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***Remitting Behaviour of Turkish Migrants:
Evidence from Household Data in Germany***

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ISBN: 978-1-907247-14-9

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April 2010

BWPI Working Paper 115

Creating and sharing knowledge to help end poverty

www.manchester.ac.uk/bwpi

Abstract

This paper provides an empirical analysis of the remittances of Turkish migrants using data from 590 households in Berlin. It distinguishes between migrants who do and do not intend to return to Turkey and the different uses of remittances. The findings show that those migrants who intend to return remit mostly for reasons of self-interest, while those with no such intention remit for reasons of tempered altruism. There is no evidence of pure altruism in any of the samples. In addition, remitters are more likely to increase the amount of remittances where they are to be spent on education and investment. The same relationship does not hold for basic needs.

Keywords: remittances; household data; Turkish migrants; IV regression

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Acknowledgements: The author would like to thank the Nuffield Foundation for funding this research; German Institute for Economic Research (DIW Berlin) for its support; Alexander M. Danzer for his help throughout the fieldwork; Serdar Sayan, Ali Cevat Tasiran, Kyriakos Neanidis, Kunal Sen, Armando Barrientos, and the participants of the seminar at Brandeis University for their constructive feedback and comments; and the research assistants, Zeycan Yesilkaya, Fatma Goksu, Gulhan Yildirim, Cagri Kahveci, Deniz Erkan, Alper Yenilmez and Rut Gollan, for their excellent work on interviews and data entry.

1. Introduction

In the last decade, remittances have emerged as one of the largest and potentially most effective sources of foreign financing in promoting development. Although there is no consensus on the positive impact of remittances on development, there is an extensive body of work indicating their developmental impact. The strength of remittances as a development tool arises from a number of their characteristics. They constitute the second largest source of foreign financial flows to developing countries after foreign direct investment (World Bank, 2006), tend to increase in times of economic hardship, go directly to the people who need them, and are stable (Kapur, 2004; Ratha, 2003). There is also strong evidence that they alleviate poverty (Adams and Page, 2005) and promote human and physical capital accumulation, economic growth and income generating activities in developing and less developed countries (Taylor, 1992; Adams, 1998; Ziesemer, 2008; Woodruff and Zenteno, 2001).

As Turkey is both one of the largest sources of emigration and receivers of remittances, the country has great potential to augment its remittances flows and promote their impact on its growth and development. Although its official remittances have declined somewhat during the last decade, the total of official and unofficial remittances flows to Turkey was estimated as US\$7.5 billion in 2006, the second largest amount received in the Middle East (International Fund for Agriculture Development, 2007).¹ Given that the majority of these remittances are from Germany, examining the remitting behaviour of Turkish migrants in Germany is crucial to our understanding of the developmental potential of remittances for Turkey.²

Although there are a number of recent macro-level studies on the determinants of remittances of Turkish migrants, there is a big gap in micro-level research. Among the macro-studies, Sayan (2004), Sayan and Tekin-Koru (2007) and Durdu and Sayan (2008) show that remittances flows from Germany are procyclical with Turkey's output, suggesting that Turkish migrants in Germany do not remit for altruistic reasons. The findings of Alper and Neyapti (2006) and Aydas et al. (2005) provide evidence that remittances are used for both consumption and investment, although in both studies investment is more dominant in the long term. Akkoyunlu and Kholodilin (2008), on the other hand, show that remittances from Germany were procyclical with Turkey's output until 1974, after which they become acyclical. In addition to the level of output in the host and home countries, the market premium, interest rate differential, inflation rate, and military regime also seem to be important determinants of remittances flows to Turkey (Aydas et al., 2005).

¹ Until 2003, official remittances flows to Turkey had been among the largest ten in the world (World Bank, 2006). The sharp decline in 2003 partly reflects the fact that the Central Bank of Turkey reclassified workers' remittances so as to exclude foreign exchange accounts and money spent during visits to Turkey (Mouhoud et al., 2006).

² According to the World Bank (2008), Turkey is the seventh largest country of emigration and the Turkey-Germany migration corridor is the fifth largest in the world. In 2007, 68.4 percent of total remittances flows to Turkey came from Germany (Unan, 2009). Turkey's biggest emigration took place during 1961-1974 due to the recruitment of Turkish Guest Workers by several European governments. During this time, 800,000 workers migrated to Europe, 649,000 of whom settled in West Germany (Icduygu, 2009), which remains the largest community of Turkish migrants in the world. As of 2007, 2,738, 551 are resident in Germany, of whom 755,000 hold German citizenship but were once Turkish citizens, and 270,000 are German citizens with at least one Turkish citizen as a parent (European Stability Initiative, 2008).

To the best of our knowledge, Unan (2009) provides the only micro-level econometric analysis of the determinants of remittances of Turkish migrants. She uses data from 197 Turkish migrants residing in France and finds that familial linkages and exchange motivation are the main determinants of their remittances. The remaining micro-level studies focus on the impact of remittances rather than their determinants and they do not use up-to-date data. Among these, Koc and Onan (2004) employ nationwide household data collected in 1996 and conclude that remittances improve the welfare of recipient households. Day and Icduygu (1999) use data from 234 individuals in Turkey during 1992-1993 and show that returned migrants and their relatives have a higher consumption pattern and are more progressive than non-migrants. In addition, remittances do not seem to reduce imbalances between regions in Turkey, although they improve the lives of migrant households (Keles, 1985) and they are often used for the maintenance of migrants' families and are spent on investment in property or new enterprise (Atalik and Beeley, 1993).³

Given this background, we attempt to fill the gap in the literature by employing a comprehensive up-to-date database of Turkish households in Berlin in 2007 to examine the determinants of their remittances. This study contributes to the literature in some important ways. It is the first to investigate the determinants of remittances of Turkish migrants in Germany using micro-level data. It is also one of the first studies providing a separate analysis of remittances for those migrants who do and do not intend to return to Turkey, in order to investigate the proposition that the remitting behaviour of these two groups might be different. Finally, different from the previous studies, it assesses the impact on the size of remittances of their different uses using ordinary least squares (OLS) and instrumental variable (IV) regression analyses.

