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**Out-Migration of Immigrants: Implications for Assimilation Analysis**

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# Out-Migration of Immigrants: Implications for Assimilation Analysis[1]

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# Abstract

The labor market behavior of immigrants is studied in relation to the propensity to out-migrate. Utilizing a large micro dataset for individuals in Norway, which enables identification of out-migrants, I find in line with other studies that attachment to the labor market influences positively on the propensity to stay in the host country. Among the individuals in the labor force I find that out-migrants originally from Non-OECD countries are negatively selected in terms of labor market earnings, from the pool of Non-OECD immigrants. Among immigrants from OECD countries a more mixed picture arises, with the out-migrants drawn from both extremes of the earnings distribution. Further, I find some indications that immigrants in the upper part of the earnings distribution for OECD immigrants are highly mobile and consequently stay only a very short time in the host country.

# 1. Introduction

Immigrant labor is an essential part of the labor force in most western countries. They are willing to undertake jobs in low-status occupations, and provide vital services as self-employed in small businesses, working long hours. For small countries especially, immigrants fill certain highly specialized positions in the labor market where the host country could not provide supply from its own labor force. Also, to some extent they act as a buffer in the labor market by providing a supply of labor in booms, and by a withdrawal from the labor market in downturns. On the other hand, immigrants are accused of over-utilizing the relatively generous welfare system found in most Western countries, to generate ethnic conflicts and to undermine the existing national culture.

Western governments have taken notice of the ongoing trend of declining and ageing native populations (United Nations, 2000), which could increase the pressure for allowing more immigrants into these countries. Also, the labor market in certain regions, for instance within EU, are becoming more integrated, and the mobility of the work force is, in general, increasing. Moreover, as the EU expands eastwards more countries will experience the drastic decline in the overall costs of moving across borders.[2] In sum, the discussion of immigration policy is on the forefront in most western countries.

Any immigration policy should be based on a base of knowledge as wide as possible. Crucial information in this respect is how immigrants conform to, or assimilate in the labor market. Obviously, one very important aspect of the assimilation process is how long the immigrant stay in the host country. At each point in time the immigrant can in principle choose whether to stay in the host country or not.[3] If the immigrant choose to leave the host country, he/she could either migrate back to the source country (return migrate) or to another country (repeat migration). To this end I denote both these events out-migration.

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[2] On the other hand, the possible inclusion of new East-European members of EU has raised a huge debate on whether the new member should have free access to the European labor market. One suggestion is to define a transition period for the new members where the flow of immigrants are restricted.

[3] I here ignore the existence of contracts which limits the stay in the host country, as well as the possibility of involuntary deportations. Dustmann (2000) provides an overview of the different types of migrants.

The number of immigrants who out-migrate from Western countries is substantial. Figure 1 presents the annual flows of foreign-born individuals in- and out of Norway for the period 1961-1999.[4] The outflow as a share of inflow has a mean equal to 0.79 in the period. That is, for every 10 foreign-born individuals that move into Norway, roughly 8 individuals move out. Studies of questions related to immigration should therefore ideally include both immigration and out-migration, and the selection process implied by the large difference between gross- and net immigration.

**Figure 1.** Inflow and outflow of foreign-born individuals into- and out of Norway.



Out-migration is a topic which, due to insufficient and incomplete data, has mainly been studied from a theoretical point of view.[5] However, information about return propensities

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[4] Source: Statistics Norway, Population Statistics.

[5] As far as I know, only Tysse and Keilman (1998) have studied the out-migration of immigrants in Norway. However, they did not consider the correlation between earnings and out-migration which is the main focus in the current study.

and knowledge of how the out-migrants are characterized is essential for policy. For instance, if only a small percentage out-migrate when the labor market worsen, the scope for using immigration as a buffer in the labor market becomes less attractive. Even worse, if the most able leave the host country such a policy could result in a less able immigrant population. On the other hand, if those who do not succeed in the host country labor market leave, we are left with a gradually positively selected immigrant work force.

The earnings assimilation studies typically utilize two or more cross sectional data sets, which makes it possible to identify assimilation effects under strong assumptions, a survey is provided in Borjas (1999). One of these assumptions is that the group of out-migrants is a random sample from the immigrant cohort under study. All logic and scattered empirical evidence contradicts that this is the case. If the out-migrants are selective, in the sense that the distribution of earnings-determining characteristics differ from the distribution to those who stay, earnings assimilation estimates obtained from cross sectional data would be biased (henceforth denoted the out-migration bias). Very few attempts have been made in correcting the estimates for possible out-migration bias. However, recently a couple of studies have focused on this problem on U.S. data (Hu, 2000; Demombynes, 1999). Both studies rely on comparing estimates obtained on data from very different sources, and as such have come only part of the way in identifying the sign and strength of the bias. Also, there are promising ongoing work on data from Denmark and Sweden (Husted et. al., 2000b; Edin et. al., 2001). These studies utilize data from a very long time frame. However, the sample sizes are rather small, and the availability of covariates are limited. The main conclusion in these studies, both on the U.S. data and the Nordic data, is that the out-migrants are negatively selected in terms of earnings, from the group of immigrants. This leads the authors to conclude that standards earnings assimilation estimates, obtained from repeated cross-sectionals in which out-migration is ignored, are upward biased.

This paper aims at clarifying these issues using Norwegian data. The main advantage is that I observe the entire population of immigrants at each point in time. This allows me to rather precisely characterize the different subgroups of the immigrant population. The out-migrants are identified by sample attrition, which allows for an analysis of the propensity to out-migrate. The paper is organized a follows. In the next section I discuss what economic theory has to say about why individuals move across international borders. In section 3 I survey the available empirically related literature on out-migration, focusing on

those studies which analyse labor market earnings. In section 4 I present the data structure. Section 5 contains an analysis of how the out-migrants differ from those who stay. In section 6 I discuss how selective out-migration could influence on earnings assimilation estimates. Finally, in section 7 the results are summarized and interpreted.

## 2. Theory

In general, why do individuals move across borders? Originating in Sjaastad (1962) the dominating explanation has been human capital investment. By making an investment (forgone earnings, travel costs etc.) the migrants explores wage differentials and/or acquire skills not obtainable in the source country. The basic model, along with some common interpretations, are neatly summarized in Chiswick (1999). This model, in its most simple version, assumes perfect foresight, no unemployment, fixed wage rates in the source- and host country, and that the migration decision is irreversible (permanent migration). A risk neutral individual who maximizes lifetime income, and who lives infinitely, will migrate if the rate of return to migration, is greater than the real rate of interest cost in financial markets.

If all workers are identical we will typically end up with a corner solution, were either all or no one migrates. In reality both wages and costs will vary according to skill level. Given that high skilled workers earn more than low skilled and that they are more efficient in the migration process in the sense that they face lower direct costs and that they spend less time on the migration process, they will have a higher rate of return of return to migration compared to low ability workers. The more the rate of return differs between high and low ability workers, the more selective would the migration be. Also, a key insight from this very simple model is that the larger are the direct migration costs, the lower is the propensity to migrate, but the greater is the propensity for a favorable (positive) selectivity in migration.

Within this framework an important determinant of the flow of immigrants is the ratio of wages for high skilled versus low skilled, in the source and host country. If for instance the ratio is higher for high skilled workers (as it would be if the wage distribution is more compressed in the source country compared to in the host country) this would further

increase the positive selectivity in migration. If the opposite is true, that is if the ratio is lower for high skilled workers, this effect would work in the opposite direction and counteract the effects stemming from higher efficiency and lower direct costs.

However, people move across borders also for other reasons than purely economical. One would expect that the mechanism outlined above would be less intense among those migrants who move across borders as refugees or due to family reunification etc. Also, more realistic, the information about the skill level would be asymmetric in the sense that the host country employer would not have full information about the skill level and productivity for the newly hired migrant. One simple assumption (Katz and Stark, 1987) is that the migrant on arrival is paid according to the average skill level among immigrants. Thus, the high skill workers would face a less favorable ratio of source country/host country wages at the outset, which would work in the direction of a less favorably selected migration.

To sum up, the model outlined above identifies wage differentials along with cost- and time efficiency as the main push factors (supply side) behind migratory behavior. As such, the model does not point to any particular mechanism for returning, besides from the obvious possibility that the wage differential could turn around over time in favor of the source country, or in principle of other countries, and induce the migrant to out-migrate. Still, the model serves as a useful reference in any discussion and analysis of labor migration.

What then motivates immigrants to out-migrate? Dustmann (1996b) provides some suggestions within an optimal life-cycle human capital model. In particular, it is rationalized why the migrant would out-migrate despite a higher wage in the host country compared to the source country, and the optimal duration in the host country is calculated. Three different motives are put forward: (i) accumulation of human capital; (ii) complementarities between consumption and the location for consumption; and (iii) differences in relative prices. It is shown that the optimal duration is not necessarily increasing in the wage level in the host country. More conventionally, the optimal duration is increasing in the planning horizon, and in the desired stock of savings at the end of the planning horizon.

What do the above mentioned theories imply for the labor market behavior of those who out-migrate versus those who stay? Assuming that there is a wage premium associated with the initial move, the temporary migrant will typically, due to the limited horizon of the stay in the host country, supply more labor, save more of their income, and invest less in host country specific human capital. Also, to the extent that the human capital requirements in the labor market varies across borders, short-term migrants would have less incentive to invest in host-country human capital, which could lead to a less favorable selective migration.

Dustmann (2000) contains an excellent discussion of these questions. The motives behind the move across borders are investigated from a theoretical point of view, and the implications for empirical analysis is discussed. The main point is that the length of the stay in the host country could affect earnings-influencing investment to a high degree, and hence empirical specifications which do not take this into account risk to obtain estimates that are biased. As investments in human capital in general may have strong impacts on the earnings profile, differences in assimilation rates between immigrant groups of different origins can be explained by different return probabilities. However, it is not clear how to approach this problem, even with full information on completed duration, as it is the unobserved intention which in principal determines the investments in general- and country specific human capital.

