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Theoretical Considerations and Empirical Evidence**

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## **ABSTRACT**

### **Remittances and Gender: Theoretical Considerations and Empirical Evidence**

In this paper, we focus on network- and gender-specific determinants of remittances, which are often explained theoretically by way of intra-family contracts. We develop a basic formal concept that includes aspects of the transnational network and derive hypotheses from it. For our empirical investigation, we use data from the German Socio-Economic Panel Study (SOEP) for the years 2001-2006. Our findings show: first, the fact that foreign women remit less money than foreign men can be explained by the underlying transnational network contract. Second, remittances sent by foreigners and naturalized immigrants have at least partly different determinants. Acquiring German citizenship increases the probability of family reunification in the destination country and decreases remittances. Third, the structure of the existing social network in Germany and the network structure in the home country both play important roles in explaining remittances.

JEL Classification: F22, J16, D13

Keywords: remittances, gender, foreigners, naturalized migrants

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## 1. Introduction

Migration and the existence of family and friend networks in the home country are crucial preconditions for remittances. Feminist critique has revealed how gender roles and a gender-specific division of labor shape the migratory process (Carlota Ramirez, Mar Garcia Dominguez, and Julia Miguez Morais 2005). With remittances, women's economic importance within the transnational network increases (Manuel Orozco, Lindsay Lowell, and Johanna Schneider 2006). In many cases, sending financial remittances home makes women important players in the transnational network<sup>1</sup>, and this in turn can provide them a higher degree of social independence. To understand remittance patterns, it is also important to understand the legal situation of the immigrant in the destination country. Acquiring destination country citizenship has implications for the likelihood of chain migration, for the immigrant's social integration into the country of destination, and therefore for remittances. Remittance decisions of males and females might thus be affected in a similar way by the acquisition of destination country citizenship.

Up to now, standard economic theory on remittances has mainly focused on the analysis of international labor migration. A growing strand of this literature has begun considering household characteristics (Edward Funkhouser 1992) and family ties (Jacob Mincer 1978; Brenda Davis Root and Gordon De Jong 1991) as important aspects of migration. In general, they distinguish between joint migration and split migration. In the case of joint migration, the entire household moves to the destination country. In the case of split migration, on the other hand, the composition of the household in the home country changes but still survives. Split household models

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<sup>1</sup> The transnational network is defined, in our case, as immediate and extended family and friends in the home as well as in the destination country.

have potentially rich implications for predicting remittance behavior by women and men (Lisa Pfeiffer, Susan Richter, Peri Fletcher, and Edward Taylor 2008).

Within this context, remittances are usually seen as the result of international transnational family contracts for insurance and investment (Robert Lucas and Oded Stark 1985; Mark Rosenzweig 1988; Oded Stark 1995; Bernard Poirine 1997; Andrew Foster and Mark Rosenzweig 2001; Reena Agarwal and Andrew Horowitz 2002). There are strong arguments that these contracts are gender-sensitive. From empirical evidence, it is known that in some cases, social norms prevent females from independent migration and thus constrain remittances. In addition, gender roles might influence the power of the immigrant within the transnational network and might thereby affect the amount remitted. However, standard economic theory on remittances fails to provide a more detailed analysis of these intra-network contracts. Yet there is an extensive body of empirical studies seeking to understand how immigrants send money home and to describe their patterns of remittance behavior: who sends what, what (and how much) is sent to whom, how often, which channels are utilized, and how the money is “spent” by the recipients. Quite distinct cultural and gendered remittance patterns have been examined in what is sent by whom (Sherri Grasmuck and Patricia Pessar 1991; Sarah Curran 1995). So far, the existing empirical literature on gender-specific remittance patterns has not inspired detailed theoretical approaches on this topic.

Therefore, and in line with the growing literature on gender patterns in international migration and remittances, we intend to shed light on the linkages between gender, the structure of the transnational network, and the amount remitted. Our empirical case comes from Germany, where we draw upon secondary data from immigrants with and without German citizenship (mainly citizens of Turkey, Italy,

and the countries of ex-Yugoslavia) for the years 2001-06.<sup>2</sup> Germany is one of the most important countries sending remittances. About 6.7 million foreigners, of whom almost 50 percent are women, currently live in Germany (Federal Statistical Office 2010). It has been reported in the literature that male immigrants to Germany remit more than female immigrants, even after controlling for income (Lucie Merkle and Klaus Zimmermann 1992; Ursula Oser 1995; Elke Holst and Mechthild Schrooten 2006).<sup>3</sup> Up to now, however, the research has failed to explain this effect. Our objective is to demonstrate that the structure of the transnational network and the legal status of the immigrant are essential to understanding differences in financial remittance patterns of male and female immigrants to Germany.

## **2. Research Insights**

Standard theoretical models explain migration and remittances based on economic considerations (Lucas and Stark 1985; Stark 1995; Edward Funkhouser 1995), while neglecting differences in female and male migration patterns and remittances decisions. However, a growing number of applied studies have stressed that “*migration is a profoundly gendered process*” (Shawn Malia Kanaiaupuni 2000:1312). Basically it can be assumed that the economic returns of education (human capital) depend on the degree of labor market segmentation by gender in the destination country (Pfeiffer, Richter, Fletcher and Taylor 2008). In addition, there are significant differences between men and women in several aspects of migration, such as motivations, risks, norms (movement and assimilation), and consequences (Curran 1995).

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<sup>2</sup> For the SOEP, see Gerd Wagner, Joachim Frick, and Jürgen Schupp (2007).

<sup>3</sup> Studies analyzing remittances in the context of savings support this view (Mathias Sinning 2007).

