

Galloway, Taryn Ann

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Taryn Ann Galloway

Re-Examining the Earnings Assimilation of Immigrants

Abstract:

Studies on the earnings assimilation of immigrants have traditionally focused exclusively on immigrants in employment. However, given evidence of immigrants' difficulties in entering and remaining in the labor market, restricting the population to those in employment may entail a selection bias. In addition, the primary variable of interest in such studies is often the duration of residence or the years since migration (YSM), which is interpreted as a proxy for potential labor market experience in the host country. The appropriateness of that proxy will, however, also depend on the extent to which immigrants are able to quickly enter and remain in the labor market. This study thus re-examines evidence on the earnings assimilation of immigrants in light of selection into the labor market and with better information on actual labor market experience in the host country. The findings suggest that a major revision of previous conclusions about the earnings assimilation of immigrants in Norway may be in order.

Keywords: Immigration, assimilation, employment, earnings

JEL classification: J20

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Address: Taryn Ann Galloway, Statistics Norway, Research Department. E-mail:
tag@ssb.no

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1 Introduction

The pioneering study of Chiswick (1978) on the earnings of immigrant men led to a renewed interest in the topic of immigrant adjustment within the field of economics. Since that time, the topic has burgeoned into a substantial field of study encompassing analysis of immigrants' performance not only in the labor market, but also in terms of participation in social assistance programs and with respect to poverty.¹ Further study into earnings assimilation has led to refinements such as the discussion of 'cohort quality' in Borjas (1985) or the attempt to identify and entangle period effects from measures of the duration of residence and the arrival cohort in Barth, Bratsberg og Raaum (2004). Studies also now span across a wide-range of countries and include Baker and Benjamin (1994) for Canada, Bell (1997) and Shields and Price (1998) for the United Kingdom, Schmidt (1997) for Germany, Aguilar and Gustafsson (1991) and Gustafsson and Zheng (2006) for Sweden and Hayfron (1998), Longva and Raaum (2003) and Barth, Bratsberg and Raaum (2004) for Norway. Barth, Bratsberg and Raaum (2006) also present recent results for the US.

The majority of these analyzes of immigrant labor market performance have, however, focused solely on the earnings of employed immigrant men. In a situation in which a large portion of immigrants are unable to immediately enter the labor market and women are increasingly entering employment in many of the host countries studied, such an approach becomes questionable. Selection bias quite clearly poses a threat to the accuracy of the conclusions in such studies. Furthermore, delayed entry into the labor market or a tenuous relationship to employment has implications not just as a selection bias with respect to current observations of earnings. It also undermines the appropriateness of the duration of residence or the years since migration (YSM) as a proxy for the labor market experience of immigrants in the host country, simply because immigrants may have spent considerable amounts of time outside the labor market.

The main purpose of this study is to indicate how the failure to account for employment status and actual labor market experience can affect our conclusions about the earnings and earnings assimilation of immigrants. In light of the evidence to be presented here, a major revision of previous conclusions on the earnings assimilation of non-Western immigrants in Norway may be in order. More specifically, while previous studies suggest that immigrants initially have lower earnings than natives and experience some degree of earnings assimilation as time passes, immigrants' earnings still tend to be lower than natives' after many years in the country. However, results based on slightly different methods and definitions indicate that the immigrants in the groups to be studied here earn roughly the same as – and in some cases even better than – natives with similar levels of human capital.

¹See Borjas and Trejo (1991), Baker and Benjamin (1995), Borjas and Hilton (1996) and Hansen and Lofstrom (2003) for studies of social assistance or welfare; Galloway and Aaberge (2005) and Blume et al. (2007) study poverty among immigrants.

In addition, earnings growth for immigrants largely follows the same pattern as for natives. Thus, there appears to be neither a meaningful gap in earnings between immigrants and native nor indication of some sort of added premium to labor market experience for immigrants in Norway. Of course, if (most) immigrants earn roughly the same as comparable natives, then there is no need for such an added return to host country labor market experience for immigrants.

The following section will first present the underlying and, to a certain extent, largely unspoken and unchallenged assumptions prevalent in the previous literature on the earnings assimilation of immigrants. The intention is, perhaps unsurprisingly, to be able to articulate doubts as to the pertinence of those assumptions. The discussions will also be used to motivate and introduce some important conceptual distinctions which will enable us to more easily discuss different aspects of earnings assimilation. Section 2 will also provide the reader with a brief overview over immigration to Norway and previous results on the labor market performance of immigrant there. The section will culminate in the formulation of explicit questions to be addressed empirically in this study. Section 3 will present in detail the methods, data and definitions to be used in the actual empirical analysis; Section 4 will report the empirical results. Much of Section 4 will focus on answering the main question of this study, i.e. how the results with modified methods differ from results based on previous methods. The final section will summarize those results while also interpreting them and highlighting their significance in broader terms.

2 Studying Immigrants' Adjustment to the Host Labor Market

2.1 Immigrants' Accumulation of Human Capital in the Host Country

Following Chiswick (1978), theories of human capital have generally been invoked when discussing and interpreting the earnings levels and earnings assimilation of immigrants. In order to fix ideas, we can broadly speak of three periods with respect to immigrants' human capital accumulation in the host country. In the first period, immigrants have just crossed the border into the host country and experience a 'destruction' or large depreciation of their human capital due to the non-transferability of their skills and qualifications. In the second period, immigrants are actually adjusting to the host country by learning the language, acquiring additional training and gaining experience in the labor market. Finally, in the third phase, the immigrants are fully integrated in the host country society and labor market.

The degree of depreciation in human capital at the start of an immigrant's stay depends on various special features within the context of each particular host

country, i.e. the extent of the knowledge, familiarity and ties the host labor market has with respect to the home or source country. The actual skills and abilities of the individual immigrant may not have changed dramatically, but the host labor market may not value or be able to assess the appropriateness of those skills, and language difficulties can make it impossible for the immigrants to express and use existing skills and knowledge.² The productivity and earnings potential of new arrivals to the host country may therefore be quite low in the eyes of prospective employers; alternatively, employers might view new immigrant employees as a risky investment.

The second period is the actual period of adjustment; immigrants learn the host country language and gain experience and knowledge of the host country labor market. They may engage in further education or training within their previous occupation or acquire skills in a new field more relevant in the host country. Chiswick (1978) also suggests that job turnover may be quite high among immigrants as they test the waters of the labor market and make use of different jobs and types of employment in order to find the correct match for their skills and abilities in the host labor market. Initial employment – with low earnings – may also be used to build up experience interpretable by host country employers; from this perspective, the element of 'risk' in hiring the immigrant will also gradually decline, because the immigrant's experience can be more easily understood and evaluated by employers in the host country. In addition, immigrants may not work full-time while they pursue formal education or training. All in all, a very large number of factors and forces are likely to be at play during this period of adjustment and the period itself may extend over many, many years. These factors would, however, be expected to lead to an increase in the immigrants' earnings potential on the job or in the labor market in general as well as a rise in an immigrants' productivity from the view of current and potential employers. Finally, the presence, form and strength of unions will also have an impact on possibilities for rapid successful entry into the labor market. If unions disregard general economic conditions and focus exclusively on 'insiders', then immigrants may experience initially difficulties in entering the labor market, i.e. becoming an insider. Altogether, therefore, in this phase of adjustment to the host country there are several forces that may cause us to expect larger growth in earnings for immigrants compared to similar natives, especially at the start of their stay in the host country, but, at the same time,

²Within Norway immigrants from other Scandinavian countries probably experience but a slight depreciation in their human capital upon moving to Norway; their native tongue is, with a little bit of effort, understandable for Norwegians and Norwegian employers will generally have good knowledge and respect for the institutions of the other Scandinavian countries. Note too, however, that language is likely to represent a particularly large barrier to the (host) labor market in small countries or language communities such as Norway; Norwegian as a second language is hardly widespread, so few, if any, non-Scandinavian immigrants arrive in Norway with substantial knowledge of the language. Lack of language skills will therefore severely limit the types of jobs available to almost all immigrants at the start of their stay in Norway.

many of these same factors also may make it difficult for immigrants to enter and remain in the labor market.

In the final phase of the immigrant's development of human capital in the host country, adjustment to the labor market and investments in education or training are complete. The immigrant is fully integrated in the labor market; he or she has acquired the skills, training and/or experience necessary to find the correct employment match and the labor market is able to properly assess and value his or her productivity. At this point, growth in earnings for the immigrant might be expected to largely flatten out, although they might also continue to a level above that of natives for a while as immigrants make up for their lower earnings earlier in life.

As this scenario illustrates, there are really three distinct phenomena that characterize the situation which is normally subsumed under the term "earnings assimilation". Firstly, talk of earnings assimilation only makes sense if there is some meaningful difference in earnings for immigrants and natives; studies of earnings assimilation generally aim to explain this difference in relation to immigrants' lack of experience in the host country. Thus, this difference is usually assumed to be more pronounced at the start of the stay in the country. Secondly, as immigrants adjust and adapt to the labor market in the host country, they may experience larger earnings growth than natives; their earnings thus move closer to the level of natives. Finally, one might expect that immigrants' earnings eventually converge to roughly the same level as natives. In order to distinguish between these different aspects of earnings assimilation, we shall refer to a meaningful difference in earnings as an "earnings gap". The term "earnings assimilation" will be reserved for the situation in which earnings growth somehow appears to be greater for immigrants than for natives, i.e. there is reason to suggest that immigrants' earnings are becoming more similar to natives'. Finally, it is possible that immigrants experience earnings assimilation, in the sense just described, but that their earnings never quite converge to the same level as natives. Earnings growth for immigrants might, for example, flatten out before earnings reach the same level as natives. A situation in which immigrant and native earnings are roughly the same will be referred to as "earnings parity".

The importance of these distinctions will become more apparent as we start to discuss the main empirical results of this study. The main idea, however, is that changes in the methods used to study earnings assimilation can affect just one or all of these different aspects or influence them to varying degrees. Thus, we will need to be able to distinguish between them in later discussions.

2.2 Selection in the Labor Market and the Earnings Assimilation of Immigrants

In the scenario of the previous subsection, the duration of residence in the host country is simply a proxy for human capital investments and developments largely unobservable to the econometrician. Growth in earnings relative to the duration of residence is also often interpreted as a measure of immigrants' success (or failure) to integrate into the labor market of the host country. As hinted at above, the structure and institutions of the labor market in the host country can confound or complicate this picture. The existence of minimum wages and the strength of job protection may make employers unwilling to hire new arrivals with low or uncertain productivity. The extent of unionization and the system of wage bargaining may leave immigrants as 'outsiders' in the labor market or inflate the general level of wages in society to a level above the productivity of (newly arrived) immigrants. If the skills of other workers is believed to be of higher quality or more productive, employers may bypass immigrants when hiring. Finally, the availability of social assistance or other forms of income support and welfare programs can raise the reservation wage for immigrants and natives alike. In the special case of refugees or those granted political asylum, the host country may even willingly finance special programs of education, training and income support in order to ease initial difficulties and facilitate integration into society. Such programs might, thus, keep new arrivals out of the labor market during the first few years of residence, but are implemented in the expectation that they generate good returns with respect to labor market performance in the long run. Altogether one might suspect that immigrants are not all immediately able or willing to enter employment in the host country, and it would be quite wrong to base conclusions solely on analyzes of immigrants in employment.

Estimations of earnings assimilation based on *observed* earnings of *employed* immigrants may thus be biased by selection into the labor market and the use of a poor proxy for actual labor market experience. Figure 1 provides an example of how selection into the labor market may affect results on the earnings assimilation of immigrants. The y-axis represents the log of wages or earnings; the x-axis represents the duration of residence in the host country. The darkest gray curve is the true (unobserved) earnings curve for immigrants who immediately enter the labor market upon arrival in the host country. The two curves of a lighter gray color represent those immigrants who enter the labor market at later dates, i.e. only after an increasing number of years in the country. In the figure we assume that the first immigrants to enter the labor market are the "most able" and, hence, achieve higher wages; this difference in ability is assumed to be unobservable for the econometrician. Later labor market entrants have successively lower wages and are, thus, assumed to be "less able". The overlaid black curve is meant to represent what sort of (biased) results might arise if one focused only on immigrants in employment, i.e. used a traditional approach for studying earnings assimilation.

