MARRIED IMMIGRANT WOMEN AND EMPLOYMENT

The role of family investments

by

Saman Rashid*

Abstract

This study examines whether the transition probability from employment to non-employment among married immigrant women is consistent with the Family Investment Hypothesis (FIH). A dynamic random effects model is used and the estimations are based on a longitudinal database covering the period 1990-1996. The results indicate that the relationship between the transition probability from employment to non-employment and the family's time of residence in Sweden, considered here as an indication of the husband's need for host country-specific human capital, does not seem to be consistent with the interpretation of the FIH. Further, when immigrant women married to native-born Swedes are used as a comparison group, the corresponding relationship is similar despite the fact that this group should not need to apply family investment strategy.

Keywords: Immigrant women, family investment, international migration

JEL classification: C35, J61, H31

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1 INTRODUCTION

Over the last two decades, a considerable amount of research has been put into studying the economic behavior of immigrants, see e.g. Chiswick (1978), Borjas (1985, 1989) and LaLonde & Topel (1992) for the US, Baker & Benjamin (1994) for Canada, and Wadensjö (1972, 1992), Aguilar & Gustafsson (1991), Ekberg (1994, 1999) and Edin *et al*. (2000) for Sweden.[1] The common theme in these and other similar studies is the relationship between the immigrants' earning development and the length of residence in the host country (so-called earnings assimilation). However, previous studies have typically focused on the situation for immigrant males or males and females separately. The economic literature has not paid much attention to the role of the family in the economic activity decisions of immigrants both in general, and of women in particular, which is the aim of the present study.

Long (1980) is the first to explicitly point out the role of the family for immigrant women's economic situation. Using US data, he finds that immigrant women with few years of residence worked more hours and earned more income than both comparable native-born women and immigrant women who had lived longer in the country. In order to explain this pattern, Long puts forward the so-called Family Investment Hypothesis (FIH). According to this theory, newly arrived immigrants need to invest in host country-specific human capital as their skills from their country of origin are difficult to transfer to another country. However, because of credit restrictions, new immigrant families have to finance these investments themselves within the family. This, according to Long, gives rise to specialization among family members, with the husband investing in human capital and the wife undertaking labor market activities in order to finance the family's current expenses. Therefore, an immigrant wife is expected to adjust her labor market activity according to how much her husband needs to invest in host country specific human capital.

It is plausible that the transfer system in Sweden, along with opportunities to take study loans/allowances and to receive transfer payments make it possible for

[1] For a summary of Swedish studies, see Arai, *et al*. (1999).

immigrants to finance investments in human capital. This could imply that newly arrived immigrant families in Sweden do not necessarily need to employ the strategy discussed above, i.e. to finance investments in human capital within the family itself. On the other hand, it is possible that the Swedish transfer system is not sufficient to completely replace "private" initiatives. Another possibility is that immigrant groups from different countries of origin are not covered by the system to the same extent. For example, refugees are entitled to transfer payments as soon as they are granted a visa, whereas this is not the case for other types of immigrants. In the case of these groups, the implementation of the family investment strategy may be needed. Taking this argument as a point of departure, it is interesting to examine the Family Investment Hypothesis in Sweden.

The aim of this study is, therefore, to examine whether the labor market behavior of married immigrant women in Sweden is consistent with the FIH. More specifically, I will study whether the married immigrant women's probability to participate in the labor market varies with time of residence in the host country (Sweden) in a way that is consistent with FIH. The length of residence time may be considered as an indicator of the family's (husband's) need to invest in host country-specific human capital; the longer the residence, the less the need to invest.

The gathered results from earlier studies, based on US and Canadian data, are consistent with the implications of the FIH. Using US data from 1980, Duleep & Sanders (1993) find that immigrant wife's probability to be employed declines with the length of her husband's residence in the host country, holding her own residence time constant. This result is interpreted to mean that the shorter the time the husband has resided in the host country, the more he needs to invest in host country-specific human capital and, consequently, the higher is the wife's propensity to participate at the labor market. It is interesting to observe that this pattern concerns families born in countries in Asia where the need for investments in host country-specific human capital is often assumed to be greater than that of other immigrants, i.e. European and Canadian immigrants. Baker & Benjamin (1997) use Canadian data from 1986 and 1991 to evaluate different explanations, including FIH, of the immigrant families' labor market activities. A comparison

of the wives' (and the husbands') labor supply and earnings across different family types (native-born, immigrant, and mixed) indicates that the husband's time of residence is negatively correlated with the wife's labor supply as well as earnings. This effect is more apparent in families where both spouses are immigrants, which is interpretable as support for FIH. Worswick (1996) uses Canadian data from 1981 and 1991 but finds only weak evidence for FIH. Note that he employs the same model as in the above-mentioned studies, i.e. a reduced-form model of labor supply. On the other hand, using the same data, but employing a structural model of intertemporal labor supply, Worswick (1999) finds support for FIH. His results indicate that during the first years after arrival, immigrant wives (married to immigrant husbands) work more hours than comparable non-immigrant wives (married to non-immigrant husbands) as well as immigrant wives with longer time of residence in the host country. As an explanation, Worswick suggest that newly arrived families might face credit constraints.

Duleep & Sanders (1993) treat immigrants as heterogeneous groups, since they separate immigrants according to country of birth, but they do not control for potential cohort differences, i.e. differences in unobserved qualifications between immigrant cohorts.[2] Baker & Benjamin (1997), on the other hand, control for cohort differences, but ignore the possibility that immigrants may be heterogeneous, i.e. different groups of immigrants may behave differently. This is also the case in Worswick (1996). In addition, the data used in these studies include immigrant couples where the spouses have not necessarily arrived in the host country during the same year.

