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Do Female Immigrants Experience A Double Earnings Penalty?**

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Panel Estimates of the Earnings Gap in Norway: Do Female Immigrants Experience A Double Earnings Penalty?[1]

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Abstract

Using Norwegian panel data, this paper explores the possibility that being both a "female" and "immigrant" would impose an earnings disadvantage on immigrant women in the Norwegian labor market. Both the traditional Blinder/Oaxaca decomposition method, and an alternative method owing to Neumark, are used to decompose the observed earnings gap between Norwegian men and immigrant women into three parts. The first portion is due to differences in productivity-related characteristics; the next portion is due to gender effect; and the final portion is due to an ethnicity effect. The results show that there exists a combined double negative (gender + ethnicity) effect on the earnings of immigrant women. However, the earnings penalty for being a "female" tends to be larger than the earnings penalty for being an "immigrant". Finally, the measured labor market discrimination is sensitive to the choice of decomposition method.

I.   Introduction

The purpose of this paper is to determine whether being female and an immigrant affects the earnings of immigrant women in Norway. Previous Norwegian studies have shown that women in Norway earn less on average than men (Petersen 1984, Barth 1992, and Asplund 1993). Similarly, immigrants in Norway may earn less on average than their Norwegian counterparts, depending on the period of residence in the country (Hayfron 1998).[2] Is it the case that immigrant women suffer a double earnings penalty vis-à-vis Norwegian men? This paper provides an answer to this question in the Norwegian context, by comparing the observed earnings of immigrant women with those of Norwegian men.

As shown in Table 1, during the period 1991-1993, full-time working immigrant women earned 76.3% of what full-time working Norwegian men earned, 79.5% of what full-time working immigrant men earned, but earned 1% more than full-time working Norwegian women in the Norwegian labor market. On the whole, full-time working immigrants earned 98% of what full-time working Norwegians earned. Several possible explanations can be given for why immigrant women earn less on average than Norwegian men. Among them are lack of skill transferability, age, education differences and labor market discrimination. Also, like immigrant men, the pre-migration skills of immigrant women may not be recognized in the Norwegian labor

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[2] The assimilation hypothesis owing to Chiswick (1978), has been empirically tested using data on immigrant men in Norway (Hayfron 1998), but not on immigrant women. However, evidence from Canadian studies (e.g., Beach and Worswick, 1993) and U.S. studies (e.g., Funkhuser and Trejo 1997) suggests that the earnings of immigrant women do not catch up with those of native-born women.

market.[3] This suggests that the observed skills of immigrant women could be rewarded differently in the Norwegian labor market from the corresponding skills of Norwegian men. Furthermore, Norwegian men may have more experience and greater education than immigrant women which leads to greater earnings.[4] Recent debate about the relative economic performance of immigrant women suggests two possible types of discrimination against immigrant women in the labor market. One being the earnings penalty immigrant women pay for being "females" (gender discrimination), and the other, for being "immigrants" (ethnic discrimination). These two effects when combined constitute the "double-negative effect" in the migration literature.

Several recent studies have estimated the double-negative effect on immigrant female earnings. Two recent Canadian studies, Beach and Worswick (1993) and Shamsuddin (1998) have tested this hypothesis with two different data sets. Beach and Worswick found that some immigrant women (mostly highly educated ones) suffer from a double-negative effect on their earnings, while others do not. Shamsuddin concluded that the double-negative effect on Canadian female immigrant earnings is very large. He argues (without direct evidence) that the presence of double-negative effect leads to overpayment of Canadian men. However, neither Beach/Worswick nor Shamsuddin discusses the relative contributions of the individual components of the double-negative effect. I intend to fill this gap.

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[3] Studies done elsewhere (e.g., Chapman and Iredale 1993) indicate that the number of immigrants who fail to get their qualifications recognized in a particular host country vary by country of birth and gender. For example, while males from Asia and Africa were unsuccessful, females from Asia and Latin America had the greatest likelihood of having a lower assessment in Australia.

[4] This may be true for most immigrant women, in particular those who migrated to Norway as tied-movers. Immigrant married women may not be necessarily admitted into the country for their economic attributes.

Since no comparable Norwegian studies exist I will estimate the double-negative effect on female immigrant earnings.[5] In addition, I address the underlying methodologies used in decomposing earnings differentials between two groups (males, females, natives, immigrants). As Oaxaca (1973) notes in the context of gender wage discrimination, the wage structure that will prevail in the absence of discrimination in a competitive labor market should probably lie somewhere between the male wage and the female wage. Neumark (1988) suggests that the competitive wage is a weighted average of the male wage and female wage.[6] This paper examines these alternative methods using Norwegian panel data to test if evidence for discrimination is sensitive to choice of decomposition indices.

The paper proceeds as follows. Section II provides a theoretical framework that links the theory of employer discrimination with the "double-negative" hypothesis. Section III discusses the econometric approach and the data employed in the study. Section IV presents the empirical results. Section V decomposes the (log) earnings differentials into a portion attributable to skill (or productivity) differentials, and a portion due to labor market discrimination. Section VI estimates the combined double-negative effect on female immigrant earnings. Finally, section V offers concluding remarks.

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[5] There are several studies in Norway that examine wage differentials between Norwegian men and women in the Norwegian labor market (see, e.g., Pettersen 1984, Barth 1992). However, their results are not directly comparable with my results for two reasons. First, these authors do not focus on (or account for) immigrants in their studies. Moreover, these studies use wages in their analysis rather than earnings as in this study.

[6] See also Reimers (1983), Cotton (1988), Oaxaca and Ransom (1994).

II.   Theoretical Framework

Two reasons motivate the use of the Becker (1957)-Arrow (1972) model of employer discrimination, as a framework for analyzing the double-negative effect on the earnings of immigrant women in Norway. First, the popular Blinder (1973) and Oaxaca (1973) decomposition estimators are derived from this model. The double-negative effect analysis is an extension of the Oaxaca decomposition estimators. Second, Neumark (1988) argues that the non-discriminatory wage structure used in decomposing a prevailing wage differential between two groups should be derived from a theoretical model of discriminatory behavior. For example, the way that individual workers enter the production function, and the utility function of a particular employer will have implications for the interpretation of the wage differentials.

To simplify the analysis, I assume that employers in the Norwegian labor market have identical preferences and behave in a similar fashion, when hiring workers.[7] Suppose a representative employer hires two groups of workers, Norwegians (N) and immigrants (I). Within each group there are male (m) and female (f) workers. Assume further that a representative employer cares not only about profit, but also about the gender and the ethnic composition of the workers he hires. Then his preferences can be represented by a utility function of the form

(1) $$U = U(\pi, N_m, N_f, I_m, I_f).$$

Where π denotes profit. The profit function can be defined as

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[7] For simplicity sake, assume that the discrimination by other economic agents such as employees and customers is unimportant. For a more detail analysis of employee and customer discrimination, see e.g., Becker (1957) and Arrow (1972) .

(2)
$$\pi = f(N_m + N_f, I_m + I_f) - w_m N_m - w_f N_f - w_m I_m - w_f I_f,$$

where $f(\cdot,\cdot)$ is increasing and concave in the arguments, w_{Nm}, w_{Nf}, w_{Im} and w_{If} denote Norwegian and immigrant male and female wages respectively. The price of output is normalized to one. Assume that the utility function of the employer is homogenous of degree zero within each group of workers. Then, letting $j = m$, f, the optimality conditions for a representative employer's maximization can be written as:

(3)
$$U_\pi (f_j - w_{Nj}) + U_{Nj} = 0; \ U_\pi (f_j - w_{If}) + U_{If} = 0.$$

Where the subscripts for U and f denote partial derivatives. Expanding and re-arranging (3), the first order conditions can be re-written as

(4)
$$w_{Nj} = f_j - d_{Nj}; \ w_{Ij} = f_j - d_{Ij},$$

where $d_{Nj} = \frac{-U_{Nj}}{U_\pi}$ and $d_{Ij} = \frac{-U_{Ij}}{U_\pi}$ are the equivalents of Becker's (1957) discrimination coefficients.[8] If $d_{ij} > 0$, $(i = N, I)$, this implies that the less preferred group suffers from discrimination, while $d_{ij} < 0$ indicates that the preferred group enjoys some benefits as a result of employers' discriminatory behavior (nepotism or favoritism). Given the signs of the first derivatives of the utility function, (4) implies that

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[8] An alternative definition of d_{ij} is that at any given fixed level of utility, profit is a decreasing function of employers' tastes for discrimination.

$$w_{Nj} \geq f_j \geq w_{Ij} \, .$$

At least one of the inequalities should hold if there is in fact discrimination (Arrow 1972). Suppose a representative employer is indifferent between hiring Norwegian workers and immigrant workers. Then, from (3) above, $U_{Nj} = U_{Ij} = 0$, and $d_{Nj} = d_{Ij} = 0$. All workers irrespective of gender and ethnic background, would be paid their marginal products. If, on the other hand, a representative employer has a weaker preference for immigrant workers, because the employer is not certain about their credentials, productivity or has a greater preference for Norwegian workers because of nepotism etc., then $(U_{Ij} < 0$ and $d_{Ij} > 0)$ and $(U_{Nj} > 0$ and $d_{Nj} \leq 0)$. Immigrant workers would suffer from discrimination since their individual "characteristics" would be valued differently by the employer.

