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## Return Migration and the "Healthy Immigrant Effect"

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**Return Migration and the “healthy immigrant effect”**

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# Return Migration and the “healthy immigrant effect”

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## Abstract

According to the “healthy immigrant effect” (HIE), immigrants upon arrival are healthier than locally born residents. However, this health advantage is supposed to diminish or even disappear over a relatively short period and the immigrants’ health status is converging to that of the natives. The causes for this gradient of immigrants’ health are subject to an ongoing discussion and the underlying trajectories are not yet fully understood.

This paper investigates whether return migration can serve as an additional explanation for the declining health of immigrants, and thus aims at shedding some light on the trajectories underlying the HIE.

The data used are drawn from 13 waves of the German Socio-Economic Panel. Using a random-effects probit model, this analysis explores the factors influencing re-migration by means of a sample of 4,426 migrants.

In line with the existing literature, the study shows that e.g. having spouse and children in the home country, or being non-working or jobless yield a higher return probability, whereas all factors associated with attachment to Germany (e.g. language fluency, German citizenship, house ownership) reduce the probability of re-migration.

Additionally, the results indicate that men reporting poorer health (‘good’, ‘satisfactory’, ‘poor’ or ‘bad’) are significantly less likely to return home relative to male immigrants who describe their health as ‘very good’. However, for women, the effects are adverse to that of men, and none of the health coefficients for women is significant.

Hence – at least for men – re-migration can be seen as an additional explanation for the HIE.

Keywords: Return migration, healthy immigrant effect, SOEP

JEL Classification: C 25, F 22, I 19

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# I. Introduction

One of the most striking hypotheses concerning immigrants and their health status is the so-called “*healthy immigrant effect*” (HIE). This theory consists of two parts. According to the first part immigrants upon arrival are healthier than locally born residents. This is mostly explained by the idea that immigrants are positively selected among their origin population such that – *ceteribus paribus* – healthier persons are more likely to migrate. However, according to the second part, this health advantage diminishes or even disappears over a relatively short period of time, which means that the immigrants’ health status is converging to that of the native population or is getting even worse (for Canada see, for example, Newbold and Danforth 2003, Deri 2004, McDonald and Kennedy 2004; for Australia, Biddle et al. 2007, for the US see Antecol and Bedard 2005 or Jasso et al. 2004, and for Germany see, among others, Lechner and Mielck 1998 and Ronellenfitsch and Razum 2004)<sup>2</sup>. Although there is a growing amount of literature which seeks to explain this gradient of immigrants’ health, the underlying trajectories are not yet fully understood. The explanations for the second part of the HIE include acculturation, relationship between low socio-economic status and health, additional stress, and access to health care, and they are rather controversially discussed (see section 2 for a detailed discussion).

In this paper *return migration* as an additional explanation for the decline in health is proposed. The idea behind this possible explanation is that the decline in health can additionally be caused by a kind of “*statistical artefact*” in the way that *healthier immigrants are re-migrating*, because then the average health of the remaining immigrants will fall. Measures of the HIE (in cross section analysis) may therefore be biased if a significant fraction of immigrants emigrate back to their home country (or to a third country) and if these immigrants are non-randomly selected by health.

In studies examining immigrants’ health this idea is quite often pronounced (see for example Chiswick et al. 2006: 11, Deri 2004), but – to the best of my knowledge – it has not yet been empirically analysed.

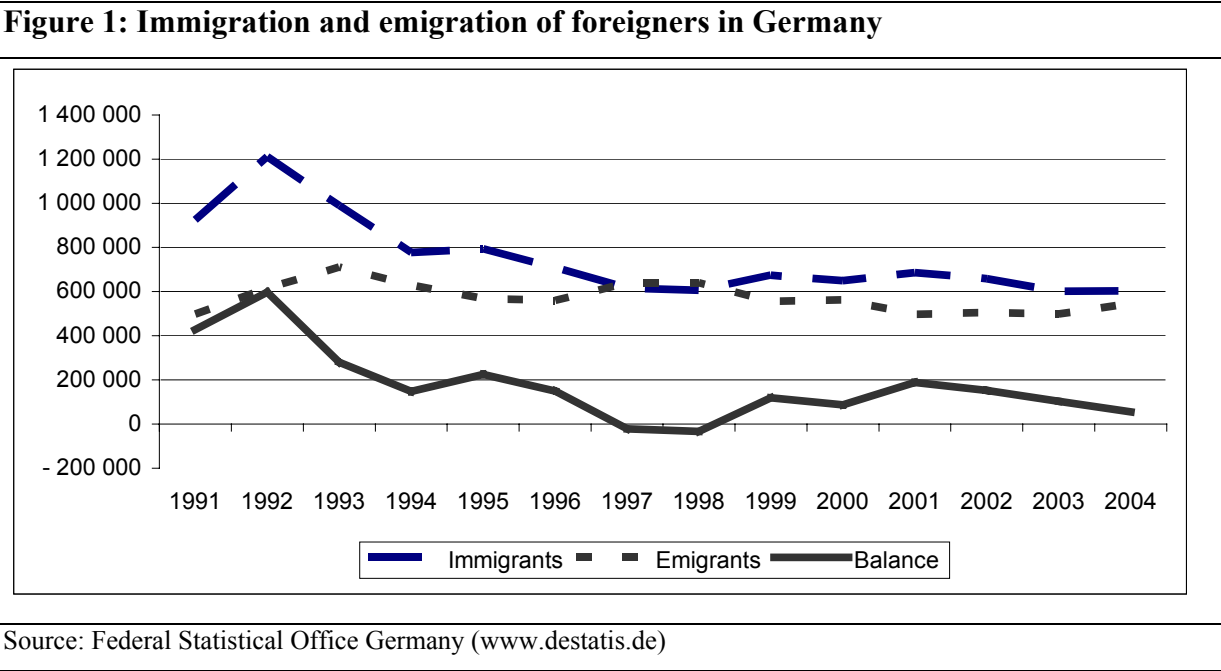
Also in the empirical literature on return migration ‘health and health care’ are rather neglected, and surprisingly little is known about the role of health regarding return behaviour.

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<sup>2</sup> In some studies the HIE is only referred to what is here called part one. According to this definition, the decline in immigrants’ health status is a reduction of the HIE (see for example Lechner and Mielck 1998).

There is only one qualitative study of Turkish emigrants in which health as a determinant of return migration is discussed (see Razum et al. 2005).<sup>3</sup>

Return migration is a quite considerable phenomenon in Germany (see figure 1). Apart from the meaning of return migration as a possible additional explanation of the HIE, a better understanding of return migration is in general important for at least three reasons. First, a deeper understanding of return migration can help assessing the relative success and assimilation of immigrants in the host country. Second, a more accurate research on re-migration can help to improve the forecasting of trends in immigration. Finally, it can be possible to improve calculations of the financial impact of immigration (see Massey and Constant 2001: 3); in the case of health analysing return migration can especially promote the understanding if immigrants pose any social burden on the health care system.



So the overall aim of the paper is to give first insights whether health plays a role in re-migration behaviour and to investigate whether re-migration can serve as an additional explanation for the HIE.

As evidence for the HIE already exists for Germany (see Lechner and Mielck 1998, Ronellenfisch and Razum 2004), an analysis of the HIE is not provided in this paper.

<sup>3</sup> Razum et al. (2005) interviewed 44 Turkish men, who had lived in Germany. The reasons for their return migration have been very varying and include, among others, better climate in the home country, lifestyle (lower stress in the home country; moral), family and friends, and bad working conditions status (see Razum et al. 2005).

The outline of the paper is as follows. The next section explains the “healthy immigrant effect”. Section 3 gives an overview on the existing literature of return migration and provides first theoretical considerations regarding the possible role of health in return migration. The description of the data and the specification of the econometric model can be found in section 4. Section 5 presents the results and section 6 concludes.

## **II. What is the “healthy immigrant effect”?**

The explanation for the first part of the HIE – the immigrants’ better state of health upon arrival in relation to the natives’ state of health – is quite consistently explained in the existing literature by the idea that immigrants are *positively selected* among their origin population. The underlying explanation is that healthier persons are physically or financially more able to migrate (see for example McDonald and Kennedy 2004: 1614). Additionally – according to the neoclassical economic theory where migration is seen as an investment in human capital – the young, the healthy, and the more educated are in general more able to reap the rewards of their investment, and are thus more likely to migrate (see Jasso et al. 2004 for a detailed description by means of a simple model).

The second part of the HIE – the worsening of immigrants’ state of health after a relatively short period of time – is quite controversially discussed in the existing literature. The next paragraphs roughly summarize the existing literature aiming at explaining the worsening of immigrants’ health.

First, the immigrants’ health decline is said to be caused by an “*acculturation process*”. That means immigrants are supposed to change their former healthy behaviours and take up unhealthy lifestyles such as smoking, alcohol consumption, poor dietary habits and low exercise upon settlement in the host country (see for example Deri 2004: 6; McDonald and Kennedy 2004: 1614; Newbold 2005: 1360). However, it takes usually a longer time to observe such health effects caused by behavioural aspects like smoking (see for example Deri 2004: 4). Additionally, it should be taken into account that acculturation means not only the adaptation of an unhealthy lifestyle, but also factors such as community participation, social contacts, income adequacy, housing etc., which may be associated with improved health (see Newbold 2005: 1360).

Closely related to the acculturation process is the possibility that immigrants' attitudes towards the constitution of "good" or rather "poor" health can evolve with the years in the host country (see McDonald and Kennedy 2004: 1624).