The present study is, to a large extent, based on Baker & Benjamin (1997) and Duleep & Sanders (1993), but it differs from earlier research in at least two ways. Firstly, the study considers both cohort effects and observable heterogeneity. Note that, in order to identify the effect of residence time, which is essential here, we need to control for potential cohort effects.[3] It is also important

[2] The reason is that Duleep & Sanders use cross section data from one single year, where the cohort effect and the effect of residence time cannot be separately identified (see e.g. Borjas, 1985 for further discussion).

[3] This issue is stressed in numerous studies (see e.g. Borjas, 1985, 1987, 1989 and LaLonde & Topel, 1992).

to consider observable heterogeneity, as it is likely that immigrants from certain countries need to invest more in host country-specific human capital than others. Secondly, in accordance with the assumptions on which the FIH is based, the spouses in the families are required to have arrived in the host country (Sweden) during the same year. In the empirical analysis, I use a dynamic random effects model where a lagged dependent variable is included among the explanatory variables. This construction seems convenient, since the labor market state (here employed or not) in one period of time is likely to be correlated with the state in the previous period (see Heckman, 1981a). This aspect is not considered in earlier studies.

The estimations are based on the LOUISE-database, which contains longitudinal individual information on, e.g. demographic characteristics, employment status, income, and education for the entire population in Sweden and covers the period 1990-1996. For immigrants, the database also provides information on the world region of birth and the year of arrival in Sweden.

In the next section of the paper, the family investment hypothesis and its implications are discussed. The empirical approach is presented in section 3, whereas the data and the individual characteristics are described in section 4. The empirical analyses are presented in section 5 and section 6 concludes the paper.

2 THE FAMILY INVESTMENT HYPOTHESIS

Consider an immigrant family composed of two earners; husband and wife. If the family's emigration decision was primarily based on the husband's skills and not the wife's, which appears to be in accordance with the FIH, we may assume that the husband is expected to earn relatively more than the wife. Moreover, assuming that "human capital" is difficult to transfer across countries, it is likely that newly arrived spouses lack some skills (such as the host country's language), which may result in lower income than otherwise comparable natives. Therefore, investments in host country-specific human capital are essential in order to attain income levels similar to those of natives.

Due to asymmetric information, newly arrived immigrants are likely to face credit restrictions in the host country.[4] As a result, they will not necessarily be able to finance these human capital investments via the credit market, thus the family will need to self-finance these investments to some extent. This is the main assumption on which the Family Investment Hypothesis is built.

Let us, in accordance with Duleep & Sanders (1993) and Baker & Benjamin (1997), assume that a family maximizes the present value of the expected lifetime income. This implies that the spouses, in cooperation, decide that the one with the highest earnings capacity, i.e. the primary earner, is to invest in host country-specific human capital, whereas the other one, i.e. the secondary earner, works in order to finance the family's current consumption. According to the FIH, this means that the wife, in a newly arrived immigrant family, is likely to work more than wives in immigrant families that have spent a longer time in the host country, ceteris paribus. She may undertake jobs that do not require any particular education, training, or knowledge in the host country's language.[5]

A convenient approach to examine whether the hypothesis is consistent with Swedish data is to examine how the transition probability from employment to non-employment among immigrant women married to immigrant men varies with the length of the time of residence in the host country (*transition-time-profile*). In accordance with the hypothesis, we expect that the transition probability for these women is relatively low shortly after arrival, while it is expected to increase with the time of residence. In order to study whether other immigrant women, to whom the FIH does not apply, behave in a similar way, the corresponding transition-time-profile for immigrant women married to native-born Swedes is examined. The point is to control, in an indirect way, for the need for investments in host country-specific human capital, that immigrant husbands may have, and its effect on immigrant women's transition-time-profile.

The subject of the analysis is, thus, *immigrant families*, i.e. immigrant women married to immigrant men, where both spouses arrived in Sweden during

[4] Note that also natives might face credit restrictions (see Weiss, 1997). At the same time, it is likely that newly arrived immigrants are more exposed to credit restrictions.
[5] Wadensjö (1992) finds that the percentage of immigrant women who hold temporary or dead-end jobs is fairly high.

the same year any time between 1968-1990. As comparison group, I use *mixed families*, i.e. immigrant women married to native-born Swedes, where the wife has arrived in Sweden, any time between 1968-1990.[6] The purpose is to compare the transition-time-profiles (the variation in the transition probability, from employment to non-employment, over time) of women in immigrant families with those in mixed families. I simply assume that mixed families do not face the same kind of need, i.e. investments in the husband's human capital and, therefore, the wife in these families should not show the same transition-time-profiles as those in the immigrant families.

3 EMPIRICAL APPROACH

The econometric model employed in this analysis is a reduced form, since it does not directly consider the potential wage effect on the employment probability. As an alternative, I use traditional individual socio-economic characteristics, such as education and age, which are expected to affect individual productivity and, thus, the wage. This means that the effect of the wage is considered indirectly by its determinants. Following Chiswick (1978), I use the length of residence time in the host country as an indicator of unobservable investments in host county-specific human capital.

Further, I assume that a person's employment state in one period is dependent on his/her employment state in the previous period. This assumption is reasonable, since the employment history is likely to affect the current status in the labor market (Heckman, 1981a). Heckman calls this kind of dependence "*true* state dependence". However, potential unobservable individual-specific and time-invariant heterogeneity generates another kind of dependency; *spurious* state dependence. Heckman (1981a) suggests using dynamic models with random individual-specific effects to consider the state dependence as well as to separate the *true* from the *spurious* state dependence. This approach will be followed in

[6] This approach, i.e. using mixed families as a comparison group, has been employed in Baker & Benjamin (1997).

this paper. More specifically, I use a dynamic random effects logit model. The choice of using the logit model is based on computational convenience.

