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# Why Do Immigrants to Norway Leave the Country or Move Domestically? Some Important Facts

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Additional information is available at the end of the chapter

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## Abstract

We consider immigrants living in Norway and their behavior with respect to mobility. Using cross-sectional data, we employ a trinomial logit model. An immigrant may (i) move to another centrality level, (ii) emigrate, or (iii) stay at the same centrality level as in the previous period. We carry out separate estimations for eight different groups, brought about combining four centrality levels with two genders. To assess the effect of different explanatory variables related to (i) duration of residence in Norway, (ii) labor market status, (iii) reason for immigration, (iv) the extent of education and (v) family size and composition, we calculate marginal effects. In line with earlier results, we obtain that longer duration of residence tends to decrease the probability of emigration and that immigrants who have stated escape as the reason for immigration to Norway tends to have lower probabilities for emigration than those who have stated work as the reason.

**Keywords:** Norway, immigrants, immigration, internal/domestic migration, emigration, importance of education, labor force participation, duration of residence, family

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## 1. Introduction

With a demographic development that provides perspectives on future labor shortages in the entire European Economic Area, the ability to retain migrant labor in general and highly qualified migrant labor in particular, could prove to be of key importance for a country. In 2013, about 24,000 former immigrants left Norway. Emigration from Norway has increased over time as more immigrants have entered the country, but there are large fluctuations from year to year. It is therefore natural to ask what drives emigration from Norway and whom do we “lose”?

In this article, we look at different patterns of movements of immigrants and how they vary because of factors such as the degree of rurality (we call it “centrality levels” which are explained in Section 3), duration of residence in Norway, immigrants’ education level, immigrants’ labor force participation as a measure of the degree of integration, as well as family size and family composition. We try to answer important issues such as: What drives the exodus of immigrants from Norway? Which groups of immigrants emigrate? Are they immigrants that are well integrated into society, as measured by labor force participation and educational enrollment, or are they the least integrated ones? What is the impact of having family in Norway? In addition, we investigate at what extent differences in centrality can explain variation in emigration from different parts of Norway and the likelihood of alternatively remaining in a region or to move to another region in Norway.

As opposed to other studies that analyze emigration among immigrants, we not only focus on emigration but also consider the alternative of moving within the country, to another centrality level (see definition in Section 3). In Norway, refugees are placed across the country in order to obtain a balanced regional settlement pattern. In principle, however, they are free to move to another location and after some time in the country, many immigrants seem to do that. Thus, in this study we estimate multinomial (i.e., trinomial) logit models for the probabilities of (i) internal migration, (ii) emigration and (iii) remaining at the same centrality level using data for immigrants in Norway. Estimation is done separately for eight different groups, brought about by combining four centrality levels with two sexes.

As a basis for the analysis, we use individual-based registry data for population, migration, education and employment for all immigrants. The estimations are concentrated on Immigrants’ adjustments from 2012 to 2013. There is one record for each of the observational units. The data are cross-sectional data with all the observed characteristics of individuals taken from the year 2012, while the outcome of the settlement, internal migration and emigration is measured for the year 2013.

We find that the probabilities for emigration and domestic migration decrease when the duration of residence increases. These results are rather robust across centrality levels and sexes.

With respect to labor market status, we find that being employed or combining work and education contributes to a lower probability of emigration and an increased probability of remaining at the same centrality level.

Internal migration among immigrants draws in centralizing direction, especially among refugees, while immigrants from the more central regions are more inclined to emigrate.

This paper is organized as follows: In Section 2, we take a closer look at some of the earlier literature. In Section 3, we define different concepts and variables and elaborate on the institutional setting. Section 4 presents the trinomial logit model and the calculation of the marginal effects. The empirical results are provided in Section 5 and some conclusions are drawn in Section 6.

## 2. Earlier studies on emigration among immigrants

A comprehensive study addressing return migration to countries within the OECD area has been carried out by Dumont and Spielvogel [1]. According to the definition of the United Nations Statistics Division, return migrants are “persons returning to their country of citizenship after having been international migrants (whether short-term or long-term) in another country and who are intending to stay in their own country for at least a year.” The study finds that the return rate is highest in the years immediately following the immigrants’ entry to the host country, between 20 and 50% of the immigrants emigrate within a period of 5 years. This percentage varies with the time periods considered and with the characteristics of the host country. The rate of emigration is higher from some European countries than from countries such as Canada, New Zealand and the USA. The study also emphasizes that sex has small impact on the return migration, but age is of importance. There is a u-shaped relationship between return emigration and age and education. Young immigrants and immigrants who approach the pension age have, in other words, a higher probability to emigrate than immigrants of the middle age. Furthermore, not surprisingly the study also finds that there is higher mobility among countries that are at the same level of economic development. The return rates to OECD countries are usually double as high as to developing countries. Many countries run different programs aiming at promoting voluntarily return, but Dumont and Spielvogel [1] state that these arrangements seem to have limited influence on the total level of return migration. Whether this feature is due to the low impact of the arrangements or whether the arrangements only are directed at a limited number of immigrants is not clear. For most of the immigrants, return migration is only an option if the political, social and economic conditions in the origin country have become more satisfactory than what they were initially, see [1]. Furthermore, the study lists four main reasons for return migration:

- Weak integration into the host country
- Close attachment to the country of origin
- Return after accumulation of financial resources (achievement of a savings objective)
- Improved/new employment possibilities in the country of origin following work experience in the host country.

Even though Norway possesses very good (registry) data on migration, there have been very few newer studies on emigration among immigrants using Norwegian data. Four studies that go beyond a descriptive study using inter alia two-way tables and graphs are the work by [2–5]. Carling and Pettersen [2] study the relationship between intentions of return migration in the future and what they refer to as the integration-transnationalism (IT) matrix of return migration. According to this approach, return migration depends on both the immigrants’ integration in the host country and their attachment to the country of origin and it is the relative strength of these two effects that is decisive for the level of the return migration. If one either scores low or high on both these measures, they tend to cancel each other out.

Longva [5] studies the relationship between labor market attachment and (inter alia) emigration among immigrants in Norway and its implications for labor market assimilation analyses. Attachment to work, as measured by the level of the wage earnings, impacts emigration through two different channels. The first one is that economic success may inspire or be a requirement for emigration. The second is that a certain income is forgone if one leaves Norway.