However, the extent of which the immigrants behave rationally according to the factors outlined above could vary between groups of immigrants. I would expect that both the motivation behind the initial migratory move as well as the geographical and cultural distance are important in this respect. Immigrants who arrive as refugees and asylum seekers would be expected to behave less rational than pure labor migrants. Also the less the geographical and cultural distance between the source and the host country, the more would we expect the immigrant to respond to for instance changes in the wage structure and job opportunities.

# 3. A brief review of the literature

My review of the related empirical literature is threefold. Firstly, I discuss the existing literature on earnings assimilation. Secondly, I give a review of those studies who analyse out-migration in general, and which focus on to which extent the out-migrants are selected from the group of immigrants in the host country. Lastly, I discuss those contributions in the literature which explicitly have gone into the issue of how (selective) out-migration affects earnings assimilation estimates.

The empirical literature on how immigrants conform to the host country labor market is substantial, and although most of the focus has been on the U.S. labor market a number of studies have been undertaken for European countries, Canada and Australia as well. The typical modern study of earnings assimilation utilize two or more cross sections, as in Borjas (1995), in order to separate cohort- and years-since-immigration effects. Evidence for Norway is provided by Hayfron (1998) and Longva and Raaum (2001a). Aguilar and Gustafson (1991) provides results for Sweden, while Husted et. al. (2000) studies Danish data. There are huge differences across nations when it comes to the history of immigration, immigration policy, and also in how an immigrant, as well as earnings, are defined  and measured in the data sets. This, together with the variations of methods applied to cope with the assorted data deficiencies, makes a cross country comparison difficult. However, in most countries there seems to be a underlying declining earnings capacity of the most recent immigrant cohort over time, especially in the 80's. This justifies the use of two or more observations in time when measuring the effect of years-since-migration on earnings. Next, immigrants starts out with an earnings disadvantage compared to natives, but improve their earnings over time. The speed at which this happens (the degree of assimilation) varies. For instance, Longva and Raaum (2001a) finds that immigrants from Non-OECD countries improve their earnings by about 6 percent relative to natives during their initial 10 years of residence in Norway.

Turning to the out-migration studies, Borjas and Bratsberg (1996) analyzes the return migration of immigrants in the U.S. Based on measures of the return migration flow by source country, data from the 1980 Census, and various aggregated data from the source countries, they find that immigrants tend to return to rich countries and to countries not far away from U.S. Also, the data gives some support to the hypothesis that return migration

tend to accentuate the selection originally characterizing the immigrant flow. A similar study is conducted by Ramos (1992) who finds that the migrants from Puerto Rico to the U.S. are negatively selected, both on observables and unobservables. Those who return from U.S. are, on the other hand, positively selected from the pool of Puerto Rican migrants in the U.S. These findings are interpreted as a support of a model where individuals from the lower part of the earnings distribution move from economies with the larger income inequality to economies with the less income inequality.[6]

Within the European context, Dustmann (1996a) provides a simple empirical analysis of the determinants of the intended stay in the host-country among immigrants to Germany. Also, on a small sample of returned immigrants (after a stay in Germany) to Turkey, the out-migration decision is evaluated ex ante. He finds that the propensity to out-migrate increases with the age at entry, but declines with the number of years in the host country, holding age at entry constant. This latter effect is interpreted as a strong assimilation effect. However this could also be caused by selection if those who have the highest propensity to out-migrate do so after a short duration of stay.

Husted et. al. (2000b) studies out-migration on a comprehensive Danish data set. The main focus is on estimations of the probability among the stock of immigrants in 1986 of leaving Denmark in the subsequent nine years. Like Dustmann (1996a) they find a negative duration dependence in the sense that the probability of leaving is a decreasing function of the number of years the immigrant has resided in the host country. Further, the closer the immigrant has been attached to the labor market, the lower the probability of leaving, which is interpreted as an indication of that the least successful out-migrate. On the other hand, registered unemployment works in the other direction, as those with a high number of months receiving unemployment benefits yield a low out-migration probability. Interestingly, the ratio between income from work and gross income, interpreted by the authors as the ability to provide for oneself, enters negatively in the probit equation. This leads the authors to infer that the more able the immigrant are to provide for her/himself, the lower is the probability of out-migration.

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[6] However, as the inhabitants of Puerto Rico are U.S. citizens, the relevance of this analysis in an international migration context could be questioned.

Borjas (1989) is the first study I am aware off that explicitly focuses on the problems, due to selective out-migration, inherited in the standard approach to earnings assimilation estimation. At hand he has a small panel sample of scientist and engineers in the U.S., for the years 1972 and 1978. He finds that immigrants are more likely to leave the sample relative to natives (as expected), and that the probability is decreasing with the number of years since immigration, controlling for a number of other characteristics. Regarding earnings, it is shown that it is the least skilled (measured by weekly earnings) that disappear from the sample. Three separate estimations of the earnings assimilation model are undertaken, one for the full population, one for the subsample who stays in the sample, and one for the subsample who disappears from the sample. The results show that the stayers start out with a smaller wage differential compared to natives than movers.

Dustmann (1993) investigates how the earnings assimilation pattern depends on the intended duration of the stay (at arrival) in the host country. On theoretical grounds he first argues that the amount of human capital investment undertaken by the immigrant depends negatively on the intended duration of the stay, implying a flatter earnings profile as the intended duration decreases. Secondly, the selectivity of the temporary immigrants depends crucially on the state of the labor market in the source country as well as in the host country, at the time of entry. Specifically, high unemployment along with low levels of unemployment benefits, in the source country relative to the host country, could give a negatively selected pool of immigrants in the host country. Data from Germany give some support to these hypotheses. However the sample is small, with no time dimension, hence different cohort effects in the pool of immigrants are implicitly assumed away. Dustmann (1999) tests the same hypothesis on data for language acquisition, a test that supports the theory.

There have been, and still are, huge controversies regarding the assimilation of immigrants in the U.S. labor market. Thus, one should not be surprised of the fact that the potential role of out-migration has come into focus recently, in spite of the considerable difficulties in obtaining reliable data for this purpose. The studies that I am aware of are Demombynes (1999), Hu (2000) and Lubotsky (2000). The common approach is to compare earnings assimilation patterns obtained from standard repeated cross-sections and longitudinal data.

The source and approach in constructing the longitudinal data varies between the studies[7] but they all face, to a varying degree though, data problems like censoring, eligibility etc. This is a common problem for the recent U.S. studies although it seems that Lubotsky (2000) goes a long way in clarifying the comparability problem, as well as taking this into account in the approach. Hu (2000) and Lubotsky (2000) find that assimilation estimates based on the Censuses are biased upwards caused by negatively selected return migrants, in the sense that the out-migration flow is substantial and consisting of individuals who's potential earnings are below those who remain.[8] Demombynes (1999) on the other hand finds indications of a more rapid earnings growth in the 90's using the longitudinal data.

Lastly, a very interesting study is conducted by Edin et. al. (2001) on Swedish data. They observe a three percent sample of the population in each year 1970-97, and are able to distinguish between stayers and movers among the immigrant population by a simple sample attrition procedure. Within a cross-sectional framework they estimate earnings profiles for immigrants by region of origin. They find no assimilation effect for immigrants from the Nordic countries and from the OECD region, these groups stay roughly 15-20 percent below the average native in income. Immigrants from Non-OECD countries on the other hand enters the economy with a huge disadvantage in income, and experience only modest earnings assimilation, concentrated on the first five years of their stay. Next, the consequences of out-migration for the earnings assimilation estimates are investigated. They find that the least successful outmigrate. That is, within each group by region of origin, the group of out-migrants could be characterized as those: (i) least attached to the labor market, measured by whether or not they are observed with zero earnings; and (ii) in the lower part of the earnings distribution, among those with positive earnings. Thus, by restricting the sample to those who remain in Sweden, they find that the assimilation estimates weakens compared to the benchmark analysis were bias from out-migration are not taken into account. The authors state quite strongly that this is the

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[7] Demombynes (1999) uses merged CPS (Central Population Study) data for households, while Hu (2000) and Lubotsky (2000) use Social Security data.

[8] Interestingly, Lubotsky (2000) also finds that misclassification in Census based studies of transient immigrants as more recent arrivals than they actually were, leads to an overstatement of the declining earnings potential among successive immigrant cohort in the U.S.

case. However, in the regressions they only adjust for age and gender, hence they do not take into account that other variables could vary between the groups. Moreover, the sample is quite small.

To sum up, a large empirical literature exists on how immigrants fare in the host-country labor market with regards to earnings. As a rule, these studies use the so called synthetic panel approach where two or more cross sectional data sets are utilized in order to follow immigrant cohorts over time. In contrast, there exist only scattered empirical evidence on how out-migration influence the assimilation estimates. The common finding is that the out-migrants are negatively selected from the pool of immigrants, in the sense that their labor market earnings are less than for those who remain. Taken at face value this means that standard earnings assimilation estimates are upward biased. My study aims at adding to this recent literature.

