a total of 2,775,325 residents or 17.5% of the total population who were born abroad or who had at least one parent who was born abroad.<sup>4</sup> About half of these people are originally from the so-called non-western countries. The largest group is Turks (308,890), followed by Surinamese (302,515), Moroccans (262,220), and Antilleans and Arubans (107,200). The inflow of Mediterranean guest workers may well have induced a substantial downward pressure on the unskilled wage (Hartog and Vriend 1989). Immigrants from Western countries do not get attention from research or policy, at least up to now. More than half of Western immigrants (56.4%) are from European countries. People from the southern European countries (89,305) compose only 11.6% of total number of people from European countries. According to UNCHR, the number of the political refugees was 118,700 in 1999 (Zorlu and Hartog 2002).

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<sup>4</sup> Since 1992, this definition is applied for the ethnic background of the residents because the identification of an immigrant is increasingly undermined by assimilation/integration. Children of first generation immigrants were born in the Netherlands or came to the Netherlands at early ages. Moreover, between 1985-1998, 491,000 people have gained the Dutch nationality.

Ethnic minorities from EU-countries are mainly concentrated along Belgian and German borders and in the so-called Randstad area where the four largest cities are located, i.e. Amsterdam, Rotterdam, The Hague and Utrecht. Ethnic minorities from non-EU countries are highly concentrated in the same cities and to a lesser degree in old industry regions, Brabant and Arnhem.

Economic research on the effect of immigration on the Dutch economy is mostly limited to analysis of the impact of 'guest workers' (Heijke 1979, Hartog and Vriend 1989). Van Beek (1993), Kee (1993) and Bovenkerk et al. (1995) provide strong evidence that ethnic minorities are at a disadvantage in the Dutch labour market.

## 4.2 Reduced form elasticities

Percentages of ethnic minorities in the local labour market are calculated using administrative population statistics.<sup>5</sup> The population statistics cover the whole population of the Netherlands in 1997 but only five ethnic origins are identifiable:

1. Western countries (EU, Eastern Europe, Indonesia and other industrialised countries like USA, Canada and Japan)
2. Turkey
3. Morocco
4. Surinam
5. Dutch Antilles (including Aruba)

Since (un-)employed workers can not be identified from the population statistics, the participation rate is assumed to be identically distributed across local labour markets for each ethnic minority group. Wage elasticities are estimated using two alternative data sets, GPD and LSO. GPD data have been collected by SEO (Stichting voor Economisch Onderzoek), University of Amsterdam, from a questionnaire included in 20 local newspapers on Saturday, January 17, 1998 that hypothetically came in the hands of 1.7 million households in the whole country.<sup>6</sup> Unfortunately, Amsterdam is excluded. From population statistics gathered by Statistics Netherlands (CBS) for 1998, we used the number of residents in 548 municipalities by ethnicity.

Estimated earnings functions, with robust standard errors, presented in Appendix Table A.4.1, contain no surprises for the usual variables. Wage elasticities<sup>7</sup>, calculated from the coefficients and the means of relevant regressors, are presented in Table 4.1. The presence of ethnic minorities from EU countries has a positive effect on low skilled natives and a negative effect on high skilled natives. However, none of the coefficients is significant. The estimated coefficients clearly show that the concentration of people from non-EU countries has a significant negative effect on the wages of low skilled workers and a significant positive effect on the wages of high skilled native workers. The coefficient for medium skilled workers is not significant. Ethnic minorities from non-EU countries are substitutes for low skilled and complements with high skilled native Dutch workers. A 10 percent increase of ethnic minorities from non-EU countries decreases the earnings of low skilled workers by

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<sup>5</sup> These statistics are from administrative registers of the entire population in the Netherlands, specified at municipality level and published at the website of CBS.

<sup>6</sup> We are immensely grateful to professor Bernard van Praag for allowing us to use these data. Note that we use the survey only for observations on natives. Ethnic minority shares are taken from population statistics.

<sup>7</sup> These are elasticities, not semi-elasticities: relative effects of percentage changes in minority shares.



0.42% and increases the earnings of high skilled workers by 0.21%. Medium skilled natives are virtually unaffected.

Table 4.1. Wage elasticities, GPD, 1998

With respect to share of	The change in the wage of					
	Low skilled		Medium skilled		High skilled	
	Elasticity	t	Elasticity	t	Elasticity	t
Eth. minorities from EU	0.013	0.65	0.000	0.02	-0.016	1.37
Eth. minorities from Non-EU	<b>-0.042</b>	2.26	-0.010	0.50	<b>0.021</b>	2.01

t-statistics are related to the underlying coefficients (see Table A.4.1). The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

The second data set is LSO 1997, the large and representative micro data (N=148948) collected by Statistics Netherlands (CBS), a combination from three sources: the employment and wages survey (an employer survey), the administrative data for insured people (VZA) and the labour force survey (EBB). Unemployed people and self-employed are not included in the data since the employer survey and VZA are taken as base. The LSO data set from 1997 is the first large representative micro data set including enough observations from ethnic minority groups for statistical analyses. Ethnic origin is defined by the birthplace of the respondent or by one of the parents' birthplace. Note that this definition is very broad and also covers children of immigrants who were born in the Netherlands. From the data it is impossible to identify birthplace, education acquired abroad and proficiency in the Dutch language. The sample is divided up as follows (number of observations in brackets)

1. Native Dutch workers (138,722)
2. Workers from the European Union countries (2,217)
3. Workers from Eastern European countries (617)
4. Workers from non-European countries (Americans excluded) (1,705)
5. Workers from Turkey (1,205)
6. Workers from Morocco (703)
7. Workers from Surinam (1,675)
8. Workers from Indonesia (1,341)
9. Workers from Dutch Antilles (including Aruba) (570)

Native Dutch workers are disaggregated by gender and they are divided by three skill categories, approximated by education level. Low skill involves primary and extended primary education (in Dutch: BO, MAVO and VBO). Medium skill level covers secondary (vocational) education (in Dutch: HAVO/VWO and MBO). High skill level is defined as higher vocational and university education (HBO and WO). Percentages of ethnic minorities in local labour markets are calculated using the population statistics.

People who are not able to work (N=7513) do not enter the wage equation. Earnings of workers is weekly income, calculated by dividing gross monthly earnings plus bonus by 4 weeks. Seven education levels are given in the data and they are included in earnings functions as dummy variables, as controls within skill groups. The lowest education is unfinished primary education, and the highest level is university education. Years of education is calculated on the basis of these seven education levels to approximate potential experience, a subtraction of education years plus 5 from the respondents' age. Tenure indicates the years worked for the current employer. Dummies are created for 5 occupation

levels, for the four largest cities where immigrants are concentrated as well as for married and public sector. Full-time and part-time employment contracts are also defined, as dummy variables, while flexible jobs are the base category. Also 6 dummies are generated for having one or more children aged between 0-5, 6-11 and 12-17 years.

All sub-samples are estimated separately by OLS and instrumental variable (IV) methods. To take into account the effect of social networks influencing the settlement behaviour of ethnic minorities in cities, percentages of EU-people, Turks, Moroccans, Surinamese and other non-Dutch people in municipalities in 1990 are used as instruments.<sup>8</sup> To capture factors that would attract ethnic minorities to certain local labour markets, aggregated wage levels, investment levels in housing, in COROP<sup>9</sup> areas are included. Additionally, it is well known that ethnic minorities are more often employed in industry (especially Turks and Moroccans), service sector (EU) and in the public sector (workers from the former colonies). These effects are approximated by the percentage of industry and service sectors in the total wage bill and the percentage of government services in value-added. The Hausman test is applied to estimations of each sub-sample to determine whether there is sufficient difference between the coefficients of IV and OLS regressions. If the null hypothesis that differences in coefficients are not systematic, is rejected, the outcomes of the IV estimator are reported in our elasticity tables; otherwise, the outcomes of the OLS estimator are reported (in these cases, an asterisk is attached to the elasticities in Table 4.2). The estimated coefficients for the sub-samples are presented in Appendix Tables A4.2-A4.8. Note that the native Dutch sample is broken down first by skill levels and alternatively by gender. Although IV estimators are generally preferred to OLS estimators in Table 4.2, the estimation strategies provide similar results, concerning sign and significance level of coefficients. This suggests that the endogeneity problem is not very prominent.

Immigrants from Western countries, mostly high skilled workers in internationally oriented firms, have a small negative effect on the wages of low skilled (-.042) and on male native Dutch workers (-.013) when the gender decomposition is considered. The former effect is remarkable because these immigrants might be expected to compete especially with high skilled Dutch workers. Note that the aggregation of non-western immigrants has some effect on the estimated effect for western immigrants.

The impact of Turks and Moroccans on the native Dutch workers is different although both belong to the lowest skilled ethnic groups. Turks have a very small adverse effect on the wages of low (-.025) and medium skilled natives (-.018) when native labour force is disaggregated by skill, and on the wages of Dutch women (-.015) and men (-.021) when the native labour force is broken down by gender. Moroccans have a small positive effect on the wages of medium skilled natives (.012), and on the wages of native male workers (.014) when native labour force is divided into gender categories. The different effects of Turks and Moroccans may be explained by their concentration in sectors and geographical areas.

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<sup>8</sup> There is still a substantial disagreement about the conceptual framework to study the impact of immigration. Borjas (1999) argues that the impact of immigration is hard to detect by correlating native wages and the immigrant concentration in local labour markets because possible reactions of native workers and employers on increasing immigration in local labour markets lead to the diffusion of the impact of immigration to the whole economy. Card (2001) shows that the inter-city mobility of natives in the US is unrelated to immigrant inflows. Pischke and Velling (1997) also find no support for the argument that the impact of immigration is eliminated by a response of natives in Germany.

<sup>9</sup> In the Netherlands, about 574 municipalities and 40 (or 43) COROP-areas are defined. Aggregated data for COROP regions are available from Statistics Netherlands. COROP areas are defined as economically integrated areas.

Turkish people are more often employed in manufacturing, and they are much more spread out over the Netherlands, to areas with a high density of industry-dominated employment.<sup>10</sup> On the other hand, Moroccans are highly concentrated in large cities and are employed more often in the service sector, compared to Turks. This may explain the positive effects on all wages for the presence of Moroccans (even though big-city dummies are included). Moreover, the self-employment rate is higher for Turks than Moroccans. With self-employment as a more viable option for Turks, those who remain as employee are stronger competitors for the Dutch, which might explain their negative effect on native wages. The effect may be reinforced by the image of these groups in the public opinion and particularly for employers. Moroccans suffer from a poorer image than Turks which may lead to a situation in which Moroccans are allowed access only to complementary jobs but are not allowed to compete with native Dutch. In other words, they may be refused entry to many jobs while Turks may have similar jobs as natives and influence the wages. These arguments as explanations for the estimated reduced form effects cannot be verified, however, for lack of data.

Immigrants from Surinam and the Dutch Antilles are supposed to be closer substitutes for native Dutch workers because they often speak the Dutch language and (have) shared, to some extent, a common history with Dutch people. That means we may expect that this immigrant group would have an adverse effect on the wages of natives. However, it is the other way around: Surinamese have a relatively large positive impact on the wages of high skilled natives (.12) and of native males (.075) when the gender disaggregation is applied. Finally, the percentage of Antilleans has a positive effect on the wages of medium skilled (.054) and native women (.07) when native labour force is divided into gender categories. Their high concentration in prosperous Amsterdam cannot explain this effect, as we control for it.

Table 4.2. Wage elasticities LSO 1997 data, The Netherlands: natives.