The analysis by Longva [5] is based on two datasets that vary with respect to information about the duration of residence. In the analysis that accounts for the duration of residence in Norway, Longva [5] finds a strong positive effect on emigration of being in the upper income quartile. This is true for individuals who arrived from an OECD country or from another country. The same conclusion is drawn for OECD citizens in the other dataset with no information on the duration of residence, while the results for other immigrants are not clear cut. These results do not agree with those found for Swedish data by Edin et al. [6], where there is a negative relationship between the probability of emigration and the wage earnings of the individual.

The study by Pedersen et al. [4] differs from those mentioned above in that it is a comparative study in which one compares emigration from Denmark, Norway and Sweden, respectively. The study partly focuses on return migration and partly on emigration among all individuals residing in a country, but in the following we concentrate on its findings for return migration. The main focus in the study is whether it is the resourceful or individuals with few resources that emigrate from the Nordic countries (brain gain or drain) and whether systematic change has taken place over time. The study is based on registry data for 1981, 1989 (1991 for Norway) and 1998 for each of the three Scandinavian countries. The study concludes that there is no clear relationship between return migration and income and educational level in any of the Scandinavian countries.

Ekhaugen [3] focuses on the so-called welfare assimilation among immigrants in Norway, that is, how the probability for being on (economic) welfare varies with the duration of residence in Norway. Thus, this study does not aim at studying emigration of immigrants. However, modeling of emigration is needed for a proper analysis of welfare assimilation, as it captures an important control. According to the model specifications, the immigrant can choose between the three states (i) receiving welfare, (ii) emigration and (iii) none of what is mentioned under (i) or (ii). Utilizing registry data for the years 1992–2000, Ekhaugen [3] estimates the transitions between the three states. By estimating transitions, it is possible to determine the effect of receiving welfare on the probability of emigrating during the next period. The results do not entirely support the hypothesis that receiving welfare reduces the probability rate of emigrating from Norway during the subsequent period as the estimate is not significant at the 5% test level.

### 3. Institutional setting and definition of different concepts

An immigrant is defined by Statistics Norway as a person who has immigrated to Norway and has been registered as living here and as someone who is born abroad with two foreign-



born parents and four foreign-born grandparents. To be registered as a resident in Norway, one must generally have the intention to stay in Norway for at least 6 months and have acquired legal residence permit of the country. This means that seasonal workers and other people staying short term in Norway are not included. The same is the case for asylum seekers waiting to have their cases processed. It is also true that not all who have immigrated to Norway are regarded as immigrants. People who are born in Norway, but who have lived for some time abroad and then moved back, are not counted as immigrants in Norway. The same applies to people born abroad to Norwegian-born parents and/or have Norwegian-born grandparents. In this analysis, we investigate emigration in general (not only return migration) and mobility of first-generation immigrants and thus do not include their Norwegian-born children. Refugees are classified as immigrants and included in the analysis.

In the empirical analysis, it is being assumed that immigrants can move to another country or another centrality within Norway. We group municipalities according to centrality levels and distinguish between four different levels, that is, the time of travelling from the main cities/regional centers. The most central municipalities are allocated to centrality level 4 (until 75 min of travelling time to main cities, or 90 min to the capital of Oslo), the somewhat central municipalities are in centrality level 3 (until 60 min of travelling time to main regional centers), the less central municipalities are in centrality level 2 (until 45 min of travelling time to regional centers) and the remaining least central municipalities are in centrality level 1. The reason we do not only focus on emigration to another country is that the likelihood of moving inside Norway (internal migration) or remaining settled in a region constitutes alternatives to emigration. High tendency to move domestically can be expected to curb the emigration that could otherwise have taken place. Refugees are, for example, placed regionally by the authorities after they have received a residence permit. The allocation of refugees to different regions takes account of the need for maintaining a balanced regional settlement pattern. Moving between centrality levels in Norway may thus emerge as an alternative to emigration. Generally, the settlement pattern of immigrants is more centralized than what is the case for the rest of the population.

In the specification of the empirical model, we apply the following information: We have information on where the immigrants reside at the end of 2012. At the end of the subsequent year, 2013, we consider three possibilities: (i) the individual may still live at the same centrality level, (ii) the individual may have moved to another centrality level and (iii) the individual has emigrated. These will be the three states of choice in our trinomial logit models. An emigration is a registered migration from Norway to another country of a person who has been registered as a resident in Norway. The person can either have notified emigration or have been administratively emigrated by the Norwegian Tax Administration. There is no distinction between temporary versus permanent emigration. Not everyone who moves abroad is to be registered as having emigrated—it may include diplomats, people who still have a place of residence in Norway and have working ties to and/or students from Norway who are studying at foreign universities. These people are not considered as having emigrated in our analysis.

**Table 6** in Appendix provides an overview and definition of the observed variables employed in the analysis. To account for the effect of age, we include a second-order polynomial represented

by  $AGE_i$  and  $(AGE_i/10)^2$ . To capture integration effects, we construct four different dummy variables according to the duration of stay in Norway ( $DRT02_i$ ,  $DRT35_i$ ,  $DRT610_i$  and  $DRT1115_i$ ). To consider the impact of education ( $DEDU1_i$ – $DEDU5_i$ ), we have used the codes from the Norwegian Standard Classification of Education and aggregated with five levels of education for immigrants plus a group of unspecified education. These are as follows: (i) immigrants with only primary education, (ii) immigrants with some secondary education, (iii) immigrants with completed secondary education, (iv) immigrants with 1–4 years of higher education, (v) immigrants with 5 years and longer higher education and finally (vi)—the reference category—immigrants with no or unspecified education.

Immigrants are also grouped according to their labor market status ( $DLMSj_i$ ,  $j = 1, \dots, 4$ ). We distinguish between (i) employed immigrants, (ii) immigrants who combine employment with education, (iii) immigrants who are enrolled in full-time education, (iv) unemployed individuals and (v)—the reference category—individuals who are not in the workforce and not in the educational system. Employed immigrants are defined as immigrants in employment in November 2012 with an occupational status codes as wage earner or self-employed in the regional employment statistics. Persons with multiple types of employment are defined on the basis of the most important of the working conditions. Employed immigrants who, to a large extent, have been enrolled in education during the calendar year are classified in category (ii) above. We have defined immigrants involved with full-time education as anyone who has undergone training on 1 October 2012 or have taken an examination during the same year. Immigrants undergoing training who are also registered as unemployed during the year are classified as unemployed if the unemployment has lasted for 7 months or longer during the same year.