In this particular example, initial earnings would be *overestimated* by a traditional approach, because only the most able are observed with earnings at lower YSM and thus included in the analysis. In addition, a traditional analysis would *underestimate* the assimilation effect, i.e. the increase in wages for longer duration of residence, because the earlier arrivals—those observations with longer durations of residence—would encompass immigrants of successively lesser and lesser ability or earnings potential.

In light of such thoughts on selection into the labor market, one can also distinguish between two different types of experience relevant in the host country. The first type is of a general nature. In other words, it encompasses elementary knowledge and skills in such areas as language and customs as well as understanding of the basic workings of the labor market. One might suppose that the acquisition of such skills is furthered participation in employment, but at a very basic level such knowledge may be a pre-requisite for entry into the labor market and is, thus, first learned elsewhere. This type of human capital accumulation might also encompass formal education which is needed to gain a foothold in the labor market.

The second type of experience is true labor market experience, i.e. specific skills and knowledge acquired on the job and in employment. One suspects that this is the major force behind growth in the earnings of immigrants or natives once they do enter the labor market. Furthermore, selection into the labor market, or forces keeping immigrants out of the labor market, also disrupt the accumulation of human capital specific to labor market experience. Thus, such selection has an effect not only at the time of observation, but also implies that many immigrants have less employment experience than a measure of YSM would indicate. From such a perspective, one can question the appropriateness of YSM as a proxy for labor market experience in the host country.

2.3 Immigrants to Norway

Immigration from non-Western countries has a rather short history in Norway; substantial numbers of immigrants from non-Western countries only first appeared in Norway during the early 1970s. Net immigration was actually negative in Norway up until about the late 1960s. Even at the end of the 1980s, over a quarter of the immigrants to Norway were from other Scandinavian countries; over half of the immigrants were from Western or industrialized countries.³ While there were no restrictions on immigration to Norway up until 1975, immigration from outside the European Economic Area has since been limited to specialist (skills-based) labor immigration, political asylum and family reunification.⁴ As of 1 January 2008, immigrants made up 9.7 percent of the population in Norway.

³Statistics on the size and composition of the immigrant population can be found in the database Statbank available on the webpage of Statistics Norway (www.ssb.no).

⁴Brochman (2003) provides a historical account and analysis of the events and discussions related to the more modern history of immigration to Norway, i.e. from the early 1970s.

Previous studies of earnings assimilation among immigrants to Norway in Hayfron (1998), Longva and Raaum (2003) and Barth, Bratsberg and Raaum (2004) suggest that immigrants do start off earnings less than natives in Norway, but that they do in general experience some degree of earnings assimilation. However, while there is indication that immigrants from Nordic and other Western (or OECD) countries may achieve earnings parity with natives, a gap in earnings persists between natives and immigrants from non-Western (non-OECD) countries even after the immigrants have been in the country for many years.

There are many differences between immigrants and natives in terms of employment rates. If one studies several of the largest non-Western ethnic groups in Norway, evidence resoundingly rejects the notion that immigrants immediately enter the labor market. Galloway (2008) studies more directly the patterns of entrance into the labor market for immigrants from Pakistan, Turkey, Vietnam, Sri Lanka and Iran; these immigrants made up the five largest immigrant groups in the early 1990s in Norway. That analysis suggests that there is a significant rise in employment probabilities for immigrants and that the rise is in part attributable to the duration of residence in the host country. In other words, there is an "integration effect" that plays a part in how quickly immigrants gain a foothold in the labor market. Furthermore, that study indicates that unobserved heterogeneity influences the estimated pattern of integration into the labor market. Thus, there is potential for selection bias due to both observables and unobservables in studies of earnings assimilation which fail to account for employment status.

2.4 Main Questions for Analysis

The main empirical analysis of this paper is intended to estimate the earnings assimilation of immigrants while incorporating the above-mentioned thoughts and evidence on potential selection into the labor market. This is done both by means of a sample selection model and by introducing a measure of labor market experience. Results based on such an estimation strategy are compared with results from estimation based on a "traditional approach" for studying earnings assimilation. Further details of these methods will be given in the next section.

The main question for this analysis is: Do we reach vastly different conclusions about the earnings of immigrants once we have attempted to model selection into employment and used a better measure of labor market experience? More specifically, we can also ask how large the earnings gap between immigrants and comparable natives is. The definition of "comparable" is obviously important in such a context. Indeed, any meaningful answer to the question of the extent of earnings assimilation must rely on some notion of comparability; it would come as no surprise that newly arrived young immigrants with low levels of education earn less than middle-aged, highly educated natives. Very briefly stated, we will consider immigrants and natives to be "comparable" or "observationally similar" if they have the same levels of relevant observable human capital; since the definition

of those relevant variables will vary somehow in the models and methods to be used, the definition of "comparable" will also vary somewhat. The details of these matters should become clearer for the reader once we have provided a thorough description of definitions and methods in the next section.

In keeping with the conceptual distinctions about different aspects of earnings assimilation for immigrants, we can ask not only about the existence of an earnings gap between immigrants and natives; we can also ask if immigrants experience earnings assimilation, i.e. have higher earnings growth than comparable natives. Finally, we might also be interested if immigrants are thus eventually able to achieve earnings parity with comparable natives.

In discussing the results of this analysis, we do touch on several subsidiary questions, including the extent to which previous studies of Norway may have reached different conclusions on earnings assimilation also due to a failure to account for the large degree of (ethnic) heterogeneity in the immigrant population. Our main results focus on four of the largest immigrant groups, because differences between the ethnic groups are large and worthy of note.

3 Methods, Data and Specification

This analysis will focus on and compare two different econometric models for estimating the earnings for the four largest non-Western immigrant groups in Norway during the 1990s. The first model is termed the "Traditional Approach" and is meant to represent the type of specification generally employed in previous studies of earnings assimilation. The exact variables included in any particular specification are obviously going to vary somewhat from study to study and from country to country, depending on the data available. We nonetheless maintain that the specification of the Traditional Approach here remains true to the essence of such analyzes in that it only includes observations on individuals in employment and that it makes use of 'years since migration' (YSM) and age as proxies for labor market experience.

The second model, which we will refer to as the "Modified Approach", accounts for potential selection into employment by means of a selection model with an improved measure of labor market experience. Details on the data and, more specifically, the definition of employment status, earnings and the new measure of labor market experience to be used in this study will be described in the following subsection. Further details on the econometric models will be described in the second subsection; that subsection will focus largely on the main differences between the two approaches and discuss differences with respect to the main variables of interest in those approaches. The third subsection will provide additional details on other explanatory variables used in those specifications.

3.1 Data and Definitions

The ability to utilize register data on the entire resident population of the Norway provides us with unique opportunities for the study of the immigrant population. Proper study of immigrants in Norway would hardly be possible without the use of such data, simply because the immigrant population is both too small and too diverse to be done justice in surveys. The register data used in this study is collected by various government institutions and administered by Statistics Norway. It includes such information as earnings and income, marital status, family relations, household composition, education and place of residence for the entire resident population of Norway. Information from diverse sources and different government agencies can be easily merged by means of a universal and unique person number.

The information on annual earnings is based on data from tax records; earnings are defined as the sum of wages, salary or other income from employment as well as income from self-employment, where relevant. More specifically, a substantial portion of the earnings of self-employed persons may be reported as capital income for tax reasons. Hence, we also include capital income in earnings if a person is registered with any income from self-employment. Earnings from different years are deflated based on the Norwegian Consumer Price Index with 2001 used as the base year.

It should be noted that earnings for employees as well as most other forms of (taxable) income, such as from disability and old-age pensions or capital investments (in Norway), are reported directly to the tax authorities; hence, they are only self-reported to a limited degree.⁵ Self-employed persons would have to report their income to a larger degree themselves, but this process is also likely to be subjected to more scrutiny by the authorities. The data on earnings from the tax authorities are, thus, very comprehensive and can be assumed to be of reasonable quality.⁶

Finally, this study focuses on immigrants who are registered in the data and, thus, legally residing in the country. There is little evidence that large numbers of illegal immigrants are or have been residing in Norway and, for obvious reasons, little is known about the presumably few illegal immigrants that are here. A very recent study by Zhang (2008) estimates the illegal immigrant population at

⁵All adult residents of Norway were required to file tax returns during the period analyzed in this study (1993-2001). The tax authorities themselves summarize and send out individual tax information to each individual resident of Norway based on the information they have received from employers, banks, other government authorities, etc. The individual taxpayer then has to either check and confirm the information as it is or claim further deductions and/or report any additional information. This also applies to people who have not earned any income in Norway (but are registered as residents or citizens); thus, a person also has to confirm in writing that he or she did not earn any income in a given year if this is the case.

⁶There is still obviously room for tax evasion and the associated underreporting of income for some individuals in this data. However, unreported income from illegal or black market activities are a challenge for any data source on income, not only the data sources used here.

0.39 percent of the population in Norway, which is considered low in comparison to estimates from most other countries. Zhang (2008) also emphasizes the large degree of uncertainty surrounding such estimates.

While it might at first glance seem likely that such seemingly comprehensive register data also includes detailed information on employment status, this is, unfortunately, not entirely true. The Norwegian tax and benefit system is largely organized around *earnings*; more specifically, the social security system assesses the eligibility and amount of benefits on previous earnings and not previous employment status per se. Hence, information on (annual) earnings is very good, but information on the length of employment and/or working hours is poor or of questionable reliability.

Thus, the definition of employment status to be used in this study will itself be based on an earnings threshold.⁷ In principle, positive earnings of any amount could serve as indication of employment for the purposes of this study. However, zero or very low annual earnings may not reflect the true earnings potential of an individual, simply because such low earnings may be the result of either the inability to find employment of a more extensive nature or the voluntary decision to engage in only intermittent, part-time employment. Thus, we prefer to base the classification of labor market status on a level of earnings considered substantial enough to indicate true attachment to the labor market. The earnings threshold used here is itself a parameter, referred to as the "basic amount" (BA), that plays a very integral part in the Norwegian social security system. The BA is used to assess both the eligibility and amount of benefits (based on previous earnings) for a wide range of social security programs in Norway. In this study, we classify a person as participating in the labor market if his or her earnings are at least 2 times the BA in the relevant calendar year. This corresponds to the current eligibility requirements for receipt of the full duration of unemployment benefits.⁸ Galloway (2008) provides a more lengthy discussion of the BA and provides examples of the BA in relation or to other parameters of interest in the Norwegian economy and social welfare system; that study also documents that employment rates based on the BA thresholds correspond closely to employment rates in the Norwegian Labor Force Survey. Individuals with earnings below the 2 BA threshold are thus considered non-employed in the following analyzes.

The new measure of previous labor market experience is also based on the BA and its relevance in the Norwegian system for old-age pensions and disability benefits. "Pension points" are awarded to an individual if a person earns above 1

⁷It should be noted that, for practical purposes previous studies of earnings assimilation in Norway, such as Barth, Bratsberg and Raaum (2004), have also had to introduce some sort of earnings threshold to define their population for study and eliminate observations with extremely low earnings. Some discretion has always been and must always be employed when defining employment status in studies such as this one.

⁸In general, persons are eligible for the full duration of unemployment benefits in Norway if they had earned at least 2 times the BA during the calendar year preceding unemployment.