Thus, we may define the model for individual *i* at time *t* as follows

$$y_{it}^{*} = \boldsymbol{Z}_{it}\boldsymbol{\lambda} + \gamma y_{it-1} + \alpha_i + u_{it} \qquad i = 1,\ldots,\text{n and } t = 1,\ldots,\text{T} \qquad (1)$$

$$y_{it} = 1 \text{ if } y_{it}^{*} > 0$$

$$y_{it} = 0 \text{ if } y_{it}^{*} \leq 0.$$

where y_{it}^{*} represents the propensity of individual *i* to be employed at time *t*, which is latent, and y_{it} is the observable indicator of employment. The *true* state dependence is captured by the parameter γ. The vector $\boldsymbol{Z}_{it}$ represents individual characteristics, which will be described below, and $\boldsymbol{\lambda}$ is a set of associated parameters to be estimated. u_{it} denotes the random error term, which is assumed to be logistically distributed, and $\alpha_i \sim \text{N}(0, \sigma_{\alpha}^{2})$ denotes unobservable individual-specific characteristics (unobserved heterogeneity).

It is also assumed that $\boldsymbol{Z}_{it}$ is independent of α_i and u_{it} for all *i* and *t*, and that α_i is independent of u_{it} for all *i* and *t*. Moreover, I assume that u_{it} and y_{i1} are uncorrelated for all *i* and *t*. To simplify the analysis further, I assume that $E(\alpha_i, y_{i1}) = 0$ which, according to Heckman (1981b), can lead to a biased estimate of the effect of the true state dependence. Note that we are dealing with the so-called "initial condition problem".[7] In order to test whether the results are sensitive to this assumption, I have also used an alternative method suggested by Orme (1997), which allows $E(\alpha_i, y_{i1}) \neq 0$. The test (not presented here) shows that the results are approximately the same in both cases, which indicates that the simpler model, where $E(\alpha_i, y_{i1}) = 0$, can be used in the analysis.

Individual *i* in period *t* can be in one of two possible employment states; employment corresponding to state 1, and non-employment corresponding to state

[7] This problem arises when the employment state at the beginning of the observation period is not randomly distributed across the sample but is dependent on the unobserved individual-specific characteristics.

0. This implies that four transitions are possible: $(0 \to 0)$, $(0 \to 1)$, $(1 \to 0)$ and $(1 \to 1)$. The corresponding four probabilities take the following form (see e.g. Bhat, 1972, ch. 3) [8]

$$p^{00} = 1/[1 + \exp(\mathbf{Z}_{it}\boldsymbol{\lambda} + \alpha_i + u_{it})], \tag{2}$$

$$p^{11} = 1/[1 + \exp\{-(\mathbf{Z}_{it}\boldsymbol{\lambda} + \gamma y_{it-1} + \alpha_i + u_{it})\}], \tag{3}$$

$$p^{10} = (1 - p^{11}) \tag{4}$$

$$p^{01} = (1 - p^{00}) \tag{5}$$

The process follows a first-order Markov-chain, which implies that an individual's current state (employment or not in this case) depends on, among other things, his/her state in the pervious period (see Heckman, 1981a). The model will be estimated separately for wives in immigrant families and wives in mixed families. In both cases, I use native families as a reference group in order to be able to simultaneously identify the effect of the residence time, cohort-specific effects and period-specific effects on the employment probability of immigrant women. Equation (1) may then be specified as

$$\begin{aligned} y_{it}^{*} = \mathbf{X}_{it}\boldsymbol{\beta}_1 + \mathbf{X}_{it}\boldsymbol{\beta}_2\delta_i + \tau_1 YSI_{it} + \tau_2 YSI_{it}^2 + \sum_{k=1}^{K}\mu_k C_{ik} + \sum_{t=2}^{T}\kappa_t D_t + \\ + \gamma y_{it-1} + \delta_i \gamma y_{it-1} + \alpha_i + u_{it} \end{aligned} \tag{6}$$

where $\boldsymbol{X}_i$ is a set of socio-economic individual characteristics (such as children living at home, education, age, and residence region), which concerns immigrants and natives. δ_i is a dummy variable which takes the value 1 if the individual is an immigrant and 0 if she is native-born. $\boldsymbol{\beta}_1$ is a set of associated parameters for natives (the reference group), whereas $\boldsymbol{\beta}_2$ captures potential deviations from $\boldsymbol{\beta}_1$ for immigrants. $C_1, \ldots, C_K$ are cohort-specific dummy variables; C_{ik} takes the value 1 if the individual belongs to cohort *k* and zero otherwise, and μ captures the cohort-specific effect. The length of residence time in Sweden is represented

[8] For an application of this model see e.g. Johansson & Palme (1993).

by YSI_{it} and YSI_{it}^2, and τ_1 and τ_2 capture their effects, where *YSI* is a short notation of years since immigration. D_t is a period (time) dummy variable that takes the value 1 if the variables are observed at (calendar) year t and zero otherwise, whereas κ captures the period (time) effect, and it is assumed to be the same for both natives and immigrants. This restriction on the period effect for immigrants is essential in order to be able to identify the effect of the residence time and the cohort-effect separately.[9]

As mentioned above, equation (6) is estimated for wives in immigrant families and wives in mixed families separately. In both cases, wives in native families are used as a reference group. The estimation results are then used to compute the transition probabilities for wives in the immigrant families and wives in the mixed families with identical socio-economic individual characteristics. In accordance with the family investment hypothesis, we would expect that immigrant wives in immigrant families, shortly after arrival, experience a fairly low transition probability from employment to non-employment (p^{10}), and that the transition probabilities increase with the length of residence in Sweden. In contrast, the family investment hypothesis has no such implications for the transition-time-profile of immigrant wives in mixed families.

