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The role of transnational family distribution in shaping remittance flows

GREENBACK 2.0 WORKING PAPER N. 2

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ABSTRACT

Migration experiences are often associated with some sort of transnational economic activity which connects the past and the present of migrants abroad, and specifically with remittances. Motivations to send money at origin have been deeply investigated at the micro as well as at the macro level, as remittances can affect recipient households' well-being, investment and consumption levels in the receiving countries and play an insurance role against external shocks.

This paper contributes to the literature on migrants' remittances providing evidence for migrants from Morocco, Peru and Romania, three traditional labor-exporting countries with a medium level of economic development, from three different geographical areas and with different migration patterns to Italy. Exploiting a relatively rich, albeit small-scale, dataset we analyze the spatial distribution of migrants' nuclear families and households and we build three different migratory profiles—*Loners, Pioneers and Followers*—characterized by the timing and sequence of the migration event with respect to the rest of the nuclear family. Then we test a negative binomial model to describe the variation in the variable "remittances amount". Beyond cross-country variations and after controlling for the most commonly used individual demographic and economic characteristics, our analysis consistently clusters migrants according to their family and household structure in Italy and abroad to explain the total amount of remittances sent to the origin country.

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INTRODUCTION

Migration experiences are often associated with some sort of transnational economic activity which connects the past and the present of migrants abroad. Migrants' long-distance economic relations with their homelands are the subject of an extensive, multidisciplinary inquiry (Guarnizo 2003), often focused on monetary remittances as the most visible sign of transnational engagement and virtually the only one which can be traced both at the micro and macro-level. Quantitative information about monetary remittances comes in aggregate records from financial institutions and from sample surveys either on the sending-side, the receiving-side or both (matched-sample surveys). While official figures allow for cross-country and historical comparisons, sample surveys offer deeper information and accuracy and are in principle able to grasp also informal flows not recorded at the aggregate level (Brown et al. 2014).

Many important issues are related to the study of remittance flows and of migrants' behavior in sending money to their households and countries of origin. International development institutions, academics and policy makers have progressively integrated migration and remittances into the development discourses, policies, and programs (Ratha 2007; Ratha and Mohapatra 2007; Ratha et al. 2014). Also because of their magnitude and importance at the aggregate level, motivations behind remittances have been deeply investigated at the micro-level, as well as the extent to which remittances affect recipient households' well-being, investment and consumption levels in the receiving countries and play an insurance role against external shocks. The study of remittances helps shed some light on intra-household resource allocation, disentangling preferences and behaviours of migrants and individual household members that receive the money (Posel 2001; Azam and Gubert 2006; Erdal 2012). Moreover, for migrants' destination countries the analysis of remittance outflows helps understanding the level and depth of migrants' labor market integration at destination and of their connection with the origin households, which directly influence the amount and regularity of flows.

This paper contributes to the literature on migrants' remittances in many respects. While a consistent part of existing studies concentrates on migrants' transfers to developing countries (Sinning 2007, 3), we provide evidence for migrants from three traditional labor-exporting countries with a medium level of economic and human development (UNDP 2014), from three different geographical areas and with different migration patterns to Italy. Exploiting a relatively rich, albeit small-scale, dataset on migrants from Morocco, Romania and Peru in the City of Turin—one of the biggest cities in Northern Italy with a long tradition of internal and international immigration—we provide an empirical analysis for the understanding of the key determinants of migrants' remittances. Although the data come from a sender-side survey which took as observational unit first-generation migrants, their geographical perspective allows for the analysis of the spatial distribution of migrants' nuclear families and households, with information on the potential and actual remittance recipients and their characteristics.

In particular our research question concerns the possibility of describing a model for the variable "remittances amount" which takes into account the migration history of migrants and their nuclear families. How do the household and family structure and its spatial distribution in the country of origin, at destination and eventually in third countries, influence the remitting behavior of observed

first generation migrants in Italy? Indeed, beyond cross-country variations and after controlling for the most commonly used individual demographic and economic characteristics, our analysis intends to explicitly test the specific role of family structures and networks across borders in determining variation of the annual remittances amount sent to the origin country.

The paper proceeds as follows. The next paragraph briefly reviews the existing literature on remittance determinants. Section 2 presents the Greenback 2.0 data and provides descriptive evidence of three different migratory profiles associated with history of migration and family structure. Section 3 presents the empirical model and discusses the results. Section 4 concludes.

1 ANALYZING DETERMINANTS TO REMIT

There is an extensive literature on the motives behind migrants' remittances and on the determinants of such international economic transfers. The first and most cited article on the topic is the one by Lucas and Stark (1985) which set the framework for the development for the so-called 'new economics of labor migration' (NELM). Starting from the premise that decisions about remittances are connected with those on migration and that this decision-making process also involves the household of origin, they designed a taxonomy of motives to remit which goes from true altruism to a set of pure self-interest motives. The combination of such motives within each single household is also dependent upon its own structure, and is what makes the arrangement among household members self-reinforcing (Carling 2008).