It is worth noting that the discriminatory coefficient equals the marginal rate of substitution of the employer's profits with respect to the number of workers in a particular group. For this reason, the employer would lose profits as a result of discrimination. This is because the *d's* which reflect the employer's discrimination and/or nepotism creates a gap between wages and marginal products of immigrant and Norwegian workers. This would result in an inefficient input allocation.

Assuming Norwegian and immigrant workers are perfect substitutes in production, then $f_{Nj} = f_{Ij}$, and $w_{Nj} - w_{Ij} = d_{Ij} - d_{Nj} > 0$. As implied in Becker et. al (1957), this would result in wage discrimination. On the other hand, immigrant and Norwegian workers may differ in skills, such that $f_{Nj} \neq f_{Ij}$. Thus, immigrant workers

would be imperfect substitutes for Norwegian workers. As a result, any wage gap between immigrants and Norwegians would result from two factors; discrimination, $d_{Ij} - d_{Nj}$, and productivity differential $f_{Nj} - f_{Ij}$. Equation (4) can be re-written as

$$(5) \qquad w_{Nj} - w_{Ij} = (d_{Ij} - d_{Nj}) + (f_{Nj} - f_{Ij}).$$

Equation (5) implies that immigrant wages would be lower than Norwegian wages if $f_{Nj} > f_{Ij}$, and this will be the case even in the absence of discrimination or nepotism.

Until now the link between the double-negative effect hypothesis and employers' discriminatory theory has not been established. As mentioned earlier, the double-negative effect analysis is an extension of Oaxaca decomposition estimators, which in turn, derive from the Becker-Arrow model. To see the relationship between the double negative hypothesis and employers' discriminatory theory, consider the first term $(d_{Ij} - d_{Nj})$ on the right hand side of (5). This can be decomposed further into two parts as follows:

$$(6) \qquad w_{Nm} - w_{If} = (d_{If} - d_{Im}) + (d_{Im} - d_{Nm}) + (f_{Nj} - f_{Ij}).$$

Where the subscript *j* is as defined above. Equation (6) implies that the earnings gap between Norwegian men and immigrant women will consist of (a) a gender effect

component, $(d_{If} - d_{Im})$, (b) an ethnicity effect component $(d_{Im} - d_{Nm})$, and (c) a productivity or skill component $(f_{Nj} - f_{Ij})$.[9]

The empirical analysis will use (6) to estimate the combined double-negative effect of gender and ethnicity on the earnings of immigrant women in the Norwegian labor market. The key hypothesis in this paper is that within each group of workers, a representative employer will have a preference for male workers, due to both economic (e.g., labor market intermittency of females etc) and non-economic reasons (chauvinistic tendency etc). In that regard, we expect that $d_{If} > d_{Im} \geq d_{Nm}$. Given equal productivity, immigrant women will earn less on average than both immigrant and Norwegian men. Note that Norwegian women are not represented in (6). However, it is possible to compare their average wage, which depends partly on the magnitude of their discrimination coefficient d_{Nf}, with that of immigrant women. If, it is true that a worker's ethnic background matters, then one would expect $d_{If} > d_{Nf}$. This implies that Norwegian women would earn more on average than immigrant women, holding productivity constant. This issue is addressed in this paper.

III.   The Econometric Specification and the Data

For the purpose of estimating (6) above using Norwegian panel data, the following earnings function was specified.

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[9] Note that men and women may have different productivities as well. In this case, the productivity component (f_j) in (6) should be decomposed further to reflect the productivity

(7) $$Y_{it} = \alpha + \beta' x_{it} + \lambda_i + \varepsilon_{it,}$$

where Y_{it} represents log (earnings) for individual i in specific year t, α is the general intercept. X_{it} is a vector of the observable characteristics (e.g., education, age etc.) for individual i in specific year (t). β is a vector of unknown parameters to be estimated. The λ_i depicts the unobserved individual-specific characteristics such as motivation, ability etc. It is assumed that λ_i has a random distribution, with a zero mean and a constant variance σ_λ^2. Furthermore, the error term, ε_{it} represents unobservable characteristics, which vary both across individuals and over time. The standard assumption is that ε and λ are independent, that ε is serially uncorrelated, and that ε has a zero mean (Hsiao 1992),

$$E(\varepsilon_{it} \, \lambda_i) = 0 \quad \forall i, t \qquad E(\varepsilon_{it} \, \varepsilon_{js}) = 0 \ \text{unless} \ i = j, t = s \quad E(\varepsilon_{it}) = 0 \quad \forall i, t.$$

The earnings function in (7) is based on the human capital theory, and the vector X includes both time-variant (e.g., education, age) and time-invariant variables (country of birth etc). Equation (7) is estimated using a random effects model (*REM*).

The Data

The data source is the three waves (t=1991, 1992, 1993) of KIRUT Panel (Norwegian Social Security and National Insurance Administrative database). The *KIRUT* was originally begun in 1989 and is supplemented each year with 16 year olds

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differences across gender. However, that is not what we are interested in here. The main focus

and immigrants. According to the official definition (see *St.meld nr.*17), a person is classified as an "immigrant" if that person was born outside Norway, has a non-Norwegian parentage and is domiciled in Norway. The data is a 1/10 sample of the Norwegian population, aged 16 years and above. *KIRUT* contains information about income history, labor market and education activity, family size, social security and other benefits.

Observations for a particular year *t* were included only if individual worked full-time, full year, was between the ages 20 and 64, inclusive, was not a student.[10] Those with missing observations were dropped from the sample. The effective data include 4941 Norwegian men, 2577 Norwegian women, 2781 immigrant men and 1527 immigrant women. Immigrants are over-sampled since they constitute less than 50 % of the Norwegian sample.

As mentioned earlier, this study is limited to only full-time, full-year workers. The advantage derived from standardizing for differences in hours of work can be appreciated when one considers the standard definition of earnings. *Earnings = (wage rate)* **x** **(***total number of hours supplied***).** Now*,* drawing a sample of individuals who worked the same number of hours a week (*i.e.*, 30 hours) is equivalent to holding the total number of hours worked constant. In this case, earnings will be a function of only the wage rate.[11] It also follows that the earnings gap between Norwegians and immigrants is a function of the wage gap between these two groups in the restricted

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of the paper is on the discrimination component.

[10] The hours variable used to define full-time work is coded as follows: 1 = 4-19 hours per week, 2 = 20-29 hours per week and 3 = 30 or more hours per week. By definition, an individual is a full-time worker if he or she worked at least 30 hours per week in each year between 1991 and 1993, otherwise, the individual is a part-time worker.

[11] Since the hours variable is discrete, hourly earnings (a proxy for wages) could not be used in this analysis.

sample, holding everything else constant. In a nutshell, by restricting the analysis to only full-time workers one is in effect using individual earnings to infer information about the actual wage differential between Norwegian and immigrant workers in the sample.[12]

Limiting the analysis to only full-time workers also raises the issue of sample selection bias. However, this may not be as important a consideration given the objective of this paper. Sapsford and Tzannatos (1993; page 233), argue that an appropriate decomposition of earnings differentials between male and female workers should apply to the coefficients of the female earnings equation uncorrected for selectivity bias and to the average value of characteristics held by working women only. The intuition behind this argument is rather straightforward. Given that the discrimination being considered in the current study is a demand-side factor, only workers in the labor market would experience earnings discrimination. Those outside the labor force do not. Therefore, it is these (self-selected) workers whose productivity characteristics are evaluated in the labor market that should be of concern to researchers studying earnings discrimination.