With respect to share of	Change in the wage of									
	Low skilled Dutch		Med-skilled Dutch		High-skilled Dutch		Dutch women		Dutch men	
	Elastic.	t	Elastic.	t	Elastic	t	Elastic.	t	Elastic.	t
Western	<b>-0.042</b>	-2.76	-0.008	-1.18	0.001	0.14	0.001	0.11	<b>-0.013</b>	-2.05
Turks	<b>-0.025</b>	-4.18	<b>-0.018</b>	-5.99	-0.009	-1.39	<b>-0.015</b>	-3.83	<b>-0.021</b>	-6.52
Moroccans	0.018	1.64	<b>0.012</b>	2.27	0.009	1.10	0.012	1.77	<b>0.014</b>	2.56
Surinamese	0.006	0.16	-0.002	-0.10	<b>0.120</b>	3.95	-0.029	-1.25	<b>0.075</b>	3.62
Antilleans	0.018	0.44	<b>0.054</b>	2.51	-0.027	-0.79	<b>0.070</b>	2.70	0.001	0.06
Aggregate A										
Western	<b>-0.030</b>	-2.27	0.010*	1.75	<b>0.020</b>	2.25	0.016	1.91	0.007	1.38
Non-Western	-0.007	-0.58	<b>0.017*</b>	3.06	<b>0.028</b>	2.78	<b>0.020</b>	2.61	<b>0.014</b>	2.44
Aggregate B										
All ethnic minorities	<b>-0.036</b>	-2.36	<b>0.031*</b>	4.89	<b>0.058</b>	4.95	<b>0.039</b>	4.13	<b>0.028</b>	4.42

Elasticities for the top panel based on regression reported in Appendix Table A 4.2. t-values relate to underlying coefficients. Regression coefficients, from which the elasticities in Aggregates A and B are obtained, are not presented since the other coefficients included are not changed. \* These elasticities are based on the underlying coefficients of earnings functions estimated by OLS; the elasticities obtained by IV estimations are very similar. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

<sup>10</sup> We could not control for industry however, as it is not available in our data set.

If we pool all immigrants from non-western countries, the effect of these immigrants on the native groups is small and positive, except on low skilled natives. This confirms the wage elasticity of high skilled Dutch workers with respect to ethnic minorities from non-EU countries obtained from GPD data (see Table 4.1). However, the opposite effect of the share of non-EU immigrants on low skilled Dutch workers (in Table 4.1) seems to be contradictory to the results obtained from LSO data. This may be related to the nature of the data used. GPD data do not include the Amsterdam area with many ethnic minorities. Moreover, GPD data have self-reported earnings, while LSO has earnings from company records, with presumably smaller measurement errors in earnings. When all immigrants are aggregated into a single category, the effect of immigrants on low skilled is negative and positive for other categories, a conventional result. Hence, comparing GPD and LSO, the complementarity of non-Western immigrants to high skilled Dutch is confirmed, but the substitutability to low skilled is weakened to statistical insignificance.

Considering the results in Table 4.3, the wage elasticities of ethnic minority groups with respect to minority shares in local labour markets are often not statistically significant. Immigrants from Western countries have a large positive effect on the wages of Eastern-Europeans (.196), Moroccans (.10) and Antilleans (.193). Turks compete with Indonesians (-.066), while the wages of Surinamese are adversely affected by Moroccans (-.139) but positively affected by Antilleans (.162). Surinamese and Turks have a negative own-wage elasticity, (-.064) and (-.31).

We verified the robustness of elasticities in a couple of ways (results are in Appendix Tables). Firstly, effects on each skill category of native Dutch labour are estimated for men and women separately (Table A.4.4). The differences between men and women are minor, and some similarities are striking. Only the effect of Surinamese on Dutch medium skilled men and women differs dramatically.

Table 4.3. Wage elasticities LSO 1997 data, The Netherlands (based on OLS estimations): immigrants.

With respect to share of	Change in the wage of							
	EU		East-European		non-European		Turks	
	Elasticity	t	Elasticity	t	Elasticity	t	Elasticity	T
Western	-0.063	-0.24	<b>0.196</b>	2.65	-0.026	-0.05	-0.042	-0.92
Turks	-0.030	-1.42	-0.046	-1.22	-0.039	-1.42	<b>-0.064</b>	-2.65
Moroccans	0.000	0.00	-0.053	-0.70	0.020	0.40	-0.028	-0.69
Surinamese	-0.060	-1.06	-0.165	-1.65	0.024	0.04	-0.089	-1.17
Antilleans	0.061	0.80	0.119	1.77	0.033	0.67	0.098	1.62
	Moroccans		Surinamese		Indonesians		Antilleans	
	Elasticity	t	Elasticity	t	Elasticity	t	Elasticity	t
Western	0.108	1.84	0.068	1.18	0.041	0.94	<b>0.193</b>	2.46
Turks	0.014	0.04	-0.039	-1.35	<b>-0.066</b>	-2.28	-0.005	-0.08
Moroccans	0.011	0.24	<b>-0.139</b>	-2.59	-0.015	-0.03	0.066	0.90
Surinamese	0.029	0.39	<b>-0.310</b>	-2.60	0.111	1.42	-0.077	0.56
Antilleans	-0.013	-0.21	<b>0.162</b>	2.80	-0.020	-0.41	-0.095	-1.07

Wage elasticities are calculated using the estimated coefficients and their mean (elasticity = coefficient x mean). Coefficients are obtained by the estimation of earnings functions for all sub-samples separately using OLS. Testing indicates that IV estimates are not superior. t are t-values of the estimated coefficients. Earnings functions include also individual socio-economic characteristics based on earnings functions in Table A.4.6. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

Alternatively, the share of foreign-born people (first-generation<sup>11</sup>) in place of ethnic minority shares (including second and third generations and mixed people) is included in regressions. The wage elasticities are very similar to those reported in Table 4.2. Additionally, we define COROP-regions as local labour markets in place of municipalities. The effect of alternative demarcations of the labour market is quite modest. However, differentiation by gender is more sensitive to the labour market demarcation.

In conclusion, we note that the effect of ethnic minorities on the wages of native Dutch workers is very small, with wage elasticities up to .12. However, the effect on the wages of ethnic minorities is relatively large (up to .31), suggesting that both substitution and complementarity among ethnic minorities is stronger than between Dutch and ethnic minorities. This outcome confirms research done in the US (Borjas 1999).

## 5 United Kingdom<sup>12</sup>

### 5.1 Immigration history

Unlike other West European countries, the United Kingdom has directly recruited only a small minority of immigrants. Immigration policies have been designed to restrict immigration flows from former British colonies and dominions, although they have not always been successful in reaching their objectives. Immigration from Caribbean countries and South Asia has increased considerably. Later immigration of non-White people has continued in the form of family reunification. Additionally, a large number of professional workers, who typically did not settle permanently, have been allowed entry, and the immigration of low skilled workers from Southern Europe increased after free mobility of persons within the European Community was allowed (Wheatley Price 2001). In 1991 the total stock of non-British people numbered nearly 4 million which made up 7.4% of the UK population. Nearly 3 million of them belong to an ethnic minority (5.5 % of the total population) of whom the majority was born outside the UK (Shields and Wheatley Price 1999).

Although Irish immigrants have formed the largest non-British group in the UK (Wheatley Price 2001), both immigration policy and research have been concerned in particular with non-White immigrants and their descendants. This cannot be fully explained from their disadvantaged labour market position. Chinese and Indian people, for example, do very well but they nonetheless get attention. Hatton and Wheatley Price (1998) state that UK immigration policies have been driven by political concerns about domestic racial relations, rather than economic considerations.

Previous research on immigrants in the UK has focussed mainly on the explanation of the disadvantaged position in earnings and (un-)employment prospects.<sup>13</sup> Blackaby et al. (1997) conclude that UK born non-White ethnic minorities are not doing badly. Blackaby et al. (1999) conclude that the high unemployment rate among Pakistani relative to Indians is due

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<sup>11</sup> First-generation immigrants can be identified only in the population statistics, not in LSO 1997 data.

<sup>12</sup> Comments from Richard Berkhout, Stephen Drinkwater, Stephen Wheatly Price and participants in the Monday afternoon seminar at the Institute for Social and Economic Research, University of Essex, are gratefully acknowledged.

<sup>13</sup> Hatton and Wheatley Price (1998) give a detailed survey of immigration policy and previous studies.

to less favourable characteristics. Wheatley Price (2001) finds that the low initial employment levels for recent male immigrants increase rapidly for White immigrants while the employment rate of non-White immigrants never attains the employment level of native born men; Hatton and Wheatley Price (1998) confirm this.

Bell (1997) finds a relatively disadvantaged earnings profile for blacks, which is reduced as duration of stay in UK increases. Human capital obtained abroad appreciates less than the human capital obtained in the UK although this strongly varies per country. Shields and Wheatley Price (1998) report a low return to schooling obtained in the UK for most immigrant groups, excepting UK born non-Whites and White immigrants provided English is their first language. Shields and Wheatley Price (1999) find, not surprisingly, that fluency in English considerably improves the labour market performance of immigrants.

Clark and Drinkwater (1999) argue that the poor economic performances of ethnic minorities are related to their concentration in certain urban areas. Living in ethnic enclaves adversely affects human capital accumulation like obtaining English proficiency (Shields and Wheatley Price 1999). No research has been conducted to study the impact of immigration on the labour market.

## 5.2 The Data

Four waves of the *Quarterly Labour Force Survey (LFS)*, Spring 1997, Summer 1997, Autumn 1997, and Winter 1998, are pooled for this study because separate waves do not provide sufficient observations. Each respondent is allowed to enter once in the data analysed here. Among all respondents, the population aged 16-64 is used for the descriptive analysis. Only employees are selected for further estimations. People who are self-employed, working on a government training programme and doing unpaid family work, are excluded from the survey. Employees are divided into five main categories: Black, Indian, Pakistani/Bangladeshi and Mixed/Other origins are selected using the definition used in the Census of Population<sup>14</sup> and then the rest of population is defined as White. From here onwards, the sample of Pakistani/Bangladeshi is shortly called Pakistani and the sample of Mixed/Other is called Mixed. The samples of ethnic minority groups cover both British- and foreign-born persons.

On average, the ethnic minority population, especially Pakistani, is younger than the White population. Minorities (except Indian men) are less frequently employed. The unemployment rate among Black and Pakistani is, on average, the highest. The unemployment gap between White and other ethnic groups is considerably larger for men than for women, except Black women. A relatively large share of Indian people is self-employed. The average weekly earnings of the employed labour force vary widely among the five samples. Indian employees earn the highest net wages in a week (about £231, but with a large standard deviation), followed by Mixed (£212), White (£206), Black (£193) and Pakistani (£154). The same ranking can be observed in the number of mean working-hours.. Indian workers possess, on average, the highest skill levels, followed by Mixed, Black, White and Pakistani; almost three-quarters of Pakistani workers are low skilled. Temporary jobs are more popular for ethnic minorities than for Whites. Indian and Pakistani workers are more often employed in

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<sup>14</sup> Ethnic origin is based on the respondents own assessment, rather than birth place of respondents or their parents (ETHNICA in the Labour Force Survey). *Black* is a pool of Caribbean, African and Mixed Black workers. *Indian* covers workers from India. *Pakistani* is a pool of Pakistani and Bangladeshi workers. *Mixed* is a pool of Chinese, Asian (non-mixed), other Non-mixed and other Mixed workers.

the public sector than other ethnic minorities or Whites. A relatively large proportion of Indian and Mixed is non-manual workers and professionals.

Black people live in the West Midlands, Inner and Outer London. Indian people are concentrated mainly in the East Midlands, West Midland and Outer London. Pakistani people are concentrated in Greater Manchester, West York, the West Midlands, Inner and Outer London. People from category Mixed are concentrated around London and the South East. In addition, the differences in employment by industries among the samples are notable: ethnic minorities are concentrated in manufacturing, the wholesale industries, hotels, transport, real estate and health.

### 5.3 Reduced form elasticities

As before, we prefer to choose local labour markets, i.e. 66 counties, rather than industries, as the unit of observation, assuming labour is less mobile across regions than across industries. Ethnic minorities are more concentrated in certain regions than in certain industries. Indeed, our experimentations with earnings effects from immigrant shares in industries indicate that labour market competition between ethnic minorities and White labour, if at all present, may occur within counties rather than within industries. The entire labour force is disaggregated alternatively into 6 and 7 categories of workers, which are approximated by their education level and ethnic background. The sample of White workers, is assumed to be equivalent to native British since White immigrants and native British people have similar characteristics. White employees are divided into three skill levels using their highest education level: low, medium and high skilled workers.