BA during the course of a calendar year and details on the number of years with pension points are available in data from the social security authorities. Thus, even though we do not have comprehensive information on all earnings in the period preceding 1993, we do have information on the number of years for which an individual earned more than 1 BA going all the way back to 1967. This information is what we propose to use as an "improved" measure of labor market experience. Thus, we say a person has x years of previous "experience" if he or she has received pension points in x years prior to the current calendar year.⁹

Note, finally, that unemployment benefits are *not* included in this definition of earnings, whereas they were included in the earnings definition employed in previous studies of the earnings assimilation of immigrants in Norway.¹⁰ There are arguments both for and against the inclusion of unemployment benefits when studying the earnings assimilation of immigrants. The system of unemployment benefits is a social *insurance*, which relates benefits to previous earnings by replacement rates and determines eligibility by various rules and regulations. Thus, receipt of unemployment benefits does suggest that a person is integrated in the labor market, albeit perhaps temporarily without gainful employment. One might therefore wish to include unemployment benefits when interpreting earnings assimilation as a measure of labor market attachment. However, if one wishes to discuss earnings assimilation in relation to the extent to which immigrants eventually are able to contribute to the economy of the host society in a manner commensurate to their skills, ability and experience, then the inclusion of unemployment benefits might distort the picture, especially if immigrants are more likely to receive such benefits. Since the purpose of this paper is to examine precisely the relationship between earnings and various patterns of experience or selection in the labor market, it seems reasonable to exclude such benefits from the measure of earnings.

3.2 Econometric Models for the Study of the Earnings Assimilation of Immigrants

3.2.1 Model 1: The Traditional Approach

What we will term the "Traditional Approach" to studying earnings assimilation has typically invoked some variant of a Mincer-style earnings equation to relate an

⁹It is, perhaps, unfortunate and somewhat inconsistent that our measure of labor market experience is based on a lower earnings cut-off than our measure of current labor market participation. This is, however, largely a result of limitations in the data on pension points. As Galloway (2008) indicates, very few individuals earn between 1 BA and 2 BA; thus, one expects no large effect from this minor inconsistency. Alternative estimates with an earnings cut-off for labor market selection at 1 BA, i.e. for earnings cut-off in line with the measure of labor market experience, confirm this suspicion.

¹⁰Hayfron (1998), Longva and Raaum (2003), Barth, Bratsberg and Raaum(2004).

individual's log earnings, y_i to various relevant observable characteristics,

$$(1) \quad y_i = \beta' X_i^T + \epsilon_i,$$

where X_i^T is a vector of relevant explanatory variables, β is a vector of parameters to be estimated and ϵ_i is the classical error term in linear regression. With this approach, only persons classified as in employment are included in the analysis; in the context of this study, this means persons defined as having earnings above 2 BA. Note also that X_i^T includes age and YSM as well as second-order polynomials on age and YSM as relevant *proxies* to labor market experience in this model. Other relevant variables contained in X_i^T will be described below.

3.2.2 Model 2: The Modified Approach

Model 2 aims to incorporate the concerns raised in the previous sections along two lines: 1) by accounting for selection into current labor market status and 2) by providing a better measure of actual previous labor market experience in Norway. The new wage equation is similar to (1):

$$(2) \quad y_i = \beta' X_i^M + \epsilon_i,$$

but note that, in the vector of explanatory variables X_i^M , YSM and AGE are now replaced by a variable, experience, which is assumed to better measure the actual amount of previous labor market experience in Norway. (Other variables included in X_i^M will be described below.) With this approach, we assume that the process determining employment for the individual is latent, but related to certain observed characteristics, Z_i and y_i is thus only observed for individuals in employment. A (reduced-form) specification of this latent process determining employment can thus be expressed as

$$(3) \quad I_i^* = \gamma' Z_i + \eta_i,$$

where γ is a vector of parameters and η_i is an error term. We introduce a selection indicator I_i equal to 1 if the individual is employed; we assume that $I_i = 1$ if $I_i^* > 0$ and $I_i = 0$ otherwise.

If we assume that the error term in the earnings equation, ϵ_i , and the error term in the latent process determining employment status, η_i , are correlated such that $cov(\epsilon_i, \eta_i) \neq 0$, then expectation of y_i given X_i^M , Z_i , and $I_i^* > 0$ is given by

$$(4) \quad \begin{aligned} E[y_i | X_i^M, Z_i, I_i^* > 0] &= E[\beta' X_i^M + \epsilon_i | \gamma' Z_i + \eta_i > 0] \\ &= \beta' X_i^M + E[\epsilon_i | \eta_i > -\gamma' Z_i]. \end{aligned}$$

More specifically, if we also assume that the joint distribution of ϵ_i, η_i is bivariate normal with $E(\epsilon_i) = E(\eta_i) = 0$, $var(\epsilon) = \sigma_\epsilon$, $var(\eta) = \sigma_\eta = 1$ and $cov(\epsilon, \eta) = \sigma_{\epsilon\eta}$, then the expectation (4) becomes

$$(5) \quad E[y_i | X_i^M, Z_i, I_i^* > 0] = \beta' X_i^M + \sigma_{\epsilon\eta} \lambda(\gamma' Z_i),$$

where $\lambda(\gamma'Z_i) = \phi(\gamma'Z_i)/\Phi(\gamma'Z_i)$ is the inverse Mill's ratio and $\phi()$ and $\Phi()$ denote, respectively, the pdf and cdf of the standard normal distribution. Note in particular that we will later report and discuss the estimated correlation between ϵ and η , that is,

$$(6) \quad \rho = \text{corr}(\epsilon, \eta) = \frac{\sigma_{\epsilon\eta}}{\sigma_\epsilon\sigma_\eta} = \frac{\sigma_{\epsilon\eta}}{\sigma_\epsilon},$$

where the last equality follows from the fact that $\text{var}(\eta) = 1$.

This formulation assumes that the error term in the earnings equation is normally distributed and the estimation results that will be discussed were obtained with maximum likelihood (ML). Estimation was however also performed with the two-step method of Heckman (1979) since this also entails a relaxation of the normality assumption on the error term of the wage equation. There were no noteworthy differences between the two-stage results and the ML results, so only the ML results are reported.

3.3 Further Details

Separate analyzes are performed for in the four largest non-Western/non-European immigrant groups in Norway as of 1993 – immigrants from Pakistan, Vietnam, Turkey, and Sri Lanka – as well as for natives. Although results for the pooled population of all non-Western immigrants will be discussed briefly, the main body of this presentation of empirical results will focus on results for the separate analyzes of the various ethnic groups. The reason for this is the conviction that separate analysis of individual ethnic groups, where possible, represents best practice in the field; indeed the brief discussion of the pooled results will reveal why this is so.

Separate estimation of the models is performed for the men and women in each of the above-mentioned groups. The data are from the period 1993-2001. The focus is on ("first generation") immigrants between the ages of 25 and 64; so-called "second generation immigrants", i.e. children born in Norway to two immigrant parents, as well as individuals who arrived in the country before the age of 16 are excluded from the analysis. Immigrants married to Norwegians are also excluded, since the factors influencing their integration into the labor market are expected to be somewhat different than the core of the populations we wish to study here.

In line with common practice in the literature, cohort dummy variables or cohort fixed-effects are included based on five-year periods of arrival; the number of cohort dummy variables depends on the periods which are relevant for each specific group, i.e. to reflect when the group first started to arrive in Norway is substantial numbers. Pakistani immigrants are assigned cohort dummies for the following arrival dates: up to 1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994 and 1995-1999 with the group arriving up to 1974 used as reference; immigrants from Sri Lanka did not start arriving in Norway before the 1980s so the dummy variables for immigrants from Sri Lanka are: up to 1989, 1990-1994 and 1995-1999. The cohort dummies are included in the vector of explanatory variables for the

earnings equations in both Model 1 and Model 2, i.e. X^M and X^T , as well as in the vector of explanatory variables Z in the reduced-form selection equation of Model 2.

In order to provide a measure of general economic developments and, hence, capture period effects related to the economic climate of different years, the rate of local unemployment is included.¹¹ This measure is constructed by utilizing the regional groupings of municipalities based on labor market and economic ties as described in Statistics Norway (2001); an intermediate regional grouping is assumed to better reflect the relevant labor market where the individuals actually live and work.¹² The regional measure of unemployment is calculated by taking the average number of registered unemployed over the 12 months of the relevant calendar year and dividing this by the number of persons in the working-age population (persons age 16-66 years) in the economic region (at the start of the year). The measure of regional unemployment is included in X^T , X^M and Z .

Further variables reflect information on education¹³ in X^T , X^M and Z as well as age, YSM and household composition in Z . Note in particular that inclusion of age and YSM in Z are thus used for identification of Model 2. This implies that YSM and age are interpreted as important factors which determine employment status, but which do not influence earnings directly. The variable *experience* is thus assumed to be the main influence on earnings and earnings growth. Summary statistics for the pooled populations (over time) of each ethnic group (by gender) are presented in Table A.1 in the Appendix.

4 Results

The complete regression results for immigrants from Pakistan, Vietnam, Turkey and Sri Lanka as well as native Norwegians and the pooled population of all non-Western immigrants are provided in Tables A.2-A.5 in the Appendix. The main

¹¹This is a slight modification of the practice in Barth, Bratsberg and Raaum (2004), which is based on *municipal* unemployment rates.

¹²On the one hand, municipal level unemployment data – data on a smaller regional level – can be unsatisfactory because people do travel between municipalities for work and other economic purposes; on the other hand, county level data probably encompasses too large a region to be truly relevant in Norway.

¹³Information on the education of many newly arrived immigrants is often missing in the first few years after their arrival. We can, however, fill in some of these blanks by two means. First, we can make use of information on immigrants who participate in education in Norway and impute education for earlier years based on the education level achieved in Norway (later on). More specifically, if immigrants have taken some type of education during the period we study, we assume that their educational level is one below the level they are taking, i.e. middle school if they are taking high school education, Bachelor's degree if they are enrolled in a Master's program, etc. Second, Statistics Norway made explicit efforts to obtain this information for immigrants in 1999/2000. Given that no form of education was registered for intervening years, the information thus obtained can be used for earlier years.

insights of this paper are best illustrated by the use of appropriate figures and the figures to be presented in the following subsections attempt to compare earnings for observationally similar immigrants and natives.

The following subsection will start by discussing the main differences in results suggested by Model 1 and Model 2. Further subsections provide some general insights on the relevance of level of education for the results, selection on unobservables, common estimation for all non-Western immigrants and participation in formal education for immigrants. With results from two models for men and women for native Norwegians, non-Western immigrants as a whole as well as 4 different ethnic groups, exhaustive discussion of all the results is hardly possible in this one paper. The aim will thus be to highlight the main and most interesting findings and insights in the best and most accessible manner.

4.1 "Traditional" Methods vs. Sample Selection with Labor Market Experience

The main purpose of the first four figures to be presented here is to illustrate just how the different modelling approaches and the different proxies or conceptions of relevant (labor market) experience affect our impressions of earnings assimilation and can influence our conclusions on the subject. The estimates of immigrants' and natives' log earnings will be presented for individuals assumed to have secondary education; immigrants are assumed to have arrived in the country in the period 1985-1989. The rate of local unemployment is assumed to be 2.87 percent, which is the national average for the period when a national rate is computed the same way as for the regional rates. For the Traditional Approach, both immigrants and natives are assumed to start off the period to be presented at the age of 25; furthermore, immigrants are assumed to start off the period with $YSM=0$. Note that the passing of time represented by the x-axis for the Traditional Approach thus encompasses both age and YSM effects for immigrants and age only for natives. For the Modified Approach, both immigrants and natives are assumed to start off the period with no previous labor market experience ($experience=0$); the passing of time represented by the x-axis for the Modified Approach thus indicates the effect of increased labor market experience only, in accordance with the motivation behind the formulation of Model 2. The results for immigrants from Sri Lanka are only presented for 15 years, since few members of this group had durations of residence much longer than that in the data material for this study.

Figure 2 presents results based on the Traditional Approach (Model 1) for studying earnings assimilation. Those estimates suggest that the immigrants in these groups start off with considerably lower earnings than natives. The immigrants in most of these groups experience somewhat larger earnings growth than natives and therefore close that initial earnings gap somewhat. In this sense, some degree of earnings assimilation does appear to take place, but the immigrants in these

groups do not seem to achieve earnings parity with natives.