4 DATA AND INDIVIDUAL CHARACTERISTICS

Data

The analysis is based on the LOUISE-database, which contains longitudinal information on individual characteristics, and covers the total population of age 16-64 living in Sweden during the period 31st December 1990 to 1996. Furthermore, for immigrants, the database provides information on the place (world region) of birth and the year of arrival in Sweden. Immigrants are defined as foreign-born people, whereas natives are defined as people who were born in

[9] The reason is that time of residence, period and cohort-specific factors are linearly dependent. See e.g. Borjas (1989) for more details on this issue.

Sweden.[10] Although the focus of the database is on the individual, it is possible to link together individuals who belong to the same family (household).[11] The dataset used in this study is composed of two main parts: a native one, which contains a 5% randomly selected sample taken from the total population of native-born women married to native-born men (belonging to same household);[12] and an immigrant one, which covers the total population of married immigrant women.

To be able to control for observable heterogeneity among different immigrant groups, it is convenient to compose "homogeneous" groups. We could, for example, allow individuals (immigrants) born in the same country to compose a "homogeneous" group. Unfortunately, LOUISE does not provide information on country of birth. On the other hand, information on the world region of birth is available. Hence, based on this information, three immigrant groups are identified; immigrants born in the Nordic countries (Nordic), members of the European Union (EU) and the rest of the world (Non-EU). It is important to note that immigrants born in the Nordic countries may be considered as a "homogenous" group. This may, to some extent, also be the case for immigrants born in the EU. However, immigrants born outside the EU can hardly be considered as a homogenous group. This should be kept in mind, since it may limit our conclusions regarding the last-mentioned group.

As mentioned above, an immigrant family consists of a couple (married or cohabitant husband-wife families), where both spouses are immigrants, and where both spouses arrived in Sweden during the same year any time between 1968-1990; a mixed family consists of an immigrant wife married to a native-born husband, where the wife has arrived in Sweden any time between 1968-1990[13]; and a native family consists of a native-born wife married to native-born husband,

[10] Note that the data contain some people reported as born in Sweden, but, at the same time, the data provide information on their year of arrival in Sweden. These categories of people can neither be identified as "immigrants" nor as "native Swedish". Therefore, they are excluded.

[11] Important to note, cohabiters without common children cannot be linked to each other and, hence, are not included in the analysis.

[12] The choice of the size of the sample is based on elementary random sampling, where I presuppose 95% confidence interval with 0,5% margin of error. That is, the sample, which includes 37 747 observations, represents the total population of native families (754 940) quite well.

[13] It is important to notice that, in the data, immigration year 1968 is observed even for those who immigrated earlier than 1968. Thus, in this study, immigration year 1968 also refers to immigration prior to 1968.

and it is used as the reference group. Note that a Nordic immigrant family is identified as such if both spouses were born in Nordic countries and similarly for families from other regions. Families are required to be stable, i.e. they should be married or cohabitating during 1990-1996. Further, due to the importance of residence time in the host country, immigrants with missing information on the year of arrival are excluded. The number of observations for each family type as well as group (by origin) is presented in Table 2.

Individual Characteristics

The following variables are used in the analysis:

Employment status (y): A dummy variable indicating the employment status of the individual, where 1 refers to employment and 0 otherwise. This variable is based on Statistics Sweden's November survey "*Årsyss*", which refers to the situation in November each year.

Children present-1: A dummy variable =1 if children younger than 18 years are living at home, and 0 otherwise.

Children present-2: A dummy variable =1 if children of age 18 or older are living at home and 0 otherwise.

Metropolitan region: A dummy variable =1 if the family resides in the metropolitan regions of Stockholm, Göteborg, or Malmö, and 0 otherwise.

Education: This variable measures the number of years of schooling during each year of the estimation period. To be able to compare foreign and Swedish educations, Statistics Sweden has developed a specific method, where immigrants are clustered into educational groups: primary school, pre-secondary school, secondary school ($\leq$ 2 years), secondary school (>2 years), university graduate (< 3 years), university graduate ($\geq$3 years), and post-graduate education (PhD-degree). The average time for each education level is estimated to be 7, 9, 10.3, 12, 13.5, 15.7, and 19 years, respectively.[14]

Age: This variable is calculated by subtracting the year of birth from the year of observation.

Period-specific variables (*D*): A set of dummy variables that is used to control for specific effects related to the period of time. For example, D_{90}=1 if the observation originates from t =1990 and 0 otherwise. These dummy variables

[14] As noted, the lowest level of education is estimated to be 7 years, since only a small number of people (immigrants as well as natives) are believed to have fewer years of schooling (see Ekberg, 1994).

are expected to capture the effects of economy-wide changes compared to the situation in 1993.

Time of residence (YSI): A variable measuring the number of years that each immigrant has resided in Sweden. The calculation for e.g. the observation year 1990 is accomplished as follows; YSI_{90} = 1990 - (the year of arrival).

Immigration cohorts (C_k): A set of dummy variables indicating the period during which the immigrant arrived in Sweden. For instance, ($C_{76\text{-}80}$) =1 if the immigrant arrived between 1976-1980 and 0 otherwise. With the exception of cohort 68-70, each such period covers five years. These variables are thought to capture cohort-specific characteristics, such as ability or motivation, for different immigrant cohorts.[15] In this study, these cohort characteristics are expected to influence the immigrant cohorts' initial employment probability. This implies that we allow for a separate intercept for each single immigrant cohort. The reference group is, as noted earlier, native families.

Descriptive Statistics

In Table 1, the rate of employment among married women in different family types and groups, respectively, are presented. Table 2 contains the mean values of individual characteristics.