Further insights have been gained by incorporating the recognition that migration decisions are not made by individuals, but conditioned by membership within households (Curran 1995). These studies on gender, households, and migration show that migration is not a unified family strategy influencing individual behavior. Rather, complex negotiations are carried out between family members, where the results are dependent upon the resources available to each family member. Cultural expectations associated with gender are both reproduced and transformed within the family. This perspective implies that migration is not only an adaptive reaction to external economic conditions but also the result of a gendered interaction within households and family and friend network (Grasmuck and Pessar 1991; Pierette Hondagneu-Sotelo 1994).

These insights have been reflected in several empirical studies that have made important steps in integrating a gender perspective into the literature on remittances by focusing on gender-specific strategic behavior (Alejandro Portes 1997; Patricia Pessar and Sarah Mahler 2003; Ninna Nyberg Sørensen 2005; Ramirez, Dominguez, and Morais 2005; Nicola Piper 2005; Jorgen Carling 2008). While Lucas and Stark (1985) found, in their seminal work on remittances, that women show a higher probability to remit, more recent studies have produced the opposite finding. Up to now, a few papers have come to the conclusion that women remit more than men (Lucas and Stark 1985; UNPFA and IOM 2006). One important finding is that men seem to remit mostly to their wives, while female migrants often send remittances to the person caring for their children (Amaia Pérez Orozco and Denise Paiewonsky 2007; Amaia Pérez Orozco, Denise Paiewonsky, and Mar García Domínguez 2008). In addition, female migrants tend to remit to a wider circle of family members than men, while men send larger amounts of money than women (Moshe Semyonov and

Anastasia Gorodzeisky 2005; Orozco, Lowell and Schneider 2006). Up to now, the link between transnational network, remittances, and integration into the economy of the destination country has inspired only few theoretical studies (Thomas Faist 2000; Ewa Morawska 2002).

### **3. Theoretical Considerations: First steps beyond the traditional models of remittances**

We would like to expand upon the findings described above by borrowing basic ideas from Benedicte de la Briere et al. (2002), who assume that the income of the immigrant and the income of the household left in the home country are not correlated. Accordingly, the immigrant can insure the household in the home country against negative income shocks. We augment these ideas through four additional assumptions. First, we assume that the immigrant belongs to a transnational network. This network consists of two different sub-networks: the network in the home country and the network in the destination country. Second, we assume that the immigrant operates as an insurer, not only for the household but also for a broader network in the home country. We assume that this network consists not only of family members but also of friends. Third, we assume that the network can influence, at least partly, its relative importance to the immigrant. The relative importance depends on the network's relative size within the transnational network as well as on the structure of the network in the home country. Thus, if the spouse remains in the home country, the relative importance is high. If the spouse decides for chain migration, the structure of the network in the home country changes and its relative importance decreases. Fourth, we assume that the immigrant can spend her income on activities with the network in the country of destination (remittances) or share it with the network in the destination country.



Further, the network in the home country of the immigrant earns income  $Y$  with a probability of  $\pi$  and income  $Y - \Delta$  with a probability of  $(1 - \pi)$ , where  $\Delta$  represents a random negative income shock. The network in the home country wants to enter into an insurance contract with the immigrant. The immigrant is willing to pay remittances to the network left behind in the case of an income shock if the network agrees to pay a premium  $P$  (for example, to finance migration costs or to offer assistance in the case of return migration (remigration costs)). We assume that the network in the home country is maximizing its utility  $v(\cdot)$  and acts as principal, taking into account the situation of the immigrant. The immigrant's utility function is  $u(\cdot)$ .

The network in the home country chooses the amount of premium ( $P$ ) paid to the immigrant. In addition, it can influence its own relative importance to the immigrant,  $\alpha$ , with  $\alpha + \beta = 1$  and  $\beta$  is the relative importance of the network in the destination country. This relative importance is crucial to the amount remitted,  $R$ , by the immigrant, since  $R = \alpha * Z$  with  $Z$  is the income of the immigrant in the destination country. From the point of view of the migrant the importance of the network in the home country ( $\alpha$ ) can become zero if emigration takes place out of strong personal reasons such as separation, divorce or violence. However, in this model it is assumed that, the network in the home country tries to maximize its utility by choosing  $P$  and  $\alpha$

$$\max_{P, \alpha} \pi v(Y - P) + (1 - \pi)v(Y - P - \Delta + \alpha Z)$$

$$s.t. \pi u(Z + P) + (1 - \pi)u(Z + P - \alpha Z) \geq u(Z)$$

First-order conditions are

$$\frac{u'(Z + P - \alpha Z)}{u'(Z + P)} = \frac{v'(Y - P - \Delta + \alpha Z)}{v'(Y - P)}.$$

Taking now for  $u(\cdot)$  and  $v'(\cdot)$  the ln gives us<sup>4</sup>

$$P = \frac{Z * (\alpha Y + \alpha Z - \Delta)}{\Delta} \text{ and } \alpha = \frac{\Delta Z + \Delta P}{Z(Y + Z)} = \frac{\Delta}{(Y + Z)} + \frac{\Delta P}{Z(Y + Z)}.$$

In other words, the premium paid to the immigrant increases with the relative importance of the network, the income of network in the home country, and the income of the immigrant. The premium decreases with the size of the (expected) income shock. In case of an (expected) huge income shock, it might be rational for the network not to lower the income by a premium but to pay a lower premium—especially if it can be expected that the remittance will not totally compensate for this shock.