The characteristics of the individuals in the sample are given in Table 1. Immigrant women were 1.9 years younger on average than Norwegian men, and were 0.8 years younger than Norwegian women. The mean age is the same for immigrant men and women. On the whole, immigrants are 1.7 years younger than Norwegians. This is consistent with the migration literature, which suggests that younger immigrants are more likely to immigrate than older immigrants. Similarly, immigrant

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[12] Although, this may not be a perfect measure, given that the 30 hours per week variable used to define full-time work is the lower bound. Thus, the hours of work may still vary for full-time

men and women have lower average years of schooling than Norwegian men and women. The average education for total immigrants is 10.5 years compared with 11.9 years for the whole Norwegians. The mean value of the unspecified education shows that more immigrants (17.8%) than Norwegians (1%) have an unknown educational level. Dropping this group from the analysis would bias the estimates of particularly, immigrants. To avoid this problem, a dummy variable will be included in the earnings regression to control for this group.

The other variable of interest is the type of industry in which an individual is employed. The statistics in Table 1 show both within and between group differences in the distributions of workers across industries. For example, the employment distributions in the banking/finance and real estate sectors are similar for Norwegians and immigrants, across gender. The uneven distribution in employment manifests itself more in the services industry, where 49.5% of immigrant women in the sample are employed, compared to 21.2% of Norwegian men, 43.7% of Norwegian women and 24.5% of immigrant men. These statistics suggest the existence of a partial segregation (or partial exclusion) in the Norwegian labor market, given that women in general and immigrants in particular, are overrepresented in low paying services sector.

The skill mix of the immigrant sample depends partly on the ethnic composition of immigrants. Of the male sub-sample, 40.1% and 32.3% originated from the other Nordic countries (Denmark, Finland, Iceland and Sweden), and other developed countries (Europe, United States, Canada, Australia, New Zealand and Japan), while the remaining 27.6% originated from the less developed countries in Africa, Asia, Middle East, South America and Oceania (except Australia and New Zealand).

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workers. What is more, since the data do not report the upper bound, it is difficult to know the

Similarly, 32.2%, 49.3% and 18.5% of immigrant women originated from the Nordic, developed and less developed countries respectively. On the whole 24.4% of immigrants originate from countries that are poorer and less educated than Norway.

Although interesting, the differences in the skill and employment distributions provide only a partial explanation of the earnings gap between Norwegians and immigrants in the Norwegian labor market. In what follows, the returns to such skills are compared for immigrant and Norwegian workers, across gender.

IV.   Empirical Analysis of Earnings

Table 2 reports the results obtained from estimating (7) above separately for Norwegian and immigrant workers, differentiated by gender.[13] The dependent variable is the natural logarithm of annual earnings. The log of earnings is regressed on a number of observed human capital and job characteristics, which are defined in appendix A1.

As Table 2 shows, the coefficients of most variables are of the expected signs and have *t* ratios, which are statistically significant at the conventional levels (1% and 5%). For example, both Norwegian and immigrant workers receive significantly positive returns to additional investment in education. However, the Norwegian labor market rewards Norwegian education more than immigrant education. The returns to education are 4.6% and 4.8% for Norwegian men and women compared to 3.5% and 2.1% for immigrant men and women respectively. On the whole, Norwegians receive

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degree of variation in hours of work among individuals in the full-time sample.

[13] A Chow test was conducted to determine if the individual regressions were different from each other. The critical F-statistic at 5% level ($F_{14,11789}^{*} = 1.67$) is significantly less than F-statistic

on average a return to education of 5.2% compared to 4.1% for immigrants. The relatively low return to immigrant education is not surprising since pre-migration skills such as education cannot be easily transferred into the Norwegian labor market. [14] As mentioned earlier, a dummy variable was included in the regressions to control for those with unspecified educational level. The coefficient of the dummy variable (*Unspecified Education*) is positive and significantly different from zero, implying that omitting the variable from the earnings equations will bias the estimation results, particularly for the immigrant sample with a large proportion (17%) of individuals with unknown education.

Earnings are assumed to be a function of a fourth-order polynomial in age.[15] The coefficients on the age variable in quartic form are difficult to interpret. However, the coefficients along with the coefficients and mean values of the other explanatory variables are used to construct the age-earnings profiles for immigrants and Norwegians, across gender. The predicted age-earnings profiles are shown in Figures 1-7. The earnings profiles have a number of interesting features. First, the diagrams show clearly the earnings gap between men and women in various ethnic groups. In all cases, male earnings profiles lie above female earnings profiles. Figures (3) and (5) show

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produced by the Chow test ($F = 11.73$). This implies that the individual regressions are substantially different from each other.

[14] A better way of comparing the returns to Norwegian and foreign education, is to split immigrant education into two parts: one measuring part of the education acquired outside Norway and one measuring education obtained in Norway. Unfortunately, KIRUT data do not distinguish between pre- and postmigration education. However, studies using US data have shown that there is little deference between the return to pre- and post-migration education for immigrants in the U.S. (Chiswick 1978, Stewart and Hyclak 1984). Kee (1995) also found for the Netherlands that the significant difference between the return to pre-migration and post-migration education differs by place of birth.

[15] This follows the specifications in Murphy and Welch (1990). They found that the quadratic approximation results in significantly biased estimates of the earnings profile. Similarly, Yuengert (1994) finds that the estimates of relative wages of immigrant to native-born men are

convergence between the earnings profiles of Norwegian men and immigrant women, and between immigrant men and women at the later part of the lifecycle. Second, as expected the earnings profiles rise with age at a diminishing rate. The earnings profiles are steeper especially for men between the ages of 20 and 30 years. Apart from the earnings profile for female immigrants, the age-earnings profiles for the others decline after 55 years – a pre-retirement age.[16] This is consistent with the life-cycle hypothesis, which suggests that younger workers' earnings rise more quickly than older workers' earnings.

Third, the non-discriminatory (or pooled) earnings profile in Figure 7 lies between the earnings profiles for Norwegians and immigrants. This suggests that using either of the Norwegian and immigrants' earnings structures as a proxy for the unknown competitive earnings structure in a decomposition of earnings gap will lead to over- or underestimation of discrimination. However, given that the hypothetical non-discriminatory age-earnings profile lies closer to the earnings profile for Norwegians, the measurement error will be less if the Norwegian rather than immigrant earnings profile is used. This issue is discussed in more detail in section V.

The earnings equation for immigrants includes an additional variable that accounts for differences in the transferability of skills among the immigrant population. For example, it would be difficult for immigrant workers from less developed countries to transfer their skills to the Norwegian labor market than those with skills from the

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more sensitive to the specification of age as a quartic versus a quadratic, and that the quartic is preferable.

[16] Note that the coefficients on the age variables were not statistically significant for female immigrants. This probably explains the strange behavior of the age-earnings profile for immigrant women. Overall, the quartic specification performs poorly for immigrants relative to Norwegians.

other advanced countries.[17] Similarly, skills acquired from the neighboring Nordic countries may be easy to transfer to the Norwegian labor market than those acquired in other advanced countries. For these reasons, immigrants from the other Nordic countries are used as the reference group.[18] The results in Table 2 show that the coefficients for the dummy (Developed) are not significantly different from zero, implying that there are no earnings differential between immigrants from the other Nordic countries (base) and those from the other developed countries. On the other hand, the results show that immigrant men and women from less developed countries earn 24.8% and 16.2% less on average than their counterparts from the other Nordic countries. On the whole, immigrants from the less developed countries regardless of gender, perform poorly (in terms of earnings) relative to Nordic immigrants.

Norwegian workers may earn more on average than immigrant workers either because they work in certain industries or because they are paid more than immigrant workers who are employed in the same industry. Evidence suggests that immigrant workers in Norway are overrepresented in less-skilled and least-paid occupations and are also paid less than Norwegian workers in the same occupations (see e.g., Hayfron, 1997). For this reason, the earnings equation (7) includes a set of industry dummies that adjusts for the effect on earnings owing to the different employment distributions of

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[17] It should be noted that the problems with skill transferability could take two forms. First, there is the difficulty in transferring the physical skills (e.g., certificates, job testimonials etc), as is the case with most refugee or political immigrants whose exit from the individual host countries was not preplanned. Second, the quality of skills that are successfully transferred into Norway by some economic immigrants, especially those from the less developed countries, may be undervalued or unrecognized in the Norwegian labor market.

[18] Nordic immigrants would have a language advantage over immigrants from the other advanced countries. This is because most Nordic immigrants have a mother tongue that is similar to Norwegian language. Of course, individual immigrants (e.g., British and American workers) whose decisions to immigrate to Norway were determined solely by the demand surplus in particular sectors of the economy, such as Petroleum and Gas industry may not

Norwegian and immigrant workers in the Norwegian labor market. The reference category "other industries", includes energy, agriculture, forestry and fishery industries respectively.