The results for the Modified Approach presented in Figure 3 suggest some very different conclusions about earnings assimilation for these groups. Figure 3 gives the general impression that the earnings of immigrants do not differ greatly from the earnings of natives with the same levels of labor market experience in Norway. Men from Sri Lanka do seem to start off with slightly lower earnings than similar natives, but that small gap in earnings is closed quite quickly. Vietnamese men have slightly *higher* earnings than Norwegians with the same level of labor market experience in Norway. The earnings curve for the Vietnamese immigrants runs largely parallel to the curve for the natives, i.e. the slopes for the two groups are largely the same. Men from Turkey earn less than natives, but, once again, native and Turkish men experience very similar earnings growth, as indicated by the slopes of the relevant curves. Altogether, the Modified Approach gives the impression of earnings parity – or at least similarity – between natives and the immigrants in these groups.

Given the large numbers of observations for all of the groups in this analysis, confidence intervals for the predictions presented in Figure 2 and 3 are quite narrow; any attempt to present such intervals in these figures would largely obscure the main results. However, in order to give the reader some impression of the magnitude of the confidence intervals, we can mention that the standard errors of the predictions for natives in Figure 2 and 3 are in the range of 0.002 to 0.004. For immigrants, the standard error of the predictions are as low as 0.005 and as high as 0.022. The latter standard error can be found, for example, for Turkish men with 19 years of labor market experience in Norway with the Modified Approach; given a prediction of 12.417 for a such a Turkish man (with the other characteristics as specified for Figure 3), the 95 percent confidence interval would be [12.374, 12.460]. Such narrow intervals would hardly be distinguishable in the presented figures; perhaps more importantly, however, the interval is more than narrow enough that the difference between Turkish men and natives is statistically significant. The slight difference between Vietnamese and native men is, upon similar analysis, also statistically significant, but it is still just a very small difference in earnings levels. The main insights to be gained from this brief discussion of confidence intervals is that anything but the smallest differences presented in the figures are generally statistically significant; very small differences are, however, still just very small differences.

Overall, the Modified Approach suggests that little earnings assimilation takes place for these immigrants in Norway; this is simply because immigrants are earning more or less the same as natives with comparable characteristics. In other words, we find little, if any, earnings assimilation, because there is hardly any earnings gap to be closed by these immigrants. Immigrants in some of the groups even appear to earn *better* than comparable natives. It is difficult to say what the reasons between the persistently lower levels of earnings for Turkish men might be, but it could

depend on these workers being concentrated in certain industries or may be the result of differences in skills that are not as easily captured otherwise and which have their origins in the home country. Thus, the Turkish men may differ from natives in ways we cannot observe and are therefore unable to properly measure or account for in this analysis.

Figure 4 and Figure 5 present analogous results for women with the Traditional and Modified Approach, respectively; as with the men, the Modified Approach gives more of an impression of similarity in earnings for native and immigrant women than the Traditional Approach. Since part-time work is generally more widespread among women it should be particularly emphasized here that we are analyzing annual earnings, rather than hourly wages. The same level of annual earnings can thus be achieved with different combinations of working hours and hourly wage and there could still be differences between the immigrant and native women in the package of hours and wages which they need to obtain the same level of annual earnings as estimated by these methods and presented in the figures.

In going from Model 1 to Model 2 we have instituted two distinct modifications to the Traditional Approach. Firstly, we have introduced methods for dealing with selection into the labor market at the time of observation. Secondly, we provide a better measure of labor market experience than simply the duration of residence. The arguments for introducing those two modifications are related, since they both ultimately refer to the fact that immigrants have difficulties in obtaining and remaining in employment, especially at the start of their stay in Norway. Thus, it is difficult to separate the two and make definitive statements about the different contribution of the modifications to the changes in results. The main conclusion is, thus, that *both* modifications had an effect on both levels and slopes and that the effects of the two modifications together contributed to higher estimates of immigrants' earnings.

Since the change in going from Model 1 to Model 2 has an impact on both the estimated levels of earnings and the estimated growth in earnings, we would like to briefly isolate and discuss the differences in slope here. Figure 6 and Figure 7 present the differences in slopes for the two approaches for men and women, respectively. Growth is measured relative to a base of 100 for the first year in Norway and for a starting age of 25 years for the Traditional Approach; the growth thus reflects the effect of both YSM and age for the Traditional Approach and experience for the Modified Approach.

Compared with the Traditional Approach, the Modified Approach leads to steeper slopes, i.e. larger estimated growth, for immigrant men from Sri Lanka, Pakistan and Turkey; the slopes for immigrant men from Vietnam as well as the women in basically all the groups are *flatter* with the Modified Approach. (The difference is hardly distinguishable for the Turkish women and the Sri Lankan men.) An understanding of the pattern of employment rates for these groups can

help to shed some light on these differences.¹⁴ Most notably, the women in these immigrant groups as well as the men from Vietnam have low employment rates the first few years in Norway, but they experience a large 'integration effect' with respect to employment. In other words, their employment probabilities increase greatly as they spend more time in the country. Based on the differences presented in Figure 6 and Figure 7, it seems likely that the Traditional Approach is partly capturing this integration into employment and perhaps somewhat misleadingly interpreting it as an assimilation in earnings. It would seem likely that the later labor market entrants are thus actually biasing the earnings curves upwards. Employment probabilities are much higher from the start of the stay in Norway for the men from Sri Lanka, Pakistan and Turkey, so the differences in slopes between the different approaches suggest that later labor market entrants may have been causing a downward bias in the slopes with the Traditional Approach among the men in those groups.

4.2 Level of Education

While the estimated results presented above suggest that the earnings of immigrants with secondary education do largely converge to the same level as natives once we properly account for differences in labor market experience and selection into the labor market, such findings do not hold for immigrants with higher education. As Figure 8 illustrates, the earnings of immigrant men with higher education generally do not converge to the earnings of native men with similar levels of education. As Figure 9 indicates, immigrant men with *low* levels of education, however, quite quickly attain earnings similar to or considerably higher than observationally similar native men.¹⁵

The differences with respect to education surely reflect a number of factors. Firstly, one expects that many talented and highly motivated immigrants may have low levels of education simply because they did not have educational opportunities in their home countries or prior to arrival in Norway. To put this a different way, observationally similar natives and immigrants are quite possibly very different in unobservable ways. Secondly, the more specialized skills likely to have been acquired by higher levels of education may be less easily transferrable to the host labor market. Thus, it is possible that only a portion of the returns to higher education taken abroad can be translated into higher earnings for these immigrants in Norway. Altogether, therefore, one does not find and, indeed, might not expect to find that immigrants with high levels of education are able to match the earnings of their native counterparts.

¹⁴Such insights are provided by closer analysis of the results from the selection equations; however, a more thorough discussion on employment probabilities can be found in Galloway (2008).

¹⁵The results for the women are largely similar with the exception that highly educated immigrant women do seem to earn approximately the same as highly educated native women.

4.3 Correlation between Unobservables in Selection and Earnings Equation

The estimated correlation ρ between the unobservables in the selection and earnings equations is reported along with the other estimated parameters in the Appendix. The correlation is estimated to be negative and a likelihood ratio test of the null hypothesis of $\rho = 0$ can be resoundingly rejected for both the men and women in all the groups.¹⁶ In other words, a null hypothesis of no selection effect is clearly rejected.

A negative correlation may seem counterintuitive at first glance, but it is hardly unreasonable. The counterintuitive nature of such results seems to often stem from a belief that the (correlated) unobservables are largely determined by such factors as motivation or ability. Thus, a negative correlation is often interpreted to mean that individuals who are more motivated for employment earn less than other – less motivated or able – individuals. However, the interpretation is not quite that straightforward. Understanding how selection on observables and unobservables may interact in this specification is the key to understanding the results here.

To really understand these issues, consider two immigrants that are identical in all ways except for the amount of time they have been in the country. Note that this is also meant to imply that these immigrants' earnings and (actual) labor market experience in the host country are the same. Assume also specifically that Immigrant A has been in the country longer than Immigrant B, i.e. $YSM_A > YSM_B$. Since there is a positive relationship between YSM and employment and since the inverse Mill's ratio $\lambda(\cdot)$ is a monotone decreasing function of the probability of selection (employment), we would actually have $\lambda_A < \lambda_B$. Since we have assumed and estimated that these two hypothetical immigrants are otherwise identical, there would have to be a negative relationship between the unobservables in the earnings and selection for these two immigrants. (See also equation (5).) However, the population is obviously not just made up of two individuals. Overall, an estimated positive or negative correlation essentially depends on whether we have more immigrants like A or B in the populations we analyze. Note, too, that there are other variables other than YSM which are used for identification in this model, i.e. which imply exclusion restrictions, and which can thus be used to imagine other scenarios than the one example used here.

A negative correlation between unobservables can arise if being non-employed (for a period) has some positive effect which is unobservable and thus cannot be otherwise accounted for in the model. Since most immigrants do first need to obtain knowledge of the language and customs in Norway, they may actually be better off if they first spend some time outside the labor market and invest their time and energy in acquiring such relevant basic skills and knowledge. It might, thus, be

¹⁶The probability of the likelihood ratio test statistic being larger than the appropriate χ^2 value are less than 0.0001 for the men and women in all of the immigrant groups.

the immigrants who – for unobservable reasons – are better able to make use of human capital investment prior to labor market entry who also later earn better in the labor market. This would be the case if an immigrant of higher "ability" chooses to take full-time language classes for a longer period of time than other immigrants (of lesser ability), because he or she will be able to achieve a higher level of language skills and earn better later on when he or she does enter the labor market. We will return to this possible explanation later when we have a brief look at the extent to which the immigrants studied here participate in some form of formal education in Norway, see Section 4.5.

Of course, the key issue in this discussion is that the negative correlation is between the *unobservables* in the earnings and selection equation. Thus, since we do not know exactly which unobservable factors pull in which direction and the specification of Model 2 is a reduced-form one, it is difficult to have conclusive and definitive opinions on what sort of relationship between unobservables we should expect.

4.4 Common Estimation for All Non-Western Immigrants

One major difference between the results hitherto discussed in this paper and previous work on Norway is that separate analyzes was performed for four of the largest non-Western immigrants groups in Norway in the earlier 1990s; previous studies have used more broadly defined groups, such as immigrants from OECD and non-OECD countries. Pooling all the non-Western immigrants into one group¹⁷ in this study leads, perhaps unsurprisingly, to earnings estimations somewhere between the 'best' groups and the 'worst' groups in the analyzes of the individual groups presented above. Thus, as Figure 10 indicates we would not conclude that there is earnings parity for non-Western immigrant men based on a Traditional Approach. The Modified Approach (Figure 11) does suggest a slightly higher degree of earnings assimilation for non-Western immigrant men, but this is not estimated to be enough to achieve any sort of earnings parity with natives.

The key insights to be obtained from this brief discussion is that the non-Western immigrant population in Norway does in fact seem to be too diverse to be able to adequately account for difference in a common framework. The heterogeneity of the immigrant population is going to manifest itself in observable ways, but it can also bias results by means of selection on unobservables. The relevance of such factors can also quite easily vary across immigrants groups, as the main results for the different immigrants groups clearly illustrate. Altogether, the results presented in this paper suggest that attempts should be made to distinguish between immigrant groups in order to have better opportunities to capture and model both observed and unobservable differences between and within these groups.

¹⁷Non-Western immigrants are here defined as those coming from Asia (including Turkey), Africa, and South and Central America.

4.5 Immigrants in Education

In the discussion of the estimated correlation between unobservables in the earnings and selection equation, we suggested that unobserved factors may result in a negative correlation between the unobservables in the selection and earnings equations if there are factors which cause some immigrants of high earning ability to choose non-employment, at least for a period. Participation in language courses was given as one possible example of this. Similarly, some higher ability immigrants might remain outside of the labor market for a period in order to make further investments in human capital by taking some form of formal education within the regular educational system in Norway. Upon arrival in Norway, refugees are immediately eligible for generous student loans along the same lines as native Norwegians. Other immigrants are also eligible for student loans if they have lived and worked in Norway for at least 24 months. Thus, some immigrants may choose to invest in their human capital by taking advantage of the opportunities in the Norwegian educational system and it does not seem entirely implausible that immigrants with the most to gain from such investments – the most "able" – are also the ones that do so. Thus, such immigrants may not be observed in employment for some periods of time, but they eventually earn more when they are employed. This could lead to a negative correlation between the unobservables in the selection and earnings equations.