The remainder of the paper is organised as follows. The next section provides a brief overview of the theoretical and empirical literature, Section 3 presents the data and methodology, Section 4 provides information about the socio-economic and demographic background of Turkish households in Berlin and Germany and their remittance profile using descriptive statistics; Section 5 reports the findings of the econometric analysis, and Section 6 concludes.

2. Overview of the theoretical and empirical literature

The theoretical framework for migrants' remitting behaviour is centred on three main motivational models: altruism, self-interest and mutual intertemporal arrangements. According to the altruism model, migrants send money back home because the family's wellbeing is an important determinant of their own wellbeing (Johnson and Whitelaw, 1974). Thus, in the altruism model, remittances are expected to be positively associated with the migrant's income and negatively associated with the recipient's income. They should also decay over time, as family ties become

³ Although some studies, such as Merkle and Zimmerman (1992), Piracha and Zhu (2007), Sinning (2007), and Dustmann and Mestres (2010), analyse the remittances of all major migrant groups in Germany, they do not provide a separate analysis of the remittances of Turkish migrants. According to these studies, remittances of the major migrant groups in Germany are positively associated with income, age, an intention to return to the home country, being married and being employed, and are negatively associated with household size and age squared.

weaker the longer the migrant is away from the home country (Rapoport and Docquier, 2005). Remittances motivated by self-interest are generally sent to secure the migrant's inheritance and to invest in his/her physical and social capital (Bernheim et al., 1985; Hoddinott 1994; Stark 1995). In this case, remittances are not expected to decay over time, and migrants are assumed to have close ties to the home country and a strong intention to return.⁴

The mutual intertemporal arrangement model encompasses different forms of arrangements. The two most cited are risk sharing and insurance (Lucas and Stark, 1985), and implicit loan agreements (Poirine, 1997). Risk sharing and insurance refers to the understanding between the migrant and their family that they will support each other through bad times. In this case, there should be a negative correlation between the recipient family's income and remittances. In implicit loan agreements, the migrants are expected to pay back the costs of education and migration to their families in the home country (Stark and Bloom, 1985; Poirine, 1997). This motivation can be tested by investigating the relationship between remittances and education level (Johnson and Whitelaw, 1974) and the distance from the home country (Salomone, 2006).

The most consistent findings on the empirical determinants of remittances are that the migrant's income and social ties to the home country play an important role in their remittances (i.e. Clark and Drinkwater, 2007; Blue, 2004). In addition, the studies show that an intention to return to home country (Merkle and Zimmermann, 1992; Glytsos 1997), having a higher level of education (Durand et al., 1996) and being employed (Funkhouser, 1995) have a positive impact on remittances. Evidence on the motivational models is also extensive. For example, Lucas and Stark (1985) show that remittances of migrants in Botswana are determined by self-interest, given that there is a positive relationship between their remittances and the recipients' income. According to Osili (2001) and DeSipio (2000), remittances of Nigerian and Latino migrants in the US are determined by altruism, as they are negatively related to the wealth of the recipient and positively related to their need for health care. On the other hand, Poirine (1997) shows that the remittances of West Samoan migrants in Australia are motivated by implicit loan agreements, in that they are positively related to the migrants' university-level education and are used for consumption and investment in housing.

3. Data and methodology

Our data covers 590 Turkish households in different districts of Berlin in 2007. Berlin has been chosen as the focus of the study, as it contains the largest Turkish community outside Turkey and is one of the most cosmopolitan and economically dynamic cities in Germany, enabling us to collect information on households from different social and economic backgrounds. Data has been collected through a stratified random sampling strategy within the eight major districts of Berlin that contain 98 percent of Berlin's Turkish population. To ensure the right representation from each district, the distribution of the number of households across districts has been determined in proportion to the size of the Turkish population in each district (Table 1).

⁴ Migrants' remittances can also be determined by a combination of self-interest and altruism motivations. This hybrid model has first been pointed out by Lucas and Stark (1985) and termed as 'tempered altruism motivation'.

Data was collected through face-to-face interviews, which were conducted in public spaces, such as parks, streets, in front of houses, workplaces, and popular meeting points of the Turkish population, such as cafés, shops, clubs, community centres and organisations. Only households who are sending money to Turkey are included in the sample, as the determinants of the remittances of Turkish households are the main focus of the project. The interviewees were asked to keep a record of the people who said they did not send money back home. They reported that on average about three in every ten Turkish individuals they approached did not send any money home.