An unemployed individual is anyone who is registered in the unemployment registry at the Norwegian Labour and Welfare Administration with at least 1 month unemployment during the calendar year. Unemployed immigrants who have also been employed during the calendar year are classified as unemployed if the circumstance has lasted 7 months or longer during the same calendar year. Similarly, unemployed who have undergone training during the calendar year are classified as unemployed if this circumstance has lasted for 7 months or longer during the same calendar year.

Individuals not in the labor force in general are defined as all persons who cannot be placed into any of the status groups described above. The labor force consists of employed and unemployed persons. Persons involved in education are also to be found outside the labor force, but they are defined as a separate group, that is, persons undergoing training.

The analysis also assumes that immigrants' stated reasons for immigration ( $DRWORK_i$ ,  $DRESCAPE_i$ ,  $DRFAMILY_i$ ,  $DREDUCATION_i$  and  $DRUNK_i$ ) affects their migration patterns. For immigrants outside the Nordic countries, we distinguish between (i) work, (ii) escape, (iii) family, (iv) education and (v) unspecified reason. Immigrants from the Nordic countries do not report their reason for immigration and are allocated to their own group. The reasons for immigration are registered from 1990 on.

The data also provide information about the number of members in the family of the immigrant ( $FAMTOT_i$ ) and the composition of the family with respect to immigration status

(FAMIMM<sub>i</sub>). For instance, all in a family may be immigrants, or a family may consist partly of immigrants and partly of individuals born in Norway.

#### 4. The trinomial logit model of internal migration, emigration and continued stay at the same centrality level

The individual may choose between three alternatives (relating to their ability to move): (i) internal migration, (ii) emigration and (iii) staying at the same centrality level. Consider the dummy variable  $Y_{1i}$  (Table 6 in Appendix). It takes on the value 1 if the individual migrates from one centrality level in Norway to another centrality level in Norway and the value 0 if the immigrant stays at the same centrality level. Next, we have the dummy variable  $Y_{2i}$ . This variable takes on the value 1 if the individual emigrates and otherwise the value 0. The probability of these two binary variables being equal to 1 is given by

$$P(Y_{ij} = 1) = \frac{\exp(Z_i \beta^j)}{1 + \exp(Z_i \beta^1) + \exp(Z_i \beta^2)}, \quad j = 1, 2. \quad (1)$$

If we let  $Y_{i0} = 1 - Y_{1i} - Y_{2i}$ , it follows that the probability of not moving is given by

$$P(Y_{i0} = 1) = \frac{1}{1 + \exp(Z_i \beta^1) + \exp(Z_i \beta^2)}, \quad (2)$$

where  $Z_i$  denotes a row vector with explanatory variables (cf. the variables listed in Table 6 in Appendix) and  $\beta^1$  and  $\beta^2$  are two column vectors with unknown parameters.

Using these equations, we can specify the log-likelihood function and estimate the unknown parameters by the maximum-likelihood procedure.<sup>1</sup> Having estimated these, one may predict the various probabilities by using Eqs. (1) and (2) where the unknown parameters are substituted by their corresponding estimates. In what follows, let « $\hat{\cdot}$ » denote estimated parameters and predicted probabilities.

We are interested in how a change in one of the explanatory variables affects the three predicted probabilities (i.e., marginal effects) of a particular individual and show by an example, related to the duration of residence, how this can be done. The reference group is assumed to be immigrants with very long duration of residence, that is, more than 16 years. They are picked up by the intercept. Let us introduce the notation

$$Z_i \hat{\beta}^j = \hat{\beta}_1^j + X_i \hat{\phi}^j + \hat{\beta}_5^j DRT02_i, \quad j = 1, 2. \quad (3)$$

Here,

$$Z_i = [1 \quad X_i \quad DRT02_i], \quad (4)$$

and

$$\hat{\beta}^j = [\hat{\beta}_1^j \quad (\hat{\phi}^j)' \quad \hat{\beta}_5^j]'. \quad (5)$$

<sup>1</sup>For the trinomial logit model and its estimation cf. [7].



The variable  $DRT02_i$  is a binary variable that takes on the value 1 if individual  $i$  has a duration of residence of between 0 and 2 years and 0 otherwise, while the row vector  $X_i$  contains the other explanatory variables. If we insert from Eq. (3) into Eqs. (1) and (2), we obtain

$$\hat{P}(Y_{i1} = 1) = \frac{\exp(\hat{\beta}_1^j + X_i \hat{\phi}^j + \hat{\beta}_5^j DRT02_i)}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1 + \hat{\beta}_5^1 DRT02_i) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2 + \hat{\beta}_5^2 DRT02_i)}, \quad j = 1, 2, \quad (6)$$

$$\hat{P}(Y_{i0} = 1) = \frac{1}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1 + \hat{\beta}_5^1 DRT02_i) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2 + \hat{\beta}_5^2 DRT02_i)}. \quad (7)$$

We compare two individuals who have the same value on all explanatory variables except those related to the duration of residence in Norway. One of the individuals has a residence time in Norway of between 0 and 2 years, whereas the reference immigrant has a time of residence that is 16 years or more. We denote these two individuals, respectively, as  $i_2$  and  $i_1$  and obtain

$$\begin{aligned} \hat{P}(Y_{i2} = 1) - \hat{P}(Y_{i1} = 1) &= \frac{\exp(\hat{\beta}_1^j + X_i \hat{\phi}^j + \hat{\beta}_5^j)}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1 + \hat{\beta}_5^1) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2 + \hat{\beta}_5^2)} - \\ &\quad \frac{\exp(\hat{\beta}_1^j + X_i \hat{\phi}^j)}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2)}, \quad j = 1, 2, \end{aligned} \quad (8)$$

$$\begin{aligned} \hat{P}(Y_{i20} = 1) - \hat{P}(Y_{i10} = 1) &= \frac{1}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1 + \hat{\beta}_5^1) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2 + \hat{\beta}_5^2)} - \\ &\quad \frac{1}{1 + \exp(\hat{\beta}_1^1 + X_i \hat{\phi}^1) + \exp(\hat{\beta}_1^2 + X_i \hat{\phi}^2)}. \end{aligned} \quad (9)$$