Compared to their counterparts in the reference industries, Norwegian men receive higher (lower) earnings in the financial (services) sectors. Norwegian women also receive higher earnings in both manufacturing and financial sectors relative to their counterparts in the base industries. Both immigrant men and women receive lower earnings in all the sectors except the financial sector, relative to their counterparts in the reference sectors. On the whole, Norwegian workers perform well in the manufacturing and real estate sectors, but perform poorly in the services industry relative to their Norwegian counterparts in the reference industries. Similarly, earnings are higher for immigrant workers as a whole in the financial sector, but are lower in the manufacturing and services industries than their immigrant counterparts in the reference industries.

V. Decomposition of Earnings Differentials

Given the discussion in section II, I now partition the log of the earnings differentials between Norwegians and immigrants, differentiated by gender, into productivity differences and the differential rewards derived in the Norwegian labor market. Both the Oaxaca decomposition estimators in (10) and (11), and the alternative method (12), suggested by Neumark et. al (1988) in the appendix A2 are used in the decomposition exercise. Neumark's method involves estimating the nondiscriminatory

necessarily require proficiency in the Norwegian language. These workers may be expected to

earnings structure using the pooled sample of Norwegian and immigrant workers in the Norwegian labor market.[19]

Table 3, first column reports the log earnings gap between Norwegian and immigrant workers, differentiated by gender. For example, the difference in the average logarithm of Norwegian men's and immigrant women's earnings is 0.2709, which implies that Norwegian men earn 27.1 % more on average than immigrant women in the Norwegian labor market. Similarly, Norwegian women earn 28.1 % less than Norwegian men, and 1 % less than immigrant women.[20] The earnings gap between immigrant men and women is 24.2 %. Columns 3 – 6 report the portion of the earnings gap which is attributable to labor market discrimination, and the portion due to productivity differences. The estimated coefficients $(\hat{\beta}_{MAJ})$ and $(\hat{\beta}_{MIN})$ indicate that the majority (male, Norwegians) group's earnings structure and minority (female, immigrants) group's earnings structure are used interchangeably as weights to decompose the earnings gap between Norwegian and immigrant workers. Before proceeding with the analysis, it is perhaps instructive to define earnings discrimination. Discrimination is the difference between what immigrant workers would earn in the absence of labor market discrimination and what immigrant workers actually earn.[21]

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perform well or better on the average than Nordic immigrants.

[19] Such a nondiscriminatory earnings structure has the major advantage of being sensitive to the gender and ethnic composition of the sample and becomes implicitly related to the overall ability of the labor market to pay for labor, thus reflecting the true macroeconomic conditions in the Norwegian labor market.

[20] Barth (1992) found that Norwegian men earn 20 % more than Norwegian women.

[21] The operational weakness of the definition above is that the non-discriminatory earnings structure is unobserved and must be estimated. This again begs the question, which of the observed earnings for Norwegian (or majority group) workers, and the earnings structure of immigrant workers (or minority group) should be used as a proxy for nondiscriminatory or competitive earnings structure in the Norwegian labor market. Following Neumark (1988) and Oaxaca and Ransom (1994), the coefficients of the pooled regressions are used to proxy for competitive earnings structure in the decomposition exercise.

Consider the decomposition of the earnings gap between Norwegian men and immigrant women into discrimination and skill components. Using the formulation in (10), the measured labor market discrimination was found to be 0.2720. On the other hand, using the formulation in (11) leads to a higher estimate of discrimination, i.e., 0.2804. Note that the negative sign on the skill components (-0.0011 and −0.0095) indicates that the skill effects are in favor of immigrant women. The results show that the earnings gap between Norwegian men and immigrant women is almost entirely due to labor market discrimination (over 100%). Moreover, the discrepancy in the discrimination estimates derived from the two formulations in (10) and (11) is consistent with the literature (see, e.g., Farber and Green, 1982, Reimers 1983, Bucci and Tenorio 1997). The discrepancy in the discrimination estimates is illustrated diagrammatically in Figure 8.

Finally, an alternative formulation in (12) is used to decompose the earnings gap between Norwegian men and immigrant women. The discrimination component is made up of two elements. The first element (*MAJ.ADV*) measures the "benefit" the individual derives from being a Norwegian. Put another way, the amount by which the skills of Norwegians are overvalued in the Norwegian labor market. On the other hand, the second element (*MIN.DISADV*) measures the "cost" of being an immigrant. In other words, the amount by which the skills of immigrants are undervalued in the Norwegian labor market. As implied in Becker's discrimination model, by receiving lower earnings, immigrants will in effect be paying for the extra earnings received by Norwegians.

In the last four columns of Table 3, estimates of the discrimination and skill components obtained by using the alternative formula in (12) are presented. Focusing

on the Norwegian male-immigrant female earnings gap (row 4), the measured labor market discrimination is 0.2467. This implies that 91% of the earnings gap between Norwegian men and immigrant women is due to discrimination, while 0.0243 or 9 % of the earnings gap is due to productivity differences. This is consistent with Neumark's (1988) conclusion that the alternative method yields a smaller estimates of discrimination than either of the Oaxaca decomposition estimators. As expected, the estimates *MAJ.ADV* = 0.0891 in column (8), and *MIN.DISADV* = 0.1576 in column (9) are both positive. Thus, indicating a Norwegian male treatment advantage (benefits), and an immigrant female treatment disadvantage (costs). Even in the overall Norwegian-immigrant comparison (row 7), the estimates show both Norwegian advantage and immigrant disadvantage. Specifically, there is an "earnings penalty" for being an immigrant in the Norwegian labor market.

If the argument put forward in section II, regarding the relationship between the earnings used for this analysis and individual unknown wages is true, then as implied in Becker's theory of employer discrimination, the majority "benefit" should equal the minority "cost". However, since the "cost" is higher than the "benefit", this could be interpreted from a rent-seeking perspective that Norwegian employers share the rents derived from the underpayment of immigrant workers with the Norwegian workers.

VI. Estimating the combined double-negative effect of gender and ethnicity on female immigrant earnings

As explained in section II above, the double-negative analysis is an extension of the Oaxaca decomposition estimators. Thus, the combined double-negative effect on the

earnings of immigrant women can be calculated by adding the ethnicity effect component to the gender effect component in rows (2) and (3) of Table 3. The calculated double-negative effects obtained from using both the Oaxaca decomposition estimators and the Neumark's method are reported in the last row of Table 3. These are 0.2755 (101.6%), 0.2879 (106.3%) and 0.2467 (91%) respectively. As expected Neumark's approach yields a lower estimate of the double negative effect.[22]

I also consider the relative contributions of each component of the combined double-negative effect of gender and ethnicity. The results indicate that the gender effect far outweighs the ethnicity effect irrespective of the decomposition method used to decompose Norwegian-immigrant earnings gap. With regard to the comparison between Norwegian men and immigrant women, Figures 9 shows that the gender effects contribute 77.8%, 93.5% and 75.9% of the earnings gap, compared to 22.8%, 12.8% and 15.1% for the ethnicity effect. These results are consistent with the findings in Dean and DeVoretz (1997), who found that Jewish female immigrants in Canada receive lower earnings not because they are immigrants, but because they are women.

VII.   Summary and Conclusion

The primary question asked in this paper is whether gender and ethnic background of a worker combined confers earnings disadvantages on immigrant women in the Norwegian labor market. To be able to answer this question, this paper uses an extension of the Oaxaca decomposition method to investigate (1) whether there is a

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[22] Note that the small difference between the double-negative estimates and the discrimination estimates is due to rounding.

premium/disadvantage associated with the gender of the worker, (2) whether there is a disadvantage associated with ethnicity and (3) whether immigrant women receive less for their skills than those of Norwegian men.

The results show that immigrant women in Norway earn 27.1 % less than Norwegian men. Several explanations for the earnings gap between Norwegian and immigrant women across gender emerge from this study. First, there is evidence of a combined double-negative effect on the earnings of immigrant women. However, the gender effect tends to be more important than the ethnicity effect in explaining the earnings gap between Norwegian men and immigrant women.[23] The results show that gender discrimination contributes between 75.9 % and 93.5 % of the earnings gap, while ethnic discrimination contributes between 12.8 % and 22.9 %. This implies that policy makers formulating policies to combat labor market discrimination should focus more on the gender aspect rather than on the ethnic aspect of discrimination.

Although small, a portion of the earnings differential between Norwegian men and immigrant women is also explained by the differences in observed personal characteristics. The results show that not only do immigrant women receive lower return to their education, but they also have a lower average education than Norwegian men in the Norwegian labor market. Also to be taken into account when analyzing the earnings gap between Norwegian men and immigrant women is the age difference between the two groups. As mentioned earlier, immigrant women are younger on average than Norwegian men, and this may contribute to the earnings gap between the two groups. Unlike in several industrialized countries, Norway has a wage-

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[23]   The fact that female immigrants earn 1% more than Norwegian women supports the conclusion that ethnic background may not be an important determinant of female immigrants' earnings.

setting mechanism that favors older workers. Specifically, workers in Norway are paid more as they grow old.