Given that we have employed a random sampling strategy, and the descriptive statistics of the key variables from our data are close to those obtained from the national statistics, as seen in Table 2, we can assert that our data is largely representative of Turkish migrants in Germany. We also computed the total remittance amount of Turkish migrants in Germany from our data as \$923 million in 2007. This is comparable to the figure from Bundesbank documented in Akkoyunlu and Kholodilin (2008) as \$850 million in 2006, providing support for the representativeness of our remittances data.⁵

The most established micro-level database on migrant groups in Germany is the German Socio-Economic Panel Data (GSOEP), which includes detailed demographic and socio-economic information on a nationwide sample of natives and migrants aged between 16 and 65, and has been collected annually since 1984. Although GSOEP is the most comprehensive database on the major migrant groups in Germany, it includes only 435 Turkish individuals. Furthermore, some of these are from the same household and some are below the age of 18 and therefore not economically active, making the sample size of data on the remittances of Turkish migrants too small to conduct a separate analysis. Our data covers 590 distinct households in Berlin and includes very detailed information on the socio-economic characteristics of the households, their remittances, family and friend networks and financial assets, enabling us to provide a thorough econometric analysis of the remittances of Turkish households.

4. Stylised facts

This section provides an overview of the demographic, social and economic characteristics of Turkish households in Berlin. The summary statistics for the full sample are reported in the first columns of Tables 3 and 4. As seen from the tables, the average monthly net income and savings of a Turkish household is €1857 and €239, respectively, and their average yearly remittances are €1347.⁶ Respondents' average age, years of education, time spent in Germany and the number of years remittances have been sent are 42, 11, 25 and 15 years, respectively.⁷ In addition, 47 percent of the respondents were educated in Germany, 16 percent were born in Germany, 36

⁵ Total remittance amount of Turkish households in Germany is computed by multiplying the average annual remittance amount of a household from our data (€1347) with the total number of remittance sending households in Germany ($0.70 \times 720,000$) and converting the resulting amount to the \$US.

⁶ According to our data, average monthly per capita income of a Turkish household in Berlin is €619, which is comparable to the same figure reported in ESI (2008) as €525.

⁷ Our data is restricted to individuals aged 21 and over, which increases the average age to 42.

percent are in full-time employment, 11 percent own their business, 43 percent intend to return to Turkey, and 41 percent have fixed assets in Turkey, compared to 19 percent who have fixed assets in Germany. Regarding the key characteristics of the recipient households, their average monthly net income is €336 (excluding remittances received); 43 percent of the heads of recipient households are fully employed and 49 percent of them are considered poor by Turkey's living standards. Furthermore, 70 percent of the households send remittances for basic needs, followed by 45 percent and 20 percent of the households sending them for education and investment, respectively.⁸

The summary statistics of the variables for the migrants who do and do not intend to return to Turkey are reported in the last two columns of Table 3 and 4. As evident in these tables, these two groups are very similar in terms of most of the indicators of their socio-economic background and family and friend networks in Turkey and Germany. The only differences between these two groups are that, on average, migrants who intend to return earn more (by €192), save more (by €59), send more remittances (by €472), are more likely to have full-time employment (by 11 percent) and are more likely to hold fixed assets in Turkey (by eight percent) than those who do not intend to return. This supports the findings of the previous studies, i.e. Bauer and Sinning (2005) and Dustmann and Mestres (2010). In addition, they seem to spend marginally less time in Germany (by four years) and send remittances for a slightly shorter period (by three years).

To gain insight into the main socio-economic characteristics of the first and second generations of Turkish migrants in Germany, in Table 5 we also report the summary statistics of the key variables for these two groups, as well as those who were born in Germany.⁹ As expected, second generation migrants and migrants who were born in Germany earn more (by €354), have more years of education (by five years) and are more likely to be fully employed (by 40 percent) than first generation migrants.¹⁰ Unsurprisingly, first generation migrants are more likely to hold fixed assets in Turkey, while second generation migrants are more likely to have fixed assets in Germany. Two interesting points revealed by these statistics are that second generation migrants send slightly larger remittances and are more likely to intend to return to Turkey than first generation migrants, suggesting that, contrary to general belief, Turkish migrants continue to maintain strong economic and social linkages with Turkey.¹¹

Lastly, in Table 6 we report the remittance profile of Turkish households. Considering that the Southern, Midland and Western regions of Turkey are richer than the Eastern and Northern regions, our data reveal that the remitters tend to send more of their income to the richer regions of Turkey. Although the income share of remittances tends to increase with age and education, it seems to fluctuate with the duration of residency in Germany. In addition, households whose heads

⁸ These figures are not mutually exclusive, in that households can send remittances for more than one reason, which is why the total share of households sending remittances for investment, education and basic needs is higher than 100.

⁹ Those who were born in Germany are also included in the second generation migrant groups. We provide summary statistics for them separately to see if there is any difference between second generation Turkish migrants who were born in Germany and those who came to Germany at a young age.

¹⁰ The difference in the employment rates of first and second generation migrants stems from the fact that first generation migrants are more likely to be retired than second generation migrants.

¹¹ It should also be noted that the reason for a lower percentage of first generation migrants intending to return to Turkey is because they are more likely to have gone back to Turkey than are second generation migrants.

have full-time wage employment or are retired remit a larger share of their income, followed by those who own a business or are self-employed, while those with unemployed heads remit a lower share of their income. This implies that the households with more stable source of income tend to remit a higher fraction of their income.

Regarding the remittances across the demographic variables, the table shows that households with male heads send more than those with female heads, both in terms of the absolute value of remittances and their income share. Both married and single households tend to remit about the same fractions of their income; however, households with no children tend to remit a higher fraction of their income compared to households with children. In addition, although the absolute value of remittances increases with the size of household, income share of remittances decreases with it, reflecting the fact that a higher share of income is spent on maintaining a larger household.