In Eqs. (8) and (9), we have  $X_{i_1} = X_{i_2} = X_i$ . Furthermore, note that we have

$$\sum_{j=0}^2 [\hat{P}(Y_{ij} = 1) - \hat{P}(Y_{i1} = 1)] = 0. \quad (10)$$

Formulae constructed in the same type of line can certainly also be used to calculate the effects of partial changes in other explanatory variables than those related to the duration of residence. In fact, this is what we have done for constructing the different tables. The formulae are slightly modified when we consider changes in counting variables. When looking at formulae (8) and (9), we note that the parameter estimates enter both the nominator and the denominator. Since it is relevant to reveal whether the estimated differences are significant or not, we utilize the delta method to obtain estimated standard errors, cf. [8].

## 5. Empirical results

In the following, we report the results for eight groups. To save space, we do this in an asymmetrical way. Women in centrality level 1 constitute Group I, which is the reference group. The estimates of the parameters of the trinomial logit model of group 1 are given in **Table 7** in Appendix. Since the parameters in this model are not suitable to interpret, we instead consider the so-called marginal effects, cf. Eqs. (8) and (9). Altogether, there are five tables with

such marginal effects for Group I. **Table 1** relates to the duration of residence time in Norway, **Table 2** relates to labor market status, **Table 3** considers reasons to immigration to Norway, **Table 4** investigates at the duration of education and **Table 5** considers family size and composition. For the other seven groups, we report results in a qualitative manner. Groups II–IV consist of female immigrants living at centrality levels 2–4, respectively. Groups V–VIII consist of male immigrants living at centrality levels 1–4, respectively. The results for these seven groups are presented in **Table 8** in Appendix. For these groups, we focus on whether the same sign of the estimated differences in probabilities as for Group I can be obtained and whether the estimates significant.

### 5.1. Duration of residence: empirical results for Group I

We start with the duration of residence. Looking at **Table 1**, first line: If one compares a woman with the shortest time of residence, that is 0–2 years, with a woman with a duration of residence that is 16 years or more, the former woman has a significantly lower estimated probability for staying at the same centrality level and a higher estimated probability for emigration. The estimate of the difference in the probability of internal migration is positive, but not statistically significant at the 5% level.

The results for individuals with time of residence of 3–5 years, 6–10 years and 11–15 years resemble those of the group with the shortest time of residence, but the differences are somewhat smaller in absolute terms. Only the estimated difference in probability of emigration remains significant for these three groups.

### 5.2. Duration of residence: empirical results for Groups II–VIII

Recall that Groups II–IV (**Table 8** in Appendix) consist of female immigrants living at centrality levels 2–4, respectively, while Groups V–VIII consist of male immigrants living at

Difference in probability	No migration		Internal migration		Emigration	
	Estimate	t-Value	Estimate	t-Value	Estimate	t-Value
For woman with between 0 and 2 years of residence	–0.013	–2.932	0.006	1.516	0.008	2.842
For woman with between 3 and 5 years of residence	–0.008	–1.867	0.001	0.284	0.007	2.769
For woman with between 6 and 10 years of residence	–0.006	–1.524	0.004	0.987	0.002	2.158
For woman with between 11 and 15 years of residence	–0.002	–0.557	–0.000	–0.081	0.002	2.050

Note: *T*-values obtained by using the delta method. Assumptions with respect to other variables than the duration of residence: The individual is a woman aged 30 years who resides at centrality level 1. She is at work and has some secondary education. Her stated reason for immigration is work. She is a member of a family consisting of five persons, whereof four are immigrants.

**Table 1.** Estimated differences in probability of the three alternatives of mobility for different groups of women according to the duration of residence in Norway relative to the group with at least 16 years of residence.

centrality levels 1–4, respectively. Recall also that we in **Table 8** in Appendix only focus on whether the same sign of the estimated differences in probabilities as for Group I can be obtained and whether the estimates are significant, as indicated by the capital letters A, B and C, cf. the notes to the table. From the first block of cells in **Table 8** in Appendix, we note that many of the results obtained for Group I are also found for the other groups, indicated by the As and Bs. As can be seen from the second line in the first block of results, the estimated difference in probability of domestic migration for female immigrants at centrality level 3 is opposite compared to what was found for female immigrants living at centrality level 1. However, both for female immigrants in the benchmark group and for female immigrants living at centrality level 3, the estimate of the difference in probability is not statistically significant different from zero. For those with the next longest time of residence, there are somewhat different results compared to the benchmark group, that is, Group I. For female immigrants living at the centrality levels 2–4, an estimate of the difference in probability of domestic migration that goes in the opposite direction could be obtained. However, only at centrality level 4 a significant result is obtained.

5.3. Labor market status: empirical results for Group I

Considering the effect of changes in the labor market status, the reference group is made up by female immigrants who are neither working nor being enrolled in education. We find that women who are working have a significantly higher probability rate of staying in the same centrality level and significantly lower probability rate of internal migration and emigration than individuals who are neither in the work force nor enrolled in education. Women who combine work and education display a higher probability rate for staying at the same centrality level and a lower probability of emigration than the group of individuals not in the work force and not enrolled in education. With respect to the probability of internal migration, an insignificant estimate of the difference in probability is obtained.

The next group we consider is the one who contains immigrants who are enrolled in full-time education. This group has no significant estimates of the differences. Finally, we find that

Difference in probability	No migration		Internal migration		Emigration	
	Estimate	t-Value	Estimate	t-Value	Estimate	t-Value
For woman at work	0.034	4.009	−0.015	−2.701	−0.019	−2.838
For woman who combines work and education	0.018	2.256	−0.000	−0.048	−0.018	−2.713
For woman enrolled in education	−0.003	−0.357	0.009	1.559	−0.006	−1.188
For woman who is unemployed	0.016	2.131	−0.002	−0.495	−0.014	−2.367

Note: T-values obtained by using the delta method. Assumptions with respect to other variables than labor market status: The individual is a woman aged 30 years who resides at centrality level 1. She has some secondary education and a duration of residence between 3 and 5 years. Her stated reason for immigration is work. She belongs to a family with five persons, whereof four are immigrants.