A huge number of empirical works have analyzed the determinants of remittances starting from the framework outlined by Lucas and Stark. Some authors also reviewed the existing literature on remittances in order to systematize theories and empirical evidence collected so far by social scientists and to get to a general explanation of what causes remittance flows (Rapoport and Docquier 2006; Hagen-Zanker and Siegel 2007; Carling 2008). A recent paper from Carling, inscribes remittance transfers into more complex and *composite* transactions which include at the same time material, emotional and relational elements (Carling 2014), also discussing the different approaches in the existing economic and ethnographic literature. Economists tend to test empirical models for disentangling the determinants of remittances, which can all be attributed to one of the following main motives: *altruism, insurance, investment,* and *repayments* (Lucas and Stark 1985; Rapoport and Docquier 2006; Cox, Eser, and Jimenez 1998). Ethnographic studies instead rarely focus primarily on remittances as an autonomous study object, but offer deeper insights on the complex relationships between the migrant and the origin household (Erdal 2012; Carling 2014).

As testified by the increasing literature on the topic, there is a great variation in the nature and logic of these economic transnational transactions. In testing the responsiveness of remitting behavior to changes in the migrants' and/or recipients' conditions in terms of income, wealth or well-being, variations due to different contexts as well as due to different conditions within a single setting should be taken into consideration. As pointed out by Carling, "neither economics nor ethnography has engaged fully with the combination of complexity and variation in remittance transactions" (Carling 2014, 219). Moreover, since it is always difficult to control for all the different, intertwined components of remittances which find their actual balance in empirically determined conditions and contexts, a general explanation of what causes remittance flows is hardly achievable (Carling 2008). Hence, from time to time, altruist and self-interest motives are modelled in different ways, making sense of the incredible variation of micro and macro motivations and behaviors which derive from personal attitudes and ability, families' and households' structures and needs, migration context and historically determined factors.

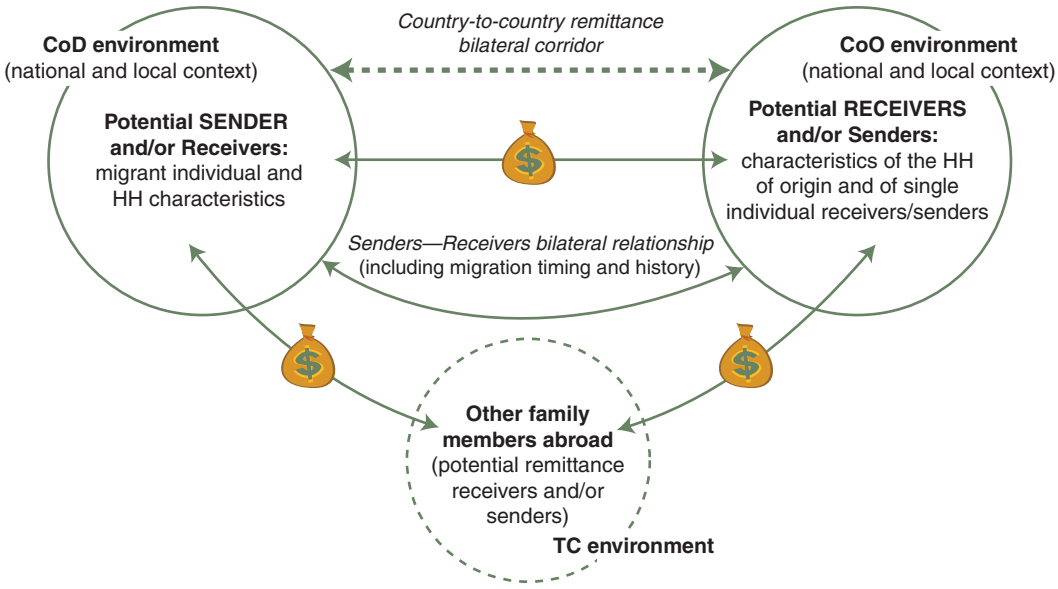
In the discussion on the relative importance of different motives and determinants of remittances, two important aspects influencing the variation of flows are often disregarded (Carling 2008). Firstly, migration itself has to be taken into consideration, as migration patterns from and to specific regions and localities define multiple demographic dynamics which are not often explicitly integrated

in empirical analysis. Secondly, some key variables have to be identified as preconditions for remittances, necessary in order to distinguish between the capacity and the desire to remit (Carling and Hoelscher 2013).

While most of the studies only focus on one of the (at least) two ends of the remittance corridor, treating separately what happens in the migrant's context of origin and of destination depending on the availability and depth of the data, explanations of the variation of remittance flows at the micro level have to be found in many different locations at the same time. Migrants are often portrayed by default as remittance senders to their origin households. Indeed, the spatial distribution of migrants and their relatives and household members has to be analyzed in the country of origin, in the country of destination, and eventually in third countries where other relatives are settled. Moreover, the remittance relationship between a migrant and the origin household and family members—wherever they live—is often presented as mono-directional: migrants send money back to their origin country and eventually to other family members elsewhere. The reality indeed is far more complex and migrants can behave as senders or receivers of monetary resources in correspondence of different moments in their migration history. Although migrants are generally primarily senders, these transfers are often associated with various forms of reciprocity (Åkesson 2011; Mazzucato 2011; Thai 2014). If we draw a stylized picture with at least three individuals—the migrant and two relatives or household members—placed in three different locations—migrant's country of origin and of destination and a third country—remittance flows can be observed from and to the three localities, in multiple, bilateral relationships which change across time and due to a variety of individual and household characteristics and of local and national contexts. Figure 1 presents our adaptation to the scheme proposed by Carling (2008) to properly locate the determinants of remittances.