## 4. Data

In two previous studies of the earnings assimilation of Norwegian immigrants we have utilized microdata with two observations in time, 1980 and 1990 (Longva and Raaum, 2001a; 2001b). The possible influence of selective out-migration was not specifically accounted for. Thus, it could be interesting in itself to apply these data, in order to get a validity check of our previous results. However, the 1980-90 time dimension is hampered by a number of complicating factors. Firstly, the macroeconomic situation was very different at the two points in time, with the aggregate unemployment almost three times higher in 1990 as in 1980. Longva and Raaum (2001a) show that immigrant earnings are much more affected by high unemployment compared to natives, thus the common assumption of equal period effects is hard to employ. Secondly, the characteristics of the immigrant population changed dramatically, as the immigration in the 1980's was dominated by refugees, asylum seekers, and family reunification, while the immigration until the mid 1970's was dominated by labor migrants. Each of these factors are by themselves worth a study. The question of how out-migration influences the results, adds to the complexity of the analysis. In addition, for those who leave the sample during the 80'ies, and thus under certain assumptions could be characterized as out-migrants, we do not observe when they arrived in Norway for the first time. This puts a limit on the use of

this data set to investigate the precise effect of out-migration on earnings assimilation estimates. Therefore, in addition to a characterization of movers versus stayers, I resort to study the out-migration decision only, by estimating the probability to out-migrate. The set builds on information of all immigrants and a random sample of natives in 1980 and 1992.[9] Details on the underlying sampling procedure are documented in Appendix 1. The set is denoted the *1980 Sample*.

The second data set available consists of all residents in Norway in 1993 and in 1997, with full information about arrival date and country of origin,[10] which enables a calculation of the length of the residence for all immigrants, including those who out-migrate. Hence, I can study the relationship between the propensity to out-migrate, earnings and years-since-migration. Moreover, I can undertake an explicit comparison of earnings assimilation estimates obtained from samples where we can include/exclude those who leave the sample due to out-migration. Details on the underlying sampling procedure are documented in Appendix 2. The set is denoted the *1993 Sample*.

*Immigrant*

I classify an individual as an immigrant if he/she is born in a foreign country, with two foreign born parents. However, as explained in Appendix 1, I do not have available the country of origin for the out-migrants in the 1980 sample. For this group I therefore assume that the country of origin is equal to the observed citizenship. That is, naturalized immigrants that out-migrate are not captured by my definition of out-migrants. This would represent a problem for the interpretations of the results (or rather the applicability of the analysis) if this group: (i) systematically differ, in observed or unobserved characteristics, from the group of out-migrants without a Norwegian citizenship; and (ii) is large in numbers. Regarding the first point I have no definite opinion, however regarding the latter I would expect that the group in question is relatively small in size. It should be noted that in order to become a Norwegian citizen one must have been in the country for at least

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[9] In light of the discussion of the 1980-90 period, the reference to 1992 may seem strange. However, the 1990 sample utilized in Longva and Rauum (2001a, 2001b), is selected conditional of their presence in Norway two years later, in 1992. Thus, as residence in Norway is crucial for the classification of out-migrants, I find it most appropriate to refer to 1992 in the presentation of this sample.

[10] This is part of the data set utilized in Barth et. al. (2000).

seven years. It is worth noting that a number of studies use only citizenship as the criterion for the classification of immigrants, which yields an inferior sample as a number of foreign born individuals naturalize.[11] As I have available both country of origin and citizenship for the majority of the sample in 1980, I am able to compare these two classification rules, see Appendix 1. Lastly, I divide each sample of immigrants into those who were born in a OECD country, and those born in a country outside the OECD.[12] Natives constitutes the residual, i.e. those born in Norway or in a foreign country with at least one Norwegian born parent.

*Out-migrant*

Out-migrants are defined by a sample attrition procedure. That is, an individual in the 1980 sample is defined as an out-migrant if he/she is not present in 1992. Correspondingly in the 1993 sample, where the classification is done based on the residence in 1997. One possible source of bias is that I wrongly classify those who die between the two points of observation, as out-migrants. A simple correction could be done using the publicly available statistics of the mortality rate in Norway by age and gender.[13] However, the main focus of this paper is on the correlation between the propensity to out-migrate and individual earnings, hence without any information about the correlation between mortality and earnings, I doubt whether such a correction would influence the main results. Also, it will be shown that the number of out-migrants are very large compared to the number of deaths at the present mortality rate.[14] Hence, I have not prioritized such an adjustment.

Note that the different sampling frame in the two data sets allows us to capture the out-migrants defined by two different lengths of stay. That is, if we capture out-migrants by sample attrition, we then select the group by a 12 and 4 years-of-stay-limit for the most

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[11] For instance OECD (2000) use citizenship to calculate the comparable share of immigrants in all European OECD countries.

[12] *OECD* (Nordic, with the exception of Norway, OECD-Europe as of 1990, North-America, Australia/New Zealand), *Non-OECD* (Eastern-Europe, Asia, Africa, Latin-America).

[13] Thanks to Tore Schweder for pointing this out.

[14] The annual average mortality rate is about 0.37 percent per 1999, SSB (2000). Interestingly, Schoeni (1997) reports some evidence of lower mortality among foreign-born in the U.S. compared to the U.S. born.

recent cohort in the 1980 and 1993 set respectively. However, the term length-of-stay must be used with caution, as the immigrants have spent a different numbers of years in Norway when I first observe them in 1980 and 1993. For instance, from the 1980 sample the subsample of out-migrants will consists of those in the *k* cohort of immigrants who spend between (1980-*k*) and (1993-*k*) years in Norway.[15] Thus, for the different immigrant cohorts we capture the out-migrants at different stages of their stay. This is important to have in mind when interpreting the results.

*Labor force participation*

As I eventually would study labor market earnings, I find it appropriate to categorize each individual according to its labor market status. Most studies use a cutoff-point in earnings to select the sample (including Longva and Raaum, 2001a; 2001b). However, such a procedure is not ideal as the sample selection criteria is highly correlated with the dependent variable under study. The 1980 Census data includes information about hours of work which allows me to avoid the cutoff-point procedure. Thus, in the 1980 sample I define an individual as a member of the labor force if the individual: (i) reported that they worked 100 hours or more during the Census year; and (ii) is registered with nonzero earnings.[16] As we miss information about the actual number of hours worked in the 1993 data set we are forced to use an income criterion to assign the crucial labor force status. The annual threshold level is, set to approximately the average monthly earnings for full time workers.

*Age, Student, Self-employed*

In order to minimize the impact of the possible bias caused by the inability to distinguish between out-migration and death, I have chosen to restrict the sample to those who are (or would have been) 64 years of age at the right endpoint in each sample. Hence, in the 1980 sample I select those aged 18-52, and in the 1993 sample I select those aged 18-60. Lastly, I throw out all students, as well as all registered as self-employed from the 1980 sample,

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[15] I here ignore the possibility that the immigrant may out-migrate, and then immigrate again between the two points of observation.

[16] Interestingly, the average annual earnings among the individuals categorized as not in labor force by my selection rule are approximately equal to the cut-off point used in Longva and Raaum (2001a, 2001b), which is the average monthly earnings for full time workers.

which excludes about 7 per cent of the natives, and 5 per cent of the immigrants. Unfortunately, I am not able to apply this selection criteria on the 1993 sample.

Given the complex data structure, and the large number of variables available, I face a number of difficult decisions regarding the empirical approach. The literature offers few guidelines in this respect. As discussed in section 3 the few studies which have been undertaken have designed the analysis according to specific structure of their data. In light of this I have chosen a rather broad empirical approach, focusing more on providing basic figures, rather than estimating heavily parameterized models. For instance, I have chosen not to undertake separate analyses for each gender as I am not convinced that a separate analysis is justified, given the other alternatives. For instance, a separate analysis by country of origin could potentially, from my point of view, provide as much insight.

Table 1 provides some basic figures according to the chosen classifications. To simplify the exposition I denote out-migrants as *Movers* and the residual as *Stayers*. For instance, 12 825 individuals from OECD countries are observed outside the labor force in 1980. Among these, 46 per cent are not observed in 1992 and thus classified as movers, and 69 per cent are females. While Non-OECD immigrants out-numbered the OECD immigrants in the 1980 sample, it is opposite in the 1993 sample. This is due to the large inflow of Non-OECD immigrants during the 1980's and underscores the importance of taking account of the region of origin distribution in the empirical analysis. Otherwise we risk to confound the findings with pure composition effects due to the dramatic shift in the population structure. Lastly, by any standard the sample sizes, are large which enables a rather detailed specification.[17] Comparing the sample sizes by labor force status we observe that the overall labor force participation rate is clearly higher among natives compared to the two groups of immigrants. This finding is in line with Husted et. al. (2000a) which finds that that the unemployment rate of immigrants in Denmark is much higher than for Danish born. The high share of immigrants outside the labor force points to the importance of not neglecting this group.

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[17] For instance, Dustmann (1993) observe a total of 1 064 immigrants while Dustmann (1996a) apply a sample of 6 901. Edin (2001) observe a 3 per cent sample each year from 1970 to 1990, which adds up to 15 574 immigrants. The sample size in Husted et. al. (2000b) is not reported.

**Table 1.** Sample sizes, share movers and share females.

| Country of origin[a] | 1980 Sample | | | | 1993 Sample | | |
|---|---|---|---|---|---|---|---|
| | Size | Movers (share) | Females (share) | | Size | Movers (share) | Females (share) |
| *Not in the labor force* | | | | | | | |
| Norway | 23 145 | .00 | .82 | | 90 120 | .02 | .54 |
| OECD | 12 825 | .46 | .69 | | 14 196 | .30 | .54 |
| Non-OECD | 5 155 | .26 | .63 | | 33 951 | .14 | .51 |
| *In the labor force* | | | | | | | |
| Norway | 95 470 | .00 | .44 | | 340 893 | .01 | .48 |
| OECD | 28 244 | .25 | .46 | | 33 963 | .10 | .50 |
| Non-OECD | 11 412 | .12 | .29 | | 37 460 | .05 | .36 |

[a] For non-residents 1992, in the 1980 sample, the country of origin is based on the citizenship.