Modelling such education decisions for immigrants brings up a myriad of further issues and is beyond the scope of this current paper. We can, however, still provide some evidence to evaluate the extent to which such a situation might contribute to the type of results we are finding here. Figure 12 presents some descriptive results on the extent to which the immigrants in from two recent arrival cohorts in the groups studied here participate in formal education in Norway; clearly, many immigrants do participate in some form of education, especially at the start of their stay in the country.¹⁸ The reader should also note that an immigrant is not classified as engaging in formal education or training here if he or she is taking language courses; information on participation in language courses is, unfortunately, not available. However, for the period we study, such language instruction was available to all immigrants in Norway free of charge. It is also likely that the rise in the rates of participation in formal education for low YSM, as seen in Figure 12, is, at least in part, due to immigrants first taking language classes before being able to later enroll in formal education.

Note also in particular that a rather large proportion of immigrants from Vietnam participate in some form of formal education. Recall, too, that this was the one group for which we found that the Traditional Approach *overestimated* the slope of earnings curve for men. Such overestimation in the Traditional Approach can easily be the result of many Vietnamese immigrants first getting an education

¹⁸Such high participation in education is not due to the fact that these immigrants are coming to Norway on student visas. Student visas are rare for the immigrants in the groups studied here.

and then entering the labor market with high earnings. The educated immigrants with late labor market entry and relatively high YSM are essentially contaminating the average returns to YSM with the Traditional Approach. The educated immigrants are not achieving higher returns to labor market experience, but returns to education; thus, the Traditional Approach may not be solely estimating *earnings* assimilation in the sense of a high return to labor market experience, but rather "assimilation in education" for Vietnamese immigrants. Such potential for assimilation in education is certainly a very interesting topic for understanding how immigrants adjust to the labor market in the host country, but it is not earnings assimilation in the strict sense of an added premium on labor market experience for immigrants.

5 Discussion

When analyzing the earnings of immigrants in four of the major groups in Norway, this study attempts to account for possible selection into employment status and also employs a better measure of actual labor market experience in the host country. Previous studies, on immigrants both in Norway and many other countries, have generally analyzed the earnings of immigrants in employment only and have used the number of years since migration (YSM) as a proxy for potential labor market experience in the host country. A comparison of the two different approaches applied to Norway and presented here suggests that previous studies may suffer from severe bias due to both the methods and definitions used. This paper thus indicates that there is good reason to doubt conclusions based on previous studies of the earnings assimilation of immigrants in Norway.

Specifically, more traditional methods which mimic those generally applied in previous studies indicate a large gap in earnings between natives and immigrants in Norway. Furthermore, analysis based on such methods suggests that while the immigrants in the groups studied here do experience some degree of earnings assimilation, i.e. that their earnings closer to the level of natives over time, they generally fail to achieve earnings parity with natives.

In contrast, estimates based on a selection model with a better measure of actual labor market experience present a very different picture on the earnings of these immigrants in Norway. Immigrants with low or intermediate levels of education appear to have earnings vastly similar to, or in some instances even slightly better, than natives with the same levels of education and labor market experience. Immigrants with higher education appear to experience a rather persistent earnings gap and, hence, do not achieve earnings parity with natives with the same level of education and experience. The estimates of earnings for such highly educated immigrants are, however, much closer to the estimates for natives with this model than with the more traditional approach.

As with all empirical work, these results are in part dependent on the assump-

tions made; several caveats do, therefore, apply. It is well-known that the results of selection models such as the one used here are sensitive to distributional assumptions. The selection equation postulated here is also admittedly of a 'reduced-form' type. It cannot therefore be used to pinpoint the exact mechanisms behind selection into employment; at best, it indicates only correlates of employment. However, the main purpose of this study was to indicate the extent to which assumptions and methods invoked by other studies may have influenced previous results. Thus, this study makes no claims of being the last word on earnings assimilation for immigrants and further study is certainly needed along several lines – in order to establish the extent to which similar considerations are relevant for other countries and to further investigate the robustness of findings of earnings assimilation to various underlying assumptions.

Non-random or selective return migration could bias results in a study such as this one and most of its predecessors. However, evidence suggests that return migration is generally a potentially confounding factor for studies of *Western* immigrants to Norway, not such non-Western groups as studied here.¹⁹ Tysse and Keilman (1998) also find no compelling evidence of any particular relationship between out-migration and labor market status, in part precisely because immigrants from non-Western countries have such low rates of return migration.

Another subtle but very important point must also be noted in closing. The results which here point to a large degree of similarity in the earnings of natives and immigrants are entirely compatible with a situation in which very many immigrants spend long periods outside the labor market and in which more basic summary statistics find a large and persistent average earnings gap between immigrants and natives. Put somewhat roughly and intuitively, the main results here are really suggesting that immigrants earn approximately the same as natives with the same level of education and previous labor market experience when they are employed and able to remain in employment. Hence, these findings can be true and we can still find low rates of employment and other problematic aspects of immigrant labor market performance. The one does not preclude the other. It is therefore also important to make a distinction between assimilation in earnings when employed and integration into the labor market, i.e. finding employment. An upshot of these findings is that policies meant to foster the integration of immigrants in the labor market should focus more closely on patterns and determinants of entry into employment rather than differences, or potential discrimination, in earnings for those immigrants when they are able to enter the labor market.

¹⁹See Tysse og Keilman (1998) for comprehensive documentation on the extent of return migration for immigrants to Norway.

References

- Aguilar, Renato and Björn Gustafsson (1991) The Earnings Assimilation of Immigrants. *Labour* 5(2):37–58.
- Baker, Michael and Dwayne Benjamin (1994), The Performance of Immigrants in the Canadian Labor Market, *Journal of Labor Economics* 12(3): 369–405.
- Baker, Michael and Dwayne Benjamin. (1995) The Receipt of Transfer Payments by Immigrants to Canada. *The Journal of Human Resources* 30:650–676.
- Barth, Erling, Bernt Bratsberg and Oddbjørn Raaum (2004) Identifying the Earnings Assimilation of Immigrants under Changing Macroeconomic Conditions. *Scandinavian Journal of Economics* 106: 1–22.
- Barth, Erling, Bernt Bratsberg and Oddbjørn Raaum (2006) Local Unemployment and the Relative Wages of Immigrants: Evidence from the Current Population Surveys. *Review of Economics and Statistics* 88(2): 243–263.
- Bell, Brian D. (1997) The Performance of Immigrants in the United Kingdom: Evidence from the GHS. *Economic Journal* 107: 333–344.
- Blume, Kræn, Björn Gustafsson, Peder J. Pedersen and Mette Verner. (2007) At the Lower End of the Table - Determinants of Poverty among Immigrants to Denmark and Sweden. *Journal of Ethnic and Migrant Studies* 33(3), 373–396.
- Borjas, George J. (1985) Assimilation, Changes in Cohort Quality and the Earnings of Immigrants. *Journal of Labor Economics* 3, 463–489.
- Borjas, George J. and Lynette Hilton. (1996) Immigration and the Welfare State: Immigrant Participation in Means-Tested Entitlement Programs, *Quarterly Journal of Economics* 111: 575–604.
- Borjas, George J. and Stephen Trejo. (1991) Immigrant Participation in the Welfare System, *Industrial and Labor Relations Review* 44: 195–211.
- Brochman, Grete (2003), Del II. 1975-2000 (Part II, 1975-2000), in *Norsk innvandringshistorie. Band 3: I globaliseringens tid 1940-2000* (History of Norwegian Immigration. Volume 3: In the Age of Globalization 1940-2000), Knut Kjelstadli (ed.), Oslo: Pax Forlag.
- Chiswick, Barry R. (1978) The Effect of Americanization on the Earnings of Foreign-born Men, *Journal of Political Economy* 86:897–921.
- Galloway, Taryn A. (2008) The Labor Market Integration of Immigrant Men and Women, mimeo, Statistics Norway. (Included as Paper 3 in this dissertation.)
- Galloway, Taryn A. and Rolf Aaberge (2005) Assimilation Effects on Poverty Among Immigrants to Norway. *Journal of Population Economics*, 18, 691–718.
- Gustafsson, Björn and Jinghai Zheng (2006) Earnings of Immigrants in Sweden 1978-1999, *International Migration*, 44(2): 79–117.

- Hansen, Jorgen and Magnus Lofstrom (2003) Immigrant Assimilation and Welfare Participation: Do Immigrants Integrate Into or Out of Welfare? *Journal of Human Resources* 38(1), 74–98.
- Hayfron, John E. (1998) The Performance of Immigrants in the Norwegian Labor Market. *Journal of Population Economics* 11, 293–303.
- Heckman, James J. (1979) Sample Selection Bias as a Specification Error. *Econometrica*, 47(1): 153–161.
- Longva, Pål and Oddbjørn Raaum (2003) Earnings Assimilation of Immigrants in Norway - A Reappraisal. *Journal of Population Economics* 16, 177–193.
- Schmidt, Christoph M. (1997), Immigrant Performance in Germany: Labor Earnings of Ethnic German Migrants and Foreign Guest-Workers, *Quarterly Review of Economics and Finance* 37, 379–397.
- Shields, Michael A. and Stephen Wheatley Price (1998) The Earnings of Male Immigrants in England: Evidence from the Quarterly LFS. *Applied Economics* 30: 1157–1168.
- Statistics Norway (2001) Classification of Economic Regions, *Official Statistics of Norway (NOS)*, C 634, Statistics Norway.
- Tysse, Tone Ingrid and Nico Keilman (1998) Utvandring blant Innvandere 1975-1995 (Emigration of Immigrants 1975-1999), Reports 98/15, Statistics Norway.
- Zhang, Li-Chun (2008) Developing Methods for Determining the Number of Unauthorized Foreigners in Norway, Documents 2008/11, Statistics Norway.

Figure 1.
An Example of Potential Bias in Studies of Earnings Assimilation.

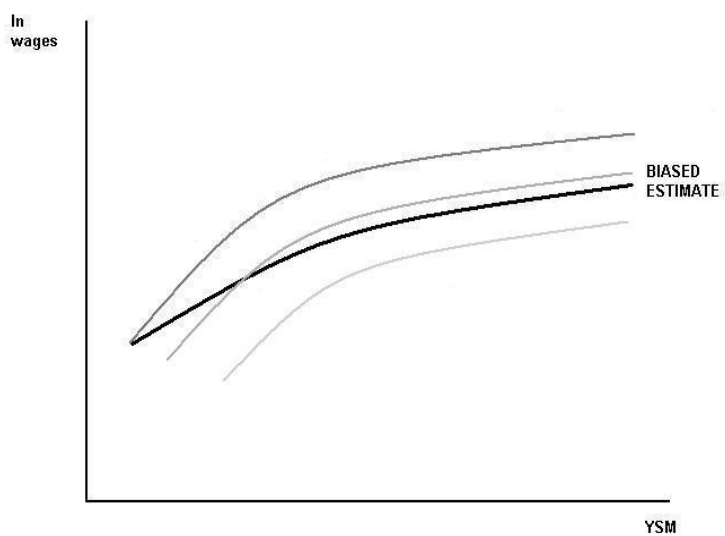
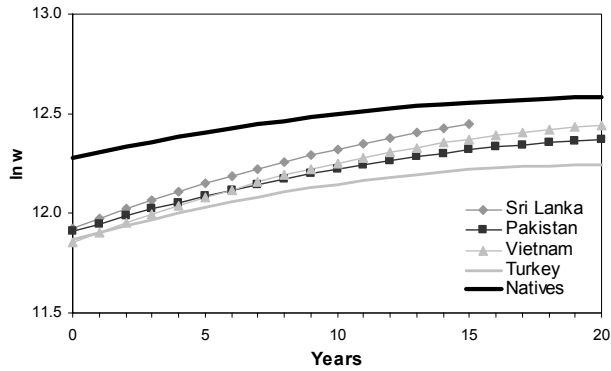
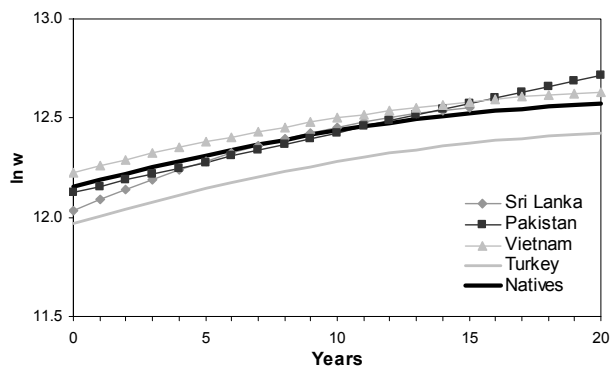