In addition, I found that the measured labor market discrimination is sensitive to the choice of decomposition method, and this is consistent with the literature. For the most part, the pooled coefficients yield lower discrimination estimates than any of the Oaxaca decomposition estimators. Neumark (1988) obtained a similar result. There were few exceptions, where the pooled coefficients used to decompose the earnings gap also yield discrimination estimates that lie between the two bounds derived from using the two Oaxaca (1973) decomposition estimators. This is also consistent with the findings in Oaxaca and Ransom (1994).

Caution must be exercised in interpreting the discrimination estimates. In other to obtain a precise estimate of earnings discrimination, there should be no omitted variable problems. Such that the absence of information on how long individual immigrants have lived in Norway in the panel data can lead to under- or overestimation of the discrimination coefficients. Furthermore, the fact that part of immigrants' human capital stock has been accumulated in a country different from Norway, can lead to measurement error problems for the experience and educational variables. Last but not the least, the KIRUT data do not distinguish between self-employed workers and salaried or wage earners. Given that these represent the weaknesses of the panel data used for the analysis, there is nothing that can be done except to recognize the check the limitations of the data place on the interpretation of the results in general, and the discrimination estimates in particular.

Appendix A1:

Definition of Variables

Earnings:	Annual Earnings (*i.e.*, labor income including social security benefits)
Age:	Calculated as the census year minus the year of birth.
Education:	The number of years of schooling.
Married:	Coded as one if individual is married; otherwise equals zero.
Unspecified Education:	Coded as one if unspecified education; otherwise equals zero.
Manufacturing:	Coded as one if individual is employed in the manufacturing industry; otherwise equals zero.
Trade/Hotel/ Transport:	Coded as one if individual is employed in either wholesale-retail trade or transport & communication or hotel industries; otherwise equals zero.
Banking/Finance /Real Estate:	Coded as one if individual is employed in the banking/finance/real estate; otherwise equals zero.
Services:	Coded as one if individual is employed in the services industry; otherwise equals zero.
Other industries:	Coded as one if individual is employed in other industries (Agriculture, forestry, fishing, mining extraction, petroleum and gas, building and construction, water and energy); otherwise equals zero. *Reference group.*
South:	Coded as one if individual resides in the southern part of Norway; otherwise equals zero.
West:	Coded as one if individual resides in the western part of Norway; otherwise equals zero.
North:	Coded as one if individual resides in the northern part of Norway; otherwise equals zero. *Reference group.*
Nordic Countries:	Coded zero if individual originated from Nordic countries (Denmark, Finland, Iceland and Sweden) except Norway. *Reference group.*
Developed Countries:	Coded as one if individual originated from developed countries except Nordic countries; otherwise equals zero.
Less Developed Countries:	Coded as one if individual originated from Less developed countries (Africa, Asia, Middle East, South America and Oceania); otherwise equals zero.

Appendix A2:

Decomposition Estimators

The point of departure is Becker's (1957) definition of discrimination coefficient, D which is expressed in percentage terms as follows,[24]

$$D = \frac{\overline{Y}_{Nj} / \overline{Y}_{Ij} - MP_{Nj} / MP_{Ij}}{MP_{Nj} / MP_{Ij}} \tag{8}$$

where $\overline{Y}_{Nj} / \overline{Y}_{Ij}$ is the ratio of the mean earnings of Norwegians to that of immigrants. Similarly, MP_{Nj} / MP_{Ij} represents the ratio of the average marginal products of Norwegians to that of immigrants. Expressing in logarithmic terms, (8) becomes

$$\ln \overline{Y}_{Nj} - \ln \overline{Y}_{Ij} = \ln MP_{Nj} - \ln MP_{Ij} + \ln(D+1). \tag{9}$$

The first two terms, $(\ln MP_{Nj} - \ln MP_{Ij})$ on the right hand side of (9) measure the log of the productivity differences between Norwegians and immigrants, while the last term, $\ln(D+1)$ represents the discrimination component.

Both the productivity and discrimination components are estimable. For example, $\ln \overline{Y}_{Nj} = \overline{X}_{Nj} \hat{\beta}_{Nj}$ and $\ln \overline{Y}_{Ij} = \overline{X}_{Ij} \hat{\beta}_{Ij}$ $(j = M, F)$, where $\overline{X}_{Nj}$ and $\overline{X}_{Ij}$ are the mean characteristics, and $\hat{\beta}_{Nj}$ and $\hat{\beta}_{Ij}$ are the estimated coefficients obtained from separate

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[24] It is worth noting that Becker's model was on discrimination (nepotism) against (in favor of) Blacks (Whites) rather than on immigrants and native-born. As is standard (see, e.g., Bucci and Tenorio, 1997), I am applying the model in the analysis of immigrants and Norwegians, differentiated by gender.

regressions for immigrants and Norwegians respectively. Equation (9) can be decomposed into a portion due to skill or productivity differences, and a portion due to differences in coefficients in two different ways:

(10) $\ln \overline{Y}_{Nj} - \ln \overline{Y}_{Ij} = \beta_{Nj}(\overline{X}_{Nj} - \overline{X}_{Ij}) + \overline{X}_{Ij}(\beta_{Nj} - \beta_{Ij})$

(11) $\ln \overline{Y}_{Nj} - \ln \overline{Y}_{Ij} = \beta_{Ij}(\overline{X}_{Nj} - \overline{X}_{Ij}) + \overline{X}_{Nj}(\beta_{Nj} - \beta_{Ij}).$

Where the first term on the right-hand side of (10) and (11) are the estimates for $\ln MP_{Nj} - \ln MP_{Ij}$ in (9). It is worth noting that these terms, by definition equal the average earnings that would be observed in the absence of discrimination in a competitive labor market. This defines the part of the earnings gap that is due to skill differences. Similarly, the second term defines the part attributed to differences in the coefficients, $\ln(D+1)$. The formulations in (10) and (11) are attributed to Blinder (1973) and Oaxaca (1973). Equation (10) assumes that the current earnings structure of Norwegians would be observed in the absence of discrimination in the labor market, while (11) assumes that the current earnings of immigrants would be observed in the absence of labor market discrimination. It is obvious that these two formulations will yield different estimates of discrimination, perhaps due to the non-linearities involved in their estimation.

Now, consider the alternative method suggested by among others, Neumark (1988), Cotton (1988) and Oaxaca and Ransom (1994).

(12) $\ln \overline{Y}_{Nj} - \overline{Y}_{Ij} = \beta^{*}(\overline{X}_{Nj} - \overline{X}_{Ij}) + [\overline{X}_{Nj}(\beta_{Nj} - \beta^{*}) + \overline{X}_{Ij}(\beta^{*} - \beta_{Ij})].$

Where $\beta^* = \Omega\hat{\beta}_{MAJ} + (1-\Omega)\hat{\beta}_{MIN}$. That is the weighted average of majority group's and minority group's earnings structures. However, since β^* is unobserved, various authors have used different proxies for it.[25] The most common method used is the set of coefficients obtained from a pooled regression. This can be formulated as, $\ln(Y_P) = X_P\beta^*$, where the subscript p denotes pooled sample of immigrants and Norwegians.

The first component, $\beta^*(\overline{X}_{Nj} - \overline{X}_{Ij})$ on the right hand side of (12) represents the differences in the observed skills between Norwegians and immigrants evaluated as the market would in the absence of discrimination. The second component, $\overline{X}_{Nj}(\beta_{Nj} - \beta^*)$ measures the differences between the way the skills of Norwegian workers are evaluated in the Norwegian labor market, and the way they would be valued in absence of discrimination in the labor market. A positive sign implies an advantage for Norwegian workers. The final component, $\overline{X}_{Ij}(\beta^* - \beta_{Ij})$ also measures the differences between the way immigrant skills are currently evaluated in the Norwegian labor market, and the way they would be evaluated in absence of discrimination. Similarly, a positive sign implies a disadvantage for immigrant workers. Specifically, the "cost" of being an immigrant.

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[25] For instance, Reimers (1983) used $\beta^* = 0.5\hat{\beta}_{MAJ} + 0.5\hat{\beta}_{MIN}$ as a proxy for the non-discriminatory wage structure, while Cotton (1988) used $B^* = f_{MAJ}B_{MAJ} + f_{MIN}B_{MIN}$, where f_{MAJ} and f_{MIN} are the proportions of majority and minority workers in the labor market. According to Oaxaca and Ransom (1997), Cotton's method is a generation of the method suggested by Neumark (1988).