Turning to the extent of out-migration we observe, as expected, that only a very small fraction, 1-2 per cent, of the native sample leave the sample between 1993 and 1997. The finding of zero attrition in the native sample between 1980 and 1992 is due to the construction of the data set, as explained in Appendix 1. The out-migration behavior for the immigrants, as represented by the share of movers, could be summarized as follows: (i) in the 1980 sample the share of out-migrants among those outside the labor force is about the double compared to the share among those within. In the 1993 sample the share is roughly three times as high for those outside compared to those within; (ii) the share of out-migrants is roughly the double among OECD immigrants compared to among Non-OECD immigrants; and (iii) the share in the 1980 sample is higher than in the 1993 sample. That the overall propensity to leave the sample is higher in the 1980-92 sample compared to in the 1993 sample could easily be explained by the difference in the time span between the two observations over time used to identify the out-migrants. While I

define those who disappear from the sample during the following 12 years in the 1980 sample, the corresponding numbers of years is 4 in the 1993 sample.

Although the large share of out-migrants among the OECD immigrants could in principle be caused by some kind of composition effect, it should not be controversial to state that OECD immigrant cross the borders more frequently than the Non-OECD immigrants. One common explanation could be found in the immigration laws which allows in principle unrestricted movement within the Nordic countries and the EU, another in the small cultural distance between Norway and many western countries. More puzzling, a larger percentage of the individuals outside the labor force out-migrate compared to the individuals in the labor force. Taken at face value, this could be interpreted as an early indication that those who do not succeed in the labor market leave. This finding is in line with Edin et. al. (2001). However, there are several objections to such an interpretation. First, people may come for other reasons than labor, for instance to take education, due to family unification, or as refugees. Second, my measure of earnings is not necessarily a good measure for success in the labor market.

Regarding the gender distribution I find that females are over-represented outside the labor force in the early sample (1980), while the distribution is more equal in 1993. This is partly due to an overall increase in the labor force participation among females, and partly due to the severe worsening in the labor market between these two points in time, which affected a number of the employed males. It should also be noted that the share of females is low among the Non-OECD immigrants compared to OECD immigrants and natives. Also (not shown), the tendency to outmigrate is much stronger among men compared to women. We know that men typically are the main breadwinners in the family, and hence would be over-represented among short term labor migrants, while women on the other hand are over-represented among the family-reunification migrants.

As remarked upon earlier in this section I observe the immigrant cohorts at different stages of their stay. This motivates a look at the share of movers for each arrival cohort. Table 2 provides an overview for the 1993 sample, using 5-year cohorts, by labor force status. For instance, among the immigrants born in an OECD country, not in the labor force in 1993, who arrived before 1965, 5 percent (first row, first column) are not observed in 1997 and thus classified as movers. It seems like the longer the immigrant has been in Norway as of

1993 the less chance for outmigration during the next four years. This can be interpreted as a cohort effect, a years-since-immigration effect, or a combination. In the first case the increasing share of out-migrants as the arrival time get closer to 1993 is due to inherent differences between the arrival cohorts, with the early cohort characterized by a low out-migration propensity, and the more recent cohort characterized by a higher out-migration propensity. In the latter case the pattern is interpreted as a declining out-migration propensity as the length of the stay increases, which is what we will observe if the arrival cohorts consists of a mix of short-term and long-term immigrants.[18] The pattern for OECD immigrants is very strong. While only five percent of the remaining immigrants from the pre 1964 arrival cohort outside the labor force out-migrated during 1994-97, the corresponding number is almost sixty percent for the most recent cohort. The pattern for those in the labor force is also clear, especially from the 1980-84 cohort on.

**Table 2.**  Share movers, by arrival cohort, 1993 sample.

| Cohort | Not in the labor force 1993 | | In the labor force 1993 | |
|---|---|---|---|---|
| | OECD | Non-OECD | OECD | Non-OECD |
| Arrived pre. 1965 | .05 | .07 | .02 | .03 |
| Arrived 1965-69 | .08 | .11 | .03 | .03 |
| Arrived 1970-74 | .14 | .10 | .04 | .03 |
| Arrived 1975-79 | .21 | .09 | .05 | .03 |
| Arrived 1980-84 | .26 | .11 | .08 | .04 |
| Arrived 1985-89 | .39 | .14 | .13 | .06 |
| Arrived 1990-92 | .59 | .18 | .34 | .10 |

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[18] This process could be illustrated within a simple formal framework modeling the stock and outflow of immigrant cohort over time.

# 5. Movers versus Stayers

The empirical analysis will proceed as follows. I start out with some basic descriptive statistics followed by a simple multivariate analysis of the earnings differential between movers and stayers. As the main focus is on earnings, this part of the analysis is undertaken on the subsample of labor force participants. Next I provide an analysis of the discrete choice of whether to out-migrate or not.

*Descriptive statistics*

Table 3 provides descriptive statistics for those in the labor force by out-migration status, separately for the two samples. First, looking at the earnings statistics, we observe that natives on average earned less than the immigrants with the exception of the group of Non-OECD immigrants in 1993. This somewhat peculiar observation was also found in Longva and Raaum (2001b), but was to some degree explained by a different age- and gender structure in the samples. Nevertheless, with the mentioned exception, these simple figures paint a fairly positive picture of immigrant labor market behavior. Taken at face value, and by using earnings as a measure of the immigrants contribution to the economy (Borjas, 1999), the high mean earnings provide some indications of a positive contribution to the economy from immigrants participating in the labor force.[19]

Turning to the earnings differential between movers and stayers we observe that the mean annual earnings among OECD movers are well above the corresponding statistics for stayers. However, the reported percentiles show that the earnings distribution among the movers is skewed to the extremes, with the 90 percentile roughly twice as large as the corresponding figure for the stayers, and with the 10 percentile below that of the stayers. Thus it seems like OECD movers consist of a number of high-earnings individuals, mixed with movers which have annual earnings clearly below that of the stayers. The earnings distribution among the Non-OECD movers is more in line with the stayers, at least in the upper part of the earnings distribution. However, both the median and the 10 percentile are clearly below that of movers, in both samples. Thus it seems like

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[19] Of course, such a statement is build on a number of strong assumptions and premises, which I will not go into in this paper (Borjas, 1999). However, from my point of view it is striking that we observe a positive earnings gap for large groups of immigrants in Norway.

**Table 3.** Means, individuals in the labor force.

| Variable | Natives | OECD | | Non-OECD | |
|---|---|---|---|---|---|
| | | Stayers | Movers | Stayers | Movers |
| *1980 Sample* | | | | | |
| Earnings[a], mean | 153 | 169 | 261 | 163 | 171 |
| Earnings[a], 90 percentile | 248 | 273 | 523 | 247 | 255 |
| Earnings[a], 50 percentile | 154 | 162 | 152 | 161 | 151 |
| Earnings[a], 10 percentile | 49 | 52 | 44 | 70 | 57 |
| Log Earnings | 11.74 | 11.81 | 11.89 | 11.86 | 11.79 |
| Females, share | 0.44 | 0.49 | 0.37 | 0.30 | 0.20 |
| Age, in years | 33.85 | 37.67 | 31.34 | 33.71 | 32.32 |
| Education, in years[b] | 10.33 | 11.43 | 11.85 | 11.15 | 10.98 |
| Education missing, share | 0.01 | 0.14 | 0.22 | 0.35 | 0.46 |
| Years since immigration | - | 11.35 | - | 7.67 | - |
| *1993 Sample* | | | | | |
| Earnings[a], mean | 164 | 190 | 258 | 130 | 141 |
| Earnings[a], 90 percentile | 271 | 317 | 527 | 226 | 245 |
| Earnings[a], 50 percentile | 160 | 175 | 174 | 124 | 97 |
| Earnings[a], 10 percentile | 46 | 64 | 49 | 33 | 25 |
| Log Earnings | 11.81 | 11.96 | 12.03 | 11.55 | 11.42 |
| Females, share | 0.48 | 0.51 | 0.44 | 0.37 | 0.30 |
| Age, in years | 37.23 | 41.74 | 36.81 | 34.98 | 34.29 |
| Education, in years[b] | 11.58 | 12.57 | 12.95 | 11.43 | 12.35 |
| Education missing, share | 0.01 | 0.43 | 0.79 | 0.52 | 0.55 |
| Years since immigration | - | 15.87 | 7.20 | 10.01 | 7.58 |

[a] Thousand 1990 NOK

[b] Among those with registered educational attainment

the movers on average are drawn from the lower part of the earnings distribution among the Non-OECD immigrants.

Further, the movers are younger than the stayers, especially among the OECD immigrants. At face value the movers are more educated than the stayers among OECD immigrants, and less educated among Non-OECD immigrants. However, I miss information on educational attainment for a large share of the immigrant groups, especially for the Non-OECD movers where I miss information for nearly half of the group. This fact hints at that we should be careful in using educational attainment as a regressor later on. Lastly, we note that the average OECD immigrants has spent less time in Norway compared to the average Non-OECD immigrant. From the 1993 sample we observe that the movers, as expected, have spent less time in Norway compared to the stayers.

*Multivariate analysis*

This exercise is motivated by the different distributions of socioeconomic variables by out-migration status, and by country of origin, as shown in Table 3. Specifically I would like to investigate whether the presented raw earnings differentials by country of origin, as well as by out-migration status, could be explained by differences in the distribution of marital status, gender, age and education. I estimate the following model by ordinary least squares, separately for each sample (1980 and 1993):

$$y_i = \alpha_0 + \alpha_1 I_i + \alpha_2 I_i * OUT_i + X_i \beta + \varepsilon_i \tag{1}$$

where $y_i$ denotes the natural logarithm of annual earnings for individual $i$, $I$ is a dummy variable for immigrant status, $OUT$ is a dummy variable which takes the value 1 if the individual is classified as a mover, 0 otherwise. $X$ is a vector of sosioeconomic variables, and $\alpha_0$, $\alpha_1$, $\alpha_2$ and $\beta$ are unknown parameters. By the specification in (1) we restrict the variables in $X$ to have the same impact on log earnings, independent of region of origin, which is a highly questionable assumption in light of the presumable very different underlying return to observable variables, for instance educational attainment. However, for the case of simplicity I stick to this restriction. Also, note that in light of the earnings

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distributions presented in Table 3, the use of a logarithmic transformation of the dependent variable is not unproblematic.[20]

Table 4 provides estimates of the immigrant dummies and the interaction terms, obtained by estimations of (1) on individuals in the labor force, in 1980 and 1993 respectively. These estimates are approximations of the group specific mean earnings, relative to natives. The controls included are indicated in the bottom of the table. For instance, in 1980, from column 5, we observe from the first row that the average stayer from an OECD country earned 2.6 percent more than natives, controlling for the differences in the distribution of gender, age and marital status. The second row is accordingly interpreted as the earnings differential between OECD stayers and movers, evaluated at the means (in the 1980 sample) of the above mentioned socioeconomic variables.