Figure 2. Earnings Assimilation for Men with Traditional Approach (Model 1)



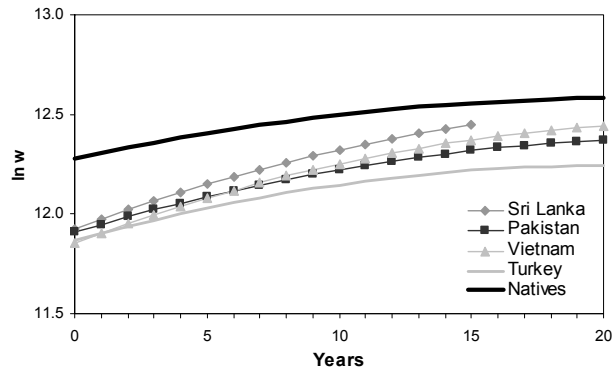
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. Both immigrants and natives are assumed to start off the period at age 25 and immigrants start off with YSM=0. Local unemployment is assumed to be 2.87%. The x-axis represents the passing of time measured as the number of years since age 25. Increases on the x-axis represent the combined effect of both age and YSM for immigrants and age effects only for natives.

Figure 3. Earnings Assimilation for Men with Modified Approach (Model 2)



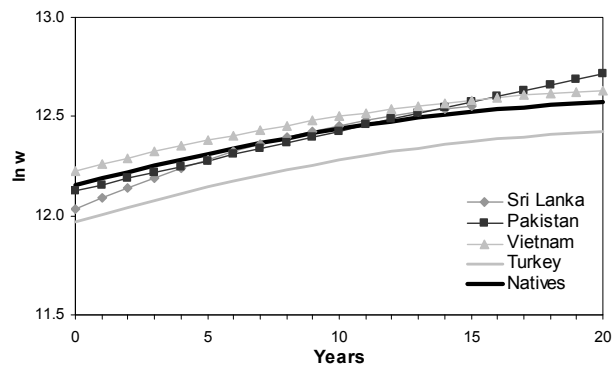
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 2. Earnings Assimilation for Men with Traditional Approach (Model 1)



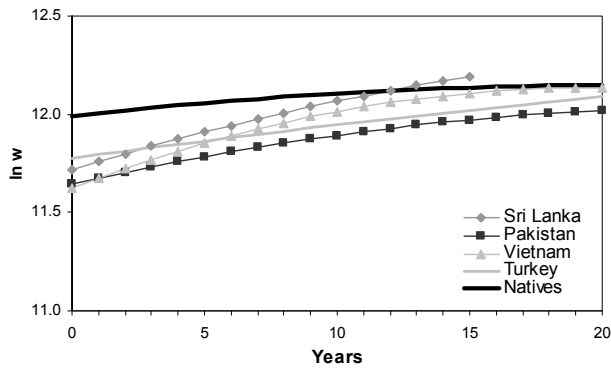
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. Both immigrants and natives are assumed to start off the period at age 25 and immigrants start off with YSM=0. Local unemployment is assumed to be 2.87%. The x-axis represents the passing of time measured as the number of years since age 25. Increases on the x-axis represent the combined effect of both age and YSM for immigrants and age effects only for natives.

Figure 3. Earnings Assimilation for Men with Modified Approach (Model 2)



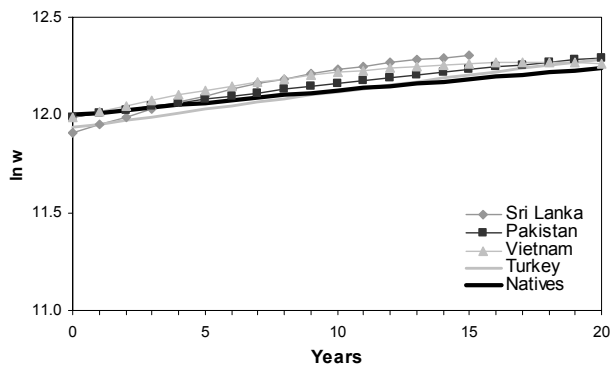
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 4. Earnings Assimilation for Women with Traditional Approach (Model 1)



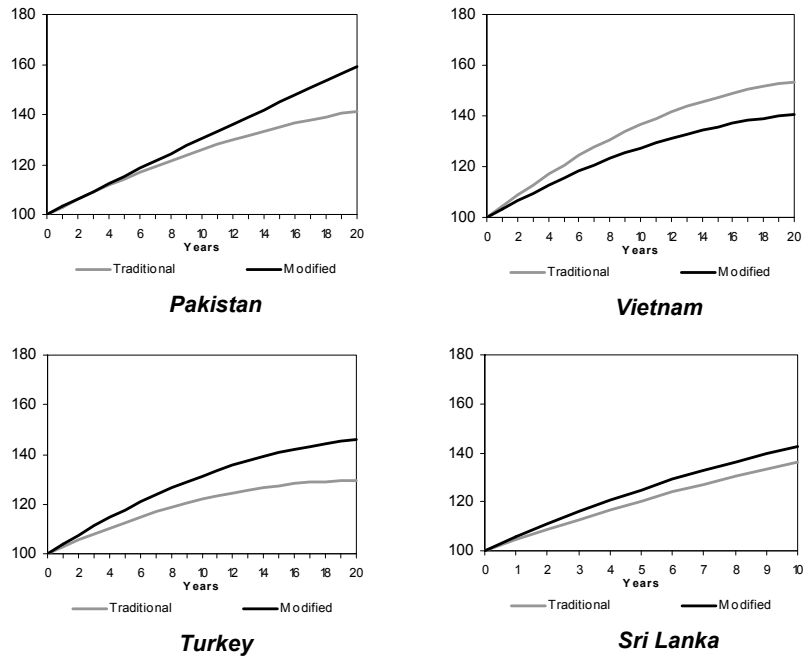
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. Both immigrants and natives are assumed to start off the period at age 25 and immigrants start off with YSM=0. Local unemployment is assumed to be 2.87%. The x-axis represents the passing of time measured as the number of years since age 25. Increases on the x-axis represent the combined effect of both age and YSM for immigrants and age effects only for natives.

Figure 5. Earnings Assimilation for Women with Modified Approach (Model 2)



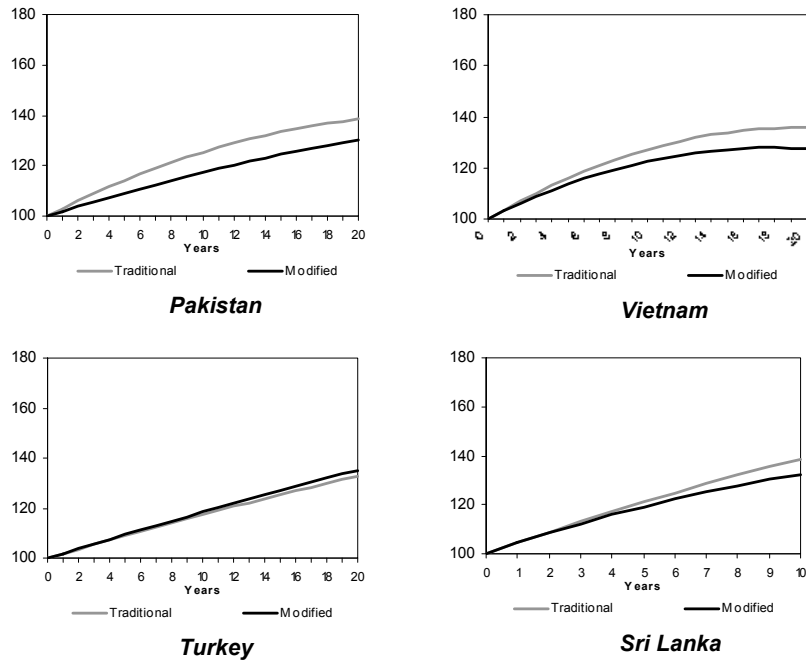
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 6. Earnings Growth with Increasing Experience in Norway for Male Immigrants



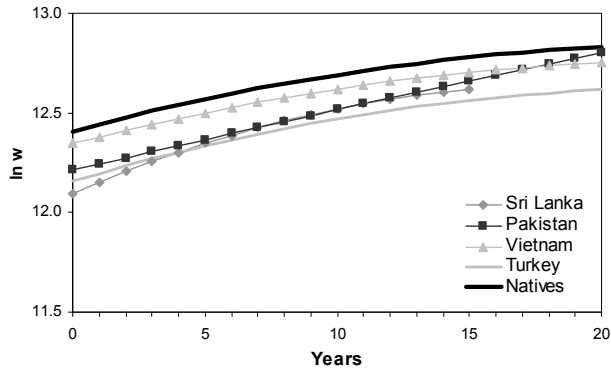
Notes: The y-axis measures growth relative to earnings in the first full year in the country (=100). The x-axis measures the number of years increasing in age and YSM from a starting point age=25 and YSM=0 for the Traditional Approach and increasing number of years of labor market experience for the Modified Approach.

Figure 7. Earnings Growth with Increasing Experience in Norway for Female Immigrants



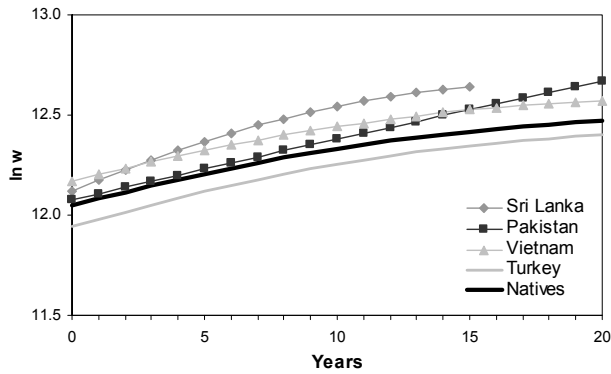
Notes: The y-axis measures growth relative to earnings in the first full year in the country (=100). The x-axis measures the number of years increasing in age and YSM=0 for the Traditional Approach and increasing number of years of labor market experience for the Modified Approach.