A second often discussed explanation is the close relationship between socio-economic disadvantage and a bad health status.<sup>4</sup> The decline in immigrants' health could be explained by low socio-economic status, often also associated with poor working conditions (see, e.g., Chen et al. 1996; Razum and Rohrmann 2002; Newbold 2005: 1360). Working against this argument is the fact that in many countries in which the HIE can be observed, income and employment of the immigrants rise with time in residence (see, among others, Borjas 1985, 1995, Hu 2000; Duleep and Regets 2002), which should lead to a better health status over time (see, e.g., Ronellenfitsch and Razum 2004; Antecol and Bedard 2005: 2).

Third, stress is an often mentioned factor which could attribute to a declining health status (see for example Deri 2004: 6). In comparison with natives immigrants could face *additional stress* due to factors associated with the transition into a new country such as language barriers, cultural differences, or a loss of social networks.

Finally, a very controversial discussed explanation is related to the *access to health care services*. In literature exists no unanimity if immigrants' access to health care services improves with increasing residence in the host country or if immigrants face additional access barriers (due to a general lack of information and experience with the host country's medical care system, language or cultural barriers) which persist more or less over time.

Assuming that access to health care (or rather the use of health services) improves over time, the *reported* health status could be influenced in both directions. On the one hand it can lead to a worsening of the reported health, because pre-existing conditions are now diagnosed and yield an increased reporting of conditions (see McDonald and Kennedy 2004; Jasso et al. 2004; Newbold 2005: 1360). On the other hand it may reduce immigrant/native gaps in preventive health care screening, diagnosis and treatment of health care problems, and thus improve reported health (see Leclere et al. 1994; Laroche 2000; McDonald and Kennedy 2004). This latter aspect would work against the observed decline in health.

Assuming poor access and "under-use" of health services, the *reported* health status could be influenced in both directions again. Whereas relative under-use of preventative health screening and under-diagnosis and treatment of health problems may lead to a worsening of the health status, one could also argue in the same line as above that pre-existing conditions remain undiagnosed and are therefore not reported.

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<sup>4</sup> Numerous studies show that a lower socio-economic status is highly associated with higher morbidity and mortality. For an overview see for example Lampert and Kroll 2005 or Mackenbach 2005.



Given that health and disease result from very complex interactions between genetic predisposition, environment, lifestyle, living circumstances and personal history, one can assume that none of these arguments is able to explain the deterioration in immigrants' health over time on its own, rather there has to be an interaction of many processes.

This paper analyses if return migration might serve as a possible additional explanation of the immigrants' state of health over time.

### **III. Return Migration: Theoretical considerations and previous empirical findings**

As mentioned above, health is rather disregarded in the empirical literature on return migration. Yet, a first idea about the role of health in explaining return migration can be developed by looking at the theories of (return) migration.

Broadly spoken, the essence of the literature on migration<sup>5</sup> can be concluded as follows: *rational agents decide to migrate if the total expected utility from migration is higher than the total expected costs given information available.*

Emigration theories are basically in accordance with the theories of migration with three important distinctions: First, re-migrants have more accurate information on the host and the home country (given that migration has not taken place in early childhood). Second, individuals who have once taken the decision to migrate are more likely to move again. Finally, family and non-economic reasons play a more important role in return migration (see Constant and Massey 2002: 10+11).

Assuming that health plays the same role for return migration as it does for migration<sup>6</sup>, one would expect that a good health status increases the probability of return migration. Regarding health care services, this supposition can be supported because if it is that the health care system in Germany is "better" than in the home country, returning home will increase the costs concerning the health care system. Especially individuals with a worse health status can benefit from the availability and almost free medical treatment, and therefore individuals with a worse health status will be more likely to stay.

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<sup>5</sup> For a detailed overview on migration theories see for example Haug 2000. A summary on return migration theories can be found in Brecht (1994: 66-78).

<sup>6</sup> According to the neoclassical theory the young and the healthy are more likely to migrate. This is also the explanation for the first part of the HIE.

However, the assumption that healthier persons return home, seems to contradict with mortality studies which find a significant lower mortality of immigrants in comparison to natives. Razum et al. (1998), for instance, found that the age-adjusted mortality rate of Turkish residents is half that of the Germans, and also less than half that of the population in Ankara. As a possible explanation they propose an “unhealthy-remigration effect” in which *“socially successful migrants with a lower mortality risk stay in the host country while less successful ones return home even before becoming manifestly ill”* (Razum et al. 1998: 297; underline added). Given an available and almost free medical treatment of conditions like cardiovascular disease in Germany, Razum et al. (1998) neglect the plausibility of re-migration of severely ill migrants.

So far, the theoretical considerations are more in favour of a returning of healthier immigrants. However, return migration is a quite complex process, and a wide array of factors has to be taken into account. For instance, in the qualitative study of Razum et al. (2005) many of the interviewed Turks judged the German climate as harmful to health. If it is that individuals hold the climate responsible for their rather worse well-being, this could maybe more support a returning of individuals in a worse health status.

Therefore, a clear prediction of the role of health in return migration is a priori not possible.

The following literature review gives a general overview on previous studies on return migration. The motivation for the covariates used in this paper is largely drawn from these previous studies.

Neoclassical static choice models explain migration behaviour by wage differentials between the home and the host country. According to these models, migration (respectively re-migration) takes place if earnings are expected to be higher in the host (home) country (see Sjaastad 1962; Harris and Todaro 1970). However, empirical evidence shows that return migration occurs despite higher expected earnings in the host country (see for example Carrington et al. 1996). Therefore, return migration theories expanded to a more general “expected utility” approach. For example Djajic and Milbourne (1988) present an intertemporal decision model of in which re-migration can occur despite higher earnings in the host country if the marginal utility of consumption is sufficiently higher in the home country than in the host country. This approach has been extended in several ways.

Dustmann (1995, 1997) shows that a high purchasing power of the host country’s currency in the migrants’ home country as well as higher returns to human capital – accumulated in the

host country – play a significant role in the decision to emigrate. Dustmann (2003a) models a life-cycle framework and finds that an increase in the host country wage increases the marginal value of staying, but, at the same time, decreases the marginal utility of wealth. He concludes therefore that higher wages in the host country may positively or negatively affect the optimal migration duration.

With regard to the skill level of emigrants, literature does not provide clear results.<sup>7</sup> Borjas and Bratsberg (1994) try to explain these conflicting results, and conclude that the selection process of return migration depends on the type of selection migration has produced. “If the immigrant flow is positively selected, so that immigrants have above-average skills, the return migrants will be the least skilled immigrants. In contrast, if the immigrant flow is negatively selected, the return migrants will be the most skilled migrants” (Borjas and Bratsberg 1994: 25).

In addition, Pohl (2005) analyses the return behaviour of immigrants using waves 1984-2003 of the German Socio-Economic Panel (SOEP) and finds that the return probability of high-educated foreigners is significantly inferior in comparison to that of less educated foreigners. However, given that return migration takes place, high-skilled migrants show shorter stays than low-skilled migrants.

Another trend in literature highlights the role of non-pecuniary motives in return migration, e. g., family and friends or integration into the host country. Details of the influence of these non-pecuniary aspects are provided in the following review of studies for Germany.<sup>8</sup>

Using the first six waves of the SOEP, Schmidt (1994) estimates a set of probit models to examine the return behaviour of immigrants regarding their country of origin, their position in the life-cycle, and their family structure. He found that return probabilities differ with respect to nationality (Greek and Yugoslavs are more likely to stay), decrease with education and increase whenever close family members have remained in the home country. He also identified the growth of GDP (respectively a large population growth) in the home country as a positive (negative) determinant of return behaviour. With respect to age, he found a convex

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<sup>7</sup> For an overview on literature regarding the quality of emigrants see Massey and Constant 2001.

<sup>8</sup> Some studies dealing with return migration use self-reported expected duration of stay as a proxy for real remigration behaviour (see Steiner and Velling 1994 or Uebelmesser 2005), thus disregarding the fact that intention and behaviour can contradict. Additionally, as Steiner and Velling (1994: 109) note, observing the expected duration of stay – thus ignoring individuals who have in fact re-migrated – could lead to a self-selectivity bias. These studies are not presented here.

pattern. However, Schmidt (1994) restricted his study to male blue collar worker between 16 and 64 years.

Velling (1994) – also using the first six waves of the SOEP – analyses a multinomial logit model, differentiating between ‘no family reunification’, ‘family follows to Germany’, and ‘re-migration’. His results indicate that the older the head of the household and the higher the labour income the less probable is return migration. The chance of return migration increases with a bad subjective well-being in Germany as well as with remittances.

Based on the waves 1984-1990 of the SOEP, Brecht (1994) specifies a set of event history models with different covariates. She found that return probabilities decrease with duration of residence, age, location of the family in the host country, and integration, and that they increase with remittances.

Using the waves 1984-1997 of the SOEP, Massey and Constant (2001) show by means of a logit model that the probability to emigrate decreases with additional time in Germany, higher education, higher wages, and secured prestigious jobs. They found a higher probability of return migration for male guest workers.

Dustmann (2003b) develops a model in which parents have paternalistic preferences. Using data of 14 waves of the SOEP and including information on intended and realised return migration, he suggests that return plans of parents differ depending on the sex of their children. Whereas the home country is judged more beneficial for daughters because of a “better” cultural environment, the host country is preferred for boys due to better economic prospects. The differences between boys and girls are larger for families which are culturally more distinct.

To conclude these previous empirical findings, figure 2 gives an overview of the factors influencing return migration and the hypothesis in which direction these factors may influence return migration behaviour. Most of these factors are used as covariates in this paper and discussed in detail in chapter 5.