Table 1. The rate of employment among married women, aged 16-64, belonging to different family types and groups.

		The year of observation						
	Family type	1990	1991	1992	1993	1994	1995	1996
Native	Native family	0,92 (0,28)	0,91 (0,29)	0,89 (0,32)	0,87 (0,34)	0,85 (0,35)	0,85 (0,35)	0,84 (0,36)
Nordic	Immigrant family	0,82 (0,38)	0,78 (0,41)	0,75 (0,43)	0,71 (0,45)	0,68 (0,46)	0,67 (0,47)	0,66 (0,47)
	Mixed family	0,87 (0,33)	0,86 (0,35)	0,83 (0,37)	0,82 (0,39)	0,80 (0,40)	0,80 (0,39)	0,81 (0,39)
EU	Immigrant family	0,61 (0,48)	0,58 (0,49)	0,51 (0,50)	0,48 (0,50)	0,44 (0,49)	0,43 (0,49)	0,40 (0,49)
	Mixed family	0,80 (0,40)	0,78 (0,41)	0,75 (0,43)	0,73 (0,44)	0,70 (0,45)	0,71 (0,45)	0,72 (0,45)
Non-EU	Immigrant family	0,54 (0,50)	0,51 (0,50)	0,49 (0,50)	0,46 (0,50)	0,45 (0,50)	0,45 (0,50)	0,45 (0,50)
	Mixed family	0,76 (0,42)	0,74 (0,44)	0,71 (0,45)	0,67 (0,47)	0,65 (0,47)	0,66 (0,47)	0,66 (0,42)

The values in brackets are standard deviations.

[15] According to Borjas (1985, 1987), the state of the economic situation and the distribution of income in the host country and the country of origin, respectively, motivate people with different qualities (to use Borjas' terminology) to migrate. For a description of cohort differences among immigrants in Sweden, see e.g. Rashid (2004).

It can be seen that the average length of residence time for wives in the immigrant and mixed families, respectively, differs by region of birth. For those who were born in non-EU countries, we can see that the wives in the immigrant families have lived in Sweden a shorter time than their counterparts in the mixed families. In contrast, for those who were born in the EU, the wives in the immigrant families have a longer time of residence than their counterparts in the mixed families. However, regardless of family type, immigrant wives born in the Nordic countries have lived in Sweden approximately the same length of time. The table also shows the share of immigrants in each immigrant cohort. For instance, among wives born in non-EU countries, more than 50% of those in immigrant families arrived in Sweden some time between 1986-1990, while the corresponding number for their Nordic counterpart is about 10%.

Table 2. The mean of individual characteristics among married women, aged 16-64, belonging to different family types and groups.

	Native	**Nordic**		**EU**		**Non-EU**	
Variables	Native family	Immigrant family	Mixed family	Immigrant family	Mixed family	Immigrant family	Mixed Family
No child present	0,22 (0,3)	0,25 (0,47)	0,15 (0,17)	0,20 (0,30)	0,23 (0,20)	0,11 (0,14)	0,27 (0,20)
Child present-1	0,65 (0,52)	0,57 (0,35)	0,81 (0,71)	0,58 (0,33)	0,72 (0,69)	0,82 (0,70)	0,70 (0,71)
Child present-2	0,13 (0,16)	0,18 (0,18)	0,03 (0,11)	0,23 (0,37)	0,05 (0,10)	0,07 (0,15)	0,03 (0,09)
Metropolitan region, in %	0,32 (0,31)	0,35 (0,38)	0,43 (0,45)	0,65 (0,69)	0,56 (0,59)	0,52 (0,61)	0,54 (0,58)
Education (in years)	10,9 (11)	9,5 (9,7)	11,4 (11,6)	9,4 (9,5)	12 (12,2)	10,3 (10,5)	11,5 (11,7)
Age	41	42	37	42,8	37	36,8	36
YSI	-	14,8	14,7	12,7	11	6,5	9,6
C. 68-70	-	0,39	0,31	0,23	0,13	0,08	0,01
C. 71-75	-	0,21	0,26	0,27	0,21	0,06	0,15
C. 76-80	-	0,20	0,24	0,17	0,24	0,14	0,25
C. 81-85	-	0,07	0,11	0,13	0,22	0,17	0,21
C. 86-90	-	0,13	0,08	0,20	0,19	0,55	0,29
Obs. Number	37 747	6 521	10 122	716	2 315	12 306	9 266

Note: The values refer to the situation in 1990 and 1996 (in brackets), respectively.

5 ESTIMATION RESULTS

The estimation results are presented in Table 3. The results for the Nordic and EU-immigrants indicate that the effect of the *true* state dependence, i.e. the employment state in the previous period on the employment state in the present period, is greater for wives in immigrant families than for their native counterparts (the reference group), whereas the effect is less for wives in mixed families. Regardless of family type, the corresponding effect for wives born in non-EU countries is less than for their native counterparts. Moreover, the results show that the state dependence is significantly greater for wives in immigrant families than for wives in mixed families belonging to the same group.[16]

The results also indicate that the employment probability increases with age at a decreasing rate. However, the effect of age on the employment probability seems to be weaker for immigrant wives than for their native counterparts in the reference group. Note that wives in immigrant families born in the EU are an exception, since the parameter that captures differences in the effect of age between native wives and wives in this group is insignificant. Further, the results indicate that the employment probability increases with the length of residence in the host country and this counts generally for all groups, with the exception of wives in immigrant families born in the EU where the effect is not significant. These results are generally similar to the results in Nekby (2003).[17]

For wives in immigrant families born in non-EU countries, the results show that the cohort-specific effects are significantly positive, indicating that different cohorts at the time of arrival have higher probabilities to be employed than comparable natives, ceteris paribus. For wives in immigrant families born in the Nordic countries and the EU, however, the effects are insignificant. Ceteris paribus, it appears as if different immigrant cohorts born in the Nordic countries and the EU have employment probabilities similar to those of comparable wives in native families. Wives in mixed families, regardless of family type or region of

[16] An F-test has been used.
[17] Note that the results in Nekby (2003) are not completely comparable to my research, since she considers immigrant women in general.