Beyond the theoretical mechanisms presented in the picture, a further, non-trivial aspect to be considered for a sound empirical analysis of migrant's remittance capacity is the 'technical' choice of the model to be adopted. The existing empirical literature has proposed different econometric models and methodologies. Earlier papers used more often Ordinary Least Squares (OLS) regression not only for the size of remittances but also for the decision to remit, leading to biased estimations. More recent papers instead have adopted a greater variety of models

FIGURE 1: Spatial distribution of remittance determinants



Source: Author's adaptation from (Carling 2008, 586).

and specifications in order to better identify the explanatory factors for remittances. In particular, some use one-stage decision models where the decisions on whether to remit and on the amount to send are taken together. In other cases, a two-stage (hurdle) approach portraits the decision to remit and the decision on the amount in two distinct, chronologically consequent models (see Hagen-Zanker and Siegel 2007; Carling 2008 for a review of most recent applied methods). Although our data do not provide information on the fundamental determinants of the decision to remit, as the Greenback 2.0 sample only includes remitting migrants (i.e. migrants having decided not to remit were not included in the survey sample), in our empirical section we will still have to take into consideration the peculiar features of our dependent variable (remittance amount) in order to choose the most appropriate model for our empirical test.

2 THE GREENBACK 2.0 DATA AND SOME DESCRIPTIVE STATISTICS

Our empirical data on migrant remittances are drawn from the Greenback 2.0 Survey (The World Bank 2014). The survey collected in-depth, quantitative data on migrants residing in Turin, in the North of Italy, during the summer of 2013. The aim was exploring migrants' financial needs and behaviors, with a focus on their remittance practices. The overall sample is composed by three equally large subsamples according to the citizenship at birth of the interviewees: short-range EU migration (Romania), short-range non-EU migration (Morocco) and long-range migration (Peru). These are the first three countries of origin per number of residents in the city (almost 60 percent of total migrant population) and per total amount of remittances outflows from the Province of Turin (Fondazione Moressa 2013; Banca d'Italia 2014). At the same time, these three countries differ for their geographical position, patterns of socio-economic integration in Italy (in terms of participation to the labor market by sex and distribution in different economic sectors) and migratory systems (in relation to the organization of the migratory chain within families).

The sample is composed by foreign-born individuals residing in the City of Turin during the summer of 2013, including naturalized immigrants, between 18 and 64 years of age. To be included in the sample, the interviewed migrants had to comply with four criteria: 1) to have resided in Italy for at least one year (with or without a regular residence status); 2) to live in the metropolitan area of Turin; 3) to have an income (broadly speaking, from any type of occupation, including informal activities); and 4) to have sent remittances to his/her country of origin at least once since the beginning of 2013. A 'centre sampling technique' (Baio, Blangiardo, and Blangiardo 2011) was adopted to capture also irregular migrants and to design a balanced sample.[2]

The average profile of the final sample is reported in Table 1 which presents the main general statistics on sex, arrival in Italy, education level, marital status and type of occupation of the 480 interviewed individuals. The overall sample is relatively gender-balanced (43 percent of the interviewed are women), but gender differences become more evident within each subsample: women represent 61 percent of Romanian, 54 percent of Peruvian, and only 14 percent of Moroccan interviewed migrants, the latter less frequently complying with the survey criteria because of their low activity rate. With regard to formal qualifications and skills, Peruvians show the highest level of education attained (24 percent of highly educated), while three quarters of all Romanians declared a medium level of education (high school) and almost half of the Moroccan subsample only has a low education level. Almost half of the overall interviewed migrants are married. Moroccans have the higher level of single individuals (35 percent), while among Romanians and Peruvians there is a higher incidence of separated or divorced individuals (respectively 18 and 16 percent).

Information on the type of job and sector of occupation[3] has been re-codified to present the most significant, frequent occupation among those listed by migrants: around 41% of the interviewees are workers in the construction sector or in manufacturing, while jobs related to the domestic and

[2] No weights have been used, but a full coverage of aggregation centres. For a detailed analysis of the sampling strategy, see A Methodological Note, in World Bank 2014, 40.

[3] The original dataset provides information on the type of occupation and sector of activity in accordance with the European NACE (Nomenclature of Economic Activities) classification.

TABLE 1: The Greenback 2.0 sample

		Morocco		Peru		Romania		Total	
		Freq.	*Col %*	Freq.	*Col %*	Freq.	*Col %*	Freq.	*Col %*
Sex	Male	136	*85.5*	74	*46.0*	62	*38.8*	272	*56.7*
	Female	23	*14.5*	87	*54.0*	98	*61.3*	208	*43.3*
Education	Low	76	*47.8*	26	*16.1*	23	*14.4*	125	*26.0*
	Medium	58	*36.5*	96	*59.6*	121	*75.6*	275	*57.3*
	High	25	*15.7*	39	*24.2*	16	*10.0*	80	*16.7*
Marital status	Partnership	88	*55.3*	99	*61.5*	101	*63.1*	288	*60.0*
	Separated/Divorced	15	*9.4*	27	*16.8*	25	*15.6*	67	*14.0*
	Single	56	*35.2*	35	*21.7*	34	*21.3*	125	*26.0*
Job type	Worker (industry/ construction)	76	*47.8*	37	*23.0*	57	*35.6*	170	*41.7*
	Domestic worker	15	*9.4*	86	*53.4*	49	*30.6*	150	*36.8*
	Seller (street vendor, salesperson, cashier)	29	*18.2*	3	*1.9*	6	*3.8*	38	*9.3*
	Nurse/care giver (OSS)	3	*1.9*	22	*13.7*	9	*5.6*	34	*8.3*
	Cook & barman	12	*7.6*	3	*1.9*	16	*10.0*	31	*7.6*
	Shop owner	3	*1.9*	2	*1.2*	8	*5.0*	13	*3.2*
	Others	21	*13.2*	8	*5.0*	15	*9.4*	44	*10.8*
Italian citizenship		15	*9.4*	10	*6.2*	3	*1.9*	28	*5.8*
Total		**159**	***100***	**161**	***100***	**160**	***100***	**480**	***100***

health care sectors employ respectively 37% and 8% of the total sample.