From the 1980 sample we observe from column (1) and (2) that the earnings advantage for the group of immigrants from Non-OECD countries disappear once we control for some basic individual characteristics. The earnings differentials in column (3) are identical to those that result from a comparison of the mean log earnings presented in Table 3. Controlling for gender we find that immigrants from OECD countries earn more than immigrants from Non-OECD countries, both among stayers and movers. Column (6) presents the differentials after controlling for the full set of variables. We observe that we end up with a structure similar to what we found by comparing the raw means, namely that the movers earn more (less) in 1980 than the stayers among the OECD (Non-OECD) immigrants. The results for the 1993 sample show that much of the earnings advantage of OECD immigrants over natives could be explained by socioeconomic characteristics. Further, by controlling for the full set of variables, the other differentials, as observed in column (3), become stronger. For instance, while the average Non-OECD mover earned 13 per cent less than the average Non-OECD stayer, this differential increases to 18.8 per cent after controlling for gender, age, marital status and education.

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[20] The widely used log transformation of earnings in the literature is normally justified by two factors: (i) the distribution of earnings is positively skewed such that the distribution of log earnings is closer to the normal distribution; (ii) the transformation simplifies the interpretations of the estimated coefficients from the regressions. Regarding (i) no such regularity is observed in the subsets of stayers and movers, judging from Table 3. In spite of this I have undertaken the transformation as this greatly simplifies the interpretation of the estimates.

**Table 4.** Estimates of the immigrant dummy and interaction with out-migration status, individuals in the labor force.

| Variable | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| *1980 Sample* | | | | | | |
| OECD | .090 | .057 | .070 | .109 | .026 | -.032 |
| | (.005) | (.004) | (.006) | (.005) | (.005) | (.005) |
| OECD*OUT | | | .081 | -.008 | .119 | .114 |
| | | | (.010) | (.009) | (.009) | (.009) |
| Non-OECD | .108 | -.017 | .116 | .020 | -.005 | -.034 |
| | (.007) | (.006) | (.008) | (.007) | (.007) | (.007) |
| Non-OECD*OUT | | | -.073 | -.145 | -.102 | -.095 |
| | | | (.022) | (.015) | (.019) | (.018) |
| *1993 Sample* | | | | | | |
| OECD | .161 | .048 | .154 | .165 | .035 | -.002 |
| | (.004) | (.003) | (.004) | (.004) | (.004) | (.004) |
| OECD*OUT | | | .074 | .049 | .125 | .148 |
| | | | (.013) | (.012) | (.011) | (.011) |
| Non-OECD | -.266 | -.337 | -.259 | -.301 | -.328 | -.317 |
| | (.004) | (.003) | (.004) | (.004) | (.003) | (.004) |
| Non-OECD*OUT | | | -.130 | -.155 | -.169 | -.188 |
| | | | (.016) | (.016) | (.014) | (.014) |
| *Controls* | | | | | | |
| gender | | X | | X | X | X |
| age | | X | | | X | X |
| marital status | | X | | | X | X |
| education | | | | | | X |

*Notes.* Standard errors in parentheses. Gender is entered as a dummy for female. Age is entered as a fourth-order polynomial. Marital status is entered as a dummy for married and a dummy for previously married. Education is entered as the number of years for those with registered education, and a dummy for education missing. The complete table of the results is available from the author.

To summarize, much of the observed difference in average earnings between natives and OECD immigrants as well between natives and Non-OECD immigrants in 1980 can be explained by socioeconomic and demographic characteristics. My earlier observations with regards to the earnings differentials by region of origin, and by out-migration status, are upheld.

*The decision to out-migrate*

In order to more precisely characterize how movers differ from stayers I undertake a probit analysis, in line with Husted et. al. (2000b) and Dustmann (1996a). Formally, the decision to out-migrate is modeled as a binary choice of whether to stay or not, with the probability of not staying given by:

$$\Pr(\text{out-migrate}) = \Phi(Z\gamma) \tag{2}$$

where $Z$ is a vector of variables, influencing the out-migration decision, $\gamma$ is an unknown vector of parameters, and $\Phi$ is the standard normal distribution function. (2) is estimated separately for OECD and Non-OECD immigrants, Table 5 gives the results for the 1980 sample. For simplicity I present only the result with the full set of variables included, as a stepwise introduction of the variables did not provide any major new insights. If a variable enters positively in the table it has a positive effect on the probability to out-migrate. In order to simplify the interpretations I have calculated the marginal effect, $ME_j$, for variable $j$ given by:

$$ME_j = \phi(\bar{Z}\hat{\gamma})\hat{\gamma}_j \tag{3}$$

where $\phi$ is the normal density function, interpreted as the change in out-migration propensity of a small change in variable $j$, calculated at sample means.

Age enters negatively for OECD immigrants, with a marginal effect of minus 1.2 percent. That is, the older the immigrant is, the lower is the probability of out-migration during 1981-92, and being 10 years older reduces the probability of out-migration by 12 percent. One interpretation is that older immigrants have spent a larger number of years in the host country and thus are more established compared to younger immigrants. Also, the group of OECD out-migrants could be dominated by young, highly mobile, labor migrants. This

**Table 5.** Probit analysis of the propensity to leave Norway 1981-92, by region of origin.

| Variable, 1980 | OECD | | | Non-OECD | | |
|---|---|---|---|---|---|---|
| | Est. | St.dev. | ME | Est. | St.dev. | ME |
| Intercept | 1.417 | .065 | .420 | -1.283 | .118 | -.239 |
| Age | -.041 | .001 | -.012 | -.001 | .002 | .000 |
| Female | -.329 | .018 | -.098 | -.212 | .038 | -.040 |
| Married | -.510 | .023 | -.151 | -.237 | .041 | -.044 |
| Previously married | -.407 | .036 | -.121 | -.273 | .080 | -.051 |
| Never married | ref. | - | - | - | - | - |
| Education, years | .001 | .003 | .000 | -.002 | .007 | .000 |
| Education, missing | .227 | .045 | .067 | .152 | .079 | .028 |
| Nordic | ref. | - | - | - | - | - |
| Western-Europe | -.232 | .020 | -.069 | - | - | - |
| North-America | .470 | .027 | .140 | - | - | - |
| Eastern-Europe | - | - | - | ref. | - | - |
| Asia | - | - | - | .330 | .046 | .061 |
| Africa | - | - | - | .321 | .060 | .060 |
| South/Middle Am. | - | - | - | .324 | .070 | .060 |
| Earnings, 1.quartile[a] | -.081 | .025 | -.024 | .211 | .045 | .039 |
| Earnings, 2.quartile[a] | -.270 | .026 | -.080 | .032 | .047 | .006 |
| Earnings, 3.quartile[a] | -.308 | .026 | -.091 | -.062 | .049 | -.012 |
| Earnings, 4.quartile[a] | ref. | - | - | ref. | - | - |
| | | | | | | |
| *Log-likelihood* | -13548.2 | | | -3975.6 | | |
| *Number of observations* | 28 244 | | | 11 412 | | |
| *Number of out-migrants* | 7 105 | | | 1 338 | | |

*Notes.* ME=Marginal effects, calculated at sample means. The dependent variable takes the value 1 if the individual is not residence in Norway in 1992 (out-migrant), 0 otherwise.

[a] Quartiles defined by the gender specific earnings distribution for the group under study

is supported by the observation that the effect of age on the propensity to out-migrate among Non-OECD immigrants, which to a less degree are labor migrants, is statistically insignificant. Being a female, married or divorced, have a strong negative effect on the probability to out-migrate, especially among OECD-immigrants. While education in years has no effect on the out-migration probability, the effect of not having reported the educational attainment in the 1980 Census, has a strong positive effect on the propensity, especially for OECD immigrants. Interestingly, being born in North-America yields a 14 percentage points larger out-migration probability compared to the reference category (Nordic), and as much as 21 percentage points more than Western-Europe. In light of the large geographical distance between North-America and Norway I suspect that these immigrants are mostly high-earnings, short-term, labor migrants working in sectors say, the oil industry. We do not find such large and marked differences among the Non-OECD immigrants.

Regarding the inclusion of earnings in the probit one possibility is to enter earnings or log earnings directly, like Edin et. al. (2001). However, the descriptive statistics in Table 3 indicate that the earnings distribution among the out-migrants is not trivial, especially for OECD-immigrants. Thus I have chosen to include a set of dummies indicating the position (in one of the four quartiles) in the group- and gender specific earnings distribution.[21] For OECD immigrants I find a strong positive effect of being in the highest earnings quartile (reference category). Thus, controlling for a number of other variables, the earlier observation of OECD out-migrants being partly drawn from the upper part of the earnings distribution, still holds. This is in contrast to the unanimously negative association between earnings and the propensity to out-migrate, found by Edin et. al. (2001) on Swedish data. For the Non-OECD immigrants the picture is roughly the same as observed in the raw data, with a larger out-migration probability for those in the lower part of the earnings distribution.

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[21] For instance, a female OECD-immigrant is assigned a quartile based on the earning distribution for all female OECD-immigrants in the sample. I have also experimented with the position in the gender specific earnings distribution of natives. This gave similar, but somewhat weaker effects. As my aim is to say something about how the out-migrants are selected from the group of immigrants, I stick to the original specification.