In addition, the network in the home country can influence its relative importance to the immigrant. According to our theoretical considerations  $\alpha$  increases with the size of the (expected) income shock and the premium. It decreases with the income of the network in the home country and with the income of the immigrant. This results from the fact that remittances are based on  $\alpha$  and the income of the immigrant. A certain amount of remittances can be realized by a high value of  $\alpha$  and a comparably low income of the immigrant or with a low value of  $\alpha$  and high income of the immigrant.

$$\text{Thus we get } R = \alpha Z = \frac{(\Delta Z + \Delta P)}{Z(Y + Z)} * Z = \frac{(\Delta Z + \Delta P)}{(Y + Z)}.$$

Thus the reduced form for  $R^*$  will be

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<sup>4</sup> Constrained by:  $\pi \ln(Z + P) + (1 - \pi) \ln(Z + P - \alpha Z) = \ln(Z)$ ,

$$R^* = \alpha Z = R(+\Delta, +P, -Y, +Z, +\alpha)$$

In other words, remittances received by the network in the home country will depend on the risk premium paid to the immigrant, the income of the immigrant, the size of the income shock in the home country, the income of the network in the home country and the relative importance of the network in the home country for the migrant. These parameters are reflected in the value of  $\alpha$ , the relative importance of the network in the home country for the immigrant.

Obviously, in such a complex context, gender matters. First, the propensity to remit money to different network members in the home country might differ by gender. It could be argued based on cursory evidence that female immigrants tend to send less money home due solely to the gender pay gap. From international studies, we know that women typically have more limited financial resources to remit on average. This again might lead to lower premiums paid to the immigrant by the network—thus, lower remittances are the result. *Accordingly, we can derive our first hypothesis: women remit smaller amounts of money than men (Hypothesis 1).*

The social network abroad is rather complex and might differ between individual immigrants. Thus *the composition of the transnational network has an impact on the amount remitted (Hypothesis 2).* In addition, we have to treat the linkages between gender effects and the structure of transnational network carefully. From the perspective of the immigrant remittances constitute a withdrawal from potential resources. According to our conceptual framework, the relative importance of the network in the home country has a positive impact on remittances. As long as spouses are living abroad, comparably high remittances can be expected. Specific patterns of remittances sent by women might, however, be due to the fact that men and women have different functions in a transnational network. From international

studies, it is well known that men typically support wives and children left in the home country. Women, on the other hand, either take younger children with them or leave them with other (female) network members in the home country. Consequently, they tend to send money to the caregivers. Migrants may also be retaining ties not with the whole network in the home country, but with particular individuals (Dorrit Posel 2001). In addition, the position of the immigrant within the network seems to matter—the amount of remittances depends on whether they are sent by a daughter, wife, mother, or head of household (Curran 1995).

From international studies, we know that in the group of immigrants the percentage of married males with families in the home country is higher than it is among women. In addition, many studies indicate that migration and remittances themselves have significant effects on a woman's relative position in the transnational network (Carlota Ramirez 2005; Orozco, Lowell, and Schneider 2006; Rachel Connelly, Kenneth Roberts, and Zhenzhen Zheng 2010). From international experience we know: "Women's mobility varied according to their position in the household. Married women could not move at will –their husband's power in this regard was clearly apparent. Unmarried women were freer to move, but depended on their position and conditions within the household. They are frequently constraint by their roles as care-givers – responsibility for children, the sick and disable, and for old parents" (Alison Todes 2001:17, 18). Therefore, *the amount of remittances depends on the relative position of the immigrant in the transnational network and the relative importance of the network abroad compared to the network in the destination country (Hypothesis 3).*

The immigrant's integration in the destination country provides an important key to understanding patterns of remittance behavior, and it is one that changes the

overall network structure. The immigrant's acquisition of destination country citizenship has far-reaching implications—not only for the individual immigrant but for the entire network of family and friends. On the one hand, this can be understood as an indicator of integration in the destination country that leads to a reduction in the relative importance of the network in the home country. In addition, it makes chain migration and family reunification much easier. This, again, results in a decreased importance of the network in the home country for immigrant's social life – at the same time the importance of the network in the destination country increases. The effect of acquiring citizenship on the decision to remit is rather large and works the same way for both men and women.<sup>5</sup> *Therefore, we expect that gender effects on remittances are not relevant in the group of immigrants with German citizenship (Hypothesis 4).*

#### **4. Data, subgroups, variables, and method**

As shown above, the multifaceted process of migration and remittances is impossible to understand by means of one or two broad indicators. It requires the consideration of a complex set of individual-level factors: human and social capital, networks in the home country and in the country of destination. In the following, we use indicators from the Socio-Economic Panel (SOEP 2001-06) to test the stated hypotheses for Germany. This representative German household survey contains a complex set of objective and subjective indicators on social status, labor market issues, attitudes, and many other aspects of daily life. The micro data was gathered mainly through face-to-

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<sup>5</sup> However, (social) networks may assume different forms and functions for women and for men that affect settlement outcomes differentially, particularly the acquisition of destination country citizenship (see Jacqueline M. Hagan 1998).

face interviews, with all members in the household since 1984. In 2001, the survey contained 11,947 households with 22,351 respondents from West and East Germany.<sup>6</sup>

### *Immigrants with and without German citizenship*

In 2006, about 6.7 million foreigners were living in Germany—3.3 million of them women (Federal Statistical Office 2010). For a long time, the citizenship of a child born in Germany was determined solely by the parent’s citizenship.<sup>7</sup> Due to the legal framework, many of the people with foreign citizenship living in Germany did not personally experience migration—they were born as in Germany with foreign citizenship. The total number of foreigners living in Germany has decreased over the last decade. During the same period, female migration to Germany has increased (Federal Statistical Office 2010). Today, women make up 49 percent of all foreigners living in Germany, although the proportion varies significantly by home country. While many foreigners were born in Germany, many Germans do have a migration background or even a personal migration history: they received foreign citizenship at birth and became Germans later in life. In general, the propensity to acquire the German citizenship has been decreasing in recent years. In 2009, only about 96,000 foreigners received German citizenship. The majority of these were female (Federal Statistical Office 2010).

We therefore differentiate immigrants into two subgroups (1) “immigrants with foreign citizenship (in the following also referred to as foreigners)” and (2) “immigrants with German citizenship,” who were born with foreign citizenship but

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<sup>6</sup> For sample size information on the SOEP, see Joachim Frick and Ingo Siebert (2010), and for attrition, see Martin Kroh (2010).