Data strengths and limitations

Measuring remittances through a small scale survey presents many conceptual and methodological issues that we had to take into account for the purposes of our analysis (Brown et al. 2014). The Greenback 2.0 Survey was designed to provide information about *individuals* and about *transactions*, asking interviewees to describe each flow of remittances they were sending to different recipients. Each recorded flow is characterized in terms of amount, frequency, channels, and cost, while recipients were defined as the individuals who materially receive the money. As such, recipients do not necessarily coincide with beneficiaries, but they represent those who control the money and who may use it to benefit a third person. This is often the case, for example, of children of minor age left in the country of origin, who are not directly receiving the money, but can benefit from remittances sent to other relatives.

Also, data provide us with the transnational family structure and the household structure at destination of respondents, which tells us who are the potential senders and recipients of transnational monetary flows. The Greenback 2.0 survey only recorded monetary transfers and does not allow comparing them with in-kind transfer. Nevertheless, recording the presence of reverse remittances gives a sense of the existing reciprocity mechanisms between Italy and abroad.

The survey is also extremely rich in terms of contextual information about individuals, their households at destination and their nuclear families, which helps inscribing the remittance behavior in a broader picture. Information on transnational family formation, on the existence and timing of family reunification processes, on the composition of the household at destination, helps understanding the number and type of relationships which might generate money flows (hence the number of potential senders and recipients).

Although collected data do not provide information on possible return intentions, they do fully cover the remitter's migration history with timing and length of migration, family formation processes before and after migration, etc. Also, with regard to individual and household income and wealth, we have full information on the situation at destination in terms of income, type of job and specialization, presence of second income earners in the household, economic trends over time, bank and investment decisions (bank services, loans and investments in mortgages or other activities).

Hence, although our analysis may suffer from data limitations and from the fact that few longitudinal information is available, the Greenback 2.0 dataset provides enough information for drawing a precise and in-depth picture over a relatively numerous sample of people (480 interviews).

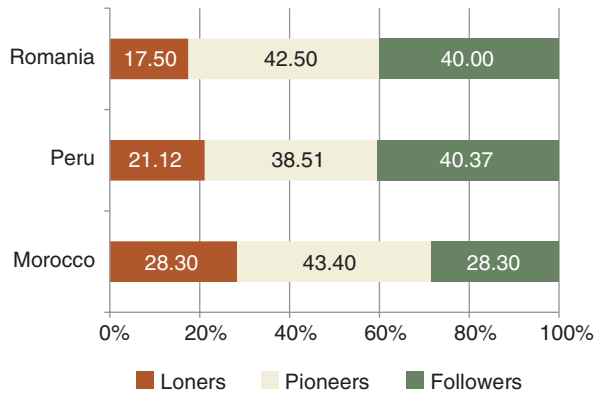
Three different migratory profiles

To start with describing the collected evidence beyond the possible cross-country comparison among the three subsamples (Moroccans, Peruvians, and Romanians), we depict three different profiles of migrants according to their history of migration. Our data provide information on the composition and demographic characteristics of the nuclear family: age, sex, marital status, place of residence and year of migration of parents, siblings, partner, and children of the interviewees. Combining this information, we can establish the presence of family re-unification processes and we can situate the interviewed migrant in a chronological sequence of migratory events. Hence we build three different migratory profiles characterized by the timing and sequence of the migration event for the interviewed migrants with respect to the rest of his/her own nuclear family. The three profiles are by no means necessary steps towards a unique, unavoidable end, nor is there a chronological order among them: although we do not have information on intentions to return, each single migration history varies from the beginning and keeps being different at each phase of the migrant life for decisions about where to settle and for how long, if and how to form a family, if and how to keep a connection with the household of origin.

We define as *Loners* those who do not have any member of the nuclear family living in Italy at the time of the interview. Hence, for the moment at least, they are the only one migrated in Italy. The second group is that of *Pioneers*: they have been the first to move to Italy among their first grade relatives and they have been then followed by at least one of them: like the *Loners*, *Pioneers* have initiated the migration history of their family in Italy, but they have been reached by other family members. The last profile is that of *Followers*, a category where we include those who migrated only after at least one of their family members was already in Italy: they can be the last to be arrived or there can be others to follow, but they do not initiate the migratory experience of their family to Italy. Figure 2 illustrates how these three different types are present within each country subsample. Consistently with the history of migration in Italy and in Turin in particular and with some specificities of these three nationalities (Cingolani and Ricucci 2013; Pastore, Salis, and Villosio 2013), in comparison with the rest of the sample, Moroccans are characterized by both a wider presence of migrants alone in Italy—who have not yet formed a family or have decided not to undertake family reunification processes—and of Pioneers, who had the time to pursue family reunification after settlement thanks to their long presence in Italy.