Interestingly, households that have heads with German education and citizenship send larger amounts of remittances in absolute terms; however, they send a lower share of their income compared to households that have heads with Turkish education and citizenship. In terms of the key economic characteristics of the recipient households, the table shows that the recipient households that are poor and have heads who are not fully employed receive only marginally larger remittances compared to those with higher income and fully employed heads. Among the different end uses of remittances, households tend to send the highest amounts of remittances for investment, almost twice of the average amount of remittances, suggesting that the size of Turkish migrants' remittances is very responsive to their use for investment. Regarding the use of remittances for education and basic needs, the table reveals that the remittances sent for education are more than the average amount of remittances, while those sent for basic needs are less than the average amount. Finally, households sending regular remittances, which constitute 35 percent of all households, send about €450 more than the average amount of remittances.

5. Econometric analysis

Econometric analysis of the determinants of remittances is carried out using OLS and Instrumental Variable (IV) regression analyses based on the following standard model employed in the literature:

$$Remittances_i = \beta_0 + \beta_1'X_1 + \beta_2'X_2 + \beta_3'X_3 + \beta_4'X_4 + \beta_5'X_5 + \lambda_i + \varepsilon_i \quad (1)$$

Where, *remittances* refer to the yearly amount of money sent or taken to Turkey. X_i 's refer to the group of variables derived from the theoretical and empirical literature on the determinants of remittances. X_1 : standard variables on demographic and socio-economic characteristics of the head of household, i.e. employment status, age, education, country of education and birth, marital status, German citizenship, years spent in Germany; X_2 : household level variables, i.e. net household income, size of household, number of children in Germany, and having spouse in Germany; X_3 : linkages to Turkey, i.e. an intention to return to Turkey, having mother and father in Turkey, and the number of siblings in Turkey; X_4 : recipient households' characteristics, i.e. employment status of the head of recipient household and the perception of the remitter regarding the economic status of the recipient household; X_5 : end uses of remittances, measured by the

number of people benefiting from remittances used for investment, education and basic needs; λ : district dummies.

There are two potential issues with the econometric modelling that need to be addressed before the analysis; these are the endogeneity problem and sample selection bias. The only variables that are potentially endogenous in the model are the uses of remittances, and this has been taken into account by using IV Regression analysis. However, as will be reported in detail subsequently, the diagnostic tests show that the number of people benefiting from different uses of remittances is exogenous to the amount of remittances. It might also be argued that there is a potential endogeneity between remittances and income; however, as pointed out by Hoddinott (1994), income tends to be exogenous to remittances, an assertion which our findings support.¹² Sample selection bias could arise from the exclusion of those households who do not send any remittances. Nevertheless, given that we analyse the determinants of the size of remittances rather than the remitting decision, using data from remitters only should not bias our results in any significant way. There are many studies examining the determinants of remittances that use data on remitters only, e.g. Knowles and Anker (1981), Hoddinott (1994) and Durand et al. (1996). As explained in detail in Knowles and Anker (1981), including non-remitters in the analysis could actually bias the estimation towards zero if the majority of the migrants are non-remitters.¹³

Table 7 reports the benchmark results obtained from the Ordinary Least Square (OLS) analysis.¹⁴ As seen in the first column of the table, among the standard variables on the socio-economic background of the head of households, only being in full-time employment and higher education has a significant impact on the size of remittances, while having German citizenship, being born in Germany and years spent in Germany have no impact. In the second column we add the variables related to the characteristics of the respondents' households in Germany and their linkages to Turkey. Unsurprisingly, the income of the household has a positive effect, while having a spouse in Germany and the number of children in Germany have a negative impact on the size of remittances. In addition, intending to return to Turkey and the number of siblings in Turkey lead to an increase in remittances, suggesting a significant relationship between remittances and social linkages to Turkey.¹⁵

The third column of Table 7 adds to the analysis variables which measure the main characteristics of the recipient households. Although the employment position of the head of household does not have any significant impact on the size of remittances, being a poor household does lead to an

¹² The regressions are also carried out using the income share of remittances to eliminate the bias due to potential endogeneity between income and remittances. The findings are very similar to those obtained from the main analysis.

¹³ Furthermore, the only requirement we had for including households in the data was for them to send any amount of remittances, which makes the lower bound closer to zero. As a robustness check, we also employed Tobit analysis to correct for potential bias caused by using censored data and find very similar results to those obtained from the main analyses.

¹⁴ Data do not have a heteroskedasticity problem and the findings are robust to the exclusion of outliers from the data.

¹⁵ In addition to the variables reported, age, being educated in Germany and being male are also included in all regressions; however, since they were not significant in any of the regressions they are not reported.

increase in remittances, providing some evidence of altruism on the part of the remitter.¹⁶ Finally, the fourth column introduces the end uses remittances to the analysis, which is measured by the number of people benefiting from remittances from each use, namely, investment, education and basic needs.¹⁷ As observed, the use of remittances for investment and education has a positive impact on the size of remittances, while the use of remittances for basic needs has no impact. Putting together these findings, we can state that the main determinants of the remittances of the full sample are the income, employment position, household characteristics and linkages to Turkey of the remitters, together with the use of remittances for investment and education, and the level of poverty of the recipient households.

To investigate the evidence that migrant groups differ in their remitting behaviour according to whether or not they intend to return to Turkey, as suggested by previous studies, such as Merkle and Zimmermann (1992), Glytsos (1997) and Dustmann and Mestres (2010), we also conduct a separate analysis of the remittances of these two groups.¹⁸ The results are reported in the last two columns of Table 7. As observed, both groups' remittances are closely linked to their income, the poverty of the recipients and the use of remittances for education. However, the remittances of those migrants who intend to return are very responsive to the characteristics of their households (i.e. the size of household, full employment status of the head of household, being married, having spouse and children in Germany), and their close familial linkages to Turkey (i.e. mother being in Turkey). The remittances of migrants with no intent to return, on the other hand, are independent of their household characteristics, but are closely associated with their education level, being born in Germany, having a larger number of siblings in Turkey and the use of remittances for investment and education. This suggests significant differences in the remitting behaviour of these two groups, as suggested by previous studies.