Figure 8. Earnings Assimilation for Men with Higher Education. Modified Approach (Model 2)



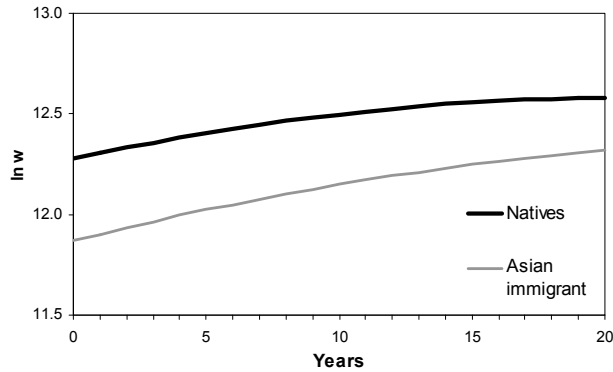
Notes: The y-axis measures the natural logarithm of earnings for individuals with higher education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 9. Earnings Assimilation for Men with Low Education. Modified Approach (Model 2)



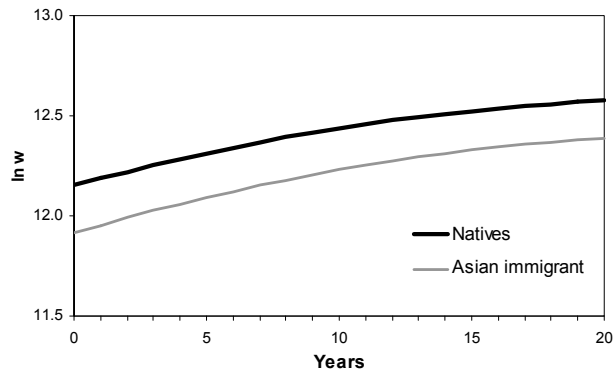
Notes: The y-axis measures the natural logarithm of earnings for individuals with education lower than secondary level. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 10. Earnings Assimilation for Non-Western Immigrant Men with Traditional Approach (Model 1)



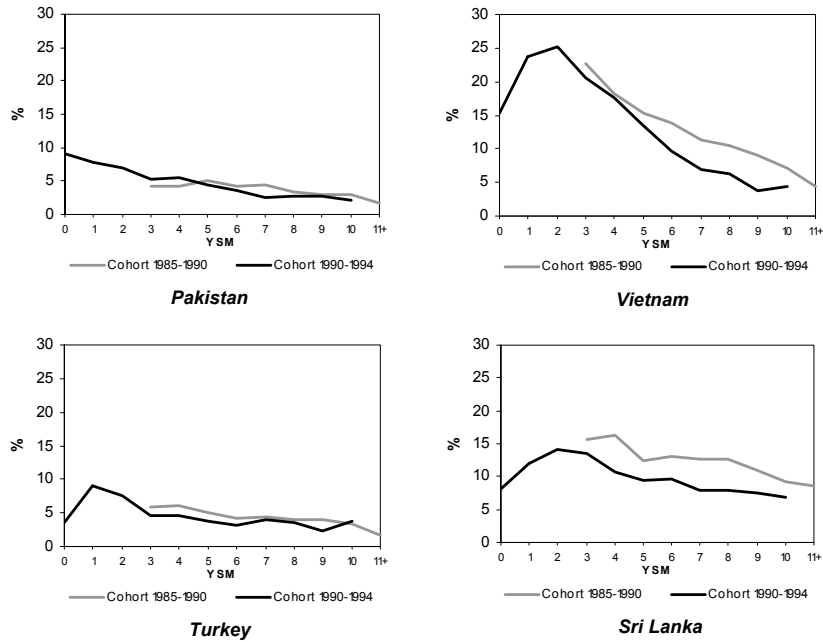
Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. Both immigrants and natives are assumed to start off the period at age 25 and immigrants start off with YSM=0. Local unemployment is assumed to be 2.87%. The x-axis represents the passing of time measured as the number of years since age 25. Increases on the x-axis represent the combined effect of both age and YSM for immigrants and age effects only for natives.

Figure 11. Earnings Assimilation for Non-Western Immigrant Men with Modified Approach (Model 2)



Notes: The y-axis measures the natural logarithm of earnings for individuals with secondary education. Immigrants are assumed to belong to the 1985-1989 arrival cohort. The x-axis represents the passing of time in increasing years of labor market experience for both immigrants and natives. Local unemployment is assumed to be 2.87%.

Figure 12. Percentage of Immigrants in Formal Education by YSM for Immigrants in Selected Cohort and Groups



Notes: Formal education refers to education within the regular system of formal education in Norway, i.e. secondary school, university, (formal) vocational training, etc. Participation in language courses is *not* classified as formal education here.

Appendix

Table A.1. Descriptive Statistics

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Single	0.254	0.187	0.437	0.161	0.198	0.054	0.265	0.066	0.324	0.131	0.397	0.121
Single parent, 1 child	0.010	0.050	0.011	0.063	0.007	0.019	0.009	0.035	0.012	0.060	0.002	0.015
Single parent, 2 children	0.003	0.031	0.007	0.082	0.008	0.038	0.007	0.051	0.010	0.092	0.003	0.016
Couple, 1 child	0.151	0.142	0.133	0.161	0.144	0.144	0.168	0.173	0.143	0.154	0.186	0.260
Couple, 2 children	0.164	0.164	0.145	0.184	0.167	0.183	0.212	0.268	0.181	0.195	0.171	0.261
Couple, 3 children	0.074	0.079	0.141	0.190	0.323	0.397	0.194	0.246	0.196	0.214	0.081	0.131
Higher education	0.235	0.243	0.227	0.176	0.147	0.081	0.095	0.058	0.124	0.074	0.165	0.131
Secondary education	0.580	0.554	0.454	0.178	0.392	0.241	0.323	0.213	0.620	0.479	0.545	0.560
Education not available			0.162	0.178	0.192	0.241	0.174	0.188	0.059	0.086	0.142	0.131
Age	42.50	42.70	38.80	37.90	42.70	39.50	39.40	37.80	39.10	39.10	35.10	34.50
Std. Dev.	11.00	11.00	8.90	9.10	9.70	9.30	9.50	9.40	9.10	9.80	7.00	7.60
Experience	13.50	13.50	5.90	2.50	12.50	1.50	8.80	2.90	5.50	2.50	5.50	2.00
Std. Dev.	8.10	8.10	7.10	5.10	8.30	4.50	7.30	5.00	5.80	5.00	3.80	3.50
YSM			10.00	8.60	16.50	12.10	12.80	10.00	10.80	8.70	8.20	5.80
Std. Dev.	2.86	2.85	2.87	2.79	2.91	2.86	2.88	2.82	2.89	2.84	2.92	2.78
Unemployment Rate (UR)	1.06	1.10	0.99	0.97	0.95	0.95	0.97	0.94	0.99	0.98	1.03	0.99
Std. Dev.			0.087	0.131	0.056	0.066	0.064	0.070	0.016	0.052	0.202	0.187
Cohort 1995-1999			0.203	0.282	0.082	0.155	0.118	0.251	0.234	0.346	0.384	0.385
Cohort 1990-1994			0.403	0.327	0.211	0.281	0.370	0.325	0.272	0.292		
Cohort 1985-1989			0.111	0.123	0.056	0.203	0.109	0.173	0.367	0.234		
Cohort 1980-1984			0.079	0.094	0.198	0.217						
Cohort 1975-1979			0.221									
Africa												
South and Central America			0.077									
Std. Dev.	0.847	0.709	0.564	0.360	0.560	0.164	0.531	0.258	0.622	0.399	0.809	0.504
Employment	264854	151359	138055	74653	135786	32247	120236	50200	148193	79993	193710	99514
Earnings	215465	124090	151868	99203	139259	67966	129537	81674	126209	95344	117755	95715
Std. Dev.	93492	89800	243297	183744	34474	31025	17006	13372	27566	24273	24861	15851
Observations												

Average and standard deviation is reported for age, experience, YSM and the local unemployment rate. Earnings is reported in NOK, observations lists the number of observations analyzed in each group. The proportion with given characteristic is reported for the other variables.

Table A.2. Estimation Results for Men. Traditional Approach

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
Higher education	0.3625	0.0026	0.1544	0.0036	0.1388	0.0090	0.2020	0.0134	0.1749	0.0094	0.0098	0.0086
Secondary education	0.1218	0.0023	0.0260	0.0033	0.0391	0.0071	0.0085	0.0093	0.0300	0.0074	-0.0328	0.0069
Education not available			0.0747	0.0046	-0.0290	0.0096	0.0271	0.0130	-0.0278	0.0162	-0.0017	0.0093
Age	0.0636	0.0007	0.0209	0.0012	0.0134	0.0033	0.0177	0.0047	0.0077	0.0028	0.0082	0.0032
Age ²	-0.0007	0.00001	-0.0003	0.00001	-0.0002	0.00004	-0.0003	0.0001	-0.0002	0.0000	-0.0002	0.0000
YSM			0.0299	0.0009	0.0374	0.0025	0.0320	0.0033	0.0508	0.0033	0.0500	0.0033
YSM ²			-0.0004	0.00003	-0.0006	0.0001	-0.0007	0.0001	-0.0009	0.0001	-0.0008	0.0002
Unemployment Rate (UR)	-0.0571	0.0039	-0.1189	0.0066	-0.1279	0.0203	-0.0776	0.0269	-0.0934	0.0158	-0.0785	0.0137
UR ²	0.0004	0.0006	0.0087	0.0011	0.0078	0.0034	0.0026	0.0044	0.0062	0.0026	0.0031	0.0022
Cohort 1995-1999			-0.0721	0.0029	0.1911	0.0308	0.1420	0.0352	0.3271	0.0360	0.3304	0.0168
Cohort 1990-1994			0.0188	0.0039	0.1304	0.0255	0.0412	0.0278	0.1646	0.0187	0.1051	0.0078
Cohort 1985-1989			0.2660	0.0092	0.0369	0.0197	-0.0365	0.0213	0.0960	0.0145		
Cohort 1980-1984			0.1304	0.0078	0.0733	0.0179	0.0351	0.0182	0.0355	0.0097		
Cohort 1975-1979			0.0699	0.0071	0.0010	0.0097						
Africa			0.0693	0.0068								
South and Central America			0.0413	0.0060								
Constant	11.1572	0.0147	11.7256	0.0271	11.9357	0.0785	11.8051	0.1062	11.8472	0.0662	12.0629	0.0649
Adjusted R ²	0.1523		0.1127		0.1133		0.1171		0.1447		0.1506	

Table A.3. Estimation Results for Women. Traditional Approach

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err.
Higher education	0.3570	0.0027	0.2072	0.1948	0.0041	0.1948	0.0146	0.2790	0.0190	0.1830	0.0109	0.1203
Secondary education	0.1159	0.0024	0.0300	0.0087	0.0038	0.0087	0.0115	0.0210	0.0139	0.0058	0.0075	0.0122
Education not available			0.0957	-0.0153	0.0056	-0.0153	0.0151	-0.0036	0.0187	0.0549	0.0157	0.0442
Age	0.0339	0.0007	0.0177	0.0001	0.0015	0.0001	0.0061	0.0017	0.0079	0.0237	0.0035	-0.0071
Age ²	-0.0004	0.00001	-0.0002	-0.00001	0.0002	-0.00001	0.0001	-0.00003	0.0001	-0.0003	0.00004	0.0001
YSM			0.0291	0.0011	0.0011	0.0313	0.0050	0.0184	0.0059	0.0421	0.0037	0.0421
YSM ²			-0.0005	-0.0004	0.0004	-0.0006	0.0002	-0.0001	0.0002	-0.0011	0.0002	-0.0007
Unemployment Rate (UR)	-0.0598	0.0038	-0.0908	-0.0986	0.0077	-0.0986	0.0313	-0.0451	0.0389	-0.1142	0.0183	-0.0538
UR ²	0.0022	0.0006	0.0087	0.0097	0.0013	0.0097	0.0054	0.0012	0.0067	0.0093	0.0031	0.0076
Cohort 1995-1999			0.0076	0.0040	0.0040	0.2334	0.0573	0.1836	0.0593	0.1953	0.0313	0.1776
Cohort 1990-1994			-0.0215	0.0043	0.0043	0.1786	0.0458	0.1147	0.0432	0.1062	0.0215	0.0505
Cohort 1985-1989			0.1691	0.0139	0.0139	0.0770	0.0371	0.0897	0.0343	0.0268	0.0178	0.0176
Cohort 1980-1984			0.0895	0.0124	0.0124	-0.0078	0.0304	0.1244	0.0257	0.0229	0.0129	0.0105
Cohort 1975-1979			0.0601	0.0116	0.0116	-0.0283	0.0220					
Africa			0.0182	0.0109	0.0109							
South and Central America			-0.0292	0.0098	0.0098							
Constant	11.4126	0.0146	11.5065	0.0342	11.7623	0.1307	11.7634	0.1620	11.4213	0.0773	11.9076	0.0936
Adjusted R ²	0.1466		0.1229		0.0852		0.1114		0.1285		0.1009	