The radar graphs below combine the cross-country disaggregation with the distinction of the three migratory profiles in order to illustrate the demographic and family characteristics as

FIGURE 2: Three migration profiles by country of origin



well as the income and remittance patterns of the sampled migrants.

The total number of relatives and their spatial distribution between Italy, the country of origin, and eventually other third countries can help us associating different observed integration patterns and transnational behaviors in terms of remittances to different stages in migrants' life and in their migration history. It is reasonable to expect that migrants with more relatives still in the country of origin, and especially those with children left behind, are those who sent more money, more frequently. As time passes, the distribution of family members between the country of origin and of destination may change, determining an alleviation of the family burden for the migrant abroad. Indeed, family reunification processes, as well as the decreasing number of dependent relatives at origin (because parents might pass away and siblings might become more independent, through migration or not), makes the remittance burden for the migrant progressively weaker. Followers then show a higher number of relatives in Italy than Pioneers and, of course, Loners (Figure 3). Also, differences among the three national communities increase if we look more specifically at the number of children and their location rather than at nuclear family members in general. Figure 4 shows that pioneers are clearly those with more children on average and more children in Italy, while loners generally have very few children at home (or not at all). Hence, with the exception of Romanians who are more likely to be parents even when they are alone in Italy, being a loner seems to be associated with not having yet started to form a family. From this descriptive evidence, one can expect that remittances are particularly driven by the presence of children and by their place of residence, rather than by the location of family members in general.

FIGURE 3: Spatial distribution of all relatives who live in Italy, in the country of origin and in third countries, by migratory profile

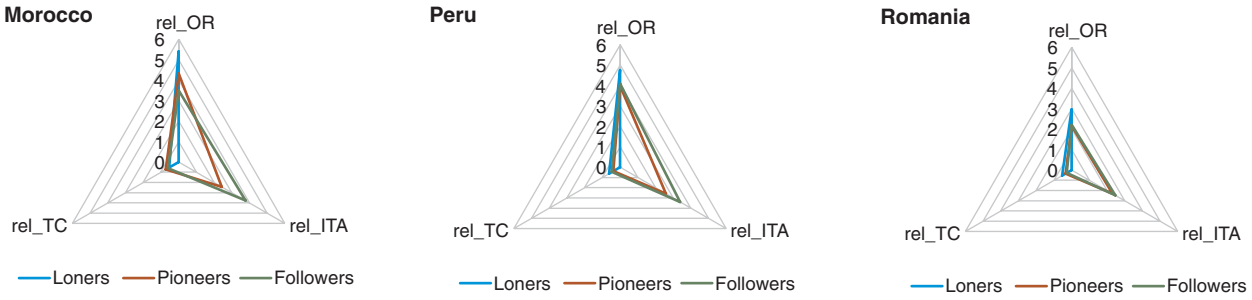


FIGURE 4: Spatial distribution of children only, who live in Italy, in the country of origin and in third countries, by migratory profile

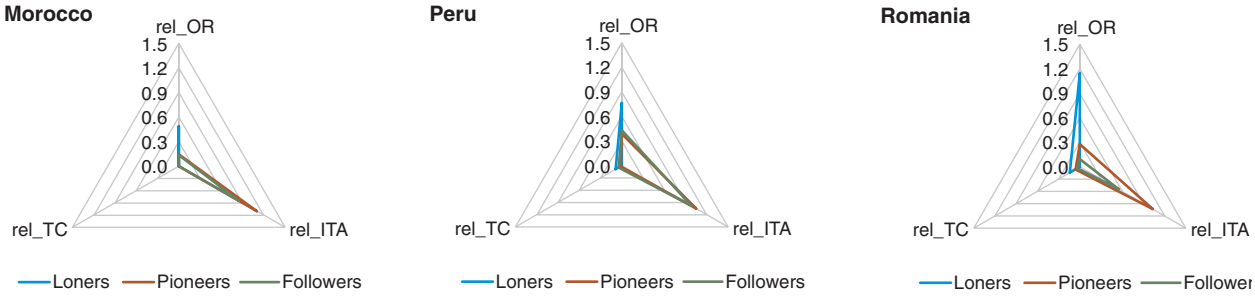
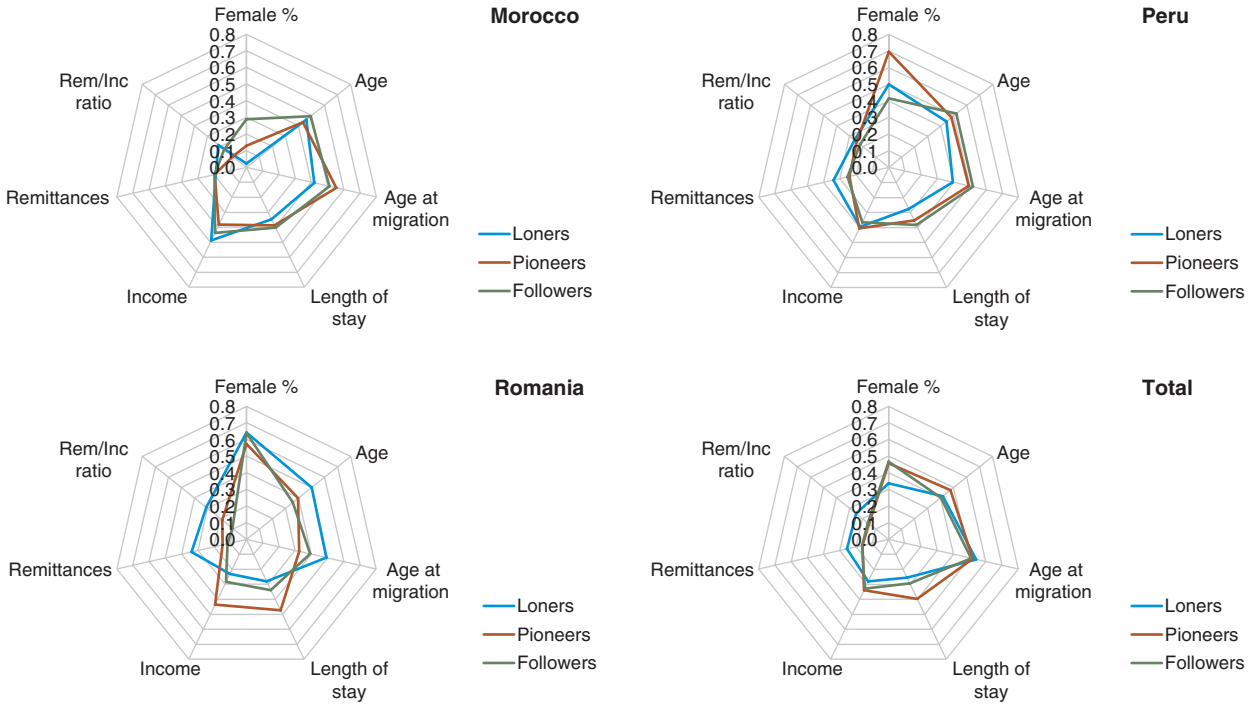