In the estimated earnings, explanatory variables of a Mincer type earnings function are included. Experience is defined as age minus the age when the full-time education is presumably finished. Tenure is the years that the individual has worked for his or her current employer. Working hours refers to total actual hours worked in the main and second job. We include dummies for industries and regions where ethnic minority workers are concentrated and for working in a firm with less than 20 employees. Further, dummy variables are used to control for differences in gender, marital status, type of job, having health problems, union membership, commuting and public/private sector. Additionally, for the earnings equations of ethnic minorities, we construct dummy variables to capture cohort effects, distinguishing five periods when immigrants arrived: between 1940-1960, 1961-1970, 1971-1980, 1981-1990 and after 1990. Dummies are also included for the separate quarterly waves of the survey. The results of the estimated earning functions with robust standard errors are presented in Table A5.1 and Table A5.2 in Appendix. They show conventional results, and also indicate that years since migration (i.e. cohort effects) have a slight tendency to improve earnings, although the effect is statistically very weak.

Table 5.1 shows the estimated wage elasticities for White workers with respect to the percentage of ethnic minority workers in the counties.<sup>15</sup> The results are rather unambiguous, with most coefficients statistically significant (15 out of 24). The estimations show that Black and Pakistani workers have in general a negative effect on the wages of Whites from the three skill categories while the percentage Indian and Mixed has a positive effect on the wages of the three skill categories. Blacks are not visibly different in education and other skill indicators and they are substitutes to all native categories.

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<sup>15</sup> Obviously, the potential bias from endogeneity of immigrant shares in local labour markets is here also present, but we have no variables available to attempt IV estimation.

Table 5.1. Wage elasticities for Whites

With respect to share of	Change in the wage of											
	LOW				MEDIUM				HIGH			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t
Black	<b>-0.020</b>	-2.31	<b>-0.026</b>	-2.04	0.015	1.10	<b>-0.054</b>	-4.90	-0.031	-1.75	-0.024	-1.69
Indian	<b>0.014</b>	1.98	0.014	1.54	<b>0.019</b>	2.22	0.000	0.01	0.011	0.66	<b>0.056</b>	4.14
Pakistani	<b>-0.032</b>	-4.88	<b>-0.019</b>	-3.81	<b>-0.026</b>	-3.17	<b>-0.020</b>	-3.64	-0.005	-0.56	<b>-0.016</b>	-2.48
Mixed	<b>0.032</b>	4.24	<b>0.041</b>	3.87	0.017	1.46	<b>0.043</b>	4.56	0.017	1.16	<b>0.029</b>	3.04

t-statistics are on the estimated coefficients in Table A 5.1 in Appendix. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

Pakistani are typically low skilled and low tenured, and they are also substitutes to all native categories. Indians and Mixed are complementary to all native categories. They are quite similar to each other in skill distribution (bi-polar relative to natives) but rather different in regional, occupational and industry concentration. If we pool the subsamples of Blacks and Pakistani (called *BPB*) and the subsamples of Indian and Mixed (called *IM*), the estimations (not reproduced here) show that the wage elasticities of low, medium, and high skilled Whites (not distinguished by gender) with respect to the percentages of *BPB* are -.04, -.03 and -.03 (coefficients are -.016, -.018 and -.015), implying a substitution relationship between *BPB* and White workers. On the other hand, the wage elasticities of low, medium, and high skilled Whites with respect to *IM* are .03, .02 and .04 (the coefficients are .011, .008 and .017), implying a complementarity relationship between *IM* and White workers. All these coefficients are statistically significant. The uniform effect on the native skill groups is remarkable. The outcomes clearly point to a substitution relationship between the low skilled *BPB* and Whites and a complementarity relationship between the high skilled *IM* and Whites.

In Table 5.2, the estimations of earnings functions of ethnic minorities show the labour market competition among ethnic minorities. Indian workers have a significant positive effect on the wages of Pakistani workers. The other coefficients underlying the elasticities are not significant. Apparently, immigrant shares have no effect on other immigrants' wages. Perhaps this is related to their regional segregation: they have different concentration areas.

Table 5.2. Wage elasticities for ethnic minorities

With respect to quantity of	Change in the wage of							
	BLACK		INDIAN		PAKISTANI		MIXED	
	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
Percentage Black	-0.213	-0.74	-0.201	-0.64	0.077	0.30	0.162	0.40
Percentage Indian	0.090	0.45	-0.174	-0.38	<b>0.875</b>	2.66	0.366	0.88
Percentage Pakistani	0.029	0.29	-0.141	-0.67	0.488	1.16	0.352	0.87
Percentage Mixed	-0.029	-0.11	0.041	0.09			0.619	0.63

t-statistics are on the estimated coefficients in Table A5.2 in Appendix. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.



From these estimates we conclude that in the UK the share of Black and Pakistani has a significant negative effect on the wages of Whites while the share of Indian and Mixed has a positive effect on the wages of Whites. The cross-elasticities among different ethnic minority groups show that Black workers are substitutes for the Mixed. Indian workers are substitute for Pakistani and they seem to be complementary to Mixed workers.

## 6 Norway

### 6.1 Immigration history

Until 1970, immigrants in Norway are mainly from other Nordic countries and industrialised countries like the UK and the US, and overwhelmingly employed in the growing oil and gas sector. Additionally, immigrants came from developing countries, especially Pakistan, India, Turkey and Morocco, finding employment in unskilled manual jobs. The Norwegian government passed a restrictive immigration law in 1974, although still admitting immigrants with specific skills. The number of immigrants has increased due to family (re-)unification and inflow of asylum seekers, initially from Chile and Vietnam, and since 1975 from Iran, Sri Lanka, Bosnia-Herzegovina and Somalia.

In 2000, 282 500 immigrants live in Norway which is 6.3 percent of the total population.<sup>16</sup> About 84 per cent of the immigrant population are counted as the first generation. The share of immigration from Nordic countries has decreased over time, from 44.8% in 1970 to 18.9% in 2000. The share of immigrants from Western Europe and North-America/Oceania decreased from 25.7% in 1970 to 11.7% in 2000, and from 13.7% to 3.4% respectively. On the other hand, in the same period, the share of immigrants from developing countries and from Eastern Europe increased from 6% to 49.7%, and from 9.8% to 16.3%.

Existing studies indicate that especially immigrants from non-OECD countries have a disadvantaged labour market position (Larsen et al. (2000); Hayfron (1998); Longva and Raaum (2000)). Earnings of immigrants from OECD-countries are comparable to the earnings of natives at the time of entry and remain at the same level (Longva and Raaum, (2000); Barth et al. (2001)) report that immigrant earnings are more sensitive to local unemployment than the earnings of natives. No research has been conducted on the impact of immigrants on the labour market outcomes of native Norwegian labour workers.

### 6.2 Data

The data used are from two cross-sections from the Norwegian individual administrative data, KIRUT, which is a 10 percent sample of the Norwegian population between 16 and 66 years old. The first wave is the starting point of this data collection, in 1989 and the second cross-section is the latest measurement point, 1996. Each wave contains a random sample of Norwegian and all non-Norwegian citizens in the KIRUT database.

We use weekly earnings derived from the yearly income of wage earners, i.e. yearly income is divided by 52. Yearly income covers all kind of income sources, like sickness payment, unemployment benefit, own-business etc. It is hard to identify the exact wage income.

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<sup>16</sup> According to the Norwegian definition, the immigrant population consists of first and second-generation immigrants. *First generation immigrants* refer to foreign-born persons with two foreign-born parents, and *second generation immigrants* are Norwegian-born persons with two foreign-born parents.

Working hours are given as a categorical variable, covering three intervals 1) 4 to 19 hours, 2) 20 to 29 hours and 3) 30 hours and more.

Relative to Norwegians, one observes a low average age and lower income level of workers from Eastern Europe and the rest of the world, and a slightly higher age and higher income level of workers from Nordic countries and EU countries. Immigrants from Nordic countries are the most similar to Norwegians. They are more likely employed in immigrant sectors like Hotels, Education and Health. Female immigrants from Nordic countries are higher educated than Norwegians. Immigrants from EU-countries have a higher education level (the percentage of high-educated people is double that in the Norwegian sample) and they are more frequently employed in Financial Services, Education, Health, Hotels and Mining. Immigrants from Eastern European countries differ strongly by gender category. A vast majority of Eastern European men is low educated (70%) while Eastern European women are concentrated at the top and bottom of education levels. In contrast, women from the rest of the world are lower educated than men from the same category. A relatively large percentage of workers from Eastern Europe and the rest of the world is employed in part-time jobs, and in the public sector. A high concentration of immigrants from the last category, both women and men, in the Hotel sector is also notable.

A major portion of immigrants is located in Southern Norway, especially concentrated in Oslo. Half of the immigrants from the category *World* and a quarter of other immigrant groups are residing in Oslo. The shares of immigrants in the counties are generally quite low, no doubt straining the estimation procedure.

### 6.3 Reduced form elasticities

Having cross-section data from 1989 and 1996 allows us to estimate wage elasticities in these two years. Percentages of immigrants in 19 counties<sup>17</sup> are calculated using KIRUT data. Experience is defined as age minus schooling years minus 6. Years of education are given by 6 through 20 years, for which 15 education dummies are defined. Additionally, dummies are constructed to control for marital status and for 12 industrial sectors and a dummy for Oslo where immigrants are highly concentrated. Low skill is defined as education level up to 10 years, medium skill refers to 11 through 15 years, high skill to 16 through 20 years of education. Within each sample, the earnings equation also includes the dummies for each of the actual years of education.

Earnings functions are estimated separately for the five and six groups of Norwegian workers: three skill categories and two gender categories (5 sub-samples), and alternatively three skill categories by gender (6 sub-samples) to trace the effect of immigration on aggregate skill and gender categories. These earnings functions are also estimated for four groups of immigrant workers (Nordic, EU, Eastern Europe and the rest of the world).<sup>18</sup> The

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<sup>17</sup> Counties are assumed to be local labour markets. Alternatively, we estimated earnings function defining 54 police districts or 422 municipalities as local labour markets. However, the percentages of immigrant groups in smaller geographical locations are very low and generate quite unstable estimations. Also we estimated earnings functions including the percentages of immigrant groups in industries which generate less sharp wage elasticities. Therefore, these are not presented here.

<sup>18</sup> All earnings equations are also estimated by IV estimations, instrumenting immigrant shares in 1996 by the immigrant percentages in 1989, to control for a possible self-selectivity of immigrants to move to high income regions. However, the Hausman test for model specification rejects IV estimations, and thus OLS estimations are preferred and consequently, the elasticities presented are based on OLS estimations.

coefficients of the earnings functions, with conventional results, are presented in Appendix Tables A6.1 to A6.4.

In Table 6.1, Panel A presents the wage elasticities with respect to four immigrant groups. Panel B presents the wage elasticities with respect to aggregate immigrant groups.<sup>19</sup> Immigrants from Nordic and EU countries are mostly labour migrants, with labour market characteristics comparable with Norwegians. Furthermore, they are mobile both ways between Norway and their home country. The second group of immigrants (non-Nordic and non-EU) are dominated by early ‘guest’ workers, their family members and political refugees. These groups have a relative low skill level and the probability of re-migration is often low because it would be hard to leave their home country again.

When all immigrants are pooled, the impact of immigrants is positive on the wages of low and medium skilled; the elasticities decrease between 1989 and 1996, i.e. from .07 to .025 for low skilled and from .092 to .02 for medium skilled. These two effects return in the effect for Norwegian males and females, also positive and decreasing, from .092 to .015 for males and from .05 to .024 for females (Panel B, Table 6.1). The positive impact of immigrants from EU countries is a consistent contributor to these results; however, Nordic immigrants, comparable in skill levels, often have a negative effect on natives’ wages. The pooled immigrants seem to have no impact on the high skilled Norwegian workers, neither in 1989 nor in 1996. This results from aggregating many weak and some strong opposing effects. Further decomposition, simultaneously by gender and skill (Table 6.2), shows that low skilled men are not affected by immigration while for medium and high skilled women the effect is restricted to a positive effect of Nordic women (for medium skilled) and of East European women (for high skilled), both only in 1996. Medium skilled men are substitutes with Nordic immigrants and complements with immigrants from EU and Rest. Many effects are not robust over time. The instability might serve to undermine confidence in the findings. However, the period from 1989 to 1996 has been characterised by a relatively large inflow of political refugees from Eastern European and some other developing countries. Indeed, the elasticities for immigrants from East Europe and Rest of the World mostly increase in absolute magnitude between 1989 and 1996. In 1996, Norwegian wages are affected negatively for low and medium skilled and positively for high skilled. But only two of these effects are statistically significant. Such a pattern is less clear for immigrants from Rest of the World, among whom especially men are lower educated than the men from East Europe.