**Figure 2: Factors influencing return migration**

economic and socio-economic characteristics	attachment to Germany / country of origin
income ?	german nationality --
years of education ?	good german language skills --
age ?	house ownership --
occupational status	spouse / children Germany --
not-working ++	spouse / children home country ++
unemployed ++	
pensioner ++	age at immigration ++
sex: male ++	remittances ++
country of origin	health status??
Eastern Europe --	
Turkey --	

Note: --: decreasing probability to re-migrate, ++: increasing probability to re-migrate  
Source: Own compilation

## IV. Data and Econometric Methods

### *Data source*

The data used are drawn from the German Socio-Economic Panel.<sup>9</sup> The SOEP is a representative longitudinal survey of currently about 12,000 randomly selected private households. Since its start in 1984<sup>10</sup>, each household member above 16 years is asked questions on a yearly basis on a broad range of socio-economic indicators covering ‘population and demography’, ‘education, training and qualification’, ‘earnings and income’, ‘health’, ‘basic orientation’, as well as questions on ‘satisfaction with life and with certain aspects of life’. Additionally, the head of the household is asked to fill in a household related questionnaire covering household income, housing, and questions on children in the household up to 16. An additional immigrants’ questionnaire contains questions on pre-immigration experiences, measures of integration as well as information about remigration intentions.

One of the most important features of the SOEP is the over-sampling of immigrants, especially of two immigrants groups. Sample B, which was started in 1984 with

<sup>9</sup> For more detailed information see [www.diw.de/soep](http://www.diw.de/soep) and Haisken-DeNew and Frick 2005 and references therein. The SOEP data are available as a “scientific use” file (see Wagner et al. 1993).

<sup>10</sup> The SOEP started in 1984 with approximately 6,000 households (Sample A and B). In 1990 – after the German reunification – the SOEP was expanded to the territory of the former German Democratic Republic by about 2,200 households (Sample C) (see Haisken-DeNew and Frick 2005, SOEP Group 2001).

approximately 1,300 households, covers those households whose head is either from Italy, Greece, Spain, Former Yugoslavia, or Turkey, that means Sample B covers the so-called former “guest workers”. In 1994/95 Sample D was started, which consists of households in which at least one household member had moved from abroad to West Germany after 1984; therefore especially immigrants from Eastern Europe are included, and thus Sample D covers to a broad extent the so-called “Aussiedler”.<sup>11</sup>

Analysing return migration, information on panel attrition is needed. ‘Going abroad’ is one form of panel attrition, other forms include mortality, refused participation or unsuccessful tracking.<sup>12</sup> The SOEP is especially suitable for analyzing return migration probabilities because lots of effort is done to investigate the causes of panel attrition in a “whereabout-study”. That means one can distinguish between households moving in Germany and households going abroad. This is essential for analysing return migration behaviour. In this analysis “going abroad” is defined as return migration. Moving on to a third country is therefore not considered, because it is not possible to distinguish between ‘return migration’ and ‘migration to a third country’. This might be seen as a rather hard assumption. However, in terms of the possible bias of the HIE, it does not matter if the individual moves back home or if the individual moves to a third country.

### ***How to measure health?***

One important and essential question is how to measure the health status of the individuals. In the SOEP, the health status has been asked for in different ways (e.g. self-rated health, disability, chronic illness, and activity limitation); but unfortunately, not every question concerning health is included in all waves.

In this study, *self-rated health* (SRH) is chosen as it has been shown to be a valid and reliable measure of overall health, and it has been used in several studies examining the “healthy immigrant effect” (see for example Deri 2004). Additionally, empirical evidence shows that it is a valid predictor for mortality (see Idler and Benyamini 1997; Schwarze et al. 2000). However, there is also a “significant literature on the extent to which perceptions of what constitutes good or poor health vary by age, socio-economic status, and other characteristics” (McDonald and Kennedy 2004: 1616), and there is an ongoing discussion on the validity of self-rated health among different ethnic groups. Hence, it should be taken in mind that the whole analysis is based on the *perceived health status*.

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<sup>11</sup> The term “Aussiedler” is used for ethnic Germans, who moved back to Germany after the fall of the iron curtain. They usually lived in Eastern European countries before.

<sup>12</sup> Overall, the panel attrition rate is rather moderate (for more detailed information see Spieß and Kroh 2004).

Questions concerning SRH have been asked in 1992 and 1994-2005. Hence, the values for 1993 are implemented by using information of 1992, and return migration behaviour of waves 1993-2005 can be studied.

The unit of analysis is the individual. The panel design is unbalanced. Each year all individuals over the age of 16 are included. Individuals born in Germany are excluded, because – per definition – someone who has not migrated cannot re-migrate.<sup>13</sup>

The longitudinal sample consists of 4,426 individuals of whom are 2,255 men and 2,171 women. 822 individuals are in the panel for all the years. Overall, the sample is composed of 31,639 person-years. The next paragraphs describe the variables included in the analysis.

### ***Dependent variable***

The dependent variable is created as a dummy, which takes the value 1 if someone has gone abroad and the value zero otherwise. That means ‘staying in the panel’, ‘refused to answer’, ‘died’, and ‘lost to follow-up’ are coded as 0. This implicitly assumes that those individuals lost to follow-up are staying in Germany.<sup>14</sup>

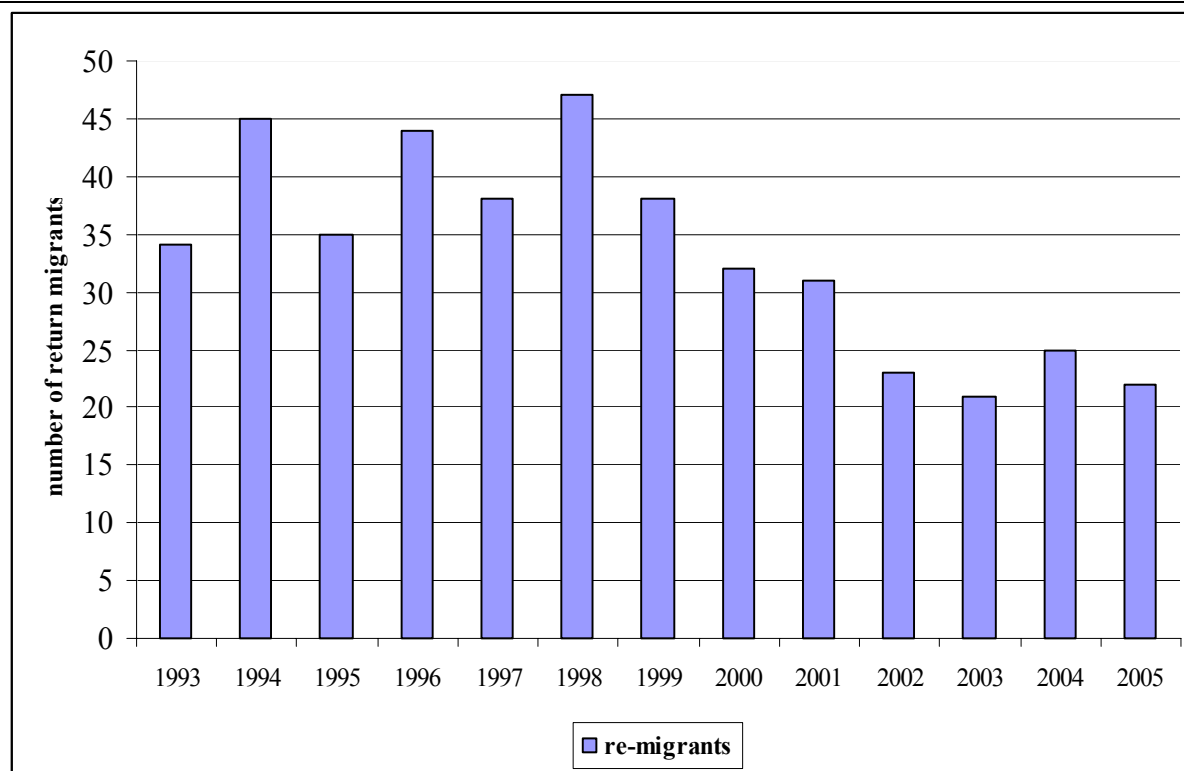
The sample consists of 435 emigrants. Figure 3 shows the distribution of return migrants according to the year; figure 4 according to the country of origin. Figure 4 displays that Greeks and Spaniards have the highest return rates, whereas only very few immigrants from Eastern Europe went back. This is not surprising because immigrants from Eastern Europe belong virtually all to the group of the “Aussiedler”; who are supposed to intend to stay in Germany.

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<sup>13</sup> That means individuals born in another country than Germany are included, independent of the sample membership.