FIGURE 5: Main sample characteristics,* by migratory profiles and total



*Continuous variables have been standardized between 0 and 1 in order to appreciate differences across profiles and countries rather than real measures.

Beyond family composition and distribution, the three typologies combined with the three countries of origin appear to be different also for what concerns their demographic characteristics (sex, age, age at migration and length of stay) and their economic profile. Figure 5 illustrates that females are more frequently followers in Morocco, while representing the 70 percent of Pioneers among Peruvians. Pioneers on average have the longer length of stay, especially within the Romanian subgroup where they also have higher earnings and fewer remittances than followers and loners. In general, the average lone migrant is younger, has a short migration history in Italy and earns less than pioneers and followers. On the other hand, being alone allows the migrant to remit more both in absolute and relative terms (to the income) than those migrants who live in Italy with other relatives.

To test the statistical strength of these observed characteristics and to see to what extent the family composition and distribution counts in determining the total amount of remittances sent, we proceed with an empirical model in the next section.

3 THE EMPIRICAL MODEL

The dependent count variable: annual volume per migrant

Differing from other types of international financial flows to developing countries, remittances are usually sent at relatively high frequencies and in small magnitudes (Yang 2011). Data from our sample show that the average amount of money sent per transaction is of €236. For the purpose of our analysis, we combined the magnitude and frequency of each flow to estimate the average annual amount sent to the same recipient and then the average amount sent by each migrant overall (see the Greenback 2.0 Survey for the original figures: The World Bank 2014). The Peruvian subsample, with the highest share of monthly transactions, shows the biggest total amount per year (€2113), followed by Romanians (€1732), and Moroccans (€1594) (see Table 2). Average annual values are in line with the most recent data provided by the Bank of Italy at the national level (Banca d'Italia 2014; Fondazione Moressa 2013).

The total amount of remittances sent during a year is a count variable, with no natural a priori upper bound and the possibility that the outcome is zero for at least some observations. Indeed, dependent variable is defined as to take non-negative, non-zero values and it is characterized by a distribution strongly skewed to the right (Figure 6). Although in principle there is no upper limit for this variable, in practice values are empirically linked to the availability of resources (measured by income) of remitters.

TABLE 2: Average amount sent per transaction and per year

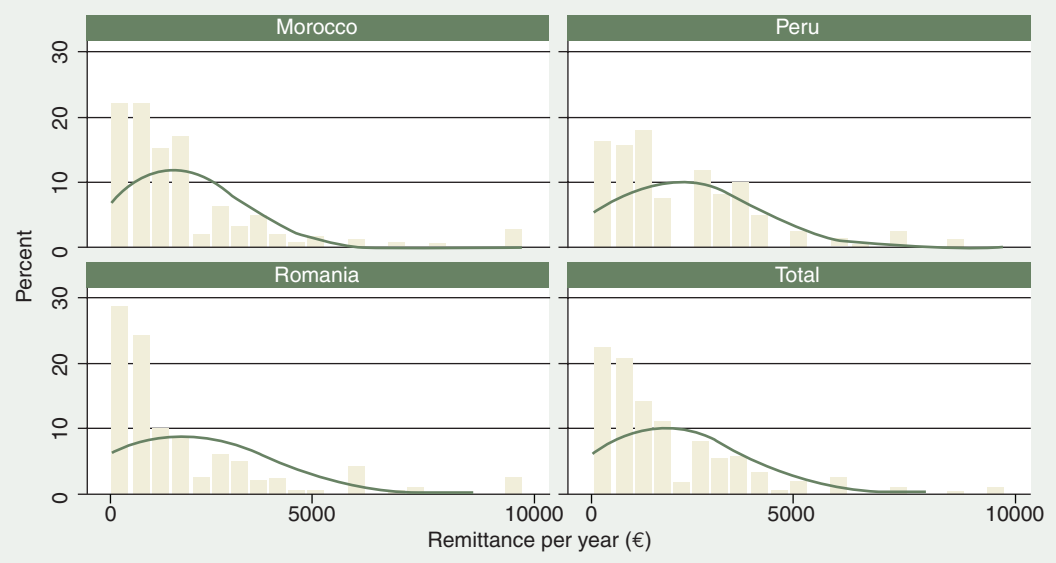
	Per Transaction		Per Year	
	Mean (€)	Standard Deviation	Mean (€)	Standard Deviation
Morocco	212.9	223.03	1594.4	1518.8
Peru	230.1	166.57	2113.0	1783.8
Romania	253.9	278.98	1732.3	2066.2