**Table 2.** Estimated differences in probability of the three alternatives of mobility for different groups of women according to labor market status relative to the group that is neither in the workforce nor being occupied with education.

unemployed female immigrants have generally a significant lower estimated probability of emigration and a significant higher probability rate of staying at the same centrality level than women not in the workforce and/or not in the educational system. The estimated probability of internal migration does not differ significantly between unemployed female immigrants and female immigrants outside the work force and the educational system.

#### 5.4. Labor market status: empirical results for Groups II–VIII

For all the groups, the results are very similar for those that are at work (Table 8 in Appendix). For the other labor market statuses, the variation is evident. For immigrants who combine work and education, the conclusion with respect to internal migration differs somewhat across the different groups. In two of the groups, that is, for female immigrants at centrality level 3 and male immigrants at centrality level 1, the results are opposite to what was found for female immigrants at centrality level 1. For female immigrants at centrality level 1, a negative estimate of the difference is obtained. For Groups II and IV, the probability rate of domestic migration is significantly higher than for immigrant women who neither are at work nor are enrolled in education. Female immigrants who are occupied with education on a full-time basis demonstrate a notable difference. It is particularly related to the probability of remaining at the same centrality level. Immigrant women in the benchmark group demonstrated a significant lower estimated probability of remaining at the same centrality level than female immigrants who are neither in the workforce nor in the educational system. Female immigrants occupied with education at centrality levels 3 and 4 revealed that the estimate of the probability of remaining at the same centrality level is significantly higher than for female immigrants outside the workforce and outside the educational system. Lastly, for immigrants who are unemployed, some discrepancies between the results for Group I and the others in relation to the probability of domestic migration could be established. For female immigrants in Group I, a negative but insignificant estimate of the difference in probability of domestic migration was found. For immigrants that are living at centrality level 4, the estimated probability of domestic migration is significantly higher for the unemployed immigrants than for immigrants in the reference group. In some of the groups, the estimate of the difference in probability is positive but insignificant.

#### 5.5. Reasons for immigration: empirical results for Group I

##### 5.5.1. Work

In Table 3, we report results relating to how reasons to immigrate impact the probability of making any of the three choices. Immigrants from the Nordic countries are the reference group. The first line of figures in Table 3 relates to women that provide work as their reason for immigration. With respect to estimated probabilities of internal migration, there is no significant difference between this group of women and female immigrants from the Nordic countries. Women with work as the stated reason for immigration have significantly lower estimated probability for emigration and significantly higher estimated probability of staying at the same centrality level than women from the Nordic countries.

5.5.2. *Escape*

The next group we consider contains those that have stated escape as the reason for immigration. According to the results reported in **Table 3**, line 2, women who provided escape as the reason for immigration have significantly lower estimated probability for emigration than female immigrants from the Nordic countries. Furthermore, these women have a higher estimated probability for internal migration than female immigrants from the Nordic countries. With respect to the probability of staying at the same centrality level, an insignificant estimate of the difference of probability is obtained.

5.5.3. *Family*

We proceed with the group that has stated family as the reason for immigration. The relevant results are reported in line 3, **Table 3**. We find that women, who specified family as reason for immigration, have a significant lower estimated probability of emigration than female immigrants from the Nordic countries. With respect to the probability of staying at the same centrality level, these women have a significant higher estimated probability than female immigrants born in the Nordic countries. With respect to internal migration, no significant difference of probability is obtained.

5.5.4. *Education*

The next group we consider consists of individuals who have stated education as reason for immigration. For none of the three choices we are able to find any significant differences in

Difference in probability	No migration		Internal migration		Emigration	
	Estimate	<i>t</i> -Value	Estimate	<i>t</i> -Value	Estimate	<i>t</i> -Value
For woman with work as reason for immigration	0.036	3.204	-0.001	-0.454	-0.035	-3.146
For woman with escape as reason for immigration	-0.004	-0.200	0.043	3.274	-0.040	-3.138
For woman with family as reason for immigration	0.032	2.736	0.003	1.071	-0.035	-3.099
For woman with education as reason for immigration	0.004	0.434	0.008	1.341	-0.012	-1.754
For woman outside the Nordic countries with unspecified reason for immigration	0.013	1.112	0.012	1.612	-0.024	-2.686

Note: *T*-values obtained by using the delta method. Assumptions with respect to other variables than the reason for immigration: The individual is a woman aged 30 years who resides at centrality level 1. She has some secondary education, a duration of residence between 3 and 5 years and is at work. She belongs to a family consisting of five persons, whereof four are immigrants.

**Table 3.** Estimated differences in probability of the three alternatives of mobility for different groups of women according to reason for immigration relative to female immigrants from the Nordic countries.



estimated probability between female immigrants with education as reason for immigration and female immigrants from the Nordic countries.

#### 5.5.5. *No reason stated*

The last group we look at consists of female immigrants from outside the Nordic area who have not stated any reason for immigration. This group of women has a lower estimated probability of emigration than female immigrants from the Nordic countries. For the two other states, there are no significant estimated differences.

### 5.6. Reasons for immigration: empirical results for Groups II–VIII

When it comes to reasons to immigrate, the results are different for different groups. For female immigrants with work as reason for immigration to Norway, the results are rather equal to those obtained for females at centrality level 1 who constitute Group I. The results for male immigrants living at centrality level 2 (cf. Group VI) differ slightly from those obtained for female immigrants living at centrality level 1. For internal migration, the estimated difference in probability for male immigrants living at this centrality level and men from the Nordic countries is positive and significant. Also, when escape is the reason for immigration to Norway there are some noticeable differences. For immigrant women at centrality level 1 with escape as reason to immigrate, we found no significant difference in the estimated probability of staying at the same centrality level compared to female immigrants from the Nordic countries. For both sexes living at centrality level 4, we find that the estimated probability of staying at the same centrality level is significantly higher for those with escape as reason for immigration than for immigrants from the Nordic countries. For immigrants stating family as reason for immigration, there are some instances of switches of sign, but in none of these cases the estimates are significant. For female immigrants living at centrality levels 2 and 3, the difference in probability of domestic migration is negative, whereas it was positive for female immigrants living at centrality level 1. In all three cases, the estimates are insignificant. There are some differences for those with education as reason for immigration, in particular for men. Male immigrants living at centrality levels 3 and 4 have significantly lower estimated probability of staying at the same centrality than male immigrants from the Nordic countries living at the same centrality levels. At last, we consider immigrants outside the Nordic countries who have not stated any reason for immigration to Norway. For female immigrants in Group I, we found that the only significant result was related to the estimated difference in the probability of emigration. This estimate was positive. For Groups II–VIII, we did not find any results where the estimated differences in probabilities switch sign and at the same time are significant.