<sup>7</sup> Only since 2000 can a child attain German citizenship by being born in Germany even if neither parent is German. One precondition is that one parent has been a legal resident in Germany for eight years and has a right of unlimited residence or an unlimited residence permit for three years.

acquired German citizenship later.<sup>8</sup> Both groups make up about 15 percent of our SOEP sample members (Appendix, Table A1). The total sample contains 19,800 observations for 5,203 immigrants, of whom 2,650 are women.<sup>9</sup> More than half of the immigrant subsample is made up of immigrants with foreign citizenship. Citizens of Turkey, Italy, and the Ex-Yugoslavian countries make up about two-thirds of all foreigner observations in our sample (Appendix, Table A2). The share of immigrants is in line with the official data from the Federal Statistical Office (2010).

### ***Measuring the amount of remittances, human capital, and networks***

Our dependent variable is the “amount of remittances” measured in Euro. Remittances are defined as individual transnational transfers. We therefore use the retrospective question in the SOEP questionnaire: *“Have you personally provided payments or support during the last year (2001) to relatives or other persons outside of your household? How much in the year as a whole? Where does the recipient live? In Germany or abroad?”*<sup>10</sup> All respondents are asked to state whether they transferred money, to whom, and how much. If they did not make transfers, they check the box: *“No, I have not given any payment or support.”* Their answers provide individual information not only on who makes transfers but also on the amount transferred.

Table A1 in the Appendix shows the numbers of immigrants with foreign and German citizenship as well as the share of remittances in the years 2001 to 2006. We include only respondents aged 18 and over. Dividing immigrants by citizenship reveals that about 9 to 12 percent of those with German citizenship and 11 to 16 percent of those with foreign citizenship send money home. Overall 2,076

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<sup>8</sup> Based on the questions: Is your nationality German? Have you had German nationality since birth or did you acquire it at a later date? What is your citizenship?

<sup>9</sup> N=2,820 observations for immigrants with German citizenship (N= 1,458 women) and N= 2,383 observations with foreign citizenship (N= 1,192 women).

<sup>10</sup> For details, see: [http://www.diw.de/en/diw\\_02.c.222729.en/questionnaires.html](http://www.diw.de/en/diw_02.c.222729.en/questionnaires.html)

observations for remittances were made during the period but only 1,995 for the amount of remittances. As we only lost about 8 percent of the observations over all years due to missing information on the place of payment, we decided not to impute or substitute missing values.<sup>11</sup>

Based on our theoretical arguments and findings from the literature, we use several variables as indicators. The Appendix (Table A2) lists the minimum, maximum, means, and standard deviations for all (micro) individual-level independent variables for all immigrants.<sup>12</sup> Life cycle effects are measured by the age of respondents (measured in years). To examine the possibility of a curvilinear relationship—that is, the possibility that the amount of remittances decreases for the very old—we include a quadratic variable for age in our models. To capture the applicability of social transfers and social responsibility for a broader family, we include an indicator of whether the respondent is currently living in a legal partnership or not. Since single-earner households may have different remittance patterns than multiple-earner households, we include not only the monthly individual net labor income but also the monthly family net income (household income minus individual income).<sup>13</sup> To ensure that we capture the role of employment selectivity on remittances the years in education are included. We also use the number of children aged 14 and below to get more information on the household composition in Germany. Further indicators for the network in destination country include the number of adult household members. One relevant indicator is the network in the home country, which is based on the question, “*Do you have family members or close*

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<sup>11</sup> N=1,559 missing values on remittances. The female share in the missing value is about 46 percent.

<sup>12</sup> The highest correlation for our independent variables is found for children below 14 years in household and age (-0.4181\*\*\*).

<sup>13</sup> We weighted the monthly net family income net family income (household income minus individual income) using the equivalent scale given by OECD: 1 for first adult person, 0,5 for each additional adult person and 0,3 for each child.



*friends in the home country you (or your family) come from? Persons in Native Country: Who are they?”*<sup>14</sup>. This information is supplemented with indicators on family network abroad for the years 2001 and 2006.<sup>15</sup>

After excluding all missing information on dependent and independent variables, the pooled data set (2001-06) for analysis contains 6,476 observations for immigrants with foreign citizenship and 3,655 observations for immigrants with German citizenship.

### ***Estimation method***

We use pooled data because the sample contains few immigrants who state that they remit, as reflected in the low numbers of respondents with remittances over the six years. It seems likely that some the immigrants did not send transfers abroad. Thus, not all immigrants remitted within the time period: those who did not were assigned a zero, which is why the data set contains many zeros. For all other respondents, we included the amount of remittances. Since we attempt to explain the transfer amount given, one way to tackle this problem is to use a Tobit model (James Tobin 1958), which has been applied in previous studies on transfers (Merkle and Zimmermann 1992; Edgard Rodriguez 1996; François-Charles Wolff, Seymour Spilerman, and Claudine Attias-Donfut 2007; Sinning 2007; Sencer Ecer and Andrea Tompkins 2010). In the Tobit model, the zero-inflated nature of our dependent variable is considered as a corner solution outcome because the stochastic process that describes the individual decision to send transfers abroad and the one that governs the decision about the amount of transfers do not differ. Therefore, to deal with non-remitters and to account for the censored nature of the dependent variable, we perform

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14 However, this variable is not defined for new entrants starting 2001.

15 Reply to the question: “And now about your close and extended family. Which of the following family members do you have?” For each, the respondent could indicate the number and whether they live in Germany or abroad.

estimations of Tobit models, which enable us to analyze the determinants of the positive amount by assuming non-remitters as left-censored.