A model for count, overdispersed data

Hence, we need to model a regression which could explain our count variable y through a vector of explanatory variables $\mathbf{x}$. The most straightforward approach is a linear model estimated by OLS of the form $E(y \mid \mathbf{x}) = \beta\mathbf{x}$. But the β OLS estimators will allow for the predicted values of y to be negative, while we would like to have $E(y \mid \mathbf{x})$ non-negative for all because $y \geq 0$ by definition. For strictly positive variables, the natural log transformation is often used in order to test a linear model of the type $\ln(y) = \beta\mathbf{x} + \varepsilon$. Another possibility is instead to fit a Poisson model of the form $y = \exp(\beta\mathbf{x} + \varepsilon)$. The Poisson regression model has some interesting features and its assumptions may fit well with our data:

- The distribution is discrete
- The response values are non-negative integers
- Observations are independent from one another
- As the value of the mean increases, the probability of zero counts is reduced
- Conditional variance and mean are identical or nearly the same: $Var(y \mid \mathbf{x}) = E(y \mid \mathbf{x})$. This means that Poisson distributions with higher mean values have correspondently greater variability.
- The Pearson Chi2 dispersion statistic has a value of approximately 1.0, which results when the observed and predicted variances of the response are the same.

FIGURE 6: Annual remittances in euro, total and by country of origin



The y axis shows the share (%) of observations per each amount of remittances. The lines plot a normal density distribution on the histograms.

When a Poisson model is overdispersed, the Poisson dispersion statistic, Pearson *Chi*2/($n - r$), is greater than one and the negative binomial value of μ is greater than zero. A true Poisson model has a dispersion statistic of one and a negative binomial dispersion parameter of zero (Hilbe 2014). Our empirical data seem to be overdispersed even after checking for bigger outliers at the top of the distribution and using a robust variance estimator to get robust standard errors. Moreover, we do not have zero values. Hence we finally adopt a negative binomial model, which is still based on the Poisson one but controls for some overdispersion and allows reducing the bias of our estimated coefficients and standard errors. The traditional negative binomial model (NB2) has the same distributional assumptions as the Poisson distribution, with the exception that it has a second parameter (the dispersion parameter) which provides for a wider shape to the distribution of counts than that allowed in the Poisson distribution. In NB2 the variance is affected by a dispersion parameter (α) and the square of the mean (μ^2): $\mu + \alpha\mu^2$. In our case, the NB2 model specification proved to fit data better than a Poisson model, adjusting for the overdispersion of the data.

Regression results

Table 3 presents the regression results for three different specifications of the negative binomial model. Model (1) presents a full list of demographic variables for migrants and their families, while Model (2) adds information on the level of labor market integration and income at destination. Model (3) substitutes the variables referring to family composition across borders (number of relatives and their place of residence) with the summary variable forged on the three migration profiles presented above. The estimated signs of the relationship between each independent variable and our outcome (remittance amount) are those expected. Table 3 presents the regression results in the form of incidence rate ratios, the estimated rate ratio for one unit increase in each variable, holding constant the other regressors.[4]

Interestingly, gender has no significant effect on the total amount remitted, once controlled for other demographic and economic variables. Hence, females would remit the same amount

[4] If the IRR is less than 1, the effect on the dependent variable (remittances) is negative. If the IRR is higher than 1, the effect is positive.