As the 1993 sample contains information about the time of arrival, I can study the interesting relationship between the decision to out-migrate, earnings and years since immigration. For the case of simplicity I have chosen to include years-since-immigration as a quadratic.[22] Further, in order to investigate the correlation between the length of the stay and earnings I include interaction terms between years-since-immigration and the position in the earnings distribution, represented as a dummy for whether or not the individual is positioned in upper half of the distribution (3'rd and 4'th quartile). Table 6 gives the results.

In contrast to the findings in the 1980 sample of a strong positive correlation between age and the out-migration probability for OECD immigrants, we observe that age enters with a small positive marginal effect in the 1993 probit. One interpretation of this finding is that young labor migrants are more responsive than older labor migrants to imbalances in the labor market, in their out-migration behavior. So when the aggregate unemployment rate decreased sharply from 1993 to 1997, the young immigrants stayed put to a larger degree than between 1980 and 1992 when the unemployment rate almost tripled in size. We note that the difference in out-migration probability between the two genders, as well as the variation in the probability by marital status, are negligible compared to what I find from the 1980 probit. This could be due to the inclusion of the years-since-migration variables in the 1993 probit.

I find only small positive effects from originating in Asia, Africa, and South/Middle America compared to Eastern-Europe. Thus, it seem like the pool of Non-OECD immigrant, as of 1993, are more equal in terms of out-migration behavior than in 1980. The structure for the OECD immigrants in this respect is roughly the same as for 1980.

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[22] I have experimented with a number of different specifications, including variants which impose few restrictions on the relationship between the propensity to out-migrate and years since immigration. None of these gave any different insight into the relationship under study.

**Table 6.** Probit analysis of the propensity to leave Norway 1994-97, by region of origin.

| Variable, 1993 | OECD | | | Non-OECD | | |
|---|---|---|---|---|---|---|
| | Est. | St.dev. | ME | Est. | St.dev. | ME |
| Intercept | -.277 | .104 | -.0369 | -2.087 | .104 | -.1969 |
| Age | .009 | .002 | .0012 | .011 | .002 | .0010 |
| Female | -.055 | .021 | -.0073 | -.112 | .024 | -.0106 |
| Married | -.215 | .026 | -.0286 | -.115 | .028 | -.0108 |
| Previously married | -.132 | .037 | -.0176 | -.143 | .044 | -.0135 |
| Never married | ref. | - | - | ref. | - | - |
| Education, years | .000 | .006 | .0000 | .073 | .006 | .0069 |
| Education, missing | .122 | .087 | .0163 | .752 | .078 | .0710 |
| Nordic | ref. | - | - | - | - | - |
| Western-Europe | -.033 | .023 | -.0045 | - | - | - |
| North-America | .125 | .037 | .0167 | - | - | - |
| Eastern-Europe | - | - | - | ref. | - | - |
| Asia | - | - | - | .118 | .035 | .0112 |
| Africa | - | - | - | .256 | .042 | .0241 |
| South/Middle Am. | - | - | - | .218 | .046 | .0206 |
| Earnings, 1.quartile* | -.354 | .050 | -.0473 | -.160 | .069 | -.0151 |
| Earnings, 2.quartile* | -.539 | .051 | -.0719 | -.290 | .071 | -.0274 |
| Earnings, 3.quartile* | -.283 | .030 | -.0378 | -.195 | .036 | -.0184 |
| Earnings, 4.quartile* | ref. | - | - | ref. | - | - |
| YSM | -.111 | .006 | -.0148 | -.070 | .009 | -.0066 |
| $YSM^2/10$ | .021 | .002 | .0028 | .018 | .004 | .0017 |
| YSM * Q. 3/4 | -.047 | .009 | -.0062 | -.043 | .013 | -.0041 |
| $YSM^2/10$ * Q. 3/4 | .013 | .003 | .0017 | .008 | .005 | .0008 |
| | | | | | | |
| *Log-likelihood* | -9 277.0 | | | -7 328.1 | | |
| *Number of observations* | 33 963 | | | 37 460 | | |
| *Number of out-migrants* | 3 402 | | | 1 964 | | |

*Notes.* ME=Marginal effects, calculated at sample means. The dependent variable takes the value 1 if the individual is not residence in Norway in 1997 (out-migrant), 0 otherwise.

[a] Quartiles defined by the gender specific earnings distribution for the group under study

In order to facilitate the interpretation of the earnings and years-since-immigration coefficients I have calculated the out-migration probability by years-since-immigration separately for each earnings quartile, presented in Figure 2. For instance, the predicted probability of out-migration during 1994-97 for a OECD immigrant, who arrived in 1992 (YSM=1), located in the 2'nd quartile in 1993 (dotted line with triangles), is 25 percent.
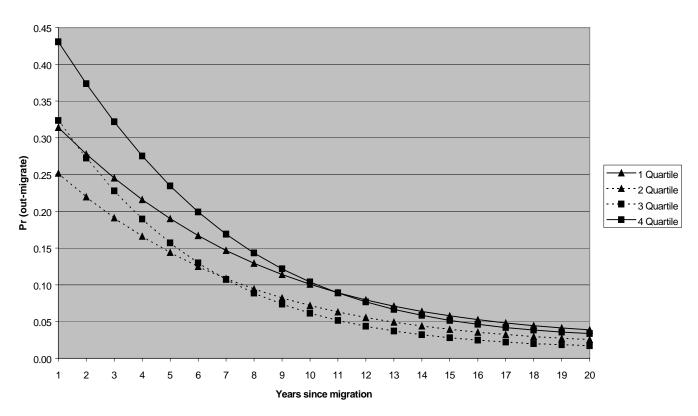
A very clear pattern is found for the OECD immigrants with the out-migration probability decreasing in YSM, at a decreasing rate. And the probability is highest for being positioned in the upper quartile in 1993, followed by the 3'rd quartile. However, the differences diminish over time, among those OECD immigrants who arrived as early as 1973 (YSM=20) I find very small differences in the out-migration probability by the position in the 1993 earning distribution. These findings could be interpreted in a number of ways. One interpretation is that the probability to out-migrate is a decreasing function of the number of years in the host country. This is the one made by Husted et. al. (2000b). However, since both the current study and Husted et. al. only observe the full sample at one point in time we risk confounding years-since-immigration effects and cohort effects. As discussed in relation to Table 2, if older cohorts of OECD-immigrants have a lower overall propensity to out-migrate than more recent cohorts, this would show up as a negative correlation between YSM and the propensity to out-migrate.

Turning to the Non-OECD immigrants in the lower panel of Figure 2 I find much weaker effects of both years-since-immigration and the position in the earnings distribution.[23] However, we find some indications of the same structure, with the more recent immigrants over-represented among the out-migrants.
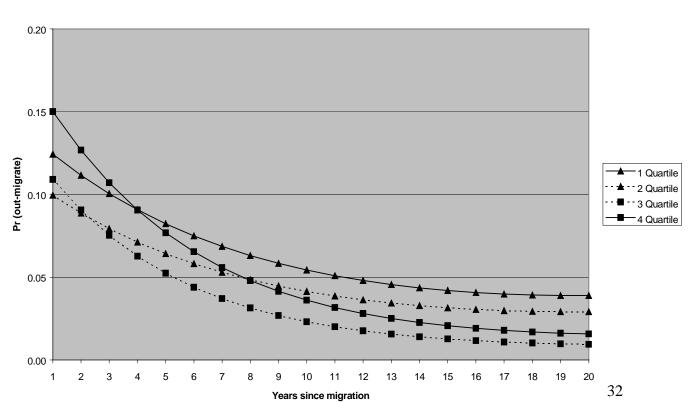
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[23] Note that the scale of the vertical axis is different in the two panels.

**Figure 2.** Predicted out-migration probabilities by years-since-migration and earnings quartile, 1993 Sample, individuals in the labor force.



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# 6. Earnings Assimilation

I have found some clear indications of non-random out-migration among immigrants in Norway. In this section I will discuss how this could influence estimates of earnings assimilation.

First of all I need to clarify the concept of earnings assimilation and how out-migrants fit within this framework. In the literature earnings assimilation is associated with how the immigrant is integrated into the labor market after arrival, measured relative to a reference group. Borjas (1999) argues strongly that natives is the relevant comparison group in this respect. Further, the term assimilation is closely connected to the long-run labor market behavior of permanent immigrants i.e. those who remain in the host country. This seems also to be the understanding of those studies, referred to in section 3, that have gone into the issue of out-migration. Most the studies have embarked upon the task simply by comparing estimates obtained from repeated cross sections (standard approach) with estimates obtained from longitudinal data. The estimates obtained from the latter source are viewed as the correct ones, and hence the difference in the estimates is interpreted as the mistake, or bias, due to not taking account of out-migration. In the following discussion I will adopt this view.

How out-migration influences earnings assimilation estimates depends on the structure of the data used. Ignore for the moment the possibility of cohort effects, that is I assume that the earnings potential do not vary across cohorts. Without selective out-migration unbiased estimates of the earnings assimilation could be obtained from a single cross-section, ignoring other disturbance factors such as measurement errors in the variables. Assume that out-migration from the immigrant cohorts occurs with a constant rate (for instance, 5 percent of the remaining individuals in the cohort out-migrates each year). With observations from only one point in time (a single cross section), the older cohorts would then consist of a smaller share of the initial pool than more recent cohorts. In other words, due to the longer length of the stay in the host country, the older cohorts would be more drained by out-migration than the more recent cohorts. If the out-migrants are negatively (positively) selected from the immigrant cohort, in the sense that those who leave have a lower (higher) earnings potential than those who remain, this will show up as

a spurious positive correlation between years since immigration and earnings. Hence we are facing a positive (negative) out-migration bias.