Table 3: Estimation results for married women, aged 16-64, belonging to different family types and groups. The dependent variable is the employment status.

		Deviation for Nordic		**Deviation for EU**		**Deviation for Non-EU**	
Variables	Native family	Immigrant Family	Mixed family	Immigrant family	Mixed family	Immigrant Family	Mixed Family
Constant	-10,45*	-	-	-	-	-	-
	(0,034)						
Employment-status: $y_{(t-1)}$	3,77*	0,5*	-0,49*	0,7*	-0,58*	-0,67*	-0,81*
	(0,034)	(0,050)	(0,043)	(0,14)	(0,067)	(0,03)	(0,032)
Child present-1	-0,16*	0,15*	0,18*	-0,05	-0,09	-0,03	0,03
	(0,034)	(0,067)	(0,068)	(0,21)	(0,10)	(0,06)	(0,045)
Child present-2	0,08*	0,07	0,21*	-0,4*	0,04	-0,02	-0,07
	(0,033)	(0,067)	(0,088)	(0,19)	(0,15)	(0,063)	(0,069)
Metropolitan area	0,06*	0,3*	0,26*	-0,25**	0,15*	-0,09*	0,06**
	(0,023)	(0,051)	(0,046)	(0,14)	(0,072)	(0,036)	(0,032)
Education	0,18*	-0,01	-0,002	0,06*	-0,05*	-0,001	-0,09*
	(0,005)	(0,011)	(0,003)	(0,026)	(0,014)	(0,007)	(0,006)
Age	0,39*	-0,05**	-0,13*	-0,14	-0,15*	-0,14*	-0,16*
	(0,011)	(0,029)	(0,023)	(0,089)	(0,04)	(0,018)	(0,017)
$Age^2/100$	-0,4*	0,02	0,13*	0,1	0,16*	0,14*	0,17*
	(0,01)	(0,032)	(0,029)	(0,1)	(0,05)	(0,022)	(0,02)
YSI	-	0,003	0,072*	0,005	0,09*	0,11*	0,06*
		(0,027)	(0,023)	(0,071)	(0,03)	(0,011)	(0,014)
$YSI^2/100$	-	0,15*	-0,06	0,04	-0,2**	-0,31*	-0,01**
		(0,070)	(0,062)	(0,21)	(0,11)	(0,046)	(0,05)
C. 68-70	-	-0,02	1,56*	1,17	2,92*	1,6*	3,95*
		(0,70)	(0,51)	(2,06)	(0,84)	(0,4)	0,36)
C. 71-75	-	0,15	1,63*	1,62	2,7*	1,61*	3,94*
		(0,70)	(0,51)	(2,03)	(0,82)	(0,4)	(0,35)
C. 76-80	-	0,41	1,75*	1,84	2,76*	1,8*	3,9*
		(0,67)	(0,51)	(2,0)	(0,82)	(0,37)	(0,34)
C. 81-85	-	0,34	1,81*	1,81	2,56*	1,86*	3,86*
		(0,67)	(0,48)	(1,9)	(0,79)	(0,37)	(0,3372)
C. 86-90	-	0,34	1,83*	1,76	2,63*	1,43*	3,71*
		(0,65)	(0,47)	(1,9)	(0,78)	(0,36)	(0,33)
D-91	0,36*	-	-	-	-	-	-
	(0,032)						
D-92	0,14*	-	-	-	-	-	-
	(0,031)						
D-94	0,01	-	-	-	-	-	-
	(0,031)						
D-95	0,16*	-	-	-	-	-	-
	(0,031)						
D-96	0,04	-	-	-	-	-	
	(0,031)						
θ^1	-	0,37*	0,52*	0,44*	0,47*	0,47*	0,33
		(0,025)	(0,017)	(0,024)	(0,021)	(0,015)	(0,0)
σ_u	-	0,77*	1,04*	0,88*	0,94*	0,94*	0,1
		(0,041)	(0,035)	(0,043)	(0,04)	(0,029)	(0,0)
Log Likelihood	-	-60745,7	-66907,45	-50993,41	-54736,62	-80563,68	-72118,69
N. Obs.		44 268	47 867	38 462	40 061	50 050	47 008

1) $\theta = \sigma_\alpha^2 \big/ \sigma_\alpha^2 + 1$ (For a description, see STATA 6 Reference manual, volume 4, pp. 375-382).