Although the above results are in line with the findings of previous studies, OLS might yield biased estimators if there is endogeneity between the size of remittances and their uses. To take this into consideration, we also employed instrumental variable (IV) regression analyses. We identified the instruments for the three uses of remittances, namely investment, education and basic needs, based on the standard criteria in the literature. More specifically, all instruments are theoretically relevant to and are significantly correlated with the relevant use of remittances, while being uncorrelated with remittances. We also conducted Sargan and Basman tests to check the relevance of the instruments and did not reject the null hypothesis that the instruments are valid (Table 8).¹⁹

¹⁶ We also included the pre-remittance income of the recipient household in the regression analysis instead of the employment position of the head of the household. However, this variable was also not significant in any of the regressions.

¹⁷ The results are not sensitive to the use of different measures of the end uses of remittances. More specifically, instead of the number of people benefiting from remittances for investment, education and basic needs, we also employed an index number measuring the importance of remittances for each of these end uses. The results were similar to those obtained with the former measurement.

¹⁸ The findings of the Chow test also indicated that a separate analysis was appropriate.

¹⁹ Instruments used for each end use of remittances are as follows: *investment*: dummy variables for the remittances sent to siblings, migrants whose children invest in Turkey and East Turkey; *basic needs*: dummy variables for East and Midland Turkey, number of aunts and uncles in Turkey and having close German friends in Germany; *education*: dummy variables for being a first generation migrant, having foreigners in the family, having close Turkish friends in Turkey and Germany and the dummy variables for remittances sent for children and parents. All of these variables are significantly correlated with the instrumented variables and

The findings of the IV regression are reported in Table 8. As observed, the results are very close to those obtained from the OLS analysis. The only difference is that, even if the use of remittances for investment has high t value in the full sample, it becomes insignificant in all groups, while the use of remittances for education remains significant only in the sample who intends to return.²⁰ However, as seen in Table 8, we did not reject the null hypothesis of the Durbin-Wu-Hausman test stating that the regressors are exogenous. This implies that the use of remittances is exogenous to the amount of remittances, in which case both IV and OLS estimators are consistent, but the OLS estimators are more efficient. Therefore we base our analysis on the findings of OLS rather than those of IV, and infer that the end uses of remittances for both investment and education are important determinants of the amount of remittances of Turkish households.²¹

To conclude, our results provide strong evidence that migrants who intend to return send remittances mainly for their own self-interest, while migrants who do not intend to return are motivated by tempered altruism. These findings are in line with the findings of Glytsos (1997), who found that temporary migrants from Greece send more remittances than permanent migrants, and their remittances are mainly motivated by self-interest. The remitting behaviour of the sample as a whole is driven by a combination of self-interest and implicit contractual agreements with the family, in that their remittances do not decrease over time, are strongly associated with their individual and household characteristics and their familial linkages to Turkey, as well as their education level and the use of remittances for education and investment (i.e. Stark, 1995; Poirine, 1997). Overall, these findings lend strong support for Unan (2009), who provided evidence that remittances of Turkish migrants in France are mainly determined by familial linkages and exchange motivation. They are also consistent with macro-level studies such as Sayan (2004) and Alper and Neyapti (2006), who found no evidence of pure altruism and concluded that the remittances of Turkish households are driven mainly by investment motivation.

6. Conclusion

The main objective of this paper was to help fill the gap in the literature by collecting micro-level data and offering an econometric analysis of the remittances of the Turkish community in Germany. To date no such study exists. Although there are some studies using remittances data from Germany, they do not provide a separate analysis for Turkish migrants. Our study is also the first to provide a separate analysis of the remittances of Turkish migrant groups who do and do not intend to return to Turkey, and assesses the impact on the size of remittances of their different uses.

are either not correlated, or have very low correlation, with the size of remittances. The results are robust to the exclusion of the instruments that have low correlation with remittances such as the dummy variables for the remittances sent to siblings, parents and children.

²⁰ As the Pagan Hall tests reported in Table 8 show, the model does not have a heteroskedasticity problem. In addition, the findings are not sensitive to the exclusion of outliers from the data.

²¹ These findings are robust to the different measurements of the use of remittances for investment, basic needs and education and the exclusion of outliers. In particular, instead of the number of people benefiting from remittances for investment, basic needs and education, we used an index measuring the importance of each of the three uses of remittances; the results are similar to those obtained with the former measure.

The data has been collected through a random sampling strategy and is largely representative of Turkish migrants in Germany. The most significant findings of our analysis are follows. First, five decades after the first generation Turkish migrants entered Germany, they still send significant amounts of remittances to Turkey on a regular basis. Second, remittances of Turkish migrants in Germany are not motivated by pure altruism, since they do not decrease over time and their size is not responsive to the basic needs and employment status of the recipient households, but related to their use for investment and education. These findings lend strong support to Unan (2009), Sayan (2004) and Aydas et al. (2005), who showed that the remittances of Turkish migrants are mainly motivated by exchange, familial linkages and investment purposes. Finally, our results show that those migrants who intend to return are motivated more by self-interest, while those who do not intend to return are motivated more by tempered altruism in sending remittances to Turkey., This is consistent with the findings of Glytsos (1997), who conducted a similar analysis for Greek migrants using macro-level data.