Using the Breusch and Pagan Lagrangian multiplier test after OLS justifies running a random effects model. However, when testing for correlation of  $u_i$  and  $x_{it}$  using the Hausman test, we had to reject the  $H_0$ . But we decided to run a random effects model because we are interested in time-invariant effects such as sex and the family network, which do not vary substantially over the observation period. Also we are not interested in variance within but between respondents. We therefore estimate Tobit models with a random effects specification to control for unobserved heterogeneity at the individual level.

## **5. Empirical Results**

Before turning to remittance behavior, we first analyze the basic motivation behind migration to Germany. We focus on the basic question of whether remitting money forms a crucial motivation behind the decision to migrate. In contrast to standard studies (International Bank for Reconstruction and Development/The World Bank Bank 2011), we find that remittances are not the main driving force behind migration to Germany (Table 1).<sup>16</sup> In addition, there are gender-specific differences. Many more females than males migrate to Germany for family reunification. Furthermore, only 6 percent of the female immigrants say that “earning money and supporting family” was a major motivation for migration. The corresponding figure for males was 10 percent in 2006. The general structure of the motivation to migrate seems to be relative stable

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16 First-time respondents have to answer the question “There are many possible reasons for moving to Germany. Which of the following reasons played a role in your decision?” in the SOEP Biography Questionnaire (see Jan Goebel and Anke Böckenhoff 2009). Answer categories include: “I wanted a better life: I wanted a better home, to be able to buy more, etc, I wanted to work and earn money in Germany in order to support my family and save money, I wanted freedom, I wanted to live with my family (spouse, parents, children), There was severe poverty in my native country, I could not live in safety in my native country (persecution, war), I just wanted to live in Germany.”

over time. This holds true for the observed gender differences as well. Consequently, we can expect that standard theoretical models explaining remittances and migration by economic considerations cannot explain the determinants of remittances from Germany. Furthermore, since family reunification and the quality of life in Germany are important factors behind migration, theoretical models based on networks and integration may explain remittances better than standard economic arguments.

*Table 1*

Reasons to migrate to Germany for all immigrants by sex for the years 2001-06

	2001		2006	
	Women	Men	Women	Men
Reasons:		(in percent)		
Family reunification	24	18	25	19
Better life	15	16	14	15
Just want to live in Germany	15	13	15	14
Live in freedom	12	14	12	14
Poverty in the country of origin	8	9	8	9
War in the country of origin	8	9	7	8
Earn money in Germany and support family (remittances)	6	11	6	10
Other reasons (not classified)	11	11	12	11
Total	100	100	100	100
Total (N)	1,354	1,257	1,018	864
Valid cases (N)	787	692	590	478

Note: Results are not weighted; multiple responses, N=19 800 immigrants.

Table 2 provides some basic information about the average and median of the annual amount of remittances sent by men and women, separated by immigrants with foreign and German citizenship. In general, those with foreign citizenship remit more money than those with German citizenship. This finding holds true for both women and men. The legal status of the immigrant has a great influence on the decision to remit. After naturalization, family reunification in Germany becomes much easier,

and close family members receive direct or indirect access to the German welfare system. Consequently, remittances decrease.

However, in both groups, women remit less money than men. In 2006, the average amount remitted by women with foreign citizenship accounted for only about 50 percent of the average amount remitted by men with foreign citizenship. However, women remit a higher share of their own labor income than men, as shown in Table 2. In addition, we know from international studies that women tend to make more non-monetary and social remittances than men. Women more often remit food, clothes, and household items and also provide a greater variety of types of support (Leah Karin VanWey 2004). Women also tend to be less involved in investment projects, as they often have less access to the formal economy. Despite the fact that we do not have sufficient data to prove these assumptions for Germany, they have to be considered when discussing and interpreting monetary remittances.

*Table 2*

Amount of remittances sent abroad and remittance-income relation by subgroup and sex for the years 2001-06

	Sum mean (in euro)		Sum median (in euro)		Median of remittance/ income relation (in percent)	
	2001	2006	2001	2006	2001	2006
<i>Immigrants with German citizenship</i>						
Women	831	968	511	500	3.8	3.3
Men	1,634	1,034	767	600	3.1	2.0
<i>Immigrants with foreign citizenship</i>						
Women	1,545	1,539	1,023	1,000	7.5	6.5
Men	2,153	3,165	1,023	1,500	4.4	4.5

Note: Respondents older than 18 years living in private households; results are weighted for mean; remittance-income relation is calculated by division of annual remittances by annual individual labor income; respondents without labor income (without remittances) have been excluded.

We proceed in several steps: First, we estimate a “core” equation, which gives insights to the explanatory power of our indicators (Models A and B). Second, since we want to obtain further insights into network effects in remittances, we estimate an extended model by adding indicators on the network in the home country (Models C and D).<sup>17</sup> All models are shown in table 3. Third, and most important, we use the full model and introduce (gender) interaction terms to check for differences in the amount remitted between men and women in the explanatory variables (Models E and F). For all models, we present marginal effects (to the mean), significance, standard errors, and log-likelihood for model fit.<sup>18</sup>

Overall we expect different remittances patterns due to integration outcomes in the country of destination, that’s why all the models are estimated separately for immigrants with foreign citizenship and with German citizenship. Since one cannot presume that the coefficients of both groups differ statistically significantly, we tested differences in coefficients. The Chow test justified separate regressions for immigrants with foreign citizenship and immigrants with German citizenship (results are shown in Notes Table 3). Thus, both groups show different pattern in amount of remittances.

Among immigrants with *foreign citizenship*, our first hypothesis is confirmed: women remit significantly lower amounts of money than men (Table 3, Model A). Further, older or better educated immigrants with foreign citizenship give more money than younger or those with lower education level. Being married as an indicator of social responsibility for a broader family leads to higher remittances. The

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<sup>17</sup> We can provide the estimates among women and among men on request.