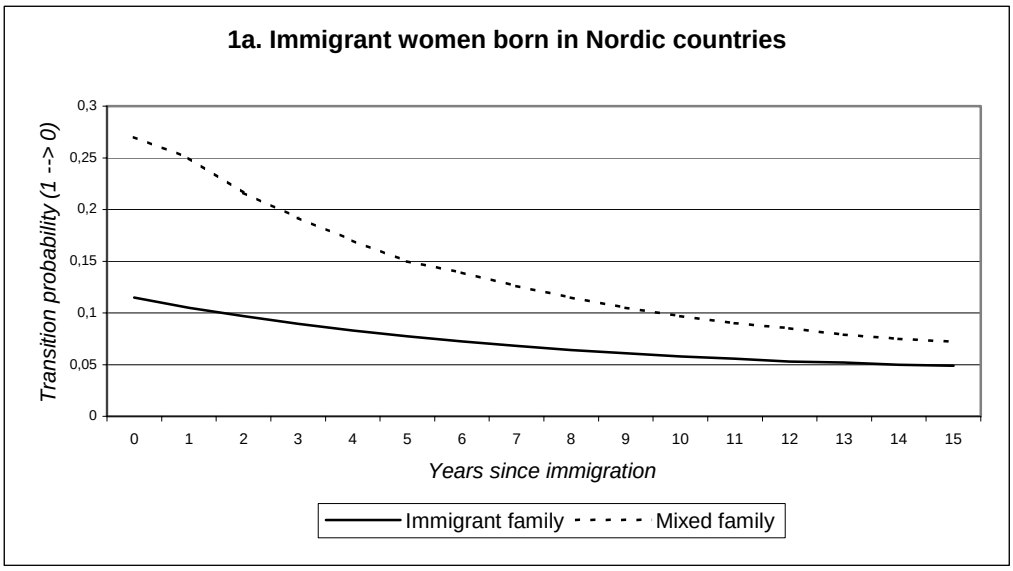
Note: * significant at 5 percent and ** significant at 10 percent. (s.e. within parentheses). The reference group is native-born Swedish women married to native-born Swedish men.

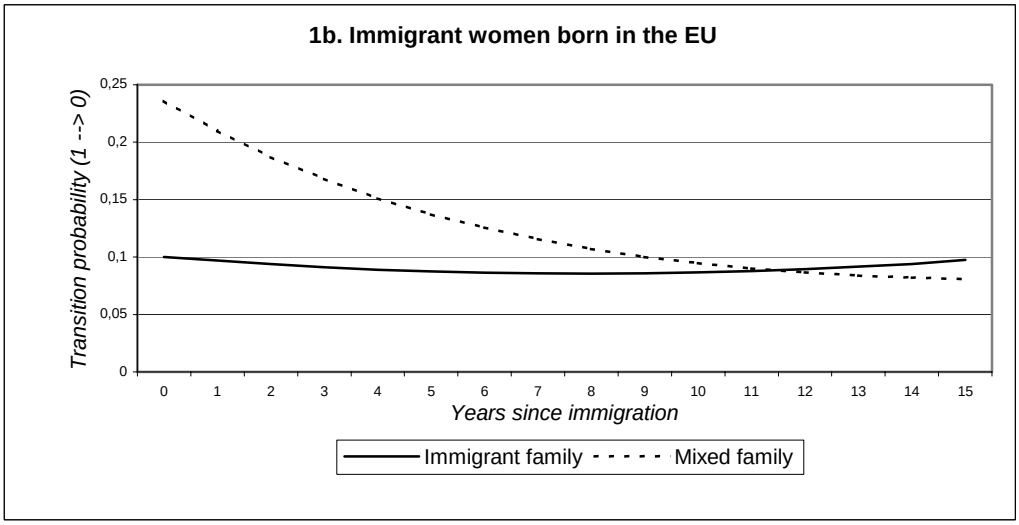
birth, show positive cohort effects, indicating that the employment probability is higher than among natives.

The results in Table 3 are used to estimate the transition probability from employment to non-employment, p^{10}, in accordance with equation (5). I analyze the situation during a 15 year period after arrival in Sweden, as a longer length of time does not seem relevant for the purposes of the present study. The estimation is based on several assumptions. The individuals in question are assumed to have no children living at home. This appears to be reasonable, as the aim is to study whether the non-employment decision depends on the family investment strategy, and not on child-care requirements. It is also assumed that the individuals reside in the metropolitan regions of Stockholm, Göteborg, or Malmö. Furthermore, I choose cohort 86-90 because the main focus is on newly arrived immigrants, and the reference year 1993 is used for the estimations. For the remaining variables, such as education and age, the mean population values for wives in immigrant families are used (see Table 2). The same mean values are also used for wives within same group, but in mixed families. The purpose of this is to make the wives in different family types comparable. The point estimates of these wives' transition probabilities, i.e. transition-time-profiles for different immigrant groups, are illustrated in figures 1a, 1b and 1c, respectively.

Starting with wives in immigrant families born in the Nordic countries, Figure 1a shows that the point estimate of the transition-time-profile tends to decline weakly the longer the time of residence, i.e. the transition probability, p^{10}, is higher shortly after arrival than later (about 12% in the first year and 5% after 15 years). For wives in mixed families also born in the Nordic countries, the transition-time-profile also declines, but to a greater extent than for comparable wives in immigrant families (about 27% in year one and 7% after 15 years).

Figure 1b shows the transition-time-profile for wives born in the EU. The profile for wives in immigrant families is, more or less, the same (about 10%) during the entire period. On the other hand, wives in mixed families show a falling transition-time-profile (about 23% in year one and 7% after 15 years). It is interesting to note that after ten years of residence, the transition-time-profile for