These findings suggest two key things about the developmental potential of remittances of Turkish migrants in Germany. The first is that the sheer volume of remittances of Turkish migrants in Germany makes them an important source of income in promoting growth and development in Turkey. As pointed out by Akkoyunlu and Kholodilin (2008), during 1964-2005, the total amount of remittances inflows from Germany was €45.7 billion, in comparison to the capital inflows and foreign direct investment from Germany which amounted to €17.8 billion and €4.2 billion, respectively. This is a very significant difference, considering that Germany is one of the biggest investors in Turkey. Second, Turkish migrants in Germany do not send remittances for purely altruistic reasons, but instead reveal genuine, continuous economic and social interests in Turkey, as evidenced by the fact that 70 percent of them send remittances, 35 percent of whom send them regularly, and that a significant fraction of their remittances is used for education and investment purposes. Such remittances have considerable potential to contribute to economic activities and human capital development in Turkey, beyond and above their contribution to the basic needs of the recipient households.

The main policy implications of our analysis are that the Turkish government should implement policies to encourage an increased flow of remittances from Turkish migrants, who have strong economic and social interests in Turkey, but who currently remit only about six percent of their income, which is equivalent to less than half of their total savings made in Germany. This can be considered modest compared to other major migrant groups' income share of remittances, e.g. Latin American migrants send about ten percent of their income. One of the main issues revealed by our interviews was that many Turkish migrants in Berlin incurred significant losses on their investments in Turkey, either through unsuccessful government projects during the period from the 1960s to the 1980s, as well documented in Abadan-Unat (1986), or through recent futile private projects. Thus, the Turkish government needs to formulate and implement serious, long-term policy reforms to further increase the remittances flows of Turkish migrants and regain their confidence in investing in Turkey. The Turkish government should also promote innovative and high return investment projects which are funded by remittances and which achieve a convergence between the priorities of Turkish migrants and the country's economic and human capital development needs.

Table 1: Distribution of the Turkish population and the households in our data in Berlin

	Total residents	Total foreigners	Turkish residents	Percent total foreign residents	Percent total residents	Turkish HH in the database
Berlin total	3,328,291	444,027	120,684	27.18	3.63	590
Kreuzberg	250,184	57,635	23,535	40.83	9.4	106
Mitte	315,205	86,108	30,153	35.02	9.56	145
Neukölln	301,953	66,069	26,451	40.04	8.76	144
Tempelhof/Schöneberg	329,450	50,801	13,707	26.98	4.16	70
Spandau	217,821	22,789	7,258	31.85	3.33	30
Reinickendorf	246,607	22,998	6,370	27.70	2.58	46
Charlott./Wilmersdorf	217,821	55,337	7,344	13.27	2.38	33
Steglitz/Zehlendorf	284,972	28,618	3,409	11.91	1.2	17

Source: Statistical Office of Berlin (2003).

Table 2. Comparison of the descriptive statistics of the key variables from nationwide data and our data

	Nationwide data	Our data
Monthly net income of HH ¹	€2070	€1857
Monthly per capita income ¹	€518	€619
Born in Germany ²	17%	16%
Size of household ¹	3.8	3
Age ⁴	34.6*	42
Kurdish ⁴	22%	21%
Male ⁵	54.2%	73
Years in Germany ¹	19.9	25
Unemployed ³	13%	18%
Spouse unification ²	53%	39%
Intention to return ¹	30%**	43%
German citizenship ⁴	31%	40%
Full-time employment ⁴	27%**	36%

Sources: 1. Erdem and Schmidt (2008) 2. Mueller (2006) 3. Kirdar (2009). 4. European Stability Initiative (2008) 5. Sen(2003)

* This figure includes all age groups, whereas our data includes only those who are at or above the age of 21, making the average age higher. Kirdar (2009) computed the average age of Turkish migrants in Germany as 47 from GSOEP database that includes the individuals at or above the age of 16. **According to the figures reported in ESI (2008), 38 percent of Turkish academics in Germany intend to return to Turkey. ***The full-time employment rate reported in ESI (2008) includes only those individuals with full social security. Our definition of full-time employment includes all full-time employees, regardless of whether or not they have social security.

Table 3. Fraction of the key variables across full sample and the samples with and without intention to return (%)

	Full sample N: 589	Intention to return N: 252	No intention to return N: 337		Full sample N: 589	Intention to return N: 252	No intention to return N: 337
Full-time employed	36	42	31	Fully employed recipient HH	43	44	42
Self-employed	0.5	0.4	0.6	Mother in Turkey	41	46	37
Own business	11	13	10	Father in Turkey	30	36	25
German citizenship	40	35	43	First generation	14	8	18
Male	73	76	64	Second generation	27	22	69
German education	47	46	49	Remittances sent to parents ^a	19	18	19
Born in Germany	16	12	19	Remittances sent to children ^a	4	4	3
Intention to return	43	100	0	Remittances sent to siblings ^a	18	17	20
Married	72	71	73	Remittances sent to aunt/uncle/cou. ^a	20	19	21
Spouse in Germany	71	69	72	Children investing in Turkey	7	6	8
Spouse unification	39	35	41	Uses of remittances: basic needs ^b	74	74	75
Fixed assets in Germ.	24	24	23	Uses of remittances: education ^b	18	20	16
Fixed assets in Turkey	64	68	60	Uses of remittances: investment ^b	43	45	42
Regular remittances	35	35	35	Alevite (sub-religion)	25	25	26
Poor Recipient HH	49	47	50	Kurdish	21	20	22

Source: Author's data and calculations. a/ These figures do not include those households sending remittances to more than one relative. b/Usually remittances are used for more than one purpose, the reported figures are not exclusive. HH stands for household.