Table 6.3 displays wage elasticities of immigrant groups (on the basis of the estimated coefficients in Table A6.2 and A 6.4). Only the wage elasticity of Nordic and EU-immigrants appears to be significant at 5% level with respect to the share of immigrants from Nordic and *World* in 1989 (.26 and .76). Since the number of observation for immigrants, in particular for immigrants from Eastern Europe, is very small, it should be no surprise that estimations of immigrant earnings functions produce rather unreliable coefficients. Moreover, most immigrants from Eastern Europe and ‘World’ came quite recently to Norway and they are extremely concentrated in a couple of industries and regions. Still, as in other countries, the absolute magnitude of elasticities for immigrant wages on average is larger than for native wages.

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<sup>19</sup> These elasticities are obtained by separate estimations of earnings functions including two immigrant groups and in another case all immigrants.

Table 6.1. Wage elasticities of Norwegian workers by skill level and gender, KIRUT

PANEL A					PANEL B				
With respect to share of	CHANGE IN THE WAGE OF				With respect to share of	CHANGE IN THE WAGE OF			
	1989		1996			1989		1996	
	Elast.	t-stat	Elast.	t-stat		Elast.	t-stat	Elast.	t-stat
Low skilled					Low skilled				
Nordic	<b>-0.050</b>	-2.45	0.047	1.92	Nordic/EU	0.022	1.09	<b>0.112</b>	3.70
EU	<b>0.040</b>	3.22	0.048	1.76	EastEuro/World	0.061	1.93	-0.059	-1.16
East-Europe	0.003	0.18	<b>-0.094</b>	-2.68					
World	0.063	1.57	0.029	0.59	All immigrants	<b>0.070</b>	3.48	<b>0.025</b>	5.68
Medium skilled					Medium skilled				
Nordic	-0.010	-0.62	-0.009	-0.48	Nordic/EU	<b>0.057</b>	3.43	0.003	0.13
EU	<b>0.047</b>	4.52	0.003	0.17	EastEuro/World	0.027	0.83	<b>0.094</b>	2.20
East-Europe	0.002	0.14	-0.035	-1.28					
World	0.028	0.72	<b>0.119</b>	3.22	All immigrants	<b>0.092</b>	5.03	<b>0.020</b>	5.75
High skilled					High skilled				
Nordic	<b>-0.110</b>	-2.65	-0.026	-0.64	Nordic/EU	<b>-0.141</b>	-3.47	-0.065	-1.40
EU	-0.048	-1.83	-0.010	-0.25	EastEuro/World	<b>0.183</b>	2.28	-0.019	-0.23
East-Europe	0.055	1.14	<b>0.112</b>	2.35					
World	0.104	1.03	-0.155	-1.59	All immigrants	-0.088	-1.63	-0.013	-0.94
Women					Women				
Nordic	-0.025	-1.22	<b>0.047</b>	2.16	Nordic/EU	0.023	1.12	<b>0.079</b>	2.88
EU	<b>0.027</b>	2.14	0.022	0.91	EastEuro/World	0.032	0.89	-0.062	-1.31
East-Europe	-0.012	-0.72	<b>-0.060</b>	-1.98					
World	0.065	1.46	0.007	0.16	All immigrants	<b>0.050</b>	2.45	<b>0.024</b>	6.44
Men					Men				
Nordic	<b>-0.038</b>	-2.35	-0.018	-1.02	Nordic/EU	<b>0.036</b>	2.27	-0.001	-0.05
EU	<b>0.045</b>	4.84	0.009	0.46	EastEuro/World	<b>0.070</b>	2.55	<b>0.125</b>	3.03
East-Europe	0.017	1.11	-0.023	-0.86					
World	0.044	1.32	<b>0.132</b>	3.57	All immigrants	<b>0.092</b>	5.35	<b>0.015</b>	4.17

t-statistics are on the underlying coefficients reported in the Appendix. *EU* refers to immigrants from EU-countries. *East EUR* refers to immigrants from Eastern Europe and *World* is the rest of the world. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

Table 6.2. Wage elasticities of Norwegian workers by skill and gender, KIRUT

With respect to share of	CHANGE IN THE WAGE OF							
	MEN				WOMEN			
	1989		1996		1989		1996	
	Elasticity	t-stat	Elasticity	t-stat	Elasticity	t-stat	Elasticity	t-stat
Low skilled								
Nordic	-0.013	-0.49	0.057	1.84	<b>-0.074</b>	-2.42	0.039	1.07
EU	0.027	1.70	0.033	0.87	<b>0.052</b>	2.76	0.057	1.47
East-Europe	0.007	0.32	-0.063	-1.38	-0.005	-0.22	<b>-0.125</b>	-2.42
World	0.096	1.76	0.035	0.52	0.015	0.26	0.022	0.31
Medium skilled								
Nordic	-0.029	-1.41	<b>-0.063</b>	-2.71	0.022	0.81	<b>0.072</b>	2.52
EU	<b>0.080</b>	6.61	0.012	0.48	-0.001	-0.03	-0.012	-0.39
East-Europe	0.009	0.36	-0.020	-0.52	-0.009	-0.36	-0.049	-1.25
World	0.000	-0.01	<b>0.180</b>	3.97	0.063	0.90	0.042	0.69
High skilled								
Nordic	<b>-0.208</b>	-3.36	-0.017	-0.31	0.067	1.31	-0.061	-0.93
EU	<b>-0.060</b>	-2.29	-0.083	-1.72	-0.009	-0.18	0.027	0.36
East-Europe	<b>0.131</b>	3.05	0.057	0.99	-0.065	-0.59	<b>0.205</b>	2.39
World	-0.005	-0.04	0.105	0.94	0.164	0.85	-0.330	-1.82

t-statistics are on the estimated coefficients in Appendix tables. *EU* refers to immigrants from EU-countries. *East EUR* refers to immigrants from Eastern Europe and *World* is the rest of the world. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

Table 6.3. Wage elasticities of immigrants, KIRUT

With respect to quantity of	CHANGE IN THE WAGE OF								
	1989		1996		1989		1996		
	Elastic	t-stat	Elastic	t-stat	Elastic	t-stat	Elastic	t-stat	
Nordic				East-Eur					
Nordic	<b>0.261</b>	2.33	0.113	1.86	Nordic	-0.296	-0.47	-0.005	-0.01
EU	-0.025	-0.30	-0.056	-0.95	EU	0.246	0.57	-0.160	-0.69
East-Europe	0.064	0.66	0.112	1.23	East-Europe	0.843	1.25	-0.084	-0.29
World	0.303	0.88	0.093	0.61	World	-1.295	-0.63	1.021	1.56
EU				World					
Nordic	<b>0.262</b>	2.06	0.089	1.19	Nordic	0.160	0.79	0.199	1.22
EU	-0.037	-0.30	0.125	1.68	EU	-0.293	-1.76	-0.253	-1.05
East-Europe	0.018	0.14	-0.033	-0.34	East-Europe	-0.215	-0.76	-0.277	-1.15
World	<b>0.763</b>	2.06	-0.039	-0.18	World	0.723	1.13	-0.039	-0.05

Based on Tables A6.2 and A.6.4 Appendix. The elasticities based on the coefficients that are significant at least at 5% level, are given in bold.

## 7 Assessment

Estimation of the wage elasticities in three countries naturally calls for a comparison of results. But we should then not forget the limitations of the data. First, as immigrants could, at best, only be differentiated by ethnic origin, and not by skill, we could only use the average human capital of immigrants in predicting or interpreting wage effects on natives. Heterogeneity within groups may differ between countries. Second, the definitions of an immigrant differ. In Norway, the immigrant or ethnic population covers the foreign-born and those with two parents born abroad, while in the Netherlands and the UK, one foreign-born parent suffices. Thus, the Norwegian immigrant population is more narrowly defined. For the Netherlands, gross wages are available from administrative data while for the UK, net wages are reported by respondents themselves and income in Norway also includes benefits. Thus, Dutch wages are closest to what theory demands; effects for the UK and Norway may be swamped by measurement errors. For Norway, people employed at least 4 hours are identifiable while for the Netherlands and UK, only people working 12 hours and more enter the analyses. If wages are more flexible for small jobs, we may pick up more effects in Norway, although the difference in impact of cut-off levels may be minor. Local labour markets are measured by geographical areas as available in the national data. This is a county for the UK and Norway, and both a COROP-area and municipality for the Netherlands; all are measured as residential area rather than work area, except for the Netherlands, where wages are based on the work area but population statistics are based on the living area. None of these properly measures a labour market area, although the Dutch COROP comes closest, as deliberately designed for economic coherence.

The labour markets of the Netherlands and Norway are highly organised and the bottom of the wage structure is protected by minimum wage legislation and an advanced welfare system. The UK labour market is characterised by a relatively wide range of the wage distribution, and is commonly taken as more flexible than in the other countries. Norway is the youngest immigration country and has a relatively large influx of immigrants from the Nordic countries and Western Europe. The Netherlands has immigrants from its former colonies. Both have guest workers and asylum seekers. The UK has immigrants mainly from (English speaking) Asian, African and Caribbean Common Wealth countries, with only recently large immigration flows from non-English speaking countries, mostly refugees. The UK has not recruited large numbers of ‘guest workers’ in the 1960s.

As Table 7.1 indicates, the most striking general finding is the very small wage effect of immigrants. Effects are estimated with greatest precision in the Netherlands, possibly because the wage data are most reliable. In the UK, with self-reported net wages, none of the coefficients is significant. In the Netherlands, immigrants are substitutes for low skilled and complements for higher skilled, which is in line with dominance of low skilled “guest-workers”. In Norway immigrants come out as complements with lower skilled, which would fit a dominance of higher skilled immigrants from the open Nordic labour market. The results are not in line with the UK having the most flexible wages.

As noted, we cannot identify the underlying parameters of the Altonji-Card model. But with equation (10), we can calculate the implications of the estimates for some parameters if we make assumptions on the others. For example, under reasonable assumptions, the estimates of wage effects by skill level for the Netherlands in Table 7.1 can be shown to imply rather high labour demand elasticities. Conversely, if we fix the demand elasticities, the estimate simply rather high cross-elasticities. The value of such exercises of course depends on the confidence one has in the a priori fixed parameters. The estimates of wage effects just give a joint region for all the implied parameters.

Table 7.1 Impact of “All immigrants” on native wages

	LOW	MEDIUM	HIGH
NL	<b>-.036</b>	<b>.031</b>	<b>.058</b>
Norway, 1996	<b>.025</b>	<b>.020</b>	-.013
Norway, 1989	<b>.070</b>	<b>.092</b>	-.088
UK	-.005	-.014	.018

Bold: Significant at least at 5% level.

Table 7.2 shows that the effects of immigrants on their own wages are much bigger. Whereas elasticities for natives’ wages are (far) below 0.15, effects on immigrants’ own wages easily reach up to 0.5 and higher. But they are also estimated with much less precision. In our detailed estimates for natives’ wages, about half the number of coefficients has *t* values above 1.96, while this holds for about one tenth of the estimates for immigrants’ own wages. Own wage effects mostly have the expected negative sign in the Netherlands, but this does not hold for the UK and certainly not for Norway. But we know that for Norway, it would be most difficult to estimate effects with precision.

Table 7.2. Impact of immigrants on their own wages

	NL	Norway		UK		
		1989	1996			
West-European	-.063	Nordic	<b>.261</b>	.113	Black	-.213
Turkish	<b>-.064</b>	EU	.037	.125	Indian	-.174
Moroccan	.011	East-Eur	.843	-.084	Pakistan	.488
Surinamese	<b>-.310</b>	World	.723	-.039	Mixed	.619
Antillean	-.095					

Bold: Significant at least at 5% level.

Since composition effects in the skill level of immigrants may be important, we have selected some immigrants groups where the skill level can be fairly reliably assessed. As high skilled immigrants, we can identify Western immigrants in the Netherlands, Nordic and EU immigrants in Norway and Blacks in the UK (Blacks are quite close to Whites in education and occupational composition). One might then anticipate these immigrants to be substitutes for high skilled natives, and complements to low skilled natives. As Table 7.3 indicates, this is not the dominant pattern. The situation in Norway comes closest, but the pattern is not supported by high significance levels.