### 5.7. Duration of education: empirical results for Group I

We now turn to the importance of educational achievement for the probability of making any of the three choices. Comparison is made with a group of women with either no or unspecified education. Estimates of differences in probabilities are reported in **Table 4**. The figures in line 1 in **Table 4** are for female immigrants with primary school as their highest education.

These women have a significant higher estimated probability of staying at the same centrality level and significant lower estimated probability of emigration than women with no or unspecified education. With respect to the probability of internal migration, no significant difference is found.

For women with some secondary education, we do not find any significant differences in probability of making any of the three choices. The third line with figures in **Table 4** is for female immigrants having completed secondary education. Female immigrants with this educational background have a significant lower estimated probability of emigration than female immigrants with no or unspecified education. For the two other states of choice, we do not find that the differences in estimated probabilities are statistically significant.

The results for women with university and/or college education (lower degree) are reported in the fourth line with figures in **Table 4**. We do not find any significant estimated differences in probability for any of the three states. Finally, we consider female immigrants with education from university and/or college education (higher degree), cf. the last line in **Table 4**. These females have a significant lower estimated probability of staying at the same centrality level and a significant higher estimated probability of internal migration than female immigrants with no or unspecified education. The estimated difference in the probability of emigration is insignificant.

5.8. Duration of education: empirical results for Groups II–VIII

The results with respect to duration of education are rather similar across the eight groups. For the two groups with the shortest time of education, almost all the signs are as for immigrant

Difference in probability	No migration		Internal migration		Emigration	
	Estimate	t-Value	Estimate	t-Value	Estimate	t-Value
For woman with primary education	0.007	2.466	−0.003	−1.459	−0.003	−2.380
For woman with some secondary education	0.007	1.141	−0.005	−0.766	−0.003	−1.123
For woman with completed secondary education	0.005	1.654	−0.002	−0.656	−0.003	−2.179
For woman with education from university/university college, lower degree	0.001	0.347	0.001	0.458	−0.002	−1.602
For woman with education from university/university college, higher degree	−0.014	−2.734	0.013	2.832	0.001	0.430

Note: T-values obtained by using the delta method. Assumptions with respect to other variables than those related to the extent of education: The individual is a woman aged 30 years who resides at centrality level 1. Her duration of residence is between 3 and 5 years and she is working. Her stated reason for immigration is work. She belongs to a family consisting of five persons, whereof four are immigrants.

**Table 4.** Estimated differences in probability of the three alternatives of mobility for different groups of women according to the extent of education and relative to the group of women with no or unspecified education.

women in Group I. The only exception is for Group II when we look at those with some secondary education. For immigrant women at centrality level 2, we obtained the opposite result for the estimated difference in the probability of domestic migration compared to what was found for female immigrants living at centrality level 1. For female immigrants with completed secondary education, we obtained a different sign of the estimated differences in probability of both staying at the same centrality level and domestic migration, but the estimates are not significant. For those with university/college education (lower degree), the most important difference is related to the probability of domestic migration. For six out of seven groups, the opposite result for the estimated difference in probability between those with this education and those with no or unspecified education was obtained. For those with the highest education different results for many of the groups compared to those obtained for Group I, that is, female immigrants living at centrality level 1, could be established. At centrality level 1, the estimated difference in probability of domestic migration was positive but insignificant, whereas this is not found for women living at centrality level 3 and for men living at centrality levels 3 and 4. For women living at centrality level 3 and men living at centrality level 4, the estimated difference in the probability of emigration is significantly lower for those with the highest type of education compared to those with no or unspecified education.

### 5.9. Family size and composition: empirical results for Group I

Finally, we consider how changes in the family size and its composition with respect to the number of immigrants and non-immigrants influence the probability of the three choices. The results are provided in **Table 5**. In all cases, comparison is made with respect to an individual who is part of a family with five members, whereof four are immigrants.

In **Table 5**, example 1, we compare a female immigrant living in a family consisting of five immigrants with a woman living in a family of the same size, but where one of its members is born in Norway. We find that the former female immigrant has a significant lower estimated probability of staying at the same centrality level and a significant higher estimated probability of internal migration. When it comes to the difference in estimated probability of emigration, we do not find any effects.

At the next row (**Table 5**, example 2), we look at a person who belongs to a family of five, two are born in Norway. For this group of women, the effects are the opposite than those found for the women living in a pure immigrant family of five persons. This result indicates that family composition with respect to immigration is of great importance when it comes to emigration in particular, but also to internal migration.

### 5.10. Family size and composition: empirical results for Groups II–VIII

In conjunction with family size and composition, we could not find any result for the other groups that deviate in a significant way from those found for Group I, but there are some examples of sign switches. This is the case both when one considers a male immigrant living in a family where all of its five members are immigrants and in a family of the same size where three of its members are immigrants.

Difference in probability	No migration		Internal migration		Emigration	
	Estimate	t-Value	Estimate	t-Value	Estimate	t-Value
For woman belonging to a family with five members, who all are immigrants	-0.008	-3.288	0.005	2.668	0.002	1.880
For woman belonging to a family with five members, three are immigrants	0.006	3.559	-0.004	-2.868	-0.002	-2.109

Note: *T*-values obtained by using the delta method. Assumptions with respect to other variables than those that are related to the number of family members and the composition of the family with respect to immigrants/non-immigrants: The individual is a woman aged 30 years who resides at centrality level 1. Her duration of residence is between 3 and 5 years and she has some secondary education. She is working and her stated reason for immigration is work.

**Table 5.** Estimated differences in probability of the three alternatives of mobility for different groups of women according to the number of members of the family and its composition with respect to immigrants/non-immigrants relative to women who are member of families with five members, whereof four are immigrants.