<sup>18</sup> The tables presented show standard errors: “Standard errors are considered essential because they provide an estimate of the extent of variation or uncertainty around the point estimate, allowing readers to exercise caution in interpreting a coefficient with a large estimated standard error.” (Yana Rodgers and Jane Miller 2008: 129).

same holds true for higher individual and household income. Network indicators of the destination country show that with increasing number of adult household members and increasing number of children below the age of 14 in Germany the amount of remittances send abroad decreases. This is also the case with the time spend in Germany: The longer the immigrant with foreign citizenship lives in Germany, the more likely the chain migration of further family members, the lower the amount of remittances. Indeed, we see that those willing to return to the home country give more money aboard than those who want to stay in Germany. All in all, the results reported support the view that remittances can be at least partly considered as a tool for international insurance and risk diversification within a transnational network. Now we check the explanatory power of the network in the home country for immigrants with foreign citizenship (Table 3, Model C). Basically, we find that having a close family network, consisting of parents, children, spouses and other relatives (such as aunt and uncle), in the home country leads to higher remittances for immigrants with foreign citizenship. In contrast, having friends in the home country has no significant impact on amount of remittances. Those immigrants with foreign citizenship in Germany who have spouses or children abroad give the most money.

Thus the composition of the transnational network has an impact on the amount remitted. Hypothesis 2 is confirmed. However, even if the network in the home country is considered, gender differences in amount of remittances send remain for immigrants with foreign citizenship. In other words, taking immigrants with foreign citizenship, gender differences in remitting cannot be explained completely by the existence of the network.

Our findings show remarkable differences in the remittance patterns among immigrants with German citizenship. Immigrant women with *German citizenship* do

not give less money abroad than men (Table 3, Model B). This confirms hypothesis 4, which states that gender effects on remittances are not as important in the group of immigrants with German citizenship. Therefore, we can assume that the acquisition of German citizenship dominates the overall decision to remit. Referring to our theoretical considerations, it can be argued that the relative importance of the network in the home country decreases with naturalization. Males and females are affected by this in a similar way. Turning now to the results of the model with network variables, two findings are of interest: having a spouse in the home country does not lead to higher remittances but having siblings and friends, next to parents and children, abroad increases the amount of remittances (Table 3, Model D). Since family reunification is comparably easy for this group, living in two countries might be a conscious decision not to live together but to be independent. Our finding might therefore result empirically from partnership features. However, what is important is that the network in the home country is important for explaining remittances and if the structure of the network in the home country changes the remittances change.

Table 3 Determinants of (ln) amount of remittances for years 2001-06: Core models A and B and network models C and D

	<i>Immigrants with foreign citizenship</i>		<i>Immigrants with German citizenship</i>	
	(Model A)	(Model C)	(Model B)	(Model D)
Women	-0.274 (0.127)**	-0.275 (0.123)**	-0.206 (0.134)	-0.198 (0.129)
Age	0.136 (0.032)***	0.110 (0.032)***	0.074 (0.027)***	0.043 (0.027)
Age squared	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)**	-0.000 (0.000)
Married	0.272 (0.148)*	0.377 (0.145)**	0.435 (0.152)**	0.440 (0.149)**
Years in education	0.050 (0.025)**	0.052 (0.024)**	0.091 (0.028)**	0.077 (0.027)**
(ln) Monthly individual labour income	0.095 (0.015)***	0.093 (0.014)***	0.076 (0.017)***	0.073 (0.017)***
(ln) Monthly net equivalent family income	0.050 (0.029)*	0.047 (0.029)	0.064 (0.036)*	0.057 (0.035)
Relative duration of stay	-1.343 (0.287)***	-1.028 (0.297)***	-1.647 (0.353)***	-1.514 (0.349)***
Remigration plans	0.208 (0.081)**	0.163 (0.079)**	0.441 (0.179)**	0.354 (0.172)**
Household size in Germany	-0.143 (0.054)**	-0.117 (0.052)**	-0.118 (0.056)**	-0.107 (0.055)**
Number of children aged 14 and below in Germany	-0.231 (0.059)***	-0.219 (0.057)***	0.025 (0.058)	0.015 (0.056)
(Grand)Parents abroad		0.272 (0.127)**		0.328 (0.161)**
Children abroad		0.949 (0.198)***		0.661 (0.298)**
Siblings abroad		-0.063 (0.117)		0.402 (0.150)**

to be continued



Table 3 Continued

	<i>Immigrants with foreign citizenship</i>		<i>Immigrants with German citizenship</i>	
	(Model A)	(Model C)	(Model B)	(Model D)
Spouses abroad		1.590 (0.640)**		0.552 (0.912)
Other relatives abroad		0.378 (0.109)***		0.341 (0.145)**
Friends abroad		0.177 (0.270)		0.377 (0.227)*
N observations	6,476	6,476	3,655	3,655
N respondents	1,628	1,628	1,179	1,179
Log-likelihood	-4,304.51	-4,272.02	-3,012.33	-2,983.19

Note: Marginal effects  $dy/dx$  after xttobit ( $y = E(\log \text{ amount remittances} | \log \text{ amount remittances} > 0)$ ) (predict, e0(0, .)) (Model A and B: 5.537 for immigrants with foreign citizenship and 4.886 for immigrants with German citizenship) (Model C and D: 5.325 for immigrants with foreign citizenship and 4.704 for immigrants with German citizenship); Standard errors in parentheses;

Chow-Test for differences in coefficients for immigrants with foreign citizenship: (1) Core model (A/B)  $\chi^2=52.73$ ,  $p\text{-value}=0.000$ ,  $df=19$ ; (2) network model (C/D)  $\chi^2=74.51$ ,  $p\text{-value}=0.000$ ,  $df=25$ ;

The regression also includes five-year dummies and two flags for imputation of income, are not shown in table.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