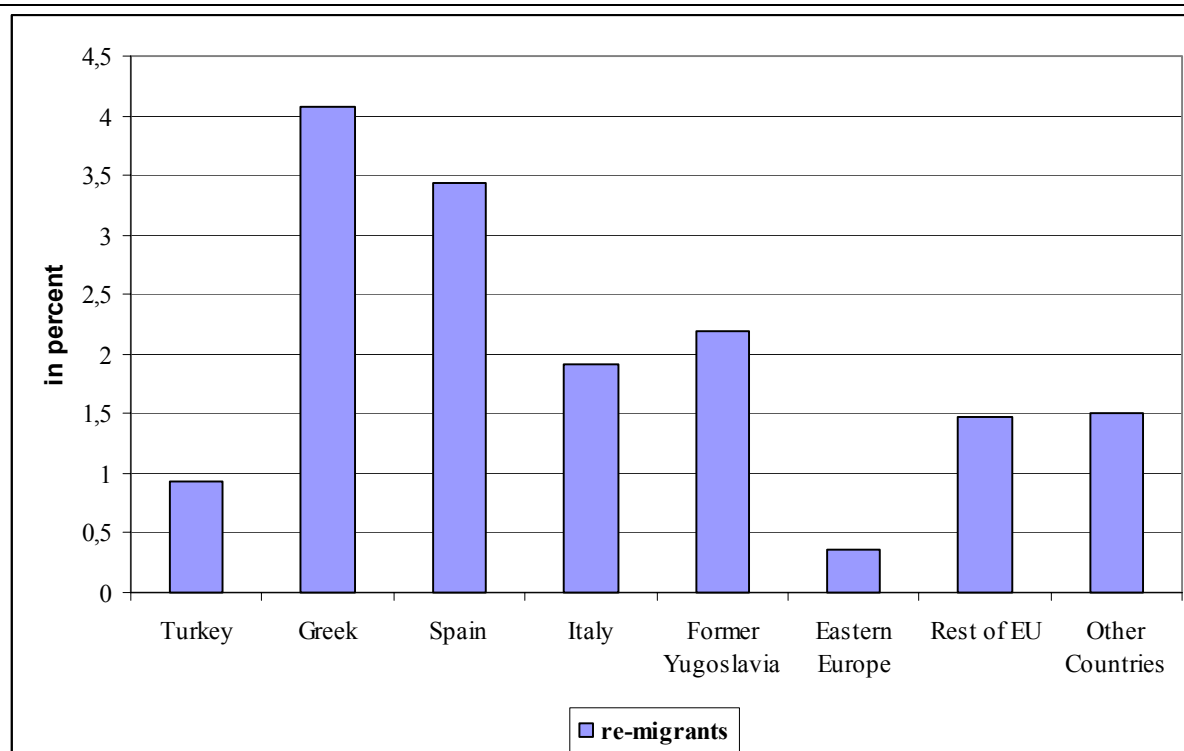
<sup>14</sup> The ‘lost to follow-up rates’ of sample A and sample B are similar. This supports this assumption.

**Figure 3: Number of return migrants in each wave**



Source: Own calculation, waves 1993-2005, unweighted.

**Figure 4: Return migration in percent according to country of origin**



Source: Own calculation, waves 1993-2005, unweighted.



In this study, return migration is modelled as an individual decision choice. However, it can be assumed that family / household interdependencies play an important role in the return decision. A first look on the data can help to gain a first impression of the importance of household relations in return migration: 119 return migrants are accompanied by another household member, 8 return migrants are accompanied by two other household members, and a few return migrants are accompanied by even more household members. That means that around 70% of all return migrants are accompanied by at least one family member when returning back (excluding children under the age of 16).<sup>15</sup> Hence, these family interdependencies should explicitly be taken into account.

### ***Independent variables***

The following explanatory variables, which have been discussed in the theoretical or empirical literature as potential determinants of return migration, are included in the regression<sup>16</sup>: a dummy variable for *sex* (taking the value one for males); three dummy variables for *age*, one taking the value one for the age category 26-50 years, one taking the value one for the age category 51-65 years, and one that takes the value one if the respondent is older than 66 (with age of 16-25 acting as reference group); dummy variables for the *country of origin* (with EU-countries – except Spain, Italy, and Greek – acting as reference group); a dummy variable for *German nationality*; two dummy variables for the *marital status* (i.e. one dummy indicating if the married spouse lives in Germany, the other one if the married spouse lives in the home country, with being separated, widowed, or single acting as reference group); two dummy variables for having *children* (one dummy for having children under the age of 18 in Germany, the other one for having children under the age of 18 living abroad); *years of education*; *occupational status* (i.e. dummy variables covering the following possibilities: ‘non-working’, ‘jobless’, ‘training’, ‘self-employed’, or ‘pensioner’ (with ‘working’ acting as reference group); a dummy for having his *own dwelling*; *equivalence income*, which is defined as household pre-government income divided by the square root of the number of household members; *transfers*<sup>17</sup>; *pension*<sup>18</sup>; a dummy variable indicating if

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<sup>15</sup> As individuals born in Germany are excluded, household interdependencies are underestimated if household members going abroad are born in Germany.

<sup>16</sup> Some of the potential determinants of return migration as ‘contact to Germans’ and ‘relatives and friends in Germany’ have to be expelled from the analysis because the questions concerning these issues have only been asked in some waves. Some factors, which are discussed in the literature as potential factors influencing return migration like ‘life satisfaction’ or ‘feeling German’, are excluded because of potential endogeneity.

<sup>17</sup> Transfers include all household public transfers of all individuals in the household 16 years and older, e.g., housing allowances, child benefits, government student assistance, subsistence assistance from the Social

*remittances* are sent to the home country; a dummy variable for *German language skills* (the dummy variable ‘speaking German fluently’ is constructed from a self-assessed question: “In your opinion, how well do you speak German?” The dummy variable takes the value 1 if the answer is very good or good, and zero otherwise); *age at immigration*.

The variable of special interest, *self-rated health*, is measured by a five-point scale question: “How would you evaluate your present health? Is it (1) very good, (2) good, (3) fair, (4) poor, or (5) very poor?” Five dummy variables are constructed with ‘very good self-rated health’ acting as reference group.

### ***Characteristics of the Sample Population***

To gain a first impression, table 1 presents selected characteristics of the sample population for 1992 and 2004 and table 2 presents characteristics of all return migrants in the sample. As Massey and Constant (2001: 4) note, most of the existing studies are gender blind and consider only male immigrants. Other studies include women, but do not distinguish in the empirical analysis between men and women. However, apart from the level of return migration, determinants of return behaviour and their effects can vary by gender. This can especially be the case if it is that the return decision is taken by the head of the household, which is in most of the cases the man. This motivates the separate analysis for men and women.

Therefore, the description as well as the estimation later on is outlined separately for men and women.

In the following overview on the sample characteristics it is not explicitly distinguish between men and women if there is no significant difference.

In 1992 there are slightly more men than women in the sample, in 2003 this ratio is reverse, which could be due to the fact that more men than women re-migrated (57% to 43%, respectively). Whereas the percentage of immigrants decreased for immigrants from all guest worker countries – with the highest decline for Turkish men (35% to 24%) –, it increased for all other immigrants – with the highest rise for immigrants from Eastern Europe (12% to 42% for men and 18% to 49% for women). This high increase can partly be explained by the enlargement of the SOEP in 1994/1995 by “subsample D”, which covers households in which at least one household member has moved to Germany after 1984. This sample includes

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Welfare Authority, maternity benefits, unemployment benefits, unemployment assistance and unemployment subsistence allowance.

<sup>18</sup> Having ones own dwelling, income, transfers, and pension are variables covering the household context. Therefore these variables can be seen as a first proxy for household interdependencies (see chapter V).

therefore basically the ethnic Germans. Another reason is that most of the return migrants come from guest worker countries: immigrants from former Yugoslavia have the highest emigration rate, followed by Turks and Greeks.

It is interesting to note that by 2004 nearly every second immigrant has German nationality, whereas in 1992 the fraction has been only around 11% for men and 15% for women. Return migrants have only to a very small percentage German nationality.

The majority of immigrants are married and live with their spouses in Germany. In 1992 it is only a very small percentage that has a spouse in the home country and in 2004 neither men nor women immigrants have still a spouse living in the home country. Similarly, the percentage of immigrants who have children living in the home country is low. This can be either due to family reunification, or due to the return migration of individuals whose family remained in the home country.

Regarding educational status the average lies around 9.8 years of education. There is a slight increase by about one year in 2004. There is no difference in educational status for emigrants: on average, emigrants have around 10 years of education.

Concerning occupational status, there is a great difference between men and women immigrants, reflecting more traditionally labour market roles whereby women do not participate in the labour market. In 1992, only 3% of men reported not to work, whereas 33% of women. This ratio does not change in 2004. Remarkable is further the ratio of pensioners which doubled from 1992 to 2004 for men and women. In the group of the return migrants, around 25% of men and 50% of women are either non-working or jobless, and around 25% are pensioners.

The percentage of home owners increased from 16% to 30%. The ratio of immigrants reporting to send remittances back home thereby dropped from around 28% to 12%. In 1992 a large fraction immigrants (44% for men and 32% for women) assess their German language skills as very good or good. This fraction is for both increasing to about 60%. All this figures show an increasing attachment to Germany over time.

Men and women are indistinguishable with regard to their age at immigration. Age at immigration does only slightly increase from 21.6 to 24 years for men (and from 21.9 to 24.6 for women). On average, the age at immigration for emigrants lies between 26.8 (men) and 27.3 (women) years.