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TABLE 1.

DESCRIPTIVE STATISTICS (MEAN AND STANDARD DEVIATION)

	NORWEGIANS			IMMIGRANTS			POOLED
	MALE	FEMALE	ALL	MALE	FEMALE	ALL	
Log Earnings	12.32	12.04	12.22	12.28	12.05	12.20	12.21
	(.38)	(.36)	(.39)	(.46)	(.44)	(.47)	(.42)
Gross Earnings	224,134	169,397	202,805	215,346	171,099	198,789	200,787
Education	11.9	11.8	11.9	10.3	10.9	10.5	11.4
	(2.9)	(2.7)	(2.9)	(5.9)	(5.6)	(5.8)	(4.2)
Age	42.6	41.5	42.2	40.4	40.7	40.5	41.6
	(10.5)	(10.9)	(10.7)	(9.7)	(9.8)	(9.7)	(10.4)
Age Sq. $\times 10^{-1}$	192.4	183.7	189.4	172.5	175.1	173.4	183.6
	(90.7)	(91.5)	(91.0)	(80.8)	(82.8)	(81.5)	(88.0)
Age cubic $\times 10^{-2}$	914.0	860.0	895.5	774.4	792.7	780.9	853.7
	(620.5)	(612.6)	(618.3)	(533.9)	(552.4)	(540.6)	(593.7)
Age quartic $\times 10^{-3}$	4525.0	4209.6	4416.9	3629.0	3750.2	3672.0	4145.5
	(3951.0)	(3838.6)	(3915.4)	(3282.8)	(3429.9)	(3335.8)	(3731.9)
Married	.676	.553	.634	.682	.639	.667	.646
	(.468)	(.497)	(.482)	(.466)	(.480)	(.471)	(.478)
Geographical Location							
South	.518	.545	.527	.699	.746	.715	.596
	(.500)	(.499)	(.499)	(.459)	(.436)	(.451)	(.491)
West	.274	.237	.261	.219	.145	.193	.236
	(.446)	(.425)	(.439)	(.413)	(.353)	(.395)	(.425)
Unspecified	.011	.009	.010	.189	.158	.178	.071
Education	(.103)	(.096)	(.101)	(.392)	(.365)	(.383)	(.258)
Industry							
Manufacturing	.251	.120	.206	.280	.120	.223	.213
	(.434)	(.325)	(.405)	(.449)	(.325)	(.417)	(.409)
Wholesale	.257	.215	.243	.274	.220	.255	.247
/Retail Trade	(.437)	(.411)	(.429)	(.446)	(.414)	(.436)	(.431)
Finance/	.075	.085	.078	.071	.075	.072	.076
Real Estate	(.293)	(.280)	(.269)	(.256)	(.263)	(.259)	(.265)
Services	.212	.437	.289	.245	.495	.334	.306
	(.409)	(.496)	(.454)	(.430)	(.500)	(.472)	(.461)
Country of origin							
Developed Country				.401	.322	.373	
				(.490)	(.468)	(.484)	
Less Developed Country				.276	.185	.244	
				(.447)	(.388)	(.429)	

TABLE 2
EARNINGS FUNCTIONS FOR WORKERS AGED 20-64
(DEPENDENT VARIABLE = *LOG* EARNINGS)

	NORWEGIANS			IMMIGRANTS			POOLED
	MALE	FEMALE	ALL	MALE	FEMALE	ALL	
Intercept	.8839	2.5723	1.3094	7.3294	9.1963	8.3226	4.0313
	(.803)	(1.837)	(1.454)	(3.739)	(3.415)	(5.100)	(4.925)
Educ	.0461	.0481	.0506	.0348	.0212	.0307	.0421
	(16.55)	(12.121)	(20.90)	(8.852)	(4.138)	(9.409)	(21.632)
Age	.9470	.8259	.9089	.3946	.1686	.2763	.6627
	(8.401)	(5.639)	(9.787)	(1.935)	(.600)	(1.625)	(7.830)
Age squared	-.0306	-.0285	-.0297	-.0129	-.0037	-.0082	-.0214
	(7.305)	(5.145)	(8.541)	(1.668)	(.346)	(1.270)	(6.716)
Age cubic	.0004	.0004	.0004	.0002	.00003	.0001	.0003
	(6.472)	(4.805)	(7.604)	(1.509)	(.178)	(1.055)	(5.940)
Age quartic $\times 10^{-3}$	-.0023	-.0024	-.0023	-.0011	-.0001	-.0006	-.0016
	(5.826)	(4.559)	(6.881)	(1.415)	(.059)	(.920)	(5.376)
Married	.0300	-.0363	.0285	.0128	-.0807	-.0195	-.0002
	(2.090)	(2.015)	(2.412)	(.593)	(2.625)	(1.070)	(.018)
Unspec. Education	.6013	.7687	.7033	.4541	.2161	.3870	.4970
	(8.648)	(7.102)	(11.21)	(7.927)	(2.860)	(8.115)	(16.071)
Geographical Location							
South	.0593	-.0186	.0229	.0586	.1357	.0967	.0298
	(3.205)	(.802)	(1.471)	(1.379)	(2.690)	(2.834)	(2.035)
West	.0997	-.0450	.0454	.0681	.1331	.1110	.0576
	(4.813)	(1.658)	(2.571)	(1.457)	(2.159)	(2.869)	(3.413)
Industry							
Manufacturing	-.0024	.1468	.0571	-.0981	-.1410	-.0933	-.0057
	(.110)	(3.995)	(2.883)	(2.511)	(2.004)	(2.613)	(.317)
Wholesale/Retail Trade	-.0222	.0420	-.0029	-.0974	-.1530	-.1294	-.0514
	(1.048)	(1.292)	(.151)	(2.463)	(2.447)	(3.686)	(2.956)
Finance/Real Estate	.1432	.1740	.1227	.1286	.1307	.1096	.1296
	(4.580)	(4.332)	(4.656)	(2.388)	(1.675)	(2.361)	(5.443)
Services	-.1183	.0135	-.1339	-.1657	-.0764	-.1923	-.1587
	(5.186)	(.476)	(7.246)	(4.092)	(1.337)	(5.694)	(9.472)
Country of origin							
Developed				-.0173	.0079	.0286	
				(.620)	(.218)	(1.242)	
Less Developed				-.2478	-.1621	-.1767	
				(7.874)	(3.436)	(6.568)	
Sample size	4941	2577	7518	2781	1527	4308	11826
Adj. R-sq	.2451	.1878	.2265	.2412	.1708	.1931	.1872
F(k, N-k)	128.5	47.9	173.5	59.6	21.6	69.7	214.4
LM-Test	2434.9	825.4	3669.8	1073.3	568.8	1826.8	5577.7

Notes: - T ratios in parenthesis.

Figure 1
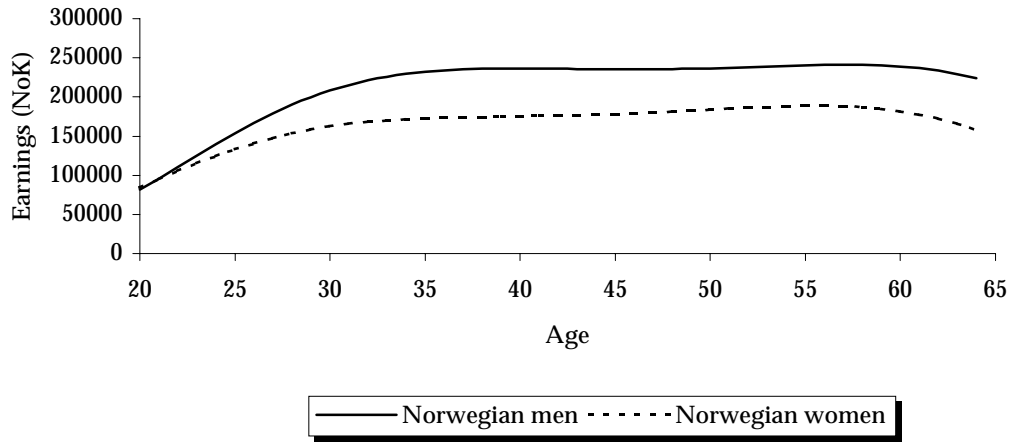Predicted Age-Earnings Profiles for Norwegian Men and Women