So far, we have analyzed the different network effects. But, are there differences in remittances behavior between men and women? So far, we have shown that immigrant women with foreign citizenship give lower amounts of money abroad than their male counterparts. But what does this mean with respect to the transnational network? And do our results mean that the amount remitted by immigrants with German citizenship does not follow gender-specific patterns? To answer this question, we add (gender) interaction terms for all variables of interest (Table 4). Looking at the two groups of immigrants with foreign citizenship and with German citizenship, we can identify gender-specific network effects on the amount of remittances.<sup>19</sup>

We find that with an increasing number of household members in Germany, immigrant women with foreign citizenship remit less than men. In contrast, if they have parents abroad, they remit more than men. This finding is especially interesting when taking into account that women remit less than men if children are abroad. Putting both results together might shed some light on this apparent conundrum. Women are less likely to migrate if they have to leave a small child in the home country than men. But if they make this choice, someone has to care for the children. It can be assumed that close relatives such as parents often take on this responsibility. A second interesting finding is that immigrant women with foreign citizenship remit less than men if they have remigration plans. According to our conceptual framework, remittances depend on the income of the immigrant and the relative importance and premium of the network in the home country. A lower premium leads to lower remittances. In general, the premium consists of payments to finance migration and the promise to support the immigrant in the case of remigration. The willingness to

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<sup>19</sup> The Chow test justified separate regressions for men and women for immigrants with German citizenship but not for immigrants with foreign citizenship (results are shown in Notes, Table 4).

*Table 4*

Determinants of (ln) amount of remittances for years 2001-06:  
 Network models E and F with interaction terms

	<i>Immigrants with foreign citizenship (Model E)</i>	<i>Immigrants with German citizenship (Model F)</i>
Women	1.333 (1.510)	-0.577 (1.355)
Age	0.148 (0.045)***	0.029 (0.039)
Age squared	-0.001 (0.000)***	-0.000 (0.000)
Married	0.260 (0.202)	0.508 (0.246)**
Years in education	0.050 (0.034)	0.092 (0.044)**
(ln) Monthly individual labor Income	0.084 (0.021)***	0.128 (0.032)***
(ln) Monthly net equivalent family income	0.021 (0.034)	0.021 (0.042)
Relative duration of stay	-0.658 (0.398)*	-1.339 (0.501)**
Remigration plans	0.278 (0.108)**	0.679 (0.273)**
Household size in Germany	-0.045 (0.067)	-0.163 (0.081)**
Number of children aged 14 and below in Germany	-0.187 (0.076)**	0.015 (0.075)
(Grand)Parents abroad	0.055 (0.167)	0.515 (0.246)**
Children abroad	1.203 (0.280)***	0.953 (0.460)**
Siblings abroad	0.016 (0.153)	0.279 (0.219)
Spouses abroad	1.996 (0.943)**	-3.151 (23.041)
Other relatives abroad	0.357 (0.147)**	0.493 (0.219)**
Friends abroad	0.656 (0.457)	0.175 (0.306)

to be continued

Table 4 Continued

	<i>Immigrants with foreign citizenship (Model E)</i>	<i>Immigrants with German citizenship (Model F)</i>
<i>Interaction Terms</i>		
Age * women	-0.068 (0.064)	0.018 (0.052)
Age squared * women	0.001 (0.000)	-0.000 (0.000)
Married * women	0.222 (0.316)	-0.152 (0.324)
Years in education * women	-0.012 (0.048)	-0.025 (0.054)
Ind. labor income * women	0.022 (0.029)	-0.102 (0.037)**
Family income * women	0.085 (0.068)	0.147 (0.078)*
Relative duration of stay * women	-0.691 (0.582)	-0.419 (0.618)
Remigration plans * women	-0.248 (0.149)*	-0.490 (0.272)*
Household size in Germany * women	-0.194 (0.106)*	0.106 (0.108)
Number of children * women	-0.076 (0.115)	-0.068 (0.112)
(Grand)Parents abroad * women	0.513 (0.271)*	-0.316 (0.282)
Children abroad * women	-0.473 (0.284)*	-0.402 (0.427)
Siblings abroad * women	-0.171 (0.226)	0.143 (0.290)
Spouses abroad * women	-0.598 (0.721)	35.984 (882.390)
Other relatives abroad * women	0.017 (0.214)	-0.250 (0.258)
Friends abroad * women	-0.716 (0.412)*	0.365 (0.449)
N observations	6,476	3,655
N respondents	1,628	1,179
Log-likelihood	-4,260.67	-2,964.76

Note: Marginal effects  $dy/dx$  after xttobit ( $y = E(\log \text{ amount remittances} | \log \text{ amount remittances} > 0)$ ) (predict,  $e0(0, .)$ ) (5.238 for immigrants with foreign citizenship and 4.570 for immigrants with German citizenship); Standard errors in parentheses;

Chow-Test for differences in coefficients for women (1) immigrants with foreign citizenship:  $\chi^2=27.07$ ,  $p\text{-value}=0.103$ ,  $df=19$ ; (2) immigrants with German citizenship:  $\chi^2=34.01$ ,  $p\text{-value}=0.018$ ,  $df=19$  (without year dummies);

The regression further includes year dummies and flags for imputation of income, not shown in table.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

pay a premium depends on the expected remittances. Due to the existing gender pay gap in Germany, it is rational from the point of view of the network in the home country that it expects lower remittances by females than by males. If expected remittances are lower for female migration, it makes sense to also cut the premium paid. This gives rise to an interesting gender specific circle and might explain at least partly gender specific remittances patterns. The results confirm hypothesis 3 that the amount of remittances depends on the relative position of the immigrant in the transnational network and the relative importance of the network abroad for the immigrant.

## **6. Conclusions**

Our findings show that in Germany, family reunification is a much more important motivation for women to migrate than for men. Family reunification has an enormous impact on the overall structure of the immigrant's transnational network. Typically, family reunification in the immigrant's destination country decreases the number of network members in the home country. This might reduce the necessity to make remittances to remaining network members.