**Table 1: Descriptive characteristics of the sample in 1992 & 2004**

Variable	1992		2004		
	Men	Women	Men	Women	
<b>Sex</b>	0.53	0.47	0.48	0.52	
<b>Age</b>	42.7 (13.8)	41.4 (13.7)	47.4 (15.0)	46.5 (14.9)	
<b>Country of origin</b>	Turkey	0.35	0.33	0.24	0.21
	Greek	0.11	0.11	0.05	0.04
	Italy	0.17	0.13	0.10	0.07
	Spain	0.07	0.06	0.02	0.02
	Former Yugoslavia	0.16	0.18	0.11	0.12
	Other EU-countries	0.02	0.02	0.07	0.07
	Eastern Europe	0.12	0.18	0.42	0.49
	Other countries	0.03	0.04	0.06	0.06
<b>German nationality</b>		0.11	0.15	0.46	0.49
<b>Marital status</b>	married / Germany	0.77	0.80	0.79	0.75
	married / home country	0.03	0.01	0	0
<b>Children</b>	Germany	0.58	0.59	0.49	0.48
	home country	0.05	0.04	0.04	0.02
<b>Years of education</b>		9.8 (2.1)	9.3 (2.2)	11.0 (2.5)	10.8 (2.8)
<b>Occupational status</b>	non-working	0.03	0.33	0.02	0.26
	jobless	0.08	0.07	0.13	0.08
	training	0.04	0.04	0.04	0.04
	self-employed	0.05	0.02	0.06	0.02
	pensioner	0.09	0.08	0.20	0.17
	working	0.70	0.44	0.50	0.41
<b>Own dwelling</b>		0.16	0.17	0.30	0.31
<b>Income</b>		18216.7	16889.2	19359.3	18233.7
<b>Transfers</b>		1842.8	1777.2	4483.4	4268.5
<b>Pension</b>		1156.0	1252.5	3429.3	3669.9
<b>Remittances</b>		0.28	0.15	0.12	0.10
<b>German fluency</b>		0.44	0.32	0.61	0.59
<b>Age at immigration</b>		21.6 (10.6)	21.9 (11.0)	24.0 (13.5)	24.6 (14.2)
<b>Self-rated health</b>	very good	0.17	0.12	0.11	0.09
	good	0.41	0.38	0.40	0.37
	fair	0.25	0.28	0.29	0.32
	poor	0.13	0.16	0.15	0.17
	very poor	0.04	0.05	0.04	0.05
<b># Observations</b>		1,142	1,002	1,107	1,189

Standard deviation in parentheses

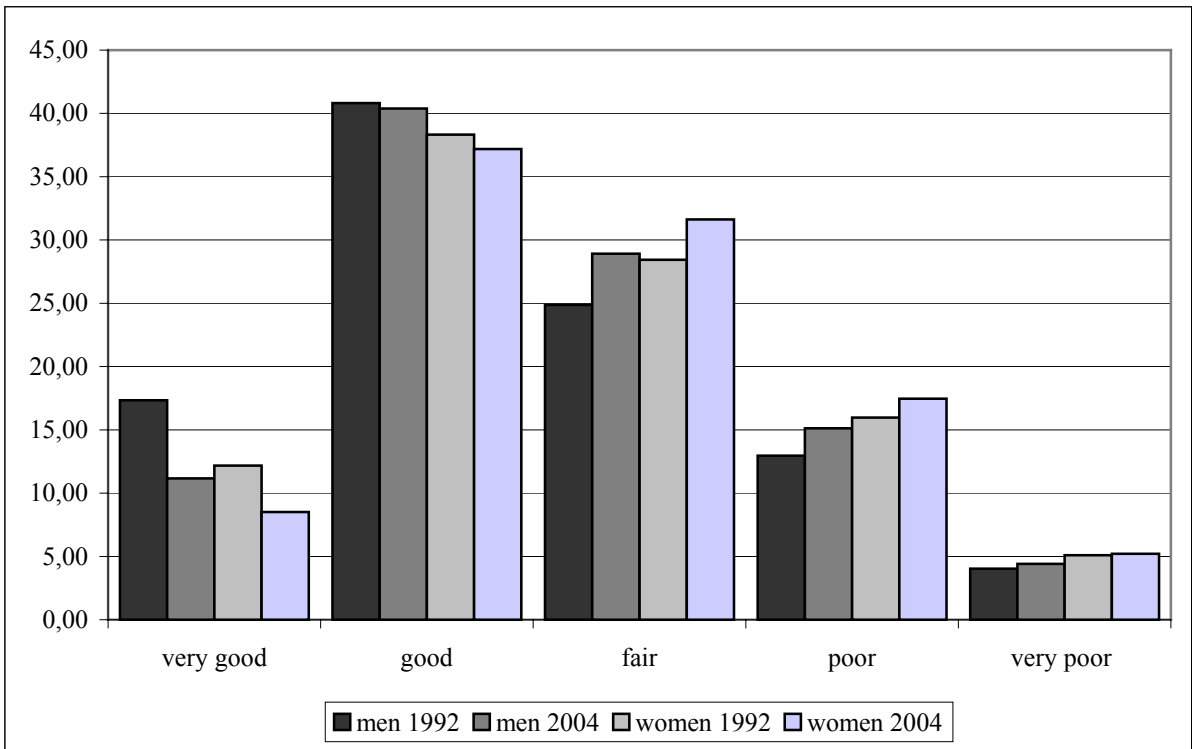
Source: Own calculation; wave 1992 & 2004 SOEP, unweighted

**Table 2: Descriptive characteristics of return migrants**

<b>Variable</b>	<b>Men</b>	<b>Women</b>
<b>Sex</b>	0.57	0.43
<b>Age</b>	47.7 (15.4)	47.8 (15.1)
<b>Country of origin</b>		
Turkey	0.20	0.15
Greek	0.18	0.23
Italy	0.15	0.16
Spain	0.08	0.10
Former Yugoslavia	0.21	0.22
Other EU-countries	0.04	0.07
Eastern Europe	0.10	0.09
Other countries	0.08	0.02
<b>German nationality</b>	0.06	0.05
<b>Marital status</b>		
married / Germany	0.64	0.77
married home country	0.08	0.02
<b>Children</b>		
Germany	0.34	0.33
home country	0.06	0.06
<b>Years of education</b>	10.0 (2.4)	9.3 (2.6)
<b>Occupational status</b>		
non-working	0.09	0.38
jobless	0.16	0.12
training	0.04	0.03
self-employed	0.05	0.03
pensioner	0.25	0.22
working	0.37	0.20
<b>Own dwelling</b>	0.09	0.11
<b>Income</b>	16069.4	16368.1
<b>Transfers</b>	2921.8	2859.9
<b>Pension</b>	3347.4	3926.7
<b>Remittances</b>	0.24	0.14
<b>German fluency</b>	0.29	0.25
<b>Age at immigration</b>	26.8 (10.4)	27.3 (11.9)
<b>Self-rated health</b>		
very good	0.17	0.06
good	0.37	0.30
fair	0.24	0.38
poor	0.17	0.20
very poor	0.05	0.06
<b># Observations</b>	249	186
Standard deviation in parentheses		
Source: Own calculation, waves 1992-2005 SOEP, unweighted		

Men as well as women rate on average their state of health in 2004 worse than in 1992. This can be due to the aging of the sample from 1992 to 2004. Additionally, part of this worsening could also be due to the return migration of individuals, which rate their health as very good. This could be especially for male emigrants as around 17% of them report their health as very good, and around 37% as good, whereas emigrant women assess their health status worse (only 6% report a very good and around 30% a good health status) (see figure 5). Overall, women rate their health status in 1992 as well as in 2004 slightly worse than do men. This ‘worse rating’ of women is an often reported phenomenon in the existing literature (see for example Pol and Thomas 1992: 298-299).

**Figure 5: Changes in health status over time**



Source: Own compilation, waves 1992 & 2004

**Econometric specification**

The purpose of this study is to model the individual choice behaviour<sup>19</sup> of migrants facing two options: returning to their home country or staying in Germany. A wide-spread approach in the literature to analyse return migration is event history analysis (EHA)<sup>20</sup> (see for example

<sup>19</sup> As outlined in the sample description a better approach would be to take household interdependencies explicitly into account. However, such an approach is behind the scope of this paper.

<sup>20</sup> For a detailed outline of event history analysis see, among others, Allison 1992, Blossfeld and Rohwer 2002, or Yamaguchi 1991.

Brecht 1994; Constant and Massey 2001). EHA is best suited to analyse the duration time until a special event – in the case at hand return migration – occurs. It is also possible to estimate the risk of the event occurring based on values of a set of independent variables, which is done in this paper. Return migration is a non-repeatable one-way transition event, that means the event occurs only at discrete<sup>21</sup> points of time, and the transition from one state (living in Germany) to another state (going abroad) can only occur once for each person. In the case of discrete time the EHA corresponds to a binary choice problem with the inclusion of dummy variables for time, and can be modelled using either logit or probit models (see Beck et al. 1998).

The event does not have to occur for every person. The data is left-truncated and right-censored. Left-truncated means that an individual has been at risk and re-migrated before the panel starts. This implies a choice biasedness of the sample: Those who have a higher propensity to remain in Germany are also more likely to be observed when the panel, respectively this subsample, starts. Therefore, the sample suffers from an over-sampling of those with long durations of residence in Germany (see Steiner and Velling 1994). To the best of my knowledge, there exists so far no approach which takes this problem explicitly into account.

It is assumed that right-censoring is random, so that the time between the beginning and the end of an observation is independent from the timing of events.

The panel structure of the data offers additionally the possibility to take unobservable individual-specific heterogeneity into account.<sup>22</sup> For example immigrants could have a “specific preference” for living in the home country or for living abroad which cannot be captured by economic or social observables. In general, panel estimators “differentiate out” this individual-specific heterogeneity while still allowing for it. To account for unobservable individual-specific heterogeneity this study estimates a random-effects probit model<sup>23</sup>, which is outlined in the following.<sup>24</sup>

An individual’s decision to emigrate in period  $t$  is modelled by a continuous latent variable,  $Y_{it}^*$ , which can be interpreted as the ‘underlying propensity to re-migrate’. It is given by:

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<sup>21</sup> The event can occur at every point of time, but only yearly information is available. The information is therefore measured discrete.