Table 4. Mean values of the key variables across full sample and the samples with and without intention to return

	Full sample N: 589	Intention to return N: 252	No intention to return N: 337
Income of remitting household (monthly net)	1857	1967	1775
Remittance amount (annual net) ^a	1347	1617	1145
Total savings (monthly) ^b	237	270	211
Savings in Germany ^c	250	271	231
Recipient household income (monthly net)	336	357	321
Years remittances sent	15	13	16
Years spent in Germany	25	23	27
Age	42	41	43
Years of education	11	11	11
Household size	3	3	3
Children in Germany	2	2	2
Siblings in Turkey	2	2	2
Aunt or uncle in Turkey	5	6	5
Children in Turkey	0	0	0
Foreigners in family	0	0	0
Close Turkish friends in Turkey	2	2	2
Close Turkish friends in Germany	4	4	5
People benefiting from remittances for basic needs	2	2	2
People benefiting from remittances for education	1	1	1
People benefiting from remittances for investment	0	0	0

Source: Author's data and calculations. Monetary units are in Euros.

a/ The distribution of the yearly amounts of remittances of Turkish households in Berlin is as follows (the amounts are in parenthesis): 8% (100); 34% (250-300); 23% (500-750); 2% (900-1400); 12% (1500-2400); 11% (2500-3500); 9% (4000-5000); 1% (7000-14000).

b/ Total savings include all savings made through banks and fixed assets both in Germany and Turkey. Savings in Germany include all savings made only in Germany. Both figures include zero savings.

Table 5. Summary statistics of the key variables across the first and second generation and German-born respondents

	First generation N: 83	Second generation N: 160	German-born N: 95
Mean values			
Years remittance sent	31	9	9
Years spent in Germany	38	30	29
Remittances (annual)	1264	1238	1251
Income (monthly)	1530	1884	1884
Age	62	33	31
Years of education	8	12	12
Percentage			
Fixed assets in Germany	15	30	34
Fixed assets in Turkey	90	53	56
Full employment	19	59	53
Intention to return	25	34	33
German citizenship	33	59	66
Regular remittances	36	33	28

Source: Author's data and calculations. Monetary units are in Euros.

Table 6. Remittance profile of Turkish migrants

	N (%)	Remittances (in Euros)	Remittances (% of income)		N (%)	Remittances (in Euros)	Remittances (% of income)
Regions of origin in Turkey				Demographics			
All	100	1374	6.35	Male	69	1430	6.78
East	35	1245	6.21	Female	31	1160	5.34
North	17	1138	5.38	Married	72	1410	6.31
South	10	1499	6.56	Single/divorced	28	1182	6.41
Midland	21	1538	7.26	No children	38	1325	7.44
West	17	1451	6.33	With children	62	1361	5.67
Duration of residency in Germany (years)				Size of household			
0-10	14	1148	7.21	1-2	36	1269	7.46
11-20	18	1474	6.60	3-4	43	1278	5.66
21-30	31	1544	6.70	5-6	18	1514	5.92
31-40	35	1183	5.50	7	2	1708	3.78
41-above	1.3	1188	6.98				
Age				German citizenship and education			
21-30	18	1164	6.04	German citizen	40	1400	5.73
31-40	33	1342	6.22	Turkish citizen	60	1312	6.74
41-50	25	1616	6.22	German education	47	1369	5.58
51-60	14	1206	6.66	Turkish education	50	1344	7.08
61-70	8	1103	6.63				
Education (years)				Uses of remittances			
18	13	1679	7.91	Basic needs	76	1310	6.48
13-10	41	1721	7.23	Education	45	1431	7.05
9-7	43	1097	5.80	Investment	20	2373	10.23
No education	2	808	5.24				
Employment position				Recipient's characteristic			
Full-time employed	36	1690	7.86	Full-time employed	41	1330	5.97
Self-employed	5	1439	5.78	Not full-time employed	55	1339	6.59
Own business	11	1811	4.92	Poor	48	1337	6.44
Retired	11	1249	7.32	Not poor	50	1334	6.19
Unemployed	19	838	4.48	Regular remittances	35	1794	7.92

Source: Author's data and calculations.

Note: Remittances sent to siblings have the highest value and income share of the remitters, followed by those sent to parents, and aunts/uncles/cousins (1325, 1199 and 1017 Euros, and 6, 6.2 and 4.63 percent, respectively).

Note: N refers to the sample size of each category as a percentage of full sample.