6. Conclusions

We have considered trinomial logit models for cross-sectional data where an immigrant chooses between (i) migrating to another centrality level, (ii) emigrating, or (iii) staying at the same centrality level. We looked at official Norwegian statistics and observed whether and how an immigrant’s state of residence had changed from the end of 2012 to the end of 2013. The explanatory variables were related to age, time of residence in Norway, the duration/extent of education, labor market status, reasons for immigration and the size and composition of the family of the individual. Using the trinomial logit models, there is no close relationship between the parameter estimates and the marginal effects related to the different variables. To demonstrate how large the different marginal effects are, we have presented results for a typical individual.

The estimations have been carried out for eight different groups obtained by combining four centrality levels and the two genders. We find that the probability of emigration and the probability of internal migration decrease systematically with the duration of residence. This conclusion holds for all eight groups. The finding indicates that there is an integration effect over time among immigrants.

When it comes to labor market status, the results show that being employed or combining employment with education contributes to a higher probability for staying at the same centrality level. There are, however, some significant differences between the different centrality levels. Our findings are consistent with the finding of other emigration studies, which conclude that labor market participation strengthens the ties to the host country. In some sense, our findings are stronger than the results of other studies in that we also find that labor market participation reduces internal migration.

With respect to the reason for immigration, the conclusion is that work, family and escape contribute to a lower probability of emigration and a larger probability of staying at the same centrality level when one compares to the reference individual, who is an immigrant from the Nordic countries. For this group of variables, the marginal effects do not seem to be larger for

men than for women, but there is a tendency that the variation in the effects across the centrality groups is slightly larger for women than for men.

We find small marginal effects with respect to the variables representing the size and composition of the family of the individual. An increase in family members born in Norway contributes to a moderate reduction in the probability of emigration.

Initially, we noticed that European countries will rely on immigration because of future labor shortages: the aging of the population and low birth rates. Our analysis shows that immigrants who are well integrated into employment are inclined to remain, while those not in the work force have the highest rates of emigration. Immigrants with the highest education are also showing high rates of probability of emigrating. This conspicuous contradiction provides a need of more in-depth analyses. Two questions that arise are why some immigrants become employed but others not and what is the effect of the relatively low dispersion in Norwegian wages, that is, that unskilled workers obtain relatively high wages whereas high-skilled workers obtain relatively low wages as compared to many other Western countries [9]. With such a wage structure, there has been some worry that Norway is more attractive to low-skilled workers than to high-skilled workers when it comes to the composition of immigration and emigration. Our finding of relatively high probability of emigration among well-educated immigrants gives some support for this concern.



## Appendix A

Variable	Description	Definition
<i>Age</i>	Age	Age in years
<i>DRT02</i>	Dummy for duration of residence	<i>DRT02</i> = 1 if the duration of residence is between 0 and 2 years, otherwise 0
<i>DRT35</i>	Dummy for duration of residence	<i>DRT35</i> = 1 if the duration of residence is between 3 and 5 years, otherwise 0
<i>DRT610</i>	Dummy for duration of residence	<i>DRT610</i> = 1 if the duration of residence is between 6 and 10 years, otherwise 0
<i>DRT1115</i>	Dummy for duration of residence	<i>DRT1115</i> = 1 if the duration of residence is between 11 and 15 years, otherwise 0
<i>DLMS1</i>	Dummy for labor market status	<i>DLMS1</i> = 1 if the immigrant is working, otherwise 0
<i>DLMS2</i>	Dummy for labor market status	<i>DLMS2</i> = 1 if the immigrant is combining work and education, otherwise 0
<i>DLMS3</i>	Dummy for labor market status	<i>DLMS3</i> = 1 if the immigrant is enrolled in education, otherwise 0
<i>DLMS4</i>	Dummy for labor market status	<i>DLMS4</i> = 1 if the immigrant is unemployed, otherwise 0
<i>DRWORK</i>	Dummy for reason for immigration	<i>DRWORK</i> = 1 if the reason for immigration is work, otherwise 0
<i>DRESCAPE</i>	Dummy for reason for immigration	<i>DRESCAPE</i> = 1 if the reason for immigration is escape, otherwise 0
<i>DRFAMILY</i>	Dummy for reason for immigration	<i>DRFAMILY</i> = 1 if the reason for immigration is family, otherwise 0
<i>DREDUCATION</i>	Dummy for reason for immigration	<i>DREDUCATION</i> = 1 if the reason for immigration is related to education, otherwise 0
<i>DRUNK</i>	Dummy for reason for immigration	<i>DRUNK</i> = 1 if the reason for immigration to Norway is unspecified and the individual does not come from one of the Nordic countries, otherwise 0
<i>DEDU1</i>	Dummy for duration of education	<i>DEDU1</i> = 1 if the individual has primary school, otherwise 0
<i>DEDU2</i>	Dummy for duration of education	<i>DEDU2</i> = 1 if the individual has some secondary education, otherwise 0
<i>DEDU3</i>	Dummy for duration of education	<i>DEDU3</i> = 1 if the individual has completed secondary education, otherwise 0
<i>DEDU4</i>	Dummy for duration of education	<i>DEDU4</i> = 1 if the individual has education from university/high school, lower degree, otherwise 0
<i>DEDU5</i>	Dummy for duration of education	<i>DEDU5</i> = 1 if the individual has education from university/high school, higher degree, otherwise 0
<i>FAMTOT</i>	Family variable (count variable)	The total number of members of the family of the immigrant
<i>FAMIMM</i>	Family variable (count variable)	The number of immigrants in the family of the immigrant present in the estimation sample
$Y_0$	Dummy for no movement	$Y_0$ = 1 if the individual lives at the same centrality level in Norway in 2013 as in 2012, otherwise 0
$Y_1$	Dummy for domestic migration	$Y_1$ = 1 if the individual lives at another centrality level in 2013 than in 2012, otherwise 0
$Y_2$	Dummy for emigration	$Y_2$ = 1 if the individual lives abroad in 2013 and in Norway in 2012, otherwise 0