Figure 2
Predicted Age-Earnings Profiles for Norwegian and Immigrant Men
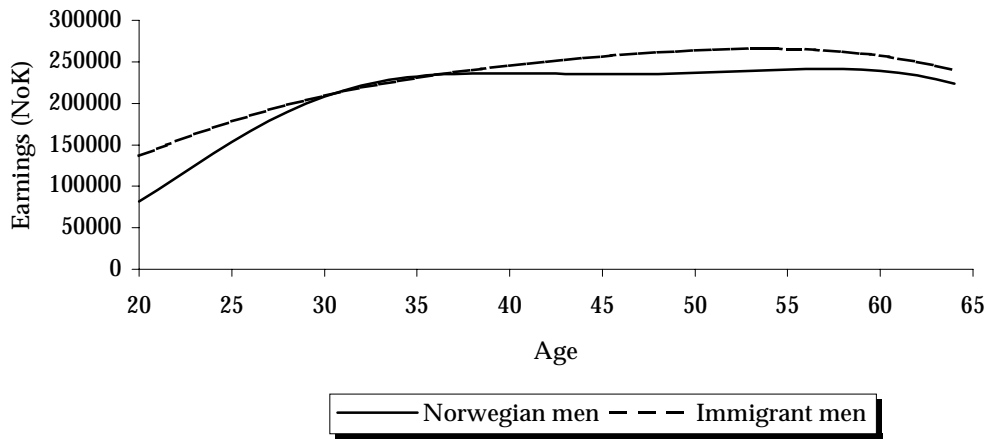
Figure 3.
Estimated Age-Earnings Profies for Norwegian men and Immigrant Women
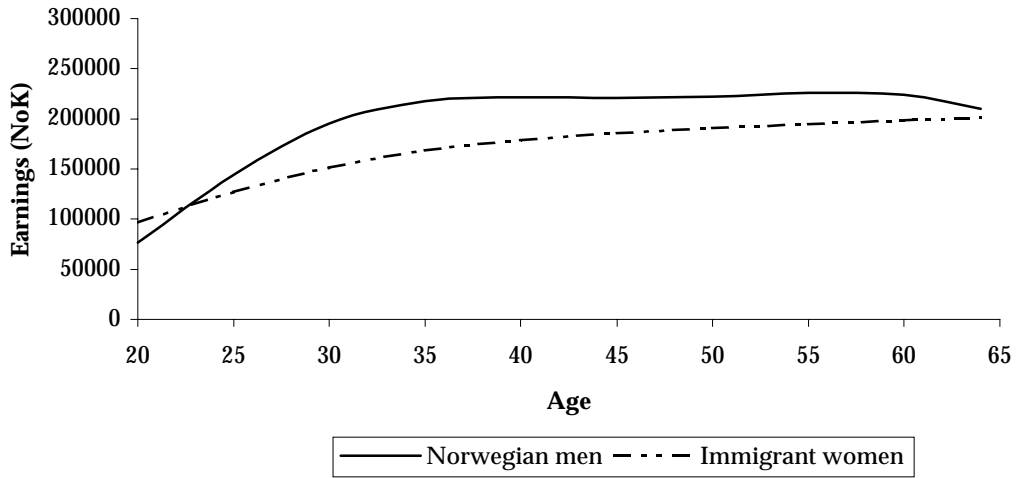in Full-time Employment

Figure 4.
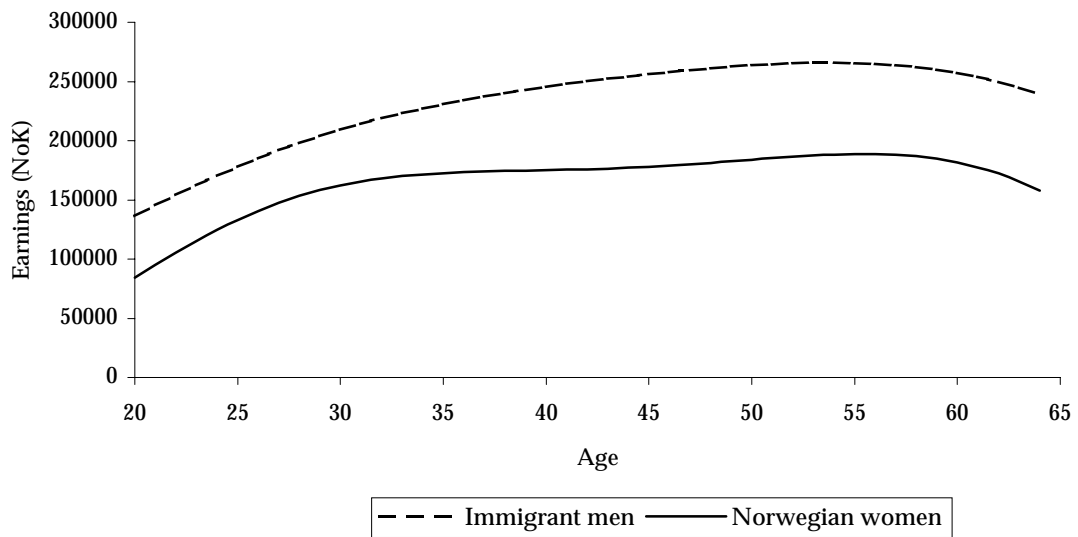Predicted Age-Earnings Profiles for Immigrant Men and Norwegian Women

Figure 5.
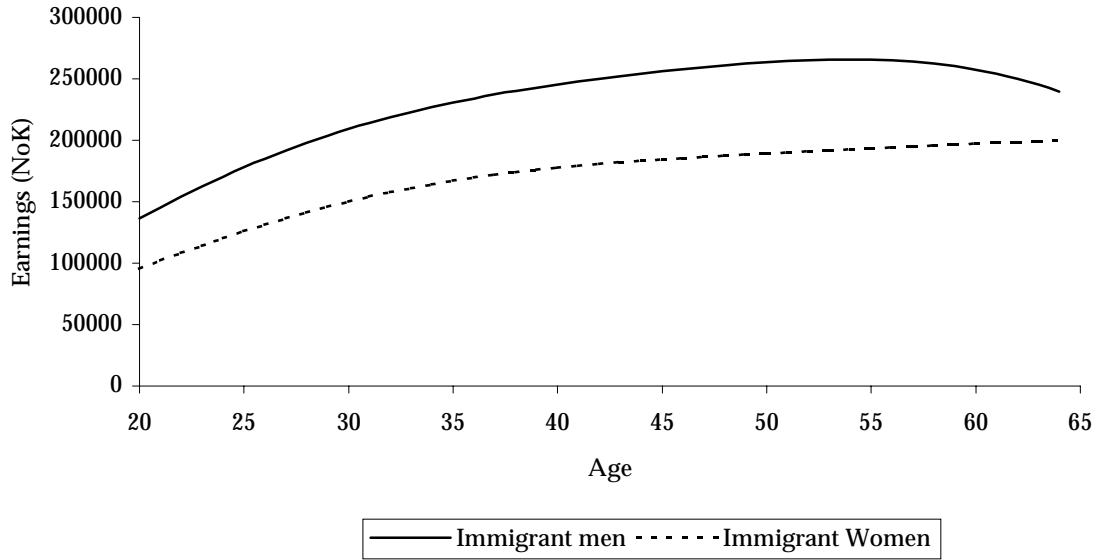Predicted Age-Earnings Profiles for Immigrant Men and Women