We have made a similar selection for immigrants of whom the skill level is low beyond any doubt. We might then anticipate a negative wage effect for the low skilled and a positive effect for the higher skilled, as we found for the Netherlands with the GPD data (Table 4.1). Again, this is not the picture that convincingly emerges (Table 7.4).

Table 7.3. Impact of high skilled immigrants

	LOW		MEDIUM		HIGH	
	Women	Men	Women	Men	Women	Men
NL						
Western	-.031	<b>-.042</b>	.002	-.011	.008	.000
Norway						
Nordic, 1996	.039	.057	<b>.072</b>	<b>-.063</b>	-.061	-.017
Nordic, 1989	<b>-.074</b>	-.013	.022	-.029	.067	<b>-.208</b>
EU, 1996	.057	.033	-.012	.012	.027	.083
EU, 1989	<b>.052</b>	.027	-.001	<b>.080</b>	-.009	<b>-.060</b>
UK						
Blacks	<b>-.026</b>	<b>-.020</b>	<b>-.054</b>	.015	-.024	-.031

Bold: Significant at least at 5% level.

Table 7.4. Impact of low skilled immigrants

	LOW	MEDIUM	HIGH
NL			
Turks	<b>-.025</b>	<b>-.018</b>	-.009
Moroccans	.018	<b>.012</b>	.009
Norway			
World, 89	.063	.028	.104
World, 96	.029	<b>.119</b>	-.155

Bold: Significant at least at 5% level.

A final comparison can be made for immigrants from former colonies (Table 7.5). These immigrants generally have a good command of the relevant language and have usually been educated in a school system set up by the former rulers. Predictions on labour market impact are still hard to make, however, without considering the skill composition. In the Netherlands, Antilleans have education levels close to the Dutch, whereas the Surinamese lean more towards the lower levels. Antilleans as complements to the medium educated Dutch does make sense in this respect. As expected, Surinamese are complements to the high-educated Dutch. In the UK, Pakistani and Bangladeshi are clearly low skilled, while the Indian population is bi-polar, relative to Whites: both high educated and low educated are more frequent. Low skilled Pakistani as substitutes for low skilled natives is clearly supported. Indian as complements to medium skilled Whites also fits the pattern. But generally, the wage effects are quite weak, just as for immigrants from other sources.



Table 7.5. Impact of immigrants from former colonies

	LOW		MEDIUM		HIGH	
	Women	Men	Women	Men	Women	Men
NL						
Surinamese	-.001	.028	<b>-.067</b>	<b>.068</b>	.083	<b>.145</b>
Antilleans	.042	-.012	<b>.099</b>	.000	.030	-.027
UK						
Indian	.014	<b>.014</b>	.000	<b>.019</b>	<b>.056</b>	.011
Pakistani	<b>-.019</b>	<b>-.032</b>	<b>-.020</b>	<b>-.026</b>	<b>-.016</b>	.005

\* Significant at least at 5% level.

Overall, we are inclined to take our key finding of low wage effects as a very real result. While one may always aim for better data, sharper models, more refined econometrics, we think that the effect of immigrants on native's wages is genuinely small. And in small, almost negligible effects it is hard to detect robust patterns. We also believe that the finding of larger wage effects on immigrants themselves hints at a real effect, even though the precision of these estimates is even less than for natives. So, we conclude that a more extensive search for immigration effects on natives' wages will not pay off, while a more extensive search on own wage effects is a worthwhile target for further work.

Still, we should point out that our results contrast with two studies for the German labour market. De New and Zimmermann (1994) find a very large adverse effect of foreign labour on the wages of German workers, comparing native wages and immigrant concentration in industries rather than regions between 1984 and 1989 in Germany. They estimate a wage elasticity of  $-4.1$ . Hatzius (1994) estimates even larger effects. Similar to our approach, he correlates changes in natives' wages with immigrant percentages across regional labour markets between 1984 and 1991. However, Pischke and Velling (1997) find no indication that immigration has an impact on wages. The effects on wages we find for three European countries are small compared to those usually estimated for the United States (Friedberg and Hunt, 1995; Borjas, 1999). This would fit in with the generally held opinion that in Europe, wages are more rigid than in the US. However, the accompanying hypothesis that in Europe immigration would noticeably affect unemployment does not meet with unambiguous support (Winkelmann and Zimmermann, 1993; Hatzius, 1994; Pischke and Velling, 1997). Finally, we note that our results of larger wage effects on immigrants than on natives also echoes American findings. So, while our results may not be very precise in quantitative terms, they seem to be quite reliable in terms of orders of magnitude<sup>20</sup>

<sup>20</sup> Recently, Borjas (2002) estimated wage effects by focussing on immigrant shares in education-experience cells. This circumvents the problem of defining labour markets and the problem of endogenous immigrant shares. He reports a wage elasticity of about 0.4, much bigger than usually found. We are unable to replicate Borjas' analysis as the data are simply not available.

## APPENDIX: BASIC WAGE REGRESSIONS

### Appendix to chapter 4 the Netherlands

Table A4.1. Estimates of logarithmic weekly wages for low, medium and high skilled native Dutch workers, Netherlands, GPD 1998

	Low skilled		Medium skilled		High skilled	
	Coeff.	t-stat	Coeff	t-stat	Coeff.	t-stat
Constant	5.244	37.00	5.396	48.36	5.305	56.67
Age	0.008	1.88	0.004	1.66	0.012	4.83
Tenure	0.007	5.66	0.007	6.80	0.005	4.32
Working hours	0.014	7.78	0.016	11.36	0.012	10.04
Experience	0.022	4.36	0.016	3.98	0.022	6.61
Experience Squared	-0.001	6.39	-0.003	3.69	-0.001	7.41
Single	0.015	0.50	-0.042	2.28	-0.036	1.86
Female	-0.238	7.01	-0.166	7.88	-0.171	9.74
Full-time	0.151	2.80	0.230	4.60	0.344	5.92
Irregular	-0.327	4.25	-0.034	0.66	-0.113	1.97
Part-time	-0.122	1.89	-0.054	1.04	0.086	1.49
Unskilled worker	-0.056	0.72	-0.126	0.80	-0.280	1.87
Skilled worker	0.043	0.69	-0.027	0.44	0.036	0.42
Low employee	0.006	0.09	-0.124	1.63	-0.374	3.52
Medium employee	0.143	2.34	0.647	1.09	0.038	0.89
High employee	0.315	4.21	0.237	3.86	0.186	4.42
Low official	0.021	0.30	0.080	1.02	-0.130	1.55
Medium official	0.164	2.55	0.109	1.73	0.089	2.12
High official	0.217	1.73	0.351	4.53	0.209	4.74
Starting entrepreneur	0.443	1.55	-0.122	0.87	-0.101	0.60
Retail trade	0.038	0.34	0.097	1.14	0.069	0.32
Manager/owner firm	0.308	2.41	0.320	3.88	0.233	2.85
Manager employee	0.666	5.84	0.427	3.39	0.342	6.42
Student	0.010	0.09	-0.338	1.99	-0.579	4.37
Private sector	-0.011	0.35	0.024	1.18	0.057	2.73
Large city (>100 000)	0.032	1.19	0.008	0.42	0.004	0.22
Small city (<20 000)	-0.002	0.06	-0.008	0.40	0.009	0.44
Percentage of EU	0.007	0.65	-0.000	0.02	-0.009	1.37
Percentage of Non-EU	-0.004	2.26	-0.001	0.50	0.002	2.01
R <sup>2</sup>	0.45		0.51		0.47	
N	1682		2809		3424	

Table A.4.2. Log weekly earnings, IV Estimations, Dutch, LSO data 1997

	low		med		high		women		men	
	coeff.	t	coeff.	t	coeff.	t	coeff.	t	coeff.	t
Perc Western	-0.005	-2.76	-0.001	-1.18	0.000	0.14	0.000	0.11	-0.001	-2.05
Perc Turks	-0.011	-4.18	-0.008	-5.99	-0.003	-1.39	-0.007	-3.83	-0.009	-6.52
Perc Moroccans	0.010	1.64	0.006	2.27	0.004	1.10	0.006	1.77	0.007	2.56
Perc Surinamese	0.003	0.16	-0.001	-0.10	0.041	3.95	-0.012	-1.25	0.030	3.62
Perc Antilleans	0.029	0.44	0.080	2.51	-0.034	-0.79	0.104	2.70	0.002	0.06
Edu2	0.106	11.53					0.024	1.69	0.069	6.83
Edu3							0.028	2.05	0.090	12.62
Edu4			0.051	6.20			0.091	5.72	0.185	15.19
Edu5			0.072	15.96			0.135	10.29	0.155	21.98
Edu6							0.234	15.68	0.318	35.80
Edu7					0.1587	23.6	0.381	21.48	0.485	44.44
Experience	0.066	37.61	0.050	58.13	0.040	29.97	0.049	46.20	0.050	60.69
Exper. sq.	-0.001	-32.49	-0.001	-49.57	-0.001	-17.93	-0.001	-38.21	-0.001	-47.31
Hours	0.040	46.54	0.041	93.79	0.049	80.58	0.042	103.11	0.045	76.16
Tenure	0.001	14.90	0.001	38.41	0.001	19.52	0.001	31.18	0.000	25.78
Full-time	0.826	23.48	0.830	45.08	1.037	30.87	0.805	43.25	0.879	37.78
Part-time	0.835	25.54	0.867	51.78	1.118	34.42	0.891	51.22	0.891	40.31
Child0-5	0.019	1.34	0.032	6.06	0.044	6.05	0.042	5.43	0.014	2.91
Child0-5 +	0.030	1.63	0.036	5.57	0.076	8.76	0.044	4.61	0.033	5.75
Child6-11	-0.022	-1.70	-0.036	-6.61	0.004	0.54	-0.057	-6.74	-0.012	-2.48
Child6-11 +	-0.070	-3.63	-0.044	-6.03	0.012	1.30	-0.101	-8.03	-0.010	-1.80
Child12-17	-0.125	-10.53	-0.062	-11.20	-0.023	-2.79	-0.113	-13.51	-0.044	-8.92
Child12-17+	-0.146	-8.70	-0.067	-9.19	-0.024	-2.50	-0.131	-11.80	-0.048	-7.48
Married	0.048	4.78	0.049	11.25	0.087	14.59	0.037	7.04	0.070	15.97
Public sect.	0.022	1.84	0.030	6.46	-0.021	-4.01	0.074	14.29	-0.031	-7.16
Occup. Level2	0.080	6.89	0.074	8.63	-0.019	-0.36	0.046	4.10	0.076	8.66
Occup. Level3	0.155	12.06	0.168	19.67	0.099	1.96	0.182	15.71	0.137	15.83
Occup. Level4	0.325	13.81	0.321	31.87	0.192	3.82	0.270	20.27	0.285	29.11
Occup. Level5	0.321	7.55	0.378	25.03	0.276	5.44	0.341	21.15	0.366	32.26
Amsterdam	0.042	0.38	0.003	0.05	-0.266	-3.86	0.053	0.84	-0.172	-3.06
Rotterdam	0.067	1.24	0.004	0.16	-0.183	-5.71	-0.007	-0.26	-0.080	-3.14
The Hague	0.057	0.61	-0.004	-0.08	-0.208	-3.49	0.086	1.59	-0.147	-3.06
Utrecht	0.007	0.132	0.054	2.01	-0.027	-0.75	0.035	1.09	0.014	0.51
Female	-0.123	-10.26	-0.086	-16.09	-0.063	-10.28				
Constant	3.264	74.28	3.503	156.34	3.351	56.46	3.360	134.24	3.225	117
N	16,077		72,818		31,397		46,948		73,344	
R-squared	0.73		0.72		0.75		0.69		0.72	

Table A4.3. Log weekly earnings, OLS-estimations, Ethnic minorities, LSO data 1997