<sup>22</sup> To the best of my knowledge there is – with the exception of Steiner and Velling 1994 – no study on return migration which accounts for unobservable individual-specific heterogeneity.

<sup>23</sup> Another possibility would be to estimate a (random-effects) logit model. These two approaches differ by the respectively based distribution: a logit model assumes a logistic distribution, a probit model a standard normal distribution. As literature shows the estimated coefficients should not vary considerable if the model is correctly specified.

<sup>24</sup> The outline is based on Baltagi 2001 and Greene 2003.

$$Y_{it}^* = x'_{it}\beta + \alpha_i + \eta_{it} \quad (1)$$

$$Y_{it} = 0 \text{ if } Y_{it}^* \leq 0; \quad (2)$$

$$= 1 \text{ if } Y_{it}^* > 0 \quad i = 1, \dots, n; t = 1, \dots, T$$

where  $x'_{it}$  is a vector of  $K$  explanatory variables including a constant,  $\beta$  the corresponding coefficient vector,  $\alpha_i$  is a time-constant individual effect, and  $\eta_{it}$  an error component which varies between individuals as well as over time.

It is assumed that

$$\eta_{it} \sim \text{i.i.d. } N(0,1)$$

$$E(\alpha_i \eta_{it}) = 0 \quad \forall i, t; E(\eta_{it} \eta_{jt'}) = 0 \quad \forall i, j, t' \neq t$$

where  $N$  denotes the normal distribution function.

Within units (here individuals) the  $\eta_{it}$ s will be correlated. It is further assumed that the  $\alpha$ s are independent random draws from a normal distribution:

$$\alpha_i \sim N(0, \sigma_\alpha^2)$$

Hence, the random-effects model incorporates the assumption that the  $x_{it}$ s and the  $\alpha_i$ s are not correlated. However, this is in most of the cases a rather implausible assumption.

An alternative would be to estimate a fixed-effects *logit*<sup>25</sup> model which allows for correlation between the covariates and the individual effect. However, the fixed-effects model has the drawback that time-invariable variables (like here e.g. sex, age at immigration, country of origin) cannot be included in the regression. This would lead to the exclusion of several important variables.

Therefore, a random-effects probit model as outlined above, and – for the sake of comparison – a (pooled) probit model with robust standard errors are estimated.

The empirical approach is additionally extended by estimating the so-called Mundlak model, which can be seen as a combination of the random and the fixed effects approach (see Mundlak 1978). The Mundlak approach accounts for the possible correlation between the independent variables and the unobserved component by including within-means of the independent variables, and by assuming that the unobserved component varies linearly with the group means. That means the correlation is assumed to be linear and constant over time, and hence the effect of the independent variables on the dependent variables can be estimated unbiased.

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<sup>25</sup> There exists no consistent estimator for a fixed effects probit model for fixed  $T$  (see Greene 2003).



The specific features of the Mundlak model can be shown by the specification of the time-constant individual effect  $\alpha_i$  in equation (1):

$$\alpha_i = \alpha \bar{x}_i + \varepsilon_i \quad (3)$$

That means in the Mundlak approach  $\alpha_i$  consists of a vector of constant parameters  $\alpha$  multiplied with the group means of the independent variables and a normally distributed error term  $\varepsilon_i$ .

Theoretically there could be a possible correlation between self-rated health and the unobservables. Hence, in the empirical estimation the within-group means of all self-rated health dummies are included to account for this possible correlation.

## V. Empirical Findings and Discussion

The results of the empirical analysis for the probit and random-effects probit model are presented in table 3. Column two and three refer to the whole sample, column four and five only to men and the last two columns present the results for women only. Overall, the results are in line with the existing literature on return migration. They show that return migrants are a self-selected group with regard to specific characteristics.

The interpretation is restricted to a simple sign interpretation: a positive sign indicates a higher probability of return migration with the respective variable, a negative sign a decreasing probability.

*Male immigrants* show a higher return propensity. This can be explained by the fact that basically men go in another country to earn a living, and then go back home.

The variable *country of origin* plays a significant role in explaining return migration: immigrants from Eastern Europe – which almost all belong to the group of the so-called ‘Aussiedler’ – have a significantly lower probability to re-migrate. This finding has been expected, because ethnic Germans have in general no intention to return back. Also being Turkish decreases the probability of return migration in comparison to immigrants from EU-countries, especially for women. This might be explained by the possibility for all immigrants from EU-countries to move freely within the European Union which also comes along with lower costs of migration; hence, return migration is expected to be higher among them.

The *location of spouse and children* is an important determinant of return migration. Having spouse and children in the home country (respectively in Germany) can be seen as a kind of social attachment to the country of origin (to Germany). Therefore, having spouse and

children in the home country yields a significant higher return probability. In return, having spouse and children in Germany lowers the probability of return migration.

Factors which cover attachment or integration into the German society like *German fluency*, *German nationality* or *house ownership* reduce the probability of return migration. In addition, *age at immigration* is a key variable to capture the effect of integration into the host country. An immigrant who migrates as a child usually goes to school in Germany; therefore he acquires social and human capital in the host country. Immigrating at an older age means that one is more attached to the home country, having a kind of “deeper roots” in the home country. An older age at immigration therefore significantly increases the return probability.

Some studies use *years since migration* instead of age at immigration, which captures also the effect of integration into the host country. Due to collinearity it is not possible to use age, age at immigration and years since migration in the same estimation. Therefore, an analysis using years since migration instead of age at immigration is estimated. As the direction of the coefficients did not change, the results are not presented here.

Concerning *occupational status* it is found that immigrants who are non-working, jobless, self-employed, in training, or pensioners show a higher return probability than working immigrants.

Sending *remittances* to the home country is an expression for the maintenance of strong ties to the country of origin. Therefore, sending remittances should increase the probability of return migration. However, this effect is not significant. In table 3 the effect is negative for the total sample and for the men sample; but including year dummies yield a (not significant) positive effect in both samples.

A reason for the insignificance could be the rather high correlation between ‘sending remittances’ and ‘having spouse abroad’.

The coefficient of *years of education* is nearly equal to zero and also not significant. As literature shows, the effect of education is ambiguous, depending on the initial selection (see Borjas and Bratsberg 1994). In addition, Pohl (2005) shows that the effect of education depends also on the duration of residence in the host country. Therefore, it is possible that the estimated small effect is due to a “cancelling out” of contrarious effects.

**Table 3: Determinants of Return Migration: Estimation results**

Variable	Total sample		Only male		Only female,	
	Probit model (robust standard errors)	Probit model random effects	Probit model (robust standard errors)	Probit model random effects	Probit model (robust standard errors)	Probit model random effects
<b>male</b>	0.177*** (0.048)	0.186*** (0.049)	-	-	-	-
<b>age (16-25 ref.)</b>	-	-	-	-	-	-
<b>age 26-50</b>	-0.148 (0.010)	-0.146 (0.097)	0.013 (0.157)	0.021 (0.144)	-0.326** (0.127)	-0.330** (0.136)
<b>age 51-65</b>	-0.312*** (0.112)	-0.314*** (0.116)	-0.197 (0.177)	-0.196 (0.171)	-0.409*** (0.157)	-0.412** (0.163)
<b>age 66 and above</b>	-0.716*** (0.162)	-0.723*** (0.159)	-0.659*** (0.230)	-0.665*** (0.225)	-0.676*** (0.235)	-0.680*** (0.233)
<b>Country of origin (other EU-countries: reference)</b>	-	-	-	-	-	-
<b>Turkey</b>	-0.394*** (0.099)	-0.406*** (0.100)	-0.229* (0.137)	-0.235* (0.140)	-0.628*** (0.140)	-0.646*** (0.147)
<b>Greek</b>	0.294*** (0.100)	0.311*** (0.103)	0.349** (0.143)	0.368** (0.148)	0.200 (0.139)	0.216 (0.148)
<b>Italy</b>	-0.034 (0.100)	-0.036 (0.104)	0.037 (0.143)	0.038 (0.148)	-0.141 (0.141)	-0.145 (0.151)
<b>Spain</b>	0.192* (0.113)	0.201* (0.119)	0.224 (0.162)	0.237 (0.169)	0.140 (0.157)	0.148 (0.171)
<b>Former Yugoslavia</b>	0.146 (0.092)	0.154* (0.090)	0.193 (0.129)	0.203 (0.130)	0.088 (0.127)	0.095 (0.130)
<b>Eastern Europe</b>	-0.522*** (0.084)	-0.541*** (0.086)	-0.397*** (0.116)	-0.412*** (0.121)	-0.661*** (0.117)	-0.683*** (0.125)
<b>other countries</b>	-0.122 (0.116)	-0.126 (0.120)	0.148 (0.154)	0.156 (0.158)	-0.615*** (0.215)	-0.634*** (0.220)
<b>German citizen</b>	-0.576*** (0.100)	-0.594*** (0.093)	-0.595*** (0.139)	-0.614*** (0.127)	-0.601*** (0.150)	-0.619*** (0.143)
<b>marital status (widowed, single, divorced ref.)</b>	-	-	-	-	-	-
<b>spouse abroad</b>	0.563*** (0.133)	0.581*** (0.141)	0.547*** (0.155)	0.564*** (0.167)	0.747*** (0.268)	0.765** (0.230)
<b>spouse Germany</b>	-0.188*** (0.055)	-0.198*** (0.058)	-0.291*** (0.078)	-0.304*** (0.081)	-0.045 (0.086)	-0.050 (0.091)
<b>children abroad</b>	0.322*** (0.102)	0.335*** (0.100)	0.240* (0.134)	0.251* (0.134)	0.539*** (0.158)	0.559*** (0.155)
<b>children Germany</b>	-0.226*** (0.053)	-0.235*** (0.054)	-0.143** (0.072)	-0.149** (0.074)	-0.296*** (0.085)	-0.306*** (0.083)
<b>years of education</b>	0.011 (0.010)	0.011 (0.010)	0.006 (0.013)	0.006 (0.014)	0.015 (0.016)	0.016 (0.016)