Figure 6.
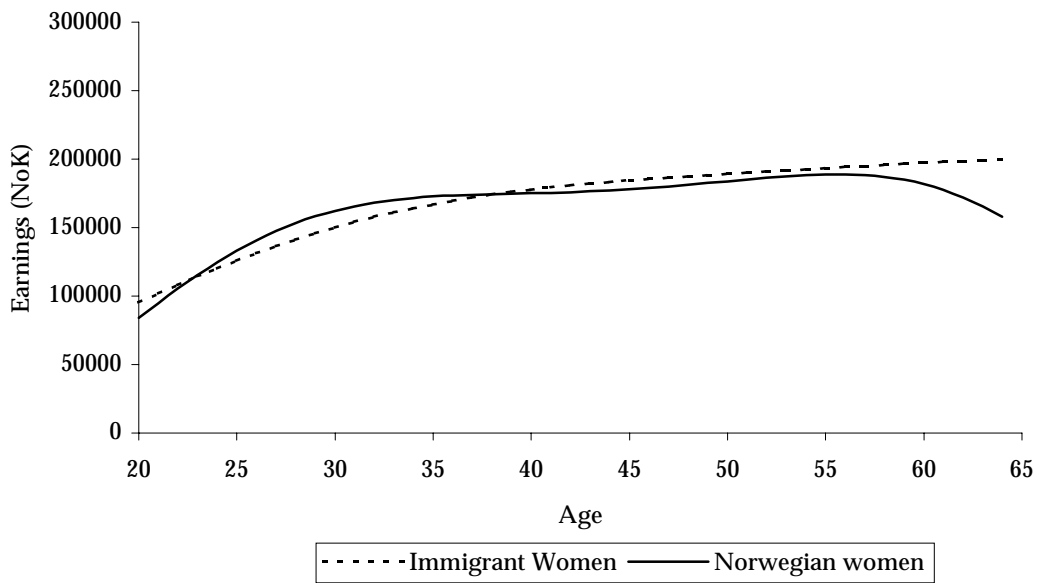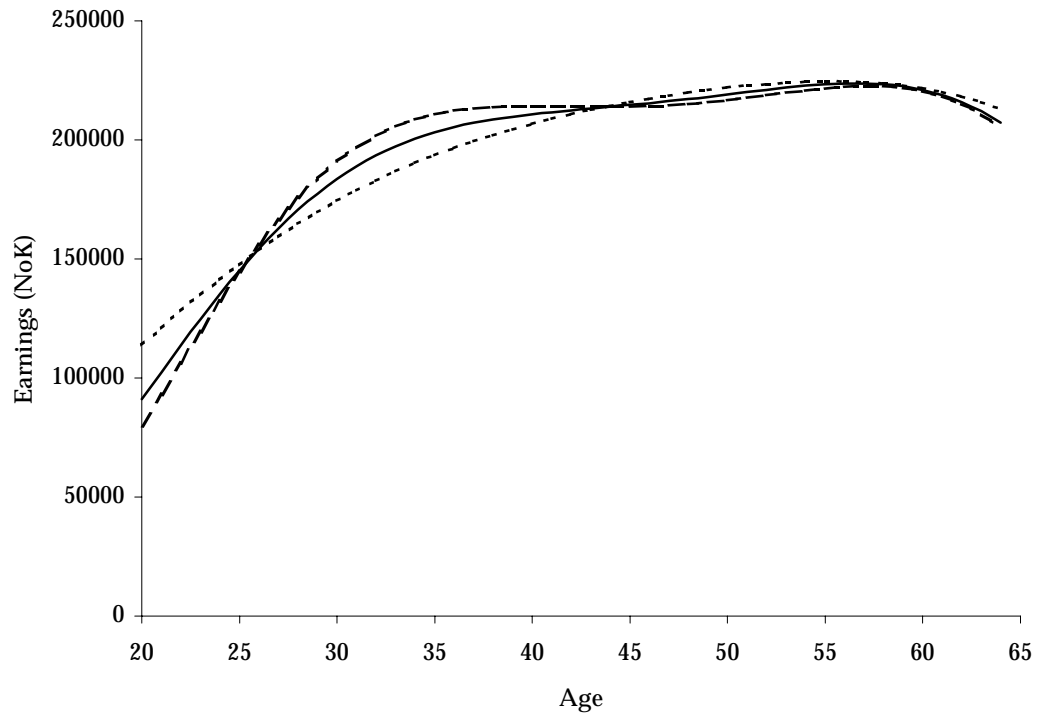Predicted Age-Earnings Profiles for Norwegian Women and Immigrant Women

Figure 7.

Predicted Age-Earnings Profiles for Immigrants and Norwegians

Figure 8.

Decomposition of Norwegian Men - Immigrant Women Earnings Gap 1991-1993
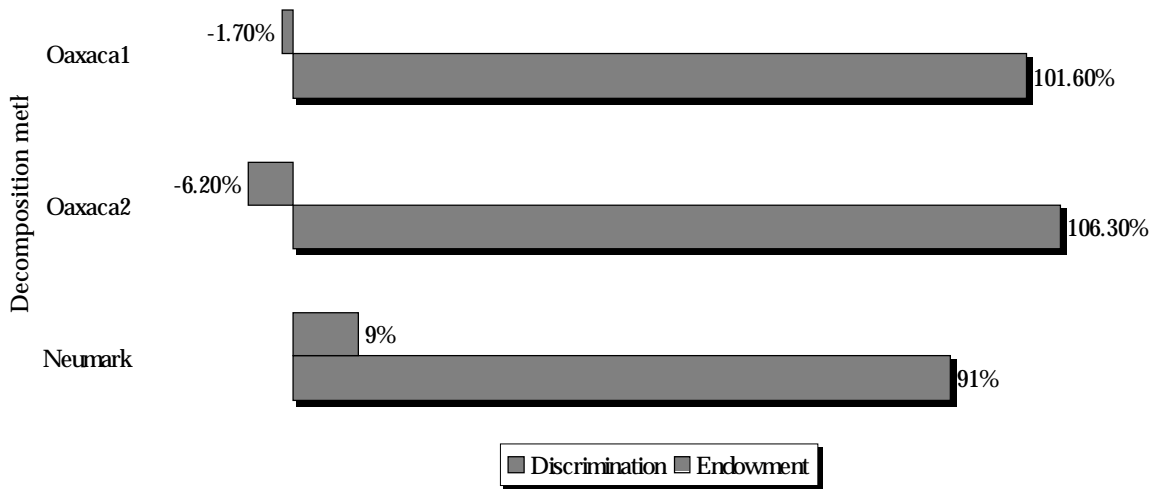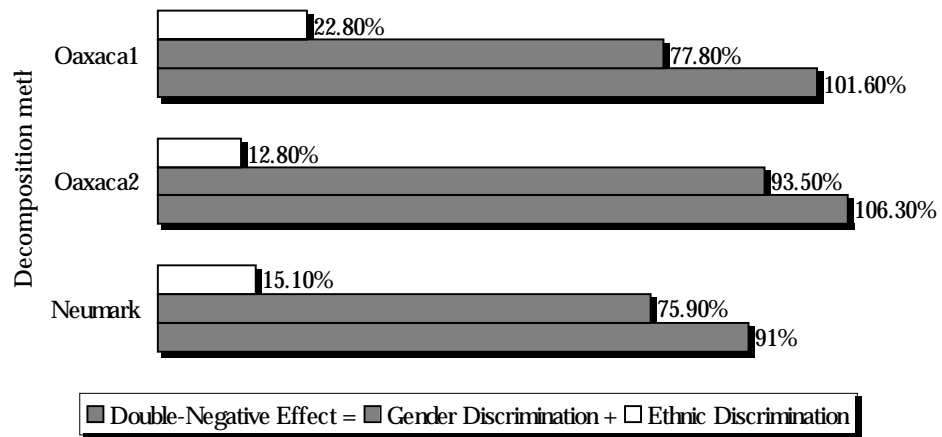

Figure 9.

Measuring the Double-Negative Effect

Note. Oaxaca1 and Oaxaca2 correspond to the two formulations in equations (10) and (11), while Neumark corresponds to the alternative formulation in equation (12) in appendix A2.

TABLE 3

DECOMPOSITION OF NORWEGIAN-IMMIGRANT EARNINGS DIFFERENTIAL USING EQUATIONS (10), (11) AND (12).

	EARNINGS GAP	$\hat{\beta}_{MAJ}$		$\hat{\beta}_{MIN}$		$\hat{\beta}_{POOLED}$			
		DISCR	ENDW	DISCR	ENDW	DISCR	*MAJ. ADV*	*MIN. DISADV*	ENDW
*NM - NW	0.2807	0.2163	0.0644	0.2429	0.0378	0.2178	0.0891	0.1287	0.0630
NM – IM (*ETHNIC EFFECT*)	0.0395	0.0619	-0.0224	0.0346	0.0049	0.0410	0.0891	-0.0481	-0.0015
IM – IW (*GENDER EFFECT*)	0.2314	0.2136	0.0178	0.2533	-0.0218	0.2057	0.0481	0.1576	0.0258
NM - IW	0.2709	0.2720	-0.0011	0.2804	-0.0095	0.2467	0.0891	0.1576	0.0243
*NW - IW	-0.0098	0.0693	-0.0791	0.0044	-0.0142	0.0289	-0.1287	0.1576	-0.0387
NW - IM	-0.2413	-0.1516	-0.0897	-0.1952	-0.0460	-0.1768	-0.0129	-0.0481	-0.0645
NOR - IMG	0.0236	0.0694	-0.0458	0.0694	-0.0440	0.0389	0.0136	0.0253	-0.0153
DOUBLE -NEGATIVE		0.2755		0.2879		0.2467			
GENDER + ETHNIC EFFECT									

NOTES: NM   = Norwegian men; NW = Norwegian women; IM = Immigrant men; IW = Immigrant women;
           NOR   = All Norwegians; IMG = All immigrants
            *   = Alternative calculation of double-negative effect.

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