	EU		East-European		Non-European		Turks		Moroccans		Surinamese		Indonesians		Antilleans	
	coeff.	t	coeff.	t	coeff.	t	coeff.	t	coeff.	t	coeff.	t	coeff.	t	coeff.	T
Percentage Western	-0.001	-0.24	0.021	2.65	-0.003	-0.52	-0.005	-0.92	0.011	1.84	0.007	1.18	0.004	0.94	0.019	2.46
Percentage Turks	-0.012	-1.42	-0.018	-1.22	-0.014	-1.42	-0.021	-2.65	0.006	0.41	-0.012	-1.35	-0.023	-2.28	-0.002	-0.08
Percentage Moroccans	0.000	0.00	-0.023	-0.70	0.008	0.40	-0.013	-0.69	0.004	0.24	-0.044	-2.59	-0.001	-0.03	0.024	0.90
Percentage Caribbean	-0.020	-1.06	-0.053	-1.65	0.001	0.04	-0.035	-1.17	0.010	0.39	-0.062	-2.60	0.033	1.42	-0.019	-0.56
Percentage Antilleans	0.080	1.80	0.151	1.77	0.038	0.67	0.140	1.62	-0.017	-0.21	0.150	2.80	-0.024	-0.41	-0.095	-1.07
Edu2	0.032	0.59	0.056	0.54	0.076	1.12	0.054	0.92	-0.186	-2.18	0.014	0.28	0.069	0.95	0.266	1.95
Edu3	0.141	2.58	0.068	0.64	0.228	3.30	0.035	0.67	-0.054	-0.75	0.013	0.28	0.131	1.72	0.166	1.55
Edu4	0.259	4.40	0.172	1.27	0.164	2.41	0.201	2.34	-0.086	-1.07	0.071	0.80	0.107	1.15	0.117	0.69
Edu5	0.142	2.85	0.064	0.64	0.272	4.62	0.124	2.13	0.093	1.45	0.119	2.59	0.115	1.56	0.361	3.44
Edu6	0.294	4.82	0.138	1.11	0.361	4.99	0.222	2.41	0.019	0.19	0.200	3.25	0.312	3.68	0.505	3.74
Edu7	0.463	6.60	0.082	0.55	0.537	6.20	0.377	3.41	-0.029	-0.23	0.385	4.39	0.450	4.22	0.489	2.23
Experience	0.057	9.55	0.027	2.40	0.049	6.21	0.036	4.01	0.030	3.32	0.039	5.91	0.046	4.32	0.051	4.75
Exper. sq.	-0.001	-7.98	0.000	-1.53	-0.001	-4.67	-0.001	-3.99	-0.001	-3.41	-0.001	-4.76	-0.001	-3.57	-0.001	-4.06
Hours	0.046	16.59	0.042	10.26	0.042	14.61	0.042	12.11	0.042	9.82	0.050	17.56	0.049	14.96	0.049	10.06
Tenure	0.001	5.25	0.001	4.08	0.001	5.76	0.001	7.05	0.001	5.55	0.001	7.96	0.001	5.71	0.001	4.05
Full-time	0.846	8.14	0.603	4.19	0.862	8.84	0.799	7.07	0.942	7.65	0.522	5.74	0.772	6.39	0.698	4.39
Part-time	0.931	9.55	0.708	4.85	0.869	9.85	0.867	7.98	1.044	8.66	0.747	8.57	0.887	7.31	0.954	5.78
Child0-5	0.022	0.59	0.087	1.28	0.016	0.39	0.012	0.31	0.031	0.62	0.047	1.41	0.043	0.95	0.067	0.95
Child0-5 +	0.127	2.52	0.048	0.41	0.152	2.91	-0.053	-0.82	-0.039	-0.67	0.121	2.13	0.077	0.71	0.152	1.81
Child6-11	-0.053	-1.45	-0.015	-0.22	-0.057	-1.39	0.008	0.19	-0.047	-0.75	-0.004	-0.12	0.030	0.75	0.066	1.22
Child6-11 +	-0.023	-0.35	-0.005	-0.07	0.042	0.85	-0.094	-1.84	-0.048	-0.59	0.041	1.02	-0.020	-0.37	0.018	0.19
Child12-17	-0.061	-1.54	-0.047	-0.76	-0.097	-1.84	-0.065	-1.19	-0.104	-1.61	-0.015	-0.46	-0.031	-0.77	-0.010	-0.15
Child12-17 +	-0.064	-1.17	-0.055	-0.63	-0.098	-1.77	-0.123	-2.02	-0.112	-1.17	-0.079	-2.03	-0.070	-1.46	0.044	0.50
Married	0.060	2.27	0.054	1.03	0.025	0.73	0.135	2.35	0.140	2.60	0.043	1.61	0.050	1.59	0.003	0.07
Public sect.	-0.017	-0.56	0.048	0.83	0.078	2.20	0.057	1.20	0.148	2.36	0.054	1.94	-0.003	-0.11	-0.027	-0.48
Occup. Level2	0.038	0.83	0.104	1.38	-0.110	-2.15	0.012	0.26	0.050	0.99	0.072	1.60	-0.055	-0.76	0.149	1.66
Occup. Level3	0.145	3.17	0.254	3.21	-0.028	-0.55	0.076	1.45	0.102	1.51	0.097	1.93	0.053	0.76	0.161	1.76
Occup. Level4	0.303	5.18	0.512	4.53	0.184	2.72	0.165	1.91	0.391	3.13	0.256	4.02	0.235	2.90	0.283	2.31
Occup. Level5	0.338	5.10	0.762	4.64	0.137	1.48	0.229	1.79	0.323	2.83	0.376	4.63	0.345	3.28	0.453	2.73
Amsterdam	0.184	1.11	0.496	1.63	0.049	0.28	0.160	0.61	-0.217	-0.93	0.699	3.43	-0.077	-0.39	0.014	0.04
Rotterdam	0.126	1.05	0.341	1.68	-0.032	-0.26	0.209	1.23	-0.152	-0.90	0.423	3.00	0.077	0.54	0.205	0.85
The Hague	0.226	1.57	0.404	1.50	0.086	0.61	0.261	1.18	-0.154	-0.79	0.570	3.38	-0.083	-0.51	0.125	0.47
Utrecht	0.169	1.58	0.201	0.75	-0.017	-0.11	0.177	1.16	-0.207	-1.34	0.446	3.35	0.079	0.56	0.007	0.03
Female	-0.092	-2.98	-0.172	-3.05	-0.035	-0.95	-0.112	-2.35	-0.117	-1.85	-0.095	-2.95	-0.041	-1.07	-0.169	-2.67
Constant	3.1508	21.3	3.559	15.72	3.351	23.70	3.609	19.32	3.398	16.31	3.462	21.68	3.108	14.28	2.856	10.98
N	2067		575		1552		1105		682		1585		1282		528	
R-sq.	0.70		0.69		0.69		0.67		0.73		0.7		0.73		0.72	

Table A.4.4. Wage elasticities by skill and gender, with respect to ethnic minorities (municipality), based on IV-estimations, LSO data 1997

With respect to share of	Change in the wage of											
	Low skilled Dutch				Med-skilled Dutch				High-skilled Dutch			
	Men		Women		men		women		men		women	
	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t
Western	-0.042	-2.03	-0.031	-1.39	-0.011	-1.44	0.002	0.20	0.000	-0.02	0.008	0.50
Turks	-0.023	-3.01	-0.024	-2.47	-0.019	-5.15	-0.013	-2.77	-0.013	-1.67	-0.004	-0.41
Moroccans	0.021	1.56	0.016	0.86	0.016	2.37	0.012	1.43	0.009	0.87	0.012	0.90
Surinamese	0.028	0.49	-0.001	-0.02	0.068	2.74	-0.067	-2.28	0.145	3.62	0.083	1.89
Antilleans	-0.012	-0.22	0.042	0.69	0.000	-0.01	0.099	3.02	-0.022	-0.49	0.030	-0.58

Table A.4.5. Wage elasticities by skill, with respect to immigrants first generation only (municipality), based on IV-estimations, LSO data 1997.

With respect to share of	Change in the wage of									
	Low skilled Dutch		Med-skilled Dutch		High-skilled Dutch		Dutch women		Dutch men	
	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t
EU	-0.015	-2.01	0.000	0.06	0.001	0.08	-0.003	-0.73	0.002	0.43
Turks	-0.025	-3.95	-0.015	-5.90	-0.007	-1.14	-0.015	-3.58	-0.016	-6.22
Moroccans	0.018	1.70	0.120	2.43	0.010	1.20	0.015	2.39	0.014	2.69
Surinamese	0.022	0.63	0.014	0.76	0.135	4.00	-0.024	-1.13	0.109	5.37
Antilleans	0.005	0.12	0.052	2.55	-0.036	-1.11	0.041	1.58	0.002	0.09
Indonesian	-0.020	-0.73	-0.020	-1.90	-0.001	-0.07	0.029	2.25	-0.036	-3.53

Table A.4.6 Wage elasticities by skill, with respect to ethnic minorities (COROP), based on IV-estimations unless otherwise indicated, LSO data 1997.

With respect to share of	Change in the wage of									
	Low skilled Dutch		Med-skilled Dutch		High-skilled Dutch		Dutch women		Dutch men	
	Elast.	t	Elast.	t	Elast.	t	Elast.	t	Elast.	t
Western	-0.055	-2.93	-0.002*	-0.54	-0.019	-1.78	0.015	1.42	-0.024	-2.05
Turks	-0.041	-3.83	-0.012*	-3.91	-0.021	-1.90	-0.015	-2.13	-0.042	-6.52
Moroccans	0.026	1.25	0.015*	2.95	0.020	1.24	0.019	1.54	0.010	2.56
Surinamese	-0.058	-1.49	0.003*	0.42	0.068	2.10	-0.018	-0.72	-0.010	3.62
Antilleans	0.088	2.07	0.036*	4.32	-0.007	-0.17	0.046	1.59	0.075	0.06
Two pooled ethnic minority groups										
Western	-0.039	-2.13	0.003*	0.75	-0.005	-0.50	0.022	2.07	-0.008	-1.15
Non-Western	0.025	1.46	0.039*	8.03	0.099	8.58	0.041	3.89	0.073	10.26
All ethnic minority groups										
All ethnic minorities	-0.024	-0.96	0.044	4.48	0.070	5.46	0.058	4.13	0.047	5.39

\* these elasticities are based on OLS estimations.

Table A.4.7. Wage elasticities by skill and gender, with respect to ethnic minorities (COROP), based on IV-estimations unless otherwise indicated, LSO data 1997

With respect to share of	Change in the wage of											
	Low skilled Dutch *				Med-skilled Dutch				High-skilled Dutch *			
	men		Women		men		Women		men		women	
	Elastic	t	Elastic	t	Elastic	t	Elastic	t	Elastic	t	Elastic	t
Western	-0.002	-0.14	-0.002	-0.13	-0.020	-2.47	0.021	1.58	0.015	1.75	-0.007	-0.68
Turks	-0.017	-2.14	-0.020	-1.77	-0.036	-5.59	-0.012	-1.43	-0.004	-0.58	-0.014	-1.55
Moroccans	0.030	2.38	0.030	1.37	0.015	1.35	0.015	0.98	0.018	1.59	0.017	1.16
Surinamese	-0.001	-0.03	0.028	1.02	-0.017	-0.84	-0.073	-2.28	0.040	2.43	0.020	1.00
Antilleans	0.021	0.93	0.005	0.14	0.073	3.01	0.095	2.64	0.024	1.18	0.025	1.02

\* these elasticities are based on OLS estimations

Table A.4.8 Wage elasticities by skill, with respect to immigrants first generation only (COROP), based on IV-estimations unless otherwise indicated, LSO data 1997.