Most recent studies find a declining cohort quality, in the sense that more recent cohort have a lower earnings potential than older ones (Borjas, 1999). Within the present framework this effect works in the same direction (on the estimates) as negatively selected out-migration. Thus, in the case that we have available only a single cross-section the existence of negatively selected out-migration would re-enforce the positive bias caused by declining cohort quality. In the case that the out-migrants are positively selected, the negative out-migration bias would counteract the positive cohort bias.

The most common data structure in analysis of earnings assimilation is repeated cross sections. Here, immigrant cohorts are followed over time, and the cohort bias is avoided. In the absence of selective out-migration, and provided that period effects do not affect the relative earnings of immigrants (Longva and Raaum, 2001b), unbiased estimates of earnings assimilation could be obtained. The selectivity of the out-migrants works in the same direction (on the estimates) as in the case of a single cross section. As time goes by a negatively (positively) selected out-migration will work in the direction of a more (less) able immigrant cohort in terms of earnings.

As mentioned above, most of the studies of the out-migration bias have chosen a comparative approach, where estimates from longitudinal data are compared to those from a single cross section or from repeated cross sections. In light of the data structure available in the current study, a natural approach is to estimate the earnings assimilation with and without the out-migrants included. In principle this enables a direct identification of the out-migration bias. I have undertaken three attempts which could be summarized as follows:

(i) 1980 Sample: As I only observe the time of arrival (and hence are able to calculate the years-since-migration) for the stayers, the estimation was undertaken as a standard two-step Heckman procedure: step 1: estimation of the probability to out-migrate as a function of gender and age; step 2: estimation of years-since-immigration effects on earnings both with and without the predicted probability to out-migrate from step 1 included. However, this exercise gave no interpretable results. Specifically, the selection term had only a

negligible effect on the earnings assimilation estimates, in spite of the differences between stayers and movers, as documented in section 5.

(ii) 1993 Sample: As discussed, the variable years-since-immigration is observed both for stayers and mover. Hence, straight forward estimations of years-since-immigration effects were undertaken with and without the mover included. However, the exclusion of the movers did not alter the predicted assimilation profile.

(iii) 1993 Sample, merged with earnings information for 1997: In order to check whether cohort effects could be the culprit for the missing effects in attempt (i) and (ii), I utilized earnings information for 1997, and created a set with two observations in time. Although the expected declining cohort effect was identified for Non-OECD immigrants, the estimates of the effect of years-since-immigration only changed marginally when excluding those from the 1993 sample who out-migrated during 1994-97. Appendix 2 provides the details regarding data and Appendix 3 provides the specification and the results.

A number of explanations for these seemingly negative findings could be put forward. Firstly, the movers are out-numbered by the stayers in the regressions based on the 1993 sample. When excluding 10 percent of the OECD immigrants and only 5 percent of the Non-OECD it should probably be of no surprise that the estimates changes only marginally, in spite of the marked pattern from the probit analysis presented in section 5. The reason for the low number of out-migrants is due to the rather short period of time (fours years) as well as the fact that we observe the individuals at only two points in time.[24] Secondly, regarding the attempt of correcting the estimates by a basic sample selection model on the 1980 sample, the specification of the selection equation (step 1) is critical. In principle one should include at least one variable which affects the out-migration decision, but not earnings. Such exclusionary restrictions were not found, and the identification was implicitly based on functional form only. Thirdly, as shown in Table 5 the earnings distribution among the movers is not trivial, especially for the movers originally from OECD countries. In this light the usual log transformation of the dependent variable, undertaken in all three attempts, is questionable.

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[24] Thus, most of the out-migration may already have taken place for the older cohorts.

# 7. Summary and Discussion

The outflow of foreign born individuals from Norway, as well as from other Western countries, is substantial. However, our knowledge of the composition of this flow, and how the different groups of out-migrants are characterized, is sparse. This study utilizes two comprehensive microdata sets for immigrants in Norway with the aim of studying the relationship between labor market earnings and out-migration.

Firstly, I find that the probability of out-migration is much smaller for immigrants from less developed countries than from more developed countries, which is in line with what others have found. Also, I find indications of out-migration being associated with short residence in Norway. Secondly, I find that labor force attachment is positively correlated with the propensity to stay. This is in line with the finding in Edin et. al. (2001) on Swedish data, as well as in Husted et. al. (2000b) on Danish data. A policy implication is that the relatively generous welfare state in Norway do not necessarily retain groups of immigrants prone to receive welfare benefits. Among the immigrants from Non-OECD countries in the labor force it seems like the least successful, in terms of labor market earnings, out-migrate. For the OECD-immigrants a more mixed picture arises with a tendency of the out-migrants either placed very high in the group specific earnings distribution, or below the median. Further, I find some clear indications that the high earnings group stays only a short period in Norway. The finding of a rather large pool of high earnings individuals among the out-migrants from OECD countries, is as far as I know not found in other studies. For instance, Edin et. al. (2001) report that all groups of out-migrants earn less, on average, than those who stay. As discussed, this group could be associated with sectors like the oil-industry, known for high compensation. The large share of out-migrants among individuals from North-America strengthens this hypothesis.

These findings have several important implications for studies of earnings assimilation. Firstly, as immigrants from Western countries stay on average only a short period in the host country, the relevance of undertaking studies on how they assimilate in the labor market could be questioned. Moreover, those studies that are not able to distinguish between countries of origin, due to limitation in data etc., should be very careful when interpreting the results, especially results regarding the earnings at arrival. However, I am not able to find any dramatic change in the assimilation profiles by excluding those who

return. This could, as discussed in the previous section, be caused by a number of factors and further investigations into this rather complex issue remains to be done. In spite of these findings the results contained in this study can be related to previous studies of earnings assimilation for Norwegian immigrants. For instance, the finding of a rather large pool of high earnings, short-term, OECD-immigrants fits well with the finding in Longva and Raaum (2001a) of an increasing earnings potential for the most recent cohort of immigrant in the period under study.

Although the two samples utilized in this study differ with respect to the composition of source countries among the immigrants, as well as a in the time span used to identify the out-migrants, some of the findings are remarkable similar. For instance, the earnings distribution for OECD out-migrants are very similar in 1980 and 1993, in spite of the huge difference in the aggregate economic situation at the two points in time. This strengthens the robustness of the result.

Further research on the out-migrants based on Norwegian microdata should, from my point of view, focus on obtaining reliable data from more than one point in time. By observing the out-migration from the immigrant cohorts over time, one could more precisely pinpoint the nature of out-migration, as well as exploring its consequences for earnings assimilation studies more accurately. Another important topic is the labor market behavior of those outside the labor force. A central questions in this respect is to which degree these individuals have income from other sources. Lastly, the reason for immigration and out-migration should be investigated. When such information becomes available, one could test more precisely the different theories of the underlying motivations for the migratory move, which are highly relevant from a policy perspective.

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## Appendix 1: 1980 Sample

All data used is provided by Statistics Norway.

Source, 1980: Norwegian Population and Housing Census 1980 (a full census).

Source, 1992: Demographic file. A register based file containing demographic information (place of residence, country of origin, time of arrival etc.) for the full Population in Norway as of 1992.

An individual is assigned a unique identification number, which is the same across time (1980 and 1992). As both samples covers the entire population at the given point in time, it is possible to construct a comprehensive panel data set. However, in this analysis we will only utilize the panel dimension in order to identify whether or not a given individual from the 1980 file is present in Norway 12 years later. For simplicity we denote this as the 1980 Sample.

Ideally, we would select all immigrants in 1980, defined by country of origin, along with random sample of natives, defined as a residual. Next we would construct a dichotomous variable indicating whether or not the individual left the sample between 1980 and 1992, not being registered as dead, and thus could be characterized as a later out-migrant or not, as seen from 1980.

However, such a procedure are not directly attainable, for three reasons: (i) we only observe country of origin for those present in 1992, for those present only in 1980 we observe citizenship only; (ii) we do not know whether sample attrition is caused by out-migration or by death; (iii) from 1980 to 1992 it is only possible to identify those natives who were present in the 1990 Census (which did not cover the entire population).

Hence, if we want the set of stayers (not out-migrants) and movers (out-migrants) to be based on the same source when it comes to the assignment of source country, we are forced to use citizenship in 1980, which yields a subsample of the group of immigrants defined by country of origin. Also, we risk that a share of those characterized as out-migrants did in fact leave the sample due to death. Lastly, it is not possible to select a random sample of natives in 1980 independent of their presence 12 years later.

In spite of these limitations we head on with the following sampling procedure:

Immigrants: (i) All foreign born individuals with two foreign born parents, residents in Norway, in 1992, present in the 1980 Census, of age 18-52 in 1980; (ii) Residents in Norway in 1980, present in the 1980 Census, of age 18-52 in 1980, with a foreign citizenship, not present in 1992.

Native comparison group: A random 8 percent sample of natives in 1992, defined as residents in Norway, not born outside Norway with two foreign born parents, present in the 1980 Census, of age 18-52 in 1980.

Thus, compared to the optimal immigrant sample, were all immigrants are selected on the basis of country of origin, we miss out those immigrants who had a Norwegian citizenship in 1980, and left the sample within 1992. However, as we would expect that the propensity to leave the sample due to out-migration is small among the naturalized immigrants, this group is probably limited in size. In the native comparison group we miss all those who left the sample from 1980 to 1992 (compared to the optimal sample). Again, as the out-migration rate among natives is small this should not represent a problem for the analysis.

Table A1 provides an overview of the classification structure by citizenship and country of origin in 1980. For instance among the individuals with a citizenship from an OECD country, 41.3 per cent were not present in 1992, and thus classified as movers. The corresponding number among the Non-OECD immigrants is 20.0 per cent. Also, 35.3 per cent of those born in an OECD country have a Norwegian citizenship as of 1980. Note that among the stayers roughly thirty-five percent of those born in an OECD country were Norwegian citizens in 1980. The corresponding share among those born in a Non-OECD country is roughly twenty percent. Thus, by using citizenship rather than country of origin as the basis for the immigrant-native categorization (as done in a number of studies) one excludes a substantial share of the immigrant population, or more precisely, a substantial share of immigrants is wrongly classified as natives.