Table A.4. Estimation Results for Men. Modified Approach

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
<i>Ln wages</i>												
Higher education	0.3610	0.0028	0.1793	0.0036	0.1351	0.0093	0.2161	0.0135	0.1783	0.0100	0.0874	0.0088
Secondary education	0.1053	0.0024	0.0593	0.0033	0.0469	0.0074	0.0255	0.0093	0.0574	0.0077	0.0228	0.0070
Education not available			0.1068	0.0047	0.0546	0.0103	0.0584	0.0137	0.0459	0.0164	0.0557	0.0098
Experience (Exp)	0.0355	0.0005	0.0400	0.0006	0.0312	0.0019	0.0398	0.0024	0.0345	0.0018	0.0577	0.0025
Exp ²	-0.0007	0.00001	-0.0008	0.00003	-0.0001	0.0001	-0.0009	0.0001	-0.0007	0.0001	-0.0015	0.0002
Unemployment Rate (UR)	-0.0555	0.0039	-0.0976	0.0065	-0.0809	0.0212	-0.0684	0.0268	-0.0431	0.0165	-0.0554	0.0139
UR ²	0.00002	0.0006	0.0056	0.0011	0.0058	0.0035	0.0022	0.0043	-0.0002	0.0027	0.0020	0.0022
Cohort 1995-1999			-0.0476	0.0030	0.3491	0.0243	0.2219	0.0276	0.2613	0.0302	0.2794	0.0141
Cohort 1990-1994			-0.0075	0.0039	0.3262	0.0208	0.1209	0.0227	0.1987	0.0145	0.1101	0.0075
Cohort 1985-1989			0.2968	0.0080	0.2465	0.0161	0.0433	0.0179	0.1287	0.0122		
Cohort 1980-1984			0.1933	0.0070	0.2206	0.0161	0.0729	0.0171	0.0293	0.0094		
Cohort 1975-1979			0.1023	0.0065	0.0691	0.0094						
Africa			0.0742	0.0065								
South and Central America			0.0257	0.0058								
Constant	12.2071	0.0073	12.1138	0.0123	12.0152	0.0386	12.0760	0.0476	12.1636	0.0289	12.1506	0.0241

Table A.4 (cont.)

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
<i>Selection equation</i>												
Couple	0.5438	0.0077	0.4358	0.0090	0.2937	0.0238	0.0831	0.0345	0.4851	0.0275	0.4906	0.0286
Single parent	0.1422	0.0297	0.0153	0.0223	-0.0417	0.0603	0.0157	0.0857	0.1510	0.0589	0.1802	0.1241
Child under 3 yrs	0.0526	0.0147	0.0385	0.0074	0.0942	0.0182	-0.0572	0.0277	0.0543	0.0229	0.0660	0.0341
1 Child	0.2655	0.0118	0.0850	0.0112	0.1478	0.0263	0.2398	0.0395	-0.0105	0.0328	0.1815	0.0426
2 Children	0.3608	0.0129	0.0745	0.0111	0.1631	0.0262	0.3066	0.0387	0.0656	0.0322	0.1101	0.0421
3 Children	0.3205	0.0190	-0.0871	0.0128	0.1555	0.0270	0.2173	0.0436	-0.0483	0.0349	0.0755	0.0505
4 Children	0.0576	0.0336	-0.3542	0.0140	0.0595	0.0274	0.1171	0.0505	0.0946	0.0385	0.0176	0.0854
Higher education	0.7646	0.0101	0.2002	0.0090	0.1779	0.0231	0.3230	0.0379	0.5147	0.0315	-0.2696	0.0368
Secondary education	0.4190	0.0076	0.0573	0.0080	0.0601	0.0178	0.0423	0.0244	0.1881	0.0217	-0.2145	0.0310
Education not available			-0.2711	0.0100	-0.3568	0.0218	-0.3457	0.0301	-0.2548	0.0401	-0.5475	0.0370
Age	0.1668	0.0024	0.0460	0.0028	0.0542	0.0075	0.0270	0.0108	0.0505	0.0077	-0.0234	0.0109
Age ²	-0.0021	0.00003	-0.0009	0.00003	-0.0011	0.0001	-0.0008	0.0001	-0.0010	0.0001	-0.0002	0.0001
YSM			0.1117	0.0019	0.0655	0.0060	0.0409	0.0080	0.2425	0.0083	0.1604	0.0111
YSM ²			-0.0035	0.0001	-0.0025	0.0002	-0.0016	0.0003	-0.0082	0.0003	-0.0076	0.0006
Unemployment Rate (UR)	-0.0355	0.0153	-0.2886	0.0167	-0.2651	0.0530	-0.1305	0.0696	-0.4427	0.0528	-0.1127	0.0558
UR ²	0.0003	0.0024	0.0230	0.0027	0.0177	0.0087	0.0088	0.0112	0.0435	0.0084	-0.0007	0.0085
Cohort 1995-1999			-0.1737	0.0067	-0.1219	0.0769	0.0694	0.0935	0.2211	0.0993	0.6893	0.0671
Cohort 1990-1994			0.4230	0.0109	-0.2841	0.0629	0.0676	0.0731	-0.0568	0.0585	0.2120	0.0324
Cohort 1985-1989			-0.1102	0.0196	-0.3734	0.0481	-0.1387	0.0544	-0.1495	0.0471		
Cohort 1980-1984			-0.2159	0.0166	-0.2596	0.0454	-0.1891	0.0468	-0.0525	0.0327		
Cohort 1975-1979			-0.1313	0.0157	-0.1439	0.0237						
Africa			-0.0589	0.0160								
South and Central America			-0.0615	0.0142								
Constant	-2.7032	0.0553	-0.3582	0.0629	0.1282	0.1879	0.3188	0.2577	-0.9584	0.1934	1.4896	0.2337
ρ	-0.3624	0.0066	-0.1866	0.0105	-0.5772	0.0207	-0.2624	0.0440	-0.6298	0.0186	-0.5291	0.0314
σ	0.3960	0.0007	0.4052	0.0009	0.4281	0.0041	0.3759	0.0038	0.3684	0.0032	0.3482	0.0029

Table A.5. Estimation Results for Women. Modified Approach

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
<i>Ln wages</i>												
Higher education	0.2655	0.0030	0.1319	0.0050	0.0929	0.0180	0.2324	0.0222	0.1372	0.0119	0.1175	0.0133
Secondary education	0.0592	0.0026	0.0020	0.0042	-0.0361	0.0135	0.0067	0.0150	-0.0136	0.0077	0.0143	0.0102
Education not available			0.0930	0.0054	-0.0063	0.0151	0.0226	0.0186	0.0514	0.0155	0.0468	0.0155
Experience (Exp)	0.0128	0.0004	0.0364	0.0008	0.0193	0.0025	0.0190	0.0033	0.0316	0.0021	0.0445	0.0031
Exp ²	-0.00004	0.00001	-0.0006	0.00004	-0.0002	0.0001	-0.0001	0.0002	-0.0009	0.0001	-0.0012	0.0002
Unemployment Rate (UR)	-0.0453	0.0039	-0.0662	0.0076	-0.0440	0.0314	-0.0357	0.0389	-0.0836	0.0185	-0.0370	0.0210
UR ²	0.0015	0.0006	0.0047	0.0013	-0.0004	0.0053	-0.0014	0.0065	0.0041	0.0031	0.0025	0.0034
Cohort 1995-1999			0.0044	0.0039	0.1276	0.0308	0.1586	0.0361	0.1373	0.0238	0.1345	0.0136
Cohort 1990-1994			-0.0250	0.0042	0.1356	0.0251	0.1110	0.0268	0.1405	0.0163	0.1345	0.0136
Cohort 1985-1989			0.2045	0.0103	0.0771	0.0222	0.0796	0.0234	0.0785	0.0146	0.0482	0.0094
Cohort 1980-1984			0.1487	0.0094	0.0217	0.0218	0.1031	0.0215	0.0300	0.0119		
Cohort 1975-1979			0.0999	0.0091	0.0087	0.0203						
Africa			0.0369	0.0090								
South and Central America			-0.0214	0.0086								
Constant	12.0587	0.0071	11.9934	0.0156	12.0773	0.0548	11.9627	0.0650	12.1306	0.0308	11.9771	0.0352

Table A.5 (cont.)

	Natives		Non-Western		Pakistan		Turkey		Vietnam		Sri Lanka	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
<i>Selection equation</i>												
Couple	0.0721	0.0076	0.0433	0.0114	-0.3265	0.0436	0.0080	0.0620	0.3713	0.0345	0.3874	0.0406
Single parent	-0.2345	0.0125	-0.2871	0.0148	-0.4160	0.0582	-0.3220	0.0763	-0.2967	0.0434	0.0893	0.0725
Child under 3 yrs	-0.1792	0.0092	-0.0650	0.0077	-0.0631	0.0225	-0.1369	0.0307	-0.0761	0.0228	-0.2213	0.0294
1 Child	-0.0508	0.0090	-0.0218	0.0113	0.0082	0.0342	0.0336	0.0471	-0.1612	0.0340	0.1079	0.0384
2 Children	-0.2754	0.0090	-0.1375	0.0113	0.0096	0.0334	-0.1188	0.0461	-0.2946	0.0341	0.0289	0.0404
3 Children	-0.6088	0.0115	-0.3845	0.0130	-0.1123	0.0345	-0.2587	0.0520	-0.4941	0.0375	-0.0120	0.0465
4 Children	-0.9445	0.0213	-0.8096	0.0153	-0.3258	0.0363	-0.6297	0.0632	-0.6818	0.0417	-0.1449	0.0764
Higher education	1.0919	0.0088	0.6391	0.0101	0.6987	0.0302	0.6611	0.0512	0.5015	0.0370	0.1256	0.0398
Secondary education	0.5425	0.0068	0.3814	0.0085	0.3851	0.0219	0.2192	0.0319	0.2152	0.0210	0.0075	0.0289
Education not available	0.1860	0.0021	-0.0946	0.0111	-0.0972	0.0252	-0.1048	0.0364	0.0497	0.0383	-0.1461	0.0392
Age	-0.0024	0.00002	0.1467	0.0033	0.0810	0.0110	0.1380	0.0154	0.2147	0.0090	0.0284	0.0123
Age ²			-0.0020	0.00004	-0.0014	0.0001	-0.0023	0.0002	-0.0029	0.0001	-0.0006	0.0002
YSM			0.1379	0.0025	0.1001	0.0090	0.1281	0.0116	0.2884	0.0090	0.2670	0.0108
YSM ²			-0.0035	0.0001	-0.0020	0.0003	-0.0033	0.0004	-0.0094	0.0004	-0.0080	0.0006
Unemployment Rate (UR)	-0.1063	0.0130	-0.3275	0.0191	-0.3260	0.0624	-0.3001	0.0881	-0.4552	0.0555	-0.1108	0.0608
UR ²	0.0109	0.0021	0.0378	0.0032	0.0385	0.0106	0.0346	0.0146	0.0512	0.0092	0.0209	0.0098
Cohort 1995-1999			-0.0054	0.0091	0.2904	0.1098	0.3842	0.1276	0.3446	0.0878	0.5588	0.0493
Cohort 1990-1994			0.2055	0.0113	0.1883	0.0896	0.3369	0.0950	0.0377	0.0650	0.2452	0.0317
Cohort 1985-1989			0.2384	0.0304	0.1771	0.0725	0.2936	0.0755	-0.1206	0.0549		
Cohort 1980-1984			0.2144	0.0269	0.0680	0.0590	0.1279	0.0545	0.0150	0.0406		
Cohort 1975-1979			0.2115	0.0252	-0.0056	0.0411						
Africa			0.0989	0.0239								
South and Central America			-0.1687	0.0214								
Constant	-2.9944	0.0487	-3.4042	0.0764	-2.0473	0.2458	-2.8483	0.3370	-4.8414	0.2109	-1.6704	0.2515
ρ	-0.5192	0.0067	-0.2968	0.0171	-0.3586	0.0541	-0.2705	0.0733	-0.3480	0.0369	-0.2693	0.0612
σ	0.3584	0.0009	0.3417	0.0015	0.3485	0.0067	0.3369	0.0063	0.3122	0.0033	0.3247	0.0041