With respect to share of	Change in the wage of									
	Low skilled Dutch		Med-skilled Dutch *		High-skilled Dutch *		Dutch women		Dutch men	
	Elastic	t	Elastic	t	Elastic	t	Elastic	t	Elastic	t
EU	-0.028	-2.09	-0.002	-0.64	-0.001	-0.33	-0.001	-0.13	-0.009	-1.83
Turks	-0.044	-4.002	-0.013	-4.29	-0.011	-1.74	-0.017	-2.32	-0.038	-6.29
Moroccans	0.025	1.325	0.013	2.74	0.013	1.46	0.018	1.54	0.020	2.30
Surinamese	-0.045	-0.994	0.001	0.07	0.015	1.01	-0.041	-1.41	0.051	2.40
Antilleans	0.088	2.024	0.025	3.22	0.013	0.89	0.034	1.12	0.036	1.68
Indonesian	-0.029	-0.948	0.019	2.71	0.032	2.93	0.047	2.68	-0.047	-3.51

\* these elasticities are based on OLS estimations

## Appendix to chapter 5: UK

Table A5.1. Estimated log weekly earnings of Whites

	LOW				MED				HIGH			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Experience	0.023	10.59	0.033	15.74	0.027	8.42	0.030	13.74	0.025	9.45	0.032	12.18
Experience sq.	0.000	-11.97	-0.001	-15.77	-0.001	-9.08	-0.001	-14.22	-0.001	-9.82	-0.001	-12.05
Tenure	0.010	10.90	0.007	9.14	0.012	9.19	0.006	8.23	0.012	7.88	0.007	7.49
Working hours	0.025	27.22	0.011	16.78	0.020	18.92	0.009	15.40	0.012	13.71	0.007	10.62
Perc. Black	-0.016	-2.31	-0.017	-2.04	0.012	1.10	-0.034	-4.90	-0.023	-1.75	-0.018	-1.69
Perc. Indian	0.010	1.98	0.009	1.54	0.015	2.22	0.000	0.01	0.008	0.66	0.039	4.14
Perc. Pakist	-0.042	-4.88	-0.023	-3.81	-0.045	-3.17	-0.028	-3.64	-0.009	-0.56	-0.032	-2.48
Perc. Mixed	0.033	4.24	0.032	3.87	0.019	1.46	0.035	4.56	0.016	1.16	0.028	3.04
Single	-0.137	-6.50	-0.186	-11.37	-0.048	-1.77	-0.176	-10.36	-0.017	-0.79	-0.180	-8.83
Married+livtog	0.208	8.89	0.205	9.09	0.134	4.88	0.138	5.29	0.034	1.38	0.057	2.01
Temporary	-0.062	-2.39	-0.065	-2.14	-0.055	-1.70	-0.064	-2.16	-0.057	-2.01	-0.082	-2.18
Manual	-0.219	-17.09	-0.214	-14.96	-0.233	-12.36	-0.189	-14.71	-0.394	-10.11	-0.226	-8.01
Part time	-0.338	-18.66	-0.905	-25.64	-0.350	-14.87	-0.809	-22.3	-0.478	-20.9	-0.763	-13.5
Small scale	-0.132	-10.83	-0.143	-9.79	-0.106	-6.38	-0.110	-8.02	-0.140	-6.17	-0.187	-7.41
Private sector	0.079	4.26	-0.055	-2.37	0.062	2.75	-0.051	-2.38	0.056	2.36	-0.079	-3.44
Union member	0.091	4.16	0.053	2.05	0.079	2.61	0.069	2.95	0.103	3.25	-0.030	-0.88
Health problem	-0.032	-2.23	-0.048	-2.90	-0.040	-1.96	-0.041	-2.50	-0.044	-1.89	-0.037	-1.50
Commute	0.087	7.43	0.082	6.90	0.109	7.01	0.087	7.24	0.112	7.21	0.067	4.33
Manufacture	0.071	3.46	0.037	1.96	0.081	2.76	0.030	1.79	0.065	1.83	-0.009	-0.37
Wholesale	-0.145	-8.19	-0.125	-5.43	-0.141	-5.78	-0.147	-7.24	-0.213	-4.66	-0.111	-3.25
Hotels	-0.140	-4.77	-0.129	-2.57	-0.184	-4.61	-0.195	-4.44	-0.154	-2.08	-0.232	-2.42
Transport	0.017	0.55	0.040	1.83	0.073	1.89	0.029	1.10	0.083	1.60	-0.069	-1.54
Real estate	0.046	2.10	0.015	0.45	0.043	1.41	0.032	1.26	0.096	2.79	0.048	1.81
Pub adm.& def.	0.047	1.99	0.042	1.47	0.004	0.15	-0.013	-0.47	0.002	0.06	0.010	0.33
Education	-0.154	-5.84	-0.110	-2.71	-0.048	-1.51	-0.099	-2.36	-0.005	-0.19	-0.022	-0.85
West Yorksh	0.056	2.19	0.017	0.67	-0.006	-0.16	0.049	1.91	0.019	0.52	0.088	2.33
Central London	0.398	9.31	0.370	9.15	0.400	9.34	0.368	8.01	0.285	6.35	0.338	11.31
Inner London	0.227	5.45	0.244	5.69	0.291	7.47	0.255	6.41	0.222	6.16	0.220	6.04
Outer London	0.159	6.48	0.177	6.49	0.128	3.78	0.185	5.92	0.193	6.10	0.111	3.16
Rest of S-East	0.062	4.58	0.083	5.30	0.061	3.19	0.083	5.45	0.066	2.92	0.114	5.98
West Midland	0.023	0.97	0.035	1.41	-0.033	-0.88	0.049	1.91	0.072	2.38	-0.019	-0.56
Autumn	-0.015	-1.11	-0.014	-0.87	0.002	0.10	-0.044	-2.57	-0.051	-1.82	0.022	0.98
Summer	-0.023	-1.93	-0.023	-1.72	0.005	0.32	-0.014	-1.02	-0.035	-2.16	0.017	1.03
Spring	0.011	0.93	0.035	2.65	0.017	1.02	0.009	0.68	0.043	2.59	-0.015	-0.93
Intercept	3.932	90.55	4.639	105.03	4.018	65.43	4.905	123.64	4.712	86.73	5.139	106.57
N	7685		5461		3705		5596		3161		3554	
R-squared	0.651		0.657		0.627		0.522		0.536		0.427	

Table A5.2. Estimated log weekly earnings of ethnic minorities

	BLACK		INDIAN		PAKISTANI		MIXED	
	Coef.	t	Coef.	t	Coef.	t	Coef.	T
Education	0.030	3.64	0.052	6.56	0.014	1.26	0.027	2.24
Experience	0.025	2.94	0.025	2.89	0.009	0.57	0.027	2.33
Experience squared	0.000	-2.28	0.000	-2.37	0.000	-0.86	-0.001	-2.26
Tenure	0.010	2.88	0.012	2.47	0.015	1.60	0.015	2.44
Working hours	0.017	6.15	0.013	5.62	0.018	3.49	0.015	5.30
Im90+	-0.015	-0.83	0.016	0.56	0.021	0.67	-0.107	-2.37
Im8090	-0.016	-0.75	0.010	0.56	-0.040	-2.00	0.080	2.19
Im7080	-0.059	-1.87	-0.036	-1.24	-0.015	-0.73	-0.045	-1.26
Im6070	0.043	1.49	0.045	1.58	0.035	1.15	0.021	1.00
Im4060	0.097	0.90	0.054	0.26	0.222	1.29	0.230	0.93
Percentage Black	-0.105	-0.74	-0.134	-0.64	0.048	0.30	0.098	0.40
Percentage Indian	0.058	0.45	-0.077	-0.38	0.433	2.66	0.219	0.88
Percentage Pakistani	0.037	0.29	-0.144	-0.67	0.191	1.16	0.228	0.87
Percentage Mixed	-0.022	-0.11	0.033	0.09			0.247	0.63
Manual	-0.114	-2.25	-0.204	-3.73	-0.140	-1.99	0.043	0.65
Female	-0.133	-2.42	-0.192	-2.94	-0.264	-2.42	-0.120	-1.22
Single	0.114	1.36	0.055	0.33	0.657	4.09	0.169	1.14
Married & liv.tog	-0.077	-0.80	0.152	1.88	0.025	0.31	-0.042	-0.49
Temporary	-0.201	-3.50	-0.201	-3.04	-0.400	-4.11	-0.150	-1.92
Part time	-0.439	-5.51	-0.420	-4.77	-0.637	-5.40	-0.644	-5.97
Small scale	-0.088	-1.65	-0.162	-2.16	-0.315	-3.55	-0.137	-1.92
Private sector	0.067	0.85	-0.008	-0.09	-0.226	-1.25	-0.056	-0.52
Union member	0.135	1.84	0.111	1.19	-0.012	-0.08	0.178	1.35
Health problem	-0.074	-1.01	0.065	0.83	0.032	0.27	0.044	0.59
Commute	0.131	2.68	0.111	2.06	0.180	2.39	0.044	0.64
Manufacture	0.065	0.81	0.046	0.44	0.134	0.89	-0.079	-0.70
Wholesale	-0.045	-0.46	-0.216	-2.05	0.004	0.03	-0.402	-3.48
Hotels	-0.026	-0.24	-0.263	-1.97	-0.353	-1.63	-0.206	-0.93
Transport	0.190	2.30	0.069	0.69	0.216	1.17	-0.165	-1.34
Real estate	-0.038	-0.49	0.155	1.77	-0.059	-0.40	0.023	0.20
Public adm.& def.	0.113	1.59	0.022	0.20	0.294	1.64	0.018	0.15
Education	-0.179	-1.56	-0.031	-0.27	0.338	1.96	0.033	0.21
West Yorksh	-0.067	-0.48	0.149	1.44	-0.017	-0.16	-0.072	-0.61
Central London	0.072	0.93	0.295	2.23	0.045	0.31	0.256	2.42
Inner London	0.093	1.42	0.129	1.38	0.096	0.87	0.341	3.38
Outer London	0.124	1.93	0.059	0.83	-0.147	-1.37	0.180	1.73
Rest of S-East	0.047	0.49	0.110	1.37	-0.108	-1.45	0.204	2.24
West Midlands	-0.071	-1.19	-0.047	-0.60	-0.112	-1.02	0.176	1.04
Autumn	-0.011	-0.22	0.002	0.03	-0.099	-1.19	-0.038	-0.48
Summer	0.037	0.70	-0.118	-2.25	-0.121	-1.73	0.037	0.58
Spring	0.049	0.95	0.086	1.41	0.076	1.26	-0.092	-1.43
Intercept	3.924	20.16	3.933	13.97	4.376	13.74	4.006	11.6
N	383		395		175		300	
R-squared	0.686		0.657		0.839		0.690	



## Appendix to chapter 6: Norway

Table A6.1. Estimated log weekly earnings of Norwegian, KIRUT 1996

	LOW				MED				HIGH			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Experience	0.043	6.82	0.045	6.55	0.083	22.75	0.078	18.70	0.061	8.17	0.064	6.05
Experience sq.	-0.001	-6.69	-0.001	-7.31	-0.002	-19.85	-0.001	-16.09	-0.001	-6.43	-0.001	-5.10
Tenure	0.005	2.97	0.009	3.94	0.005	4.16	0.006	3.86	0.002	0.94	-0.001	-0.23
Hours 2029	0.012	0.11	0.239	6.64	0.152	2.05	0.109	3.45	0.159	1.53	0.302	3.51
Hours 30 +	0.381	5.97	0.543	17.54	0.472	12.39	0.428	18.66	0.306	3.62	0.528	7.60
Edu A	-0.103	-1.43	1.253	2.58	0.102	4.47	0.000	0.00	0.131	3.82	0.198	4.06
Edu B	-0.045	-0.61	1.200	2.48	0.178	5.36	0.049	1.84	0.122	4.03	0.293	5.08
Edu C	-0.068	-0.85	1.306	2.70	0.228	7.56	0.001	0.03	0.301	6.32	0.575	6.41
Edu D	0.051	0.68	1.353	2.81	0.223	5.88	0.318	12.01	0.348	4.63	0.183	2.57
Oslo	-0.131	-0.55	-0.009	-0.03	-0.572	-3.44	-0.010	-0.05	-0.142	-0.53	0.747	1.65
Married	0.161	5.01	-0.006	-0.24	0.141	6.28	-0.004	-0.21	0.155	4.42	-0.007	-0.17
Agriculture	-0.158	-1.51	-0.270	-1.33	-0.025	-0.33	-0.140	-0.94	-0.278	-1.13	-0.621	-1.25
Mining	0.341	5.78	0.304	1.59	0.258	4.15	0.516	7.72	0.657	11.11	0.698	7.79
Manufacture	0.108	2.31	0.037	0.71	0.002	0.07	0.093	2.13	0.218	2.49	0.130	0.81
Construction	0.072	1.44	-0.099	-1.11	-0.012	-0.39	-0.049	-0.74	0.028	0.31	-0.086	-0.52
Trade	0.126	2.66	0.007	0.18	-0.007	-0.20	-0.098	-2.49	0.347	4.76	0.035	0.28
Hotel	0.011	0.09	-0.238	-3.01	-0.065	-1.03	-0.101	-1.69	-0.010	-0.09	-0.056	-0.34
Transport	0.123	2.77	0.005	0.08	0.021	0.62	0.115	2.36	0.257	3.37	0.366	3.39
Finance	0.075	1.03	0.082	1.29	0.141	4.36	0.082	2.28	0.202	2.93	0.283	2.96
Education	-0.270	-2.26	-0.078	-1.12	-0.179	-3.66	-0.099	-2.76	-0.086	-1.91	-0.044	-0.97
Health	-0.046	-0.46	0.062	1.33	-0.170	-3.30	0.054	1.94	0.132	2.14	0.013	0.17
Public sector	-0.096	-1.93	-0.010	-0.26	-0.127	-4.13	-0.058	-2.11	0.030	0.64	-0.065	-1.10
Govern. Official	0.125	4.91	0.201	6.79	0.098	5.22	0.110	4.71	0.092	3.26	0.125	2.96
Percentage Nordic	0.040	1.84	0.027	1.07	-0.044	-2.71	0.048	2.52	-0.010	-0.31	-0.037	-0.93
Percentage EU	0.026	0.87	0.044	1.47	0.009	0.48	-0.009	-0.39	-0.052	-1.72	0.018	0.36
Percentage EUR	-0.108	-1.38	-0.217	-2.42	-0.035	-0.52	-0.080	-1.25	0.086	0.99	0.324	2.39
Percentage world	0.028	0.52	0.018	0.31	0.137	3.97	0.028	0.69	0.056	0.94	-0.188	-1.82
Intercept	7.214	64.89	5.664	11.38	6.874	107.67	6.848	120.65	7.423	55.35	7.114	55.50
N		3173		3977		5672		4921		1312		1024
R-squared		0.18		0.20		0.35		0.34		0.35		0.32