**Table A1** Group sizes, 1980 sample.[a]

| Citizenship 1980 | Stayers, by country of birth | | | Movers | *Total* |
| | Norway | OECD | Non-OECD | | |
|---|---|---|---|---|---|
| Norwegian | 118 324 | 9 900 | 3 181 | 0 | *131 405* |
| | (90.1) | (7.5) | (2.4) | (0.0) | *(100.0)* |
| | (99.8) | (35.3) | (22.9) | (0.0) | |
| OECD | 286 | 18 060 | 185 | 13 048 | *31 579* |
| | (0.9) | (57.2) | (0.6) | (41.3) | *(100.0)* |
| | (0.2) | (64.5) | (1.3) | (83.1) | |
| Non-OECD | 5 | 61 | 10 548 | 2 653 | *13 267* |
| | (0.0) | (0.5) | (79.5) | (20.0) | *(100.0)* |
| | (0.0) | (0.2) | (75.8) | (16.9) | |
| *Total* | *118 615* | *28 021* | *13 914* | *15 701* | *176 251* |
| | *(100.0)* | *(100.0)* | *(100.0)* | *(100.0)* | |

[a] Row-percentages in second row, column-percentages in third row.

## Appendix 2: 1993 Sample

All data used is provided by Statistics Norway. We have available annual register files for the full population in Norway from the period 1993-97 containing demographic variables, and information on income from work and self-employment from tax-records.

The data handling process is undertaken in the following steps:

*(i)* The files are merged by a unique individual identification number, resulting in minimum one, and maximum 5, data records per individual (one per calendar year the individual is present in Norway).

*(ii)* Any inconsistencies between the yearly records regarding date of arrival (first time) and country of origin, are resolved by assigning the most current observation to each individual.

*(iii)* Two populations are defined:
   A. Immigrants: Individuals for which at least one yearly record identifies the individual as born abroad with two foreign-born parents.
   B. Natives: Individuals for which all yearly records identify the individual as born in Norway.

*(iv)* The set of yearly records are reduced to one record per individual in the sample, that is every person belonging to one of the groups specified in *(iii)* and with at least one yearly record from the sample period 1993-97.

*(v)* We regard an individual as present in entire calendar year 1993 if we have an observation (record) for the individual in 1993 and 1994. As the sample will later be conditioned on at least one years of residence in Norway, those who immigrate during 1993 will be thrown out.

*(vi)* Accordingly we regard an individual as present in the entire calendar year 1997 if: (a) we have an observation for the individual in 1996; and (b) we have an observation for the individual in 1997, and the individual is not reported with an out-migration date in 1997.

*(vii)* Lastly, based on the presence in 1993 and 1997 I assign each individual in one of the four following groups:

1. <u>Stayers</u>: present in 1993 and 1997. (natives: 97.7 %, immigr.: 57.7 %)
2. <u>Movers</u>: present in 1993, not present in 1997. (natives: 1.4 %, immigr.: 8.9 %)
3. <u>Newcomers</u>: not present in 1993, present in 1997. (natives: 0.5 %, immigr.: 18.6 %)
4. <u>Residual</u>: not in 1-3. (natives: 0.5 %, immigrants: 14.9 %)

The distribution within each population group (natives, immigrants) is given in the parentheses. The large share of immigrants in the residual group are mainly made up from the inflow of individuals to Norway during 1993 and 1997.

*(viii)* For the 1993 Sample I exclude the <u>newcomers</u> and the <u>residual</u> from the sample.

*(ix)* For the analysis presented in Appendix 3 I exclude the <u>residual</u> only.

# Appendix 3: Earnings Assimilation Estimates

This Appendix provides an analysis of earnings assimilation with and without the inclusion of out-migrants, on a data set with two observations in time.

The standard approach in the literature starts out with the specification of an earnings function where log income of individual $i$ at time $t$ is given by:

$$y_{i,t} = \alpha_0 + \alpha_1 YEAR_t + \alpha_2 IMM_i + X_{i,t}\beta + \gamma g(A_{i,t}) + \delta f(YSM_{i,t}) + C_i\lambda + \varepsilon_{i,t} \qquad (A1)$$

where *YEAR* is a dummy for the year the observation is taken from, *IMM* is a dummy variable for immigrant, *X* is a vector of other explanatory variables like gender and marital status, *A* is the age and YSM denotes years since immigration (set to 0 for natives). *C* is a vector of cohort-dummies (set to 0 for natives). In the estimations I have specified the age function $g(.)$ as a fourth-order polynomial, and the year-since-migration function $f(.)$ as a set of dummies, representing varying length of residence.[25]

(A1) follows roughly the standard approach in the literature, however the specification imposes several assumptions on the data which must be commented on. First, I impose that the effect of age (which approximates experience) on log earnings as well as the characteristics included in *X*, are equal for natives and immigrants, as well as constant over time. Second, the period effect is common for natives and immigrants. As Longva and Raaum (2001b) show, this is not unproblematic. As the macroeconomic environment was different at the two points in time[26] there are reasons to believe that this could influence on the results. Thirdly, the assimilation effect works through the year-since-migration variables only, and not through changes in the return to observable variables due to the restriction that these are constant over time. All these restrictions could principle be dealt with by introducing further interaction terms. However, in order to make the analysis as simple as possible, I have not pursued this path.[27]

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[25] The chosen specification is based on experimentation with different lengths etc. in order to capture the most interesting variation between years-since-migration and earnings with a minimum number of dummies.

[26] In 1993 the unemployment rate was 5.1 per cent, compared to 3.1 per cent in 1997, source: SSB.

[27] I have experimented with different, more complex, specifications of the earnings equation. These gave, from my point of view, no further insights into the questions under study.

As described in Appendix 2, the data set can be divided in three parts: <u>stayers</u>, <u>movers</u> and <u>newcomers</u>. By stacking the full set by year of observation, I obtain a sample that resembles the one I would have gotten if I were to take two independent cross-sections, one in 1993 and one in 1997. I denote this set *All*.[28] The subset of stayers yields a sample where a substantial share of the immigrants who would out-migrate at one point in time, are excluded.[29] I denote this set *Stayers only*.

The earnings equation (A1) are estimated separately on *All* and *Stayers only*. Table A2 brings some selected estimates. First, from the estimated years-since-migration dummies for OECD immigrants, column 1, I find no systematic pattern. If anything, the estimates indicate some sort of negative assimilation, as the effect of the years-since-migration goes from statistically insignificant different from zero (2-3, 4-5, 6-7 years dummies) to negative (8-9 years dummy). At first glance, the estimated coefficients in column 2 are indifferent from those presented in column 1. Note however that the 2-3 YSM dummy is negative when estimated on *Stayers only*. This fits well with my observation in section 5 that short-term immigrants from OECD countries earns well above the average. Turning to the Non-OECD immigrants, I find a clear pattern of earnings assimilation as the predicted earnings increases steadily with years since immigration. However, the differences between the two columns (3&4) are small. Given the standard errors they are by all means statistically indistinguishable.

In addition to this examination of the assimilation profile itself, a simple comparison with natives could be undertaken. However, this is not a prioritized task here, see Longva and Raaum (2001a, 2001b) for such an exercise.

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[28] In the set utilized in this analysis I restrict the sample to those with at least two years of residence in Norway.

[29] In fact, the sample of stayers as defined in section 4, excludes immigrants who out-migrate at different stages of their host-country labor market career. For instance, among those who arrived in 1985, we exclude those who out-migrate with between 7 and 10 years of residence.

**Table A2** Regression results, 1993-97 data.

| | OECD | | Non-OECD | |
|---|---|---|---|---|
| | All | Stayers only | All | Stayers only |
| *Years in Norway* | | | | |
| 2-3 | .0169 | -.0497 | -.3336 | -.3643 |
| | (.0169) | (.0207) | (.0278) | (.0290) |
| 4-5 | .0101 | -.0268 | -.2670 | -.2513 |
| | (.0173) | (.0186) | (.0275) | (.0277) |
| 6-7 | -.0245 | -.0291 | -.1640 | -.1539 |
| | (.0173) | (.0178) | (.0274) | (.0275) |
| 8-9 | -.0382 | -.0494 | -.1286 | -.1238 |
| | (.0164) | (.0167) | (.0272) | (.0273) |
| 10-14 | -.0290 | -.0317 | -.0518 | -.0492 |
| | (.0132) | (.0133) | (.0264) | (.0265) |
| 15-30 | -.0244 | -.0249 | -.0367 | -.0344 |
| | (.0099) | (.0099) | (.0252) | (.0253) |
| 30+ | ref. | ref. | ref. | ref. |
| *Period of arrival* | | | | |
| 1985-95 | -.0384 | -.0204 | -.2117 | -.1939 |
| | (.0139) | (.0207) | (.0216) | (.0218) |
| 1975-84 | -.0500 | -.0427 | -.1375 | -.1209 |
| | (.0094) | (.0094) | (.0200) | (.0203) |
| 1965-74 | -.0361 | -.0315 | -.1457 | -.1318 |
| | (.0085) | (.0086) | (.0201) | (.0203) |
| 1964 | ref. | ref. | ref. | ref. |
| Natives | 686 057 | 680 556 | 686 057 | 680 556 |
| Immigrants | 69 356 | 59 897 | 85 774 | 75 632 |
| R-just. | .291 | .293 | .292 | .293 |

*Note.* Standard errors in parentheses. Other variables included: Dummy for 1997, Immigrant, Region of origin, 4-order polynomial in age, gender, marital status, education in years. The complete results are available from the author