<b>Occupational status (working reference)</b>	-	-	-	-	-	-
<b>non-working</b>	0.447*** (0.069)	0.464*** (0.069)	0.664*** (0.125)	0.689*** (0.126)	0.457*** (0.091)	0.472*** (0.094)
<b>jobless</b>	0.357*** (0.077)	0.365*** (0.075)	0.333*** (0.101)	0.343*** (0.100)	0.397*** (0.119)	0.403*** (0.122)
<b>training</b>	0.290** (0.130)	0.295** (0.132)	0.259 (0.169)	0.265 (0.171)	0.367* (0.210)	0.370* (0.218)
<b>self-employed</b>	0.326*** (0.117)	0.340*** (0.111)	0.279** (0.139)	0.289** (0.136)	0.462** (0.214)	0.485** (0.203)
<b>pensioner</b>	0.455*** (0.094)	0.468*** (0.086)	0.518*** (0.125)	0.540*** (0.119)	0.443*** (0.141)	0.459*** (0.134)
<b>own dwelling</b>	-0.232*** (0.069)	-0.238*** (0.070)	-0.222** (0.094)	-0.229** (0.098)	-0.247** (0.105)	-0.250** (0.104)
<b>income</b>	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<b>transfers</b>	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<b>pension</b>	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
<b>remittances</b>	-0.001 (0.059)	-0.005 (0.060)	-0.000 (0.077)	-0.004 (0.077)	0.024 (0.092)	0.020 (0.101)
<b>German fluency</b>	-0.355*** (0.050)	-0.367*** (0.050)	-0.374*** (0.066)	-0.387*** (0.066)	-0.323*** (0.078)	-0.333*** (0.078)
<b>age at immigration</b>	0.013*** (0.003)	0.013*** (0.003)	0.015*** (0.004)	0.015*** (0.004)	0.010** (0.004)	0.010** (0.004)
<b>Self-rated health (ref. very good)</b>	-	-	-	-	-	-
<b>good</b>	-0.083 (0.071)	-0.080 (0.073)	-0.108 (0.086)	-0.108 (0.088)	0.060 (0.134)	0.067 (0.139)
<b>fair</b>	-0.110 (0.074)	-0.107 (0.079)	-0.262*** (0.095)	-0.263*** (0.100)	0.162 (0.137)	0.174 (0.144)
<b>poor</b>	-0.126 (0.083)	-0.122 (0.087)	-0.245** (0.107)	-0.245** (0.112)	0.090 (0.147)	0.102 (0.154)
<b>very poor</b>	-0.248** (0.115)	-0.248** (0.118)	-0.442*** (0.156)	-0.449*** (0.162)	0.034 (0.190)	0.043 (0.190)
<b>constant</b>	-2.013*** (0.188)	-0.206*** (0.186)	-1.892*** (0.267)	-1.937*** (0.256)	-2.107*** (0.282)	-2.155*** (0.289)
<b>Log-Likelihood</b>	-1952.91	-1953.61	-1087.12	-1087.41	-839.75	-840.23
<b>Pseudo-R<sup>2</sup></b>	0.1497		0.1534		0.1676	
<b>Number of observations</b>	31,639	31,639	16,028	16,028	15,611	15,611
Standard error in parentheses *** significant at 1%, ** significant at 5%, *significant at 10% Note: Using robust standard errors one can only refer to the log-pseudo-likelihood Source: SOEP waves 1992-2005						

*Income* is a way to capture economic well-being. The effect of income can also be ambiguous. On the one hand, if the initial motivation for migration was to save enough money, high income can lead to an increasing probability of return migration. On the other hand, it is possible that those immigrants return back who are “unable to ‘make it’ in the new country” (Constant and Massey 2002: 22). The estimated coefficient for income is equal to zero and not significant. This can be due to the same “cancelling out” effect as with years of education. Also *pension* and *transfers* show no effect.

The results regarding health status are for men and women adverse. For men being in a good, satisfactory, poor or bad health status lowers the probability of return migration compared to the reference category ‘very good health status’. With the exception of a ‘good health status’ all effects for men are significant (‘fair’ and ‘very poor’ with a p-value < 0.01, ‘poor’ with a p-value < 0.05). For women, on the contrary, all signs are positive, indicating that a health status worse than ‘very good’ increases the probability of return migration. However, none of the effects is significant. Regarding the whole sample, the signs show in the same direction as for men, that is, being in a good, fair, poor, or very poor health status lowers the probability of return migration compared to the reference.

These results support the importance of a gender sensible analysis. In addition, they emphasize the importance of analysing return migration in the context of household interdependencies. One reason for the differences between men and women could be that it is the head of household – in most cases the men – who makes the return decision by taking only his own health status into account. If it is that the health status of men and women are not systematically correlated, this could be one possible explanation for the findings.

But why should healthier men go back? One possible interpretation could be that, for instance, healthier men go back – after having saved enough money – to go into business for themselves; whereas men in a worse health status tend to stay, maybe because of the better health care system. If it is that healthier men go back – that means a kind of “adverse selection” is staying – this could have negative financial effects on the health care system.

Another explanation could be related to the missing information if an individual is really going back home, or if the individual is going to a third country. If it is the wrong assumption here that every individual going abroad is a return migrant, the finding that healthier men ‘go back’ could be explained in the way that they do not go back, but to a third country. This would fit into the theory of a positive self-selection of migrants, thus into the first part of the “healthy immigrant effect”.

An interpretation of the results has to be seen with caution due to the small fraction of return migrants in the sample. Another problem is that it is not possible to observe if migrants ‘commute’ between countries (for example they may spend some time in the home country to enjoy the better climate, culture environment etc., then coming back to Germany for health care services and so on). It can be assumed that this kind of behaviour can be found very often in reality, and neglecting this possibility could influence the results.

Overall, at least for men the hypothesis that health plays a role in return migration cannot be denied.

Regarding the HIE – again for men only – return migration can indeed be a possible explanation for the HIE in the sense that if male immigrants with a very good self-reported health status have a higher probability to return home, the average health status of the remaining immigrants is decreasing.

#### ***Estimation results of the Mundlak approach***

Table 4 shows the estimations results for the Mundlak approach. Again, the estimation is carried out for the total sample, and separately for men and women.

The coefficients of the means of self-rated health is highly significant for all three subsamples. Hence, under the assumption of the Mundlak approach these results can be interpreted as the existence of correlation between self-rated health and the individual-specific effect in the random-effects probit model.

In the Mundlak specification the effect of self-rated health on return migration is positive and significant, for the whole sample, as well as for men and women. This contradicts the findings for men of the random-effects probit model, where for men a significant negative effect has been found. However, the coefficients of means of self-rated health are highly significant and negative. According to Ferrer-I-Carbonell and van Praag (2003) the coefficients in the Mundlak approach can be decomposed into a permanent effect and a transitory effect, whereby the coefficients of the means of the variables show the permanent effect and the the coefficients of the variables the transitory effect. Hence, in the case at hand, the permanent effect suggests that immigrants who rate their health worse than ‘very good’ have a significantly lower probability to remigrate. The transitory effects shows that a health shock yield to higher probability to remigrate.

**Table 4: Estimation results: Mundlak approach**

Variable	Mundlak model		
	Total sample	Only men	Only women
<b>Self-rated health (reference very good)</b>	-	-	-
<b>good</b>	0.200** (0.097)	0.188 (0.119)	0.273 (0.177)
<b>fair</b>	0.337*** (0.111)	0.243* (0.141)	0.503*** (0.193)
<b>poor</b>	0.427*** (0.124)	0.387** (0.163)	0.538** (0.209)
<b>very poor</b>	0.393** (0.171)	0.327 (0.243)	0.543** (0.260)
<b>Within group means</b>			
<b>Mean srh (reference very good)</b>	-	-	-
<b>mean srh good</b>	-0.581*** (0.141)	-0.576*** (0.173)	-0.462* (0.260)
<b>mean srh fair</b>	-0.848*** (0.153)	-0.957*** (0.197)	-0.642** (0.264)
<b>mean srh poor</b>	-1.021*** (0.176)	-1.135*** (0.233)	-0.862*** (0.291)
<b>mean srh very poor</b>	-1.107*** (0.240)	-1.274*** (0.332)	-0.910** (0.373)
<b>Log-Likelihood</b>	-1931.79	-1070.25	-834.76
<b>Number of observations</b>	31,639	16,028	15,611
Standard error in parentheses *** significant at 1%, ** significant at 5%, *significant at 10% Note: The result of the control factors are not presented here. Source: SOEP waves 1992-2005			

***Robustness of the results***

To check the robustness of the results the model is re-estimated using a dummy variable for health status, which takes the value 1 if the individual described his health as ‘very good’ or ‘good’, and zero otherwise. This dummy variable is significant positive for men and not significant negative for women. The design of the variable “health status” has therefore no influence on the results.

The results of the Mundlak approach are robust if srh is included, and not the srh-dummies. The signs of the coefficients are robust to the inclusion of ‘age’ as a continuous variable instead of the age-dummies, but there is a slight change in the significance of the coefficients of the health status dummies. For the men sample – with exception of ‘good health status’ – all coefficients are significant (‘fair’ and ‘very poor’ with a p-value < 0.05, ‘poor’ with a p-value < 0.1).