Dummy variables Edu A, B, C and D represent the years of schooling within skill levels. The lowest schooling level within each skill category is the reference group. These dummies indicate 7, 8, 9,10 years of schooling for low skilled sample, 12, 13, 14, and 15 years of schooling for medium skilled sample, and 17, 18, 19 and 20 years of schooling for high skilled sample.

Regression equations also include 9 dummies for the number of children aged 0-11 and 12-18 years, but the parameters are not presented.

Table A6.2. Estimated log weekly earnings of immigrants, KIRUT 1996

	NORDIC		EU		EAST-EUR		WORLD	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Experience	0.050	7.92	0.032	3.99	0.050	2.46	0.041	3.17
Experience sq.	-0.001	-7.04	-0.001	-3.26	-0.001	-1.12	-0.001	-3.18
Tenure	0.012	4.54	0.009	3.76	0.043	2.76	0.019	1.92
Gender	-0.235	-6.57	-0.289	-7.72	-0.513	-3.01	-0.257	-3.63
Hours 2029	0.221	3.52	0.425	5.09	0.249	0.93	-0.010	-0.10
Hours 30 +	0.464	8.55	0.645	11.83	0.377	2.28	0.233	3.15
Education	0.062	10.75	0.072	9.94	0.078	2.53	0.026	1.76
Oslo	-0.191	-0.56	0.029	0.07	-2.145	-1.60	0.275	0.30
Married	0.065	1.90	0.157	2.97	0.176	1.07	0.229	2.60
Agriculture	-0.121	-0.62	-0.716	-2.01	-0.781	-2.32	0.232	0.89
Mining	0.337	3.86	0.369	4.53	-0.159	-0.54		
Manufacture	0.095	1.78	0.126	1.58	-0.428	-1.81	0.276	2.03
Construction	0.075	1.06	0.136	1.57	-0.376	-1.76	0.003	0.02
Trade	0.019	0.30	0.075	0.90	-0.203	-0.88	0.128	0.85
Hotel	-0.085	-1.13	-0.129	-1.04	-0.480	-1.91	-0.056	-0.35
Transport	-0.057	-0.80	0.273	2.68	-0.241	-0.79	0.440	3.09
Finance	0.058	0.77	0.065	0.75	0.219	0.82	0.458	2.65
Education	-0.246	-2.66	-0.263	-2.99	-0.083	-0.31	0.192	1.29
Health	-0.021	-0.37	0.015	0.19	0.339	1.32	0.284	1.72
Public sector	-0.103	-1.99	-0.077	-0.97	-0.519	-2.68	0.269	2.04
Govern. Official	0.117	2.11	0.212	4.03	0.603	1.96	0.332	2.81
Percentage Nordic	0.061	1.86	0.049	1.19	-0.003	-0.01	0.093	1.22
Percentage EU	-0.034	-0.95	0.068	1.68	-0.101	-0.69	-0.122	-1.05
Percentage EUR	0.164	1.23	-0.048	-0.34	-0.120	-0.29	-0.326	-1.15
Percentage world	0.046	0.61	-0.018	-0.18	0.511	1.56	-0.011	-0.05
Intercept	6.309	45.03	6.127	36.44	5.971	9.46	6.934	21.84
N	1549		1373		220		760	
R-squared	0.39		0.47		0.61		0.21	

Regression equations also include 9 dummies for the number of children aged 0-11 and 12-18 years, but the parameters are not presented.

Table A6.3. Estimated log weekly earnings of Norwegians, KIRUT 1989

	LOW				MED				HIGH			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Experience	0.035	5.92	0.061	9.35	0.047	10.81	0.030	4.15	0.035	1.89	0.050	2.75
Experience sq.	-0.001	-6.04	-0.001	-9.12	-0.001	-11.27	-0.001	-4.06	-0.001	-1.90	-0.001	-2.62
Tenure	0.004	2.81	0.004	2.38	0.007	5.12	0.007	4.18	0.005	2.09	0.005	1.00
Hours 2029	0.132	1.41	0.226	7.56	0.010	0.11	0.154	4.40	-0.049	-0.70	0.075	0.86
Hours 30 +	0.460	7.98	0.504	19.88	0.331	8.71	0.437	16.12	0.084	1.45	0.295	3.94
Edu A	-0.084	-1.74			0.038	2.30	0.024	1.03	0.035	0.70	-0.015	-0.16
Edu B	-0.031	-0.91	0.074	1.25	0.243	10.38	0.126	4.54	0.130	4.09	0.152	2.34
Edu C			0.068	1.15	0.193	7.84	0.136	3.64	0.225	3.19		
Edu D	0.058	2.58	0.180	3.37	0.188	5.14	0.221	7.49	0.272	4.07	0.140	2.00
Oslo	-0.357	-2.31	0.110	0.70	-0.065	-0.58	-0.155	-0.99	0.093	0.31	-0.213	-0.65
Married	0.177	4.74	-0.030	-1.17	0.133	6.09	0.038	1.51	0.144	3.64	-0.073	-2.01
Agriculture	-0.284	-2.55	-0.460	-2.17	-0.182	-2.42	-0.065	-0.54	0.192	2.53	-1.317	-1.65
Mining	0.325	5.11	0.537	3.67	0.269	4.60	0.481	8.05	0.394	3.98	0.707	7.03
Manufacture	0.079	2.28	-0.016	-0.38	0.054	2.30	0.095	2.13	0.037	0.32	0.444	3.13
Construction	0.024	0.62	0.079	1.26	-0.019	-0.69	0.143	1.79	-0.021	-0.21	0.103	1.00
Trade	0.047	1.26	-0.094	-2.68	0.036	1.24	0.014	0.31	0.200	3.16	0.353	2.34
Hotel	-0.063	-0.63	-0.278	-3.45	0.036	0.72	-0.269	-2.50	-0.161	-2.09		
Transport	0.052	1.45	0.069	1.59	0.072	2.50	0.099	1.82	0.275	3.23	0.727	11.09
Finance	0.042	0.75	0.069	1.44	0.150	5.79	0.126	3.26	0.145	1.79	0.423	5.53
Education	-0.052	-0.86	-0.062	-1.49	-0.192	-3.74	-0.046	-1.10	-0.115	-2.74	0.049	0.70
Health	-0.181	-1.67	0.063	1.88	-0.077	-1.93	0.100	3.10	-0.079	-1.39	0.050	0.48
Public sector	-0.114	-2.80	-0.004	-0.15	-0.077	-3.11	-0.024	-0.78	-0.033	-0.83	0.002	0.03
Govern. Official	0.191	9.01	0.152	6.78	0.082	4.11	0.207	9.44	-0.052	-1.43	0.075	1.76
Percentage Nordic	-0.008	-0.49	-0.047	-2.42	-0.018	-1.41	0.013	0.81	-0.119	-3.36	0.036	1.31
Percentage EU	0.017	1.70	0.031	2.76	0.047	6.61	0.000	-0.03	-0.032	-2.29	-0.005	-0.18
Percentage EUR	0.015	0.32	-0.011	-0.22	0.017	0.36	-0.016	-0.36	0.226	3.05	-0.095	-0.59
Percentage world	0.048	1.76	0.007	0.26	0.000	-0.01	0.025	0.90	-0.002	-0.04	0.054	0.85
Intercept	7.234	77.33	6.681	70.60	7.480	119.76	7.236	91.71	8.352	36.39	7.439	33.52
N	2594		3099		3347		2880		653		439	
R-squared	0.17		0.19		0.19		0.19		0.27		0.34	

Dummy variables Edu A, B, C and D represent the years of schooling within skill levels. The lowest schooling level within each skill category is the reference group. These dummies indicate 7, 8, 9,10 years of schooling for low skilled sample, 12, 13, 14, and 15 years of schooling for medium skilled sample, and 17, 18, 19 and 20 years of schooling for high skilled sample. Regression equations also include 9 dummies for the number of children aged 0-11 and 12-18 years, but the parameters are not presented.

Table A6.4. Estimated log weekly earnings of immigrants, KIRUT 1989

	NORDIC		EU		EAST-EUR		WORLD	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Experience	0.004	0.50	0.005	0.44	-0.044	-1.43	-0.018	-1.14
Experience sq.	0.000	-0.90	0.000	-0.62	0.001	2.13	0.000	-0.26
Tenure	0.008	3.26	0.013	4.19	-0.017	-1.11	0.002	0.31
Gender	-0.262	-7.26	-0.230	-5.38	-0.251	-2.42	-0.217	-3.42
Hours 2029	0.201	2.46	0.490	6.82	-0.063	-0.26	0.028	0.31
Hours 30 +	0.597	8.66	0.742	11.80	0.240	1.52	0.102	1.61
Education	0.059	10.21	0.066	9.68	0.043	2.38	0.037	3.13
Oslo	-0.531	-1.58	-1.008	-2.66	0.289	0.19	-0.299	-0.64
Married	0.025	0.60	0.169	3.18	-0.043	-0.33	0.154	2.13
Agriculture	-0.008	-0.06	-0.254	-2.24	-0.236	-0.77	-0.218	-0.58
Mining	0.408	5.39	0.199	0.73			0.666	4.10
Manufacture	0.088	1.51	0.217	2.06	0.198	0.85	0.112	1.44
Construction	-0.124	-1.39	0.040	0.33			0.037	0.36
Trade	0.022	0.30	0.175	1.69	0.559	2.48	-0.228	-1.93
Hotel	-0.198	-1.97	-0.106	-0.72	0.190	0.56	-0.224	-2.56
Transport	0.118	1.87	0.343	2.81	0.779	3.25	0.139	1.35
Finance	0.270	3.87	0.134	1.17	0.675	2.89	-0.235	-1.83
Education	-0.065	-1.07	-0.054	-0.55	0.229	1.06	0.081	1.07
Health	0.063	1.20	0.180	1.81	0.525	2.25	-0.133	-1.21
Public sector	-0.105	-1.69	0.031	0.32	0.283	1.25	-0.075	-1.07
Govern. Official	0.079	1.87	0.165	3.30	0.420	3.33	0.189	3.01
Percentage Nordic	0.071	2.33	0.076	2.06	-0.076	-0.47	0.041	0.79
Percentage EU	-0.007	-0.30	-0.010	-0.30	0.061	0.57	-0.072	-1.76
Percentage EUR	0.051	0.66	0.014	0.14	0.480	1.25	-0.126	-0.76
Percentage world	0.055	0.88	0.141	2.06	-0.172	-0.63	0.097	1.13
Intercept	6.867	43.74	6.171	31.36	7.764	17.54	7.825	32.18
N	1367		1158		181		1065	
R-squared	0.37		0.41		0.46		0.16	

Regression equations also include 9 dummies for the number of children aged 0-11 and 12-18 years, but the parameters are not presented.

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