Table 7. OLS regression analysis of log of remittances

	Full sample				Intention to return	No intention to return
	(1)	(2)	(3)	(4)	(5)	(6)
Full employment ^a	0.276 (2.50)**	0.244 (2.22)**	0.269 (2.41)**	0.242 (2.16)**	0.481 (2.69)***	0.070 (0.47)
Years of education	0.032 (2.14)**	0.033 (2.21)**	0.039 (2.44)**	0.038 (2.37)**	0.019 (0.82)	0.051 (2.34)**
German citizenship	-0.141 (1.37)	-0.113 (1.10)	-0.107 (1.02)	-0.108 (1.05)	-0.437 (2.77)***	0.157 (1.15)
Born in Germany	-0.250 (1.44)	-0.242 (1.35)	-0.253 (1.35)	-0.333 (1.76)*	-0.451 (1.43)	-0.390 (1.68)*
Years spent in Germany	-0.007 (0.93)	0.001 (0.08)	0.005 (0.54)	0.008 (1.00)	0.013 (1.06)	0.003 (0.23)
Married	0.054 (0.42)	0.539 (2.62)***	0.519 (2.40)**	0.538 (2.42)**	1.154 (6.16)***	0.200 (0.62)
Log of income	0.744 (6.83)***	0.767 (6.68)***	0.760 (6.32)***	0.677 (5.80)***	0.353 (1.97)*	0.959 (7.01)***
Size of household		0.065 (1.01)	0.086 (1.38)	0.103 (1.71)*	0.303 (5.29)***	0.017 (0.21)
Spouse in Germany		-0.481 (2.43)**	-0.542 (2.62)***	-0.504 (2.40)**	-1.107 (6.17)***	-0.154 (0.54)
Children in Germany		-0.104 (1.78)*	-0.129 (2.30)**	-0.146 (2.63)***	-0.341 (4.57)***	-0.086 (1.23)
Intention to return		0.177 (1.84)*	0.204 (2.10)**	0.207 (2.15)**	-	-
Mother in Turkey		0.139 (1.26)	0.145 (1.24)	0.211 (1.79)*	0.418 (2.58)**	0.020 (0.11)
Father in Turkey		-0.047 (0.37)	-0.053 (0.41)	-0.048 (0.38)	-0.148 (0.87)	0.014 (0.07)
Number of siblings in Turkey		0.051 (2.08)**	0.049 (2.02)**	0.041 (1.61)	-0.012 (0.26)	0.067 (2.51)**
Poor economic position of recipient HH			0.329 (3.41)***	0.331 (3.43)***	0.422 (2.73)***	0.355 (2.69)***
Full employment status of recipient HH			0.024 (0.24)	-0.045 (0.44)	0.049 (0.30)	-0.097 (0.73)
Use of remittances for investment ^b				0.229 (2.78)***	0.233 (1.52)	0.223 (2.40)**
Use of remittances for basic needs				-0.011 (0.57)	-0.017 (0.46)	0.006 (0.21)
Use of remittances for education				0.118 (2.96)***	0.129 (1.74)*	0.096 (2.04)**
Observations	483	481	457	447	198	249
R-squared	0.23	0.26	0.27	0.29	0.31	0.38

Source: Author's data and calculations.

Robust t statistics in parentheses * significant at ten percent; ** significant at five percent; *** significant at one percent

Note: Age, German education and being male have also been included in all regressions. They are not reported as none of them are significant in any of the regressions. HH stands for household.

a/ Full employment is a dummy variable that takes on value one if respondent is a full-time employee, own business or self-employed, and zero if respondent is retired, unemployed or part-time employed.

b/ The use of remittances for investment, education and basic needs has been measured by the number of people benefiting from remittances for each end use. For a robustness check, we also employed an index number measuring the degree of the importance of remittances for each use, and found similar results to those reported in the table.

Table 8. IV Regression analyses of log of remittances

	Full sample	Intention to return	No intention to return
Full employment ^a	0.226 (1.80)*	0.458 (2.11)**	0.086 (0.55)
Years of education	0.044 (2.34)**	0.021 (0.79)	0.056 (2.17)**
German citizenship	-0.125 (0.99)	-0.411 (2.41)**	0.146 (0.98)
Born in Germany	-0.434 (1.77)*	-0.420 (1.12)	-0.424 (1.56)
Years spent in Germany	0.016 (1.60)	0.016 (1.28)	0.002 (0.17)
Married	0.502 (1.82)*	1.046 (3.80)***	0.251 (0.64)
Log of income	0.600 (4.33)***	0.297 (1.52)	0.937 (6.02)***
Size of household	0.113 (1.94)*	0.305 (5.49)***	-0.009 (0.10)
Spouse in Germany	-0.478 (1.87)*	-1.000 (4.16)***	-0.161 (0.45)
Number of children in Germany	-0.140 (2.43)**	-0.343 (4.15)***	-0.060 (0.80)
Intention to return	0.227 (2.11)**	-	-
Mother in Turkey	0.274 (1.95)*	0.542 (2.64)***	0.010 (0.05)
Father in Turkey	-0.039 (0.28)	-0.207 (0.84)	-0.033 (0.15)
Number of siblings in Turkey	0.042 (1.26)	-0.024 (0.43)	0.072 (2.32)**
Being a poor recipient HH	0.359 (2.58)**	0.521 (2.17)**	0.360 (2.38)**
Full employment status of recipient HH	-0.107 (0.70)	-0.077 (0.39)	-0.037 (0.21)
Use of remittances for investment	0.498 (1.30)	0.607 (1.11)	0.251 (0.73)
Use of remittances for basic needs	-0.125 (1.13)	-0.087 (0.66)	0.016 (0.13)
Use of remittances for education	0.364 (2.19)**	0.360 (2.14)**	0.060 (0.36)
Number of observations	434	193	241
R-squared	0.19	0.24	0.37
Sargan test ^b	0.55	0.26	0.77
Basmann ^b	0.60	0.37	0.83
Durbin-Wu-Hausman test ^c	0.35	0.35	0.99
Pagan-Hall test ^d	0.85	0.73	0.25

Source: Author's data and calculations.

Robust t statistics in parentheses * significant at ten percent; ** significant at five percent; *** significant at one percent.

Notes: Age, German education and being male have also been included in all regressions. They are not reported as none of them were significant in any of the regressions. HH stands for household.

a/ Full employment is a dummy variable, which takes on value one if respondent is a full-time employee, own business or self-employed, and takes on value zero if respondent is retired, unemployed or part-time employed; b/H₀: instruments are valid; c/H₀: regressors are exogenous ; d/H₀: disturbance is homoskedastic.

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