In this paper, we have developed a basic theoretical framework that allows us to analyze gender-specific network effects on remittances. Remittances depend not only on the income situation of the immigrant and the network in the home country, but also on the relative importance of the network members in the immigrant's social life. In addition, the network can increase the incentives for remittances by paying the immigrant a certain "premium." In practice, this premium could help the immigrant to cover migration and possible remigration costs.

In the empirical part of the paper, we have identified a link between gender and remittances in the group of foreigners but not in the group of immigrants with German citizenship. This could be due to the fact that acquisition of German citizenship makes family reunification easier while simultaneously decreasing the number of network members in the home country. As a result, the overall importance of remittances decreases. In addition, we have shown that the composition and structure of the network abroad influences remittances. In the group of foreigners, significantly more money is remitted if members of the immediate family live abroad. In contrast, in the case of immigrants with German citizenship, the existence of a broader network plays an important role.

In the case of foreigners, the gender effect becomes insignificant when we introduce gender interaction terms that allow us to better understand gender-specific remittance patterns. We find that females remit less than males if they have children in the home country, while they remit more than males if (grand)parents are living abroad. Unfortunately, our data set does not allow us to control for the age of children in the home country. However, from international studies, we know that women rarely leave their young children in the home country without caregivers. It can therefore be assumed that women remit money for younger children to close family members. In addition, it can be assumed that men leave small children in the home country more often than women. There also seems to be evidence that men leave a higher number of small children behind. However, again due to data restrictions, we were not able to analyze this phenomenon in greater depth.

This study can be considered a first step in the analysis of remittances from the perspective of gender economics. The analysis of linkages between the structure of transnational networks and gender-specific remittance behavior also points to a

potentially interesting direction for future research. One natural extension of this study would be a more in-depth investigation of the social determinants of remittances, possibly linking the networks literature to the economic literature on remittances. Such a study should analyze how the quality of the transnational network influences the decision to remit, and should also include a broader set of different forms of transfers, such as social remittances and in-kind transfers.

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## Appendix

*Table A1*

Number of respondents in the sample for years 2001-06 (SOEP)

	<i>All immigrants</i>			<i>Immigrants with German citizenship<sup>1</sup></i>			<i>Immigrants with foreign citizenship<sup>2</sup></i>		
	N	Share total population (in percent)	Share women (in percent)	N	N with remittances	Share remittances (in percent)	N	N with remittances	Share remittances (in percent)
2001	3,536	14.5	51.4	1,530	185	10.0	2,006	255	15.1
2002	4,038	14.7	50.5	2,158	174	9.3	1,880	213	11.7
2003	3,192	14.5	51.3	1,475	163	11.8	1,717	191	15.7
2004	3,099	14.7	51.7	1,494	140	9.5	1,605	158	12.7
2005	2,917	15.1	52.3	1,398	137	11.3	1,519	161	14.2
2006	3,018	15.4	52.5	1,547	147	11.3	1,471	152	11.0

Note: 1 “AussiedlerInnen” and respondents with German citizenship; 2 respondents with foreign citizenship; only respondents aged 18 and over; percentages are weighted; total N= 3 364 observations for transfers abroad for all respondents (incl. not immigrants) 2001-06; excluded: N=1334 observations without incidence of transfer, N= 1 384 observation without place of transfer.

Table A2

Descriptive statistics for individual characteristics of all immigrants for the years 2001-06 (SOEP)

Variable	Description	Minimum	Maximum	Mean	SD
Annual amount of remittances (N=1,995)	Annual amount of payments to relatives (or other persons not living in household) (in euros) 3,542.53	5	99,999	1,709.64	
Immigrants with foreign citizenship (N=10,198)	Respondents with other than German nationality	0	1	0.52	0.49
...with ... citizenship	Turkish	0	1	0.33	0.47
	Italian	0	1	0.16	0.37
	Yugoslavian	0	1	0.16	0.37
	Greek	0	1	0.09	0.28
Immigrants with German citizenship (N=9,602)	Naturalized citizens: Respondents received German citizenship some time later (incl. ethnic Germans)	0	1	0.48	0.49
Gender	Women	0	1	0.52	0.49
Age	Age of respondents (in years)	18	97	45.03	16.42
Marital status	Respondents who are legally married	0	1	0.73	0.45
Years in education	Number of years respondent spend on schooling	7	18	10.99	2.59
Monthly individual labor income	Monthly net individual labor income (in euro) 1,077.99	0	25,000	795.52	
Equivalent family income	Monthly net equivalent "household income minus individual income" (new OECD scale) (in euro) 3,436.31	1	337,080	1,098.60	
Relative duration of stay	Duration of German residence divided by age in years	0.03	1.00	0.51	0.23
Remigration plan	Respondents who wish to return to the country of origin	0	1	0.24	0.43
Household size in Germany	Number of person living in household (only adult Household members, aged 15 and above)	1	9	2.53	1.06
Children in Germany	Number of children aged 14 and below in Household in Germany	0	7	0.64	1.00

to be continued

Table A2 Continued

Variable	Description	Minimum	Maximum	Mean	SD
(Grand)Parents abroad	Respondent has parents or grandparents living abroad	0	1	0.32	0.47
Children abroad	Respondent has children or grandchildren living abroad	0	1	0.08	0.27
Spouse abroad	Respondent has spouse or partner living abroad	0	1	0.01	0.10
Siblings abroad	Respondent has sibling living abroad	0	1	0.37	0.48
Other relatives abroad	Respondent has other relatives (e.g., aunt, uncle, niece) living abroad	0	1	0.38	0.48
Friends abroad	Respondent has friends living abroad	0	1	0.06	0.24

Note: Only respondents aged 18 and over for all immigrants (immigrants with foreign and German citizenship); N=19800, Results not weighted.