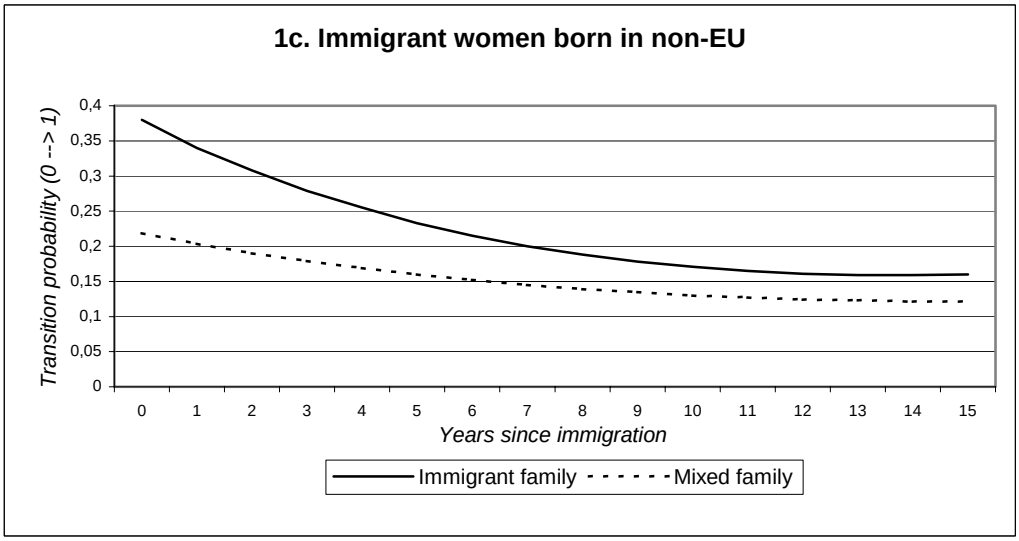


Figure 1; Illustration of predicted transition probability $(1 \rightarrow 0)$ among married women, aged 16-64, belonging to different family types and groups.

wives in mixed families tends to converge towards those of wives in immigrant families.

Finally, for wives in immigrant families born in non-EU countries, the transition-time-profile, displayed in Figure 1c, tends to fall over time, i.e. the transition probability is higher (about 37%) shortly after arrival than after 15 years (about 16%). Wives in mixed families also have a downward falling transition-time-profile, but to a lesser extent than their counterparts in immigrant families (about 22% in the first year and 13% after 15 years). In the case of non-EU families, therefore, it is the wives in the immigrant families that seem to have a higher transition probability than otherwise similar wives in the mixed families. The difference is relatively large at the beginning of the period, but it tends to decline over time. In other words, there is a tendency towards convergence also in this case.

The family investment hypothesis could be understood such that the wives in newly arrived immigrant families, shortly after arrival, experience a relatively low transition probability from employment to non-employment, but that over time, this transition probability is expected to increase. According to the same argument, we could expect that comparable wives in mixed families, where FIH should not be needed, would not behave in a similar way.

The results indicate that the transition probability for wives in immigrant families born in Nordic and non-EU countries tends to decline over time, whereas wives born in the EU show an almost unchanged transition probability over time. For wives in mixed families, the results indicate that their transition probability also declines over time, but not to same extent as wives in immigrant families. We can conclude that the results do not give any support in favor of the family investment hypothesis. Immigrant wives in immigrant families do not seem to show a transition-time-profile that is in line with the implications of the hypothesis. In addition, immigrant wives in mixed families show similar transition-time-profiles.

6 SUMMARY AND CONCLUSIONS

This study examines whether the labor market behavior of married immigrant women in Sweden is consistent with the family investment hypothesis. The hypothesis is that difficulties involved in transferring skills from one country to another, coupled with constrains in the credit market mean that the wife in newly arrived immigrant families will choose to work in order to finance the family's current expenses, while the husband invests in host country-specific human capital. Accordingly, we could expect that immigrant women, married to immigrant men, shortly after arrival experience a relatively low transition probability from employment to non-employment, but that as the length of residence grows, this transition probability is likely to increase.

The subject of analysis in this study is immigrant women married to immigrant men (immigrant families). As a comparison group, I use immigrant women married to native-born Swedes (mixed families). In accordance with the hypothesis, the comparison group is not expected to employ the strategy discussed above and, therefore, should not behave in a way similar to the subject group.

The empirical results indicate that the labor market behavior of married women in immigrant families in Sweden is *not* consistent with the implications of the family investment hypothesis. The relationship between the transition probability from employment to non-employment and the length of residence in Sweden, i.e. the transition-time-profile, does not seem to correspond to the profile that the hypothesis predicts. Married immigrant women in mixed families, where the strategy should not be needed show similar profiles.

One possible explanation is that investments in host country-specific human capital may not be of particular importance among certain immigrant groups. It is known that Nordic countries share a similar language and to some extent a similar culture. In addition, Nordic citizens are allowed to travel freely between the Nordic countries. This means that potential immigrants from the Nordic countries have the opportunity to visit Sweden and find the ”right” job before they decide to

move to Sweden.[18] As a result, newly arrived Nordic immigrants may not necessarily need to invest in Swedish-specific human capital. Edin *et al*. (2000) show that the earnings of immigrants born in Nordic countries are, at least during the first ten years after arrival, almost unaffected by the time of residence in Sweden. This could indicate that Nordic immigrants do not need to invest in Swedish-specific human capital, which could give some support to the explanation above. A similar explanation may count for immigrants born in the EU, since they are also free to travel to Sweden and find the "right" job before migrating to Sweden.

Based on information from Statistics Sweden, it is clear that refugee-immigrants dominate the population born outside Europe, i.e. non-EU countries in our case. In Sweden, refugees are granted economic support in terms of transfer payments (the "introduction" allowance) during an introductory period of about three years after arrival. It is plausible that the introduction period gives refugees the opportunity to obtain Swedish-specific human capital, such as the Swedish language. Hammarstedt (2001) confirms this conclusion, since his results indicate that immigrants born outside Europe with a short residence time in Sweden are a dominant category of people among the receivers of transfer payments. Moreover, refugees with permanent residence permits have the same entitlement to study loans and allowances for formal educations as native-born Swedes. In general, the construction of the transfer system in Sweden may explain why immigrant families born in non-EU countries do not seem to need to employ the strategy implied by the family investment hypothesis.

[18] The cultural similarity of the Nordic countries and the positive effect this may exert on Nordic immigrants' labour market situation, in terms of earning and employment, has been documented in e.g. Wadensjö (1992) and Scott (1999).

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