Additionally, the results are robust to the inclusion of year dummies.

Another analysis is conducted using ‘disability’ as a measure of the health status. ‘Disability’ is measured by the question “Are you officially registered as having a reduced capacity for work or being severely disabled?” This question is included in the questionnaire in every wave except 1990 and 1993. Including the same covariates, it is found for the whole sample and for the men sample that having a disability reduces the probability of return migration. This is consistent with the findings regarding self-rated health. This effect is significant for the whole sample ( $p < 0.05$ ), but not significant for the men sample (maybe due to the small number of cases reporting disability). For women, being registered as disabled or incapable to work reduces also the probability to return. This contradicts with the findings for self-rated health, and the effect is again not significant. The results are not provided here, and made available upon request. The direction of the other independent variables corresponds to the results presented in this study.

Utilisation of health care services, e.g. number of doctor visits or hospital stays, is another often suggested measure of health. However, this may not be an adequate measure for health within the migrant group if these group faces access barriers to health care, for example language barriers or cultural barriers. Until now, there is no clear evidence for Germany (as well as for other countries) if immigrants tend to over- or underuse the health care system. Especially, the number of doctor visits could reflect more behavioural aspects as real “need”. Regarding hospital stays, it could be assumed that they are more robust to individual health behaviour and – regarding the immigrant group – also more robust to language and cultural barriers than doctor visits. Hence, another analysis is carried out using the number of nights in hospital as health status measure. The question in the SOEP regarding hospital stays is “Where you ever admitted to a hospital for at least one night in the last year” and “How many nights altogether did you spend in the hospital last year?” A dummy variable is constructed taking the value 1 if an individual has spent at least one night in the hospital in the last year, and zero otherwise. Table 5 shows the estimation results.

For the total sample, the results are in line with the results from self-rated health: individual who have spent at least one night in hospital (and are thus in bad health status by assumption) have a lower probability to re-migrate. This effect is not significant. However, for the men sample, the opposite is found. Men who have spent at least one night in hospital have a higher probability to return; this contradicts with the findings for self-rated health. However, this effect is again not significant. Also for women the results are not line with the findings from self-rated health: for women, having been admitted to hospital for at least one night, yields a significant lower probability to re-migrate. The effect for women might be explained with



hospital stays during due to childbirth. Hence, for women, hospital stays might not be correlated with the health status.

**Table 5: Estimation results: Number of nights in hospital**

Variable	Random-effects probit model		
	Total sample	Only men	Only women
<b>Self-rated health (reference very good)</b>	-	-	-
<b>good</b>	-0.044 (0.079)	-0.097 (0.095)	0.155 (0.154)
<b>fair</b>	-0.095 (0.085)	-0.308*** (0.109)	0.267* (0.159)
<b>poor</b>	-0.141 (0.096)	-0.356*** (0.126)	0.188 (0.171)
<b>very poor</b>	-0.315** (0.133)	-0.676*** (0.194)	0.137*** (0.209)
<b>Dummy: Nights in hospital</b>	-0.037 (0.072)	0.119 (0.099)	-0.188* (0.109)
<b>Log-Likelihood</b>	-1699.02	-919.30	-751.61
<b>Number of observations</b>	28,906	14,534	14,372
Standard error in parentheses *** significant at 1%, ** significant at 5%, *significant at 10% Note: The result of the control factors are not presented here. Source: SOEP waves 1992-2005			

### *Family interdependencies*

As mentioned above, a drawback of this study is the modelling of return migration as an independent individual choice decision, because it can be assumed that return decisions of persons who belong to the same household are not made on an individual basis, but depend on the corresponding partner / household members. A first approach to investigate these interdependencies can be done by conducting an estimation for married women (men) only, and using the health status of their corresponding partner as a independent variable. Hence, a dummy variable is included, indicating if the partner has rated his or her health as very good or good. The estimation results are presented in table 6. The results indicate that a good health status of a woman's husband highers the return probability of the woman; however, the result is not significant. In contrast, a good health status of a man's spouse lowers his return probability significantly. Interestingly, the health status of the men turns insignificantly. Hence, these first results show the complexity and importance of the relationship between health, return migration and family interdependencies. Future studies on return migration,

which explicitly model household interdependencies, are needed to shed more light on these complex interactions.

**Table 6: Approach to family interdependencies: Estimation results**

Variable	Random effects probit	
	Only married women	Only married men
<b>male</b>	-	-
<b>age (age16-25: reference)</b>	-	-
<b>age 26-50</b>	-0.167 (0.206)	-0.306 (0.264)
<b>age 51-65</b>	-0.214 (0.229)	-0.468* (0.279)
<b>age 66 and above</b>	-0.451 (0.301)	-0.908*** (0.325)
<b>Country of origin (other EU-countries: reference)</b>	-	-
<b>Turkey</b>	-0.797*** (0.179)	-0.324* (0.183)
<b>Greek</b>	0.160 (0.179)	0.361* (0.187)
<b>Italy</b>	-0.227 (0.185)	0.019 (0.194)
<b>Spain</b>	0.118 (0.205)	0.423** (0.212)
<b>Former Yugoslavia</b>	-0.017 (0.161)	0.279* (0.167)
<b>Eastern Europe</b>	-0.664*** (0.153)	-0.573*** (0.151)
<b>Other countries</b>	-0.785*** (0.277)	0.081 (0.223)
<b>German citizen</b>	-1.054*** (0.224)	-0.491*** (0.167)
<b>children abroad</b>	0.825*** (0.167)	0.340** (0.173)
<b>children Germany</b>	-0.187* (0.100)	-0.100 (0.093)
<b>Years of education</b>	0.007 (0.019)	0.009 (0.017)
<b>Occupational status (working reference)</b>	-	-
<b>Non-working</b>	0.549*** (0.111)	0.745*** (0.149)
<b>Jobless</b>	0.581*** (0.141)	0.361*** (0.128)
<b>Self-employed</b>	0.555** (0.234)	0.333* (0.173)
<b>Pensioner</b>	0.539*** (0.153)	0.628*** (0.138)
<b>Own dwelling</b>	-0.376*** (0.130)	-0.343*** (0.122)

<b>Income</b>	0.000 (0.000)	-0.000 (0.000)
<b>Transfers</b>	0.000 (0.000)	-0.000 (0.000)
<b>Pension</b>	0.000*** (0.000)	-0.000 (0.000)
<b>Remittances</b>	0.152 (0.112)	0.068 (0.089)
<b>German fluency</b>	-0.313*** (0.094)	-0.370*** (0.083)
<b>Age at immigration</b>	0.015*** (0.005)	0.016*** (0.005)
<b>Self-rated health (ref. very good)</b>	-	-
<b>good</b>	0.148 (0.195)	-0.005 (0.129)
<b>fair</b>	0.299 (0.200)	-0.193 (0.140)
<b>poor</b>	0.201 (0.212)	-0.232 (0.155)
<b>very poor</b>	-0.043 (0.267)	-0.322 (0.200)
<b>Self-rated health partner good</b>	0.106 (0.086)	-0.156* (0.083)
<b>Constant</b>	2.641*** (0.402)	-2.025*** (0.398)
<b>Log-Likelihood</b>	-622.92	-703.54
<b>Number of observations</b>	11,953	12,378
*** significant at 1%, ** significant at 5%, *significant at 10%		
Note: Training is excluded because it predicts failure perfectly		
Source: SOEP waves 1992-2005		

## VI. Conclusion

Using the waves 1992-2005 of the SOEP to analyse the factors influencing return migration, the study shows – in congruence with the existing literature – that having spouse and children living in the home country as well as being non-working or jobless yield a significant higher return probability, whereas all factors associated with attachment to Germany (like German fluency, German citizenship or being a house owner) reduce the probability of return migration.

Additionally, the results indicate that relative to male immigrants who described their health as very good, men reporting poorer health ('good', 'satisfactory', 'poor' or 'bad') are significantly less likely to return home. However, for women, the effects are adverse to that of men and none of the coefficients for women is significant.

A first approach to take household interdependencies into account shows that a good health status of a woman's husband highers the return probability of the woman; however, the result is not significant. In contrast, for men whose spouse rate their health as very good or good, the return probability is significantly lower.

Interpreting the results, one should bear in mind that the results concerning health are based on self-reported conditions and do not necessarily correspond to medically diagnosed states. Further, – as Gee 2003 notes – the willingness to report health problems can be affected by cultural factors as there may be differences in the fundamental concepts of health and illness. Additionally, self-report health is assessed – at least partly – relative to those in the surrounding environment. So it could be that immigrants change their self-reported health not due to a “real” change in their state of health, but due to a changing of the surrounding norm (see Sundquist 1995:133 or Shaw et al. 1999: 225-226 as cited in Chiswick et al. 2006: 6).

Return migration is only one aspect of panel attrition. It can also occur due to refused participation or unsuccessful tracking. If this attrition follows a selectivity pattern regarding health, it can influence studies on the healthy immigrant effect. Especially, it is very probable that the individuals who have died during the period are negatively selected by health, which could lead to an opposite effect. However, only 0.4 percent of the sample has died. But nevertheless, one should in addition estimate a multinomial model, allowing for all possibilities of panel attrition, or at least a joint model of dying and return migration.

As the staying of immigrants in a bad health status is explained by the quality and availability of health care services one should additionally account for the quality of the health care system of the country of origin if future studies.

Finally, in addition to quantitative studies, more qualitative studies are needed to shed light on the wide range of factors determining re-migration as well as on the complex structures behind these decisions.

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