**Table 6.** An overview of the variables and their definition.

Variable	Description	Domestic migration		Emigration	
		Estimate	t-Value	Estimate	t-Value
<i>Constant</i>		-1.898	-5.829	-0.867	-2.361
<i>Age</i>		0.009	0.554	-0.049	-3.414
<i>(Age/10)<sup>2</sup></i>	Squared (scaled) age	-0.057	-2.752	0.045	2.967
<i>DRT02</i>	Dummy for between 0 and 2 years of residence	0.274	1.645	1.772	7.934
<i>DRT35</i>	Dummy for between 3 and 5 years of residence	0.056	0.332	1.632	7.169
<i>DRT610</i>	Dummy for between 6 and 10 years of residence	0.181	1.052	0.854	3.332
<i>DR1115</i>	Dummy for between 11 and 15 years of residence	-0.014	-0.072	0.925	3.712
<i>DEDU1</i>	Dummy for primary school	-0.157	-1.523	-0.382	-2.466
<i>DEDU2</i>	Dummy for some secondary education	-0.218	-0.729	-0.299	-1.058
<i>DEDU3</i>	Dummy for completed secondary education	-0.081	-0.691	-0.378	-2.428
<i>DEDU4</i>	Dummy for university/college, lower level	0.051	0.439	-0.249	-1.694
<i>DEDU5</i>	Dummy for university/college, higher level	0.454	3.321	0.092	0.509
<i>DLMS1</i>	Dummy for being at work	-0.594	-6.238	-1.237	-10.411
<i>DLMS2</i>	Dummy for combining work and education	-0.026	-0.182	-1.074	-4.324
<i>DLMS3</i>	Dummy for being enrolled in education	0.232	1.782	-0.249	-1.203
<i>DLMS4</i>	Dummy for being unemployed	-0.093	-0.589	-0.723	-3.047
<i>DRLAB</i>	Dummy for work as reason for immigration	-0.109	-0.705	-1.696	-11.562
<i>DRREF</i>	Dummy for escape as reason for immigration	1.123	7.562	-2.528	-11.821
<i>DRFAM</i>	Dummy for family as reason for immigration	0.119	0.827	-1.748	-12.202
<i>DREDU</i>	Dummy for education as reason for immigration	0.316	1.519	-0.33	-1.783
<i>DRUNK</i>	Dummy for unspecified reason for immigration	0.429	2.076	-0.853	-4.146
<i>FAMTOT</i>	Number of family members	-0.382	-7.630	-0.463	-6.062
<i>FAMIMM</i>	Number of family members who are immigrants	0.253	4.727	0.265	3.153
<i>Diagnostics</i>					
<i>No. of observations</i>		15,255			
<i>Scaled R<sup>2</sup></i>		0.099			
<i>Schwarz B.I.C</i>		5240.19			
<i>Log-likelihood value</i>		-5018.64			

**Table 7.** Estimation results for outbound internal migration and emigration: women.

Cases	Group						
	II	III	IV	V	VI	VII	VIII
Residence time:							
Between 0 and 2 years of res.	AAA	ABA	AAA	AAA	AAA	AAA	AAA
Between 3 and 5 years of res.	ABA	ACA	AAA	AAA	AAA	ABA	AAA
Between 6 and 10 years of res.	AAB	ABA	AAA	AAA	AAA	ABA	AAA
Between 11 and 15 years of res.	ACB	BCA	ADA	BBB	BBB	BBB	ABA
Labor market status:							
At work	AAA	AAA	AAA	ABA	AAA	AAA	AAA
Combination of work and education	BBA	BDA	BCA	ADA	BCA	ACA	ACA
Full time with education	BBB	CAA	DAA	DAA	CBA	DBA	DBA
Unemployed	BCB	ACA	ACA	ADA	ABA	ACA	ADA
Immigration reason:							
Work	BBA	ABA	ABA	ABA	CDB	AAA	ABA
Escape	AAA	CAA	DBA	BAA	AAA	AAA	DBA
Family	ABA	ACA	ACA	ABA	CAA	BBA	ABA
Education	BBB	CBC	ABA	CBC	CBC	DAD	DCD
Unspecified	CBA	CBA	ACA	BBA	CBB	BBA	ACA
Duration of education:							
Primary education	AAA	AAA	ABA	AAA	ABB	AAA	AAA
Some secondary education	BCA	ABA	ABA	AAB	AAA	AAA	ABA
Completed secondary education	AAA	AAA	ABA	AAA	CCA	AAA	AAA
University/college, lower degree	ACA	BBA	ACA	ACA	ACA	ACA	ACA
University/college, higher degree	BBC	BAC	DBD	BAC	BBC	BAD	DBD
Family variables:							
Mem. of fam. with 5 ind. who all are immi.	AAB	AAA	ABA	BBC	BBC	BBC	BCA
Mem. of fam. with 5 ind. whereof 3 are immi.	AAB	AAA	ABA	CBC	BBC	BAC	ACA

Note: **Tables 1–5** are all related to Group I, which consists of female immigrants living at centrality level 1. All the cells in the current table contain three letters written without space. The first position is related to the state of staying at the same centrality level, the second position is related to the state of domestic migration to 2 the third position is related to the state of emigration. Groups II, III and IV consist of female immigrants living at centrality levels 2, 3 and 4, respectively. Whereas the number of observations is 15,255 for Group I, the numbers of observations for Groups II–IV are, respectively, 9917, 30,539 and 203,982. Groups V, VI, VII and VIII consist of male immigrants living at centrality levels 1, 2, 3 and 4, respectively. The numbers of observations for Groups V–VIII are, respectively, 15,334, 10,883, 33,963 and 226,073. The capital letter A means that the estimated difference in probability is of the same sign as for Group I and in addition it is statistically significant. The capital letter B means that the estimated difference in probability is of the same sign as for group I, but the estimate is insignificant. The capital letter C means that the estimated difference in probability is of the opposite sign as for Group I, but the estimate is insignificant. The capital letter D means that the estimated difference in probability is of the opposite sign as for Group I and in addition it is significant. Thus, for instance, AAA in the upper left position means that all the three estimated differences related to residence time 0 and years for Group II (i.e., female immigrants living in centrality level 2) are of the same sign as for Group I, that is, immigrant females living at centrality level 1. Besides, all the three estimates are statistically significant.

**Table 8.** Comparison of the results for groups II–VIII with those of Group I.

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