TABLE 3: Negative binomial model (NB2) regression results

VARIABLES	(1) IRR	(2) IRR	(3) IRR
Sex (1=female, 0=male)	0.987	1.090	1.106
	(0.0694)	(0.0831)	(0.0886)
Age (years)	0.952*	0.943**	0.915***
	(0.0244)	(0.0227)	(0.0243)
Age squared (years^2)	1.001*	1.001*	1.001**
	(0.000297)	(0.000279)	(0.000307)
Age at arrival in Italy (years)	1.013**	1.024***	1.046***
	(0.00642)	(0.00668)	(0.00839)
Education level (base: low)			
– medium	1.042	0.979	0.956
	(0.0783)	(0.0710)	(0.0763)
– high	0.885	0.770**	0.660***
	(0.0979)	(0.0820)	(0.0792)
Mixed couple (1=partner with another citizenship at birth)	0.874*	0.859**	0.843**
	(0.0626)	(0.0626)	(0.0650)
Children in Italy (1=has at least 1 child in Italy)	0.740***	0.716***	
	(0.0787)	(0.0819)	
Children in the Country of Origin (1=has at least 1 child in the CoO)	1.497***	1.535***	
	(0.128)	(0.130)	
N. of relatives living in Italy, same HH	0.897***	0.888***	
	(0.0336)	(0.0366)	
N. of relatives for whose expenditure he feels to contribute to (burden)	1.086***	1.074***	
	(0.0178)	(0.0171)	
Receiving remittances (1=receives money from outside Italy)	1.001	0.978	
	(0.102)	(0.0914)	
Migratory profile (base: Loners)			
– Pioneers			0.710***
			(0.0691)
– Followers			0.644***
			(0.0654)
Regular at arrival (0=no visa or tourist visa)	0.836***	0.796***	0.791***
	(0.0522)	(0.0504)	(0.0567)
Country of Origin (base: Morocco)			
– Peru	1.242**	1.124	1.140
	(0.105)	(0.0916)	(0.0993)
– Romania	0.943	0.779***	0.767***
	(0.0906)	(0.0743)	(0.0772)
Annual income (€)		1.000***	1.000***
		(8.32e-06)	(7.38e-06)
Mono income HH (1=individual and HH incomes coincide)		1.068	1.129
		(0.0674)	(0.0863)
Type of job (base: Low qualified)			
– Medium (qualified workers in trade & services)		1.123*	1.190**
		(0.0749)	(0.0897)
– High (officers, professionals, technicians and managers)		1.284*	1.316*
		(0.179)	(0.213)
Savings in the last year (1=was able to save some money over the last year)		1.133*	1.174*
		(0.0843)	(0.103)
Constant	3,378***	2,252***	4,692***
	(1,820)	(1,134)	(2,499)
lndelta	1,122***	978.0***	1,212***
	(97.49)	(80.70)	(87.45)
Observations	476	474	474

Robust standard errors in parentheses
***p < 0.01, **p < 0.05, *p < 0.1

as males if they earned the same, had the same education level and the same age and family structure. Age has a convex, decreasing relationship with remittances: recalling that interviewed migrants were aged between 18 and 64, younger migrants remit more but the decrease in remittance with age reaches a maximum and then stops. Consistently, age at arrival which testifies for the seniority of migrants in Italy, is positively associated with remittances: migrants arriving at minor ages have probably less connections with their origin countries than those who migrated as adults. As for the education level, the highly-educated remit less in comparison with those with a low level of education, maybe because they belong to wealthier families at origin. Being part of a mixed couple—the spouse or the partner is of a different nationality than the interviewee—is associated with a significantly lower amount of remittances sent: this might be the effect of a stronger and more permanent integration in Italy with an Italian partner or spouse or alternatively the result of a bargaining process within the couple about who receives the money among relatives in two different countries of origin.

All the variables on the composition and distribution of the family members between Italy and the country of origin are significantly associated with the amount remitted. Having at least one child in Italy has the opposite effect on remittances than having one or more children left behind at origin.

The number of relatives living in the same household in Italy is associated with less money sent abroad. On the contrary, the higher the number of relatives for which the respondent feels to contribute to, the higher the overall amount devoted to remittances each year. Interestingly, declaring of having received money from relatives at origin or in third countries over the past year does not impact on the amount of remittance sent: this means that money flows in more than one direction and that, over the same year, migrants can receive money from some relatives and at the same time send money to others within a complex, multi-directional reciprocal network. As for the legal immigration status, we tried to test both the current status and the one held by migrants; interestingly, we found no effect for the variable 'being regular at the time of interview', while there is a strong, significant estimated effect of 'being regular at arrival' in determining a lower amount of remittance now. While migrants in an undocumented position at the time of the interview were very few, their legal status at the beginning of their presence in Italy was much more diversified with many entering without the required documents or overstaying a tourist visa. These results seem to be in line with other studies which found that undocumented migrants keep stronger connections with their origin families because of their greater uncertainty and the need of putting their money safely out of their destination country (Markova and Reilly 2007). Also, this effect could be partially due to the fact that those regular at the beginning often entered through family reunification processes, hence are less economically active on average than those migrated for the primary purpose of working in Italy.

As for the cross-country comparisons, Peruvians are associated with a bigger amount of annual remittances, followed by Moroccans and then Romanians. Since this pattern holds significant even after controlling for all the demographic and family formation patterns, this might be the sign of some underlying differences between migrants of our three origin countries which are not covered by our data.

The second model specification also includes variables accounting for the level of labor market integration in Italy and for the individual and household economic condition. Indeed, individual income can be seen as a proxy of the capacity to remit as an economic possibility and the ability of control over earned money (Carling and Hoelscher 2013), coupled by the degree of job qualification (often associated with higher incomes). Although the Italian labor market does not often offer migrants good chances of matching employment with acquired qualifications and tends to employ migrants in low qualified, service sectors' occupation (Castagnone et al. 2014), migrants' better labor market trajectories testified by better jobs and higher incomes are associated with more remittances sent abroad, other things being equal. This might be in contradiction with the effect found for the education level, but it is plausible since there is a strong degree of over-qualification (many of the medium and highly-skilled work in low qualified occupations) and the two variables are not strongly correlated. In the same direction,

migrants who declared to have been able to save some money since the beginning of the year—independently from the use of these savings—are those who engage in higher monetary transfers to their origin households.

The third and last column of Table 4 tries to test a model with a reduced number of variables without loss of explanatory power and goodness of fit. Substituting all family and household related variables with a categorical variable which summarizes them proves that our three migration profiles are a meaningful way of clustering migrants around their family and household structure in Italy and abroad. After running a two degree-of-freedom chi-square test on the migratory profiles' variable, we know that this variable is a statistically significant predictor of the amount annual of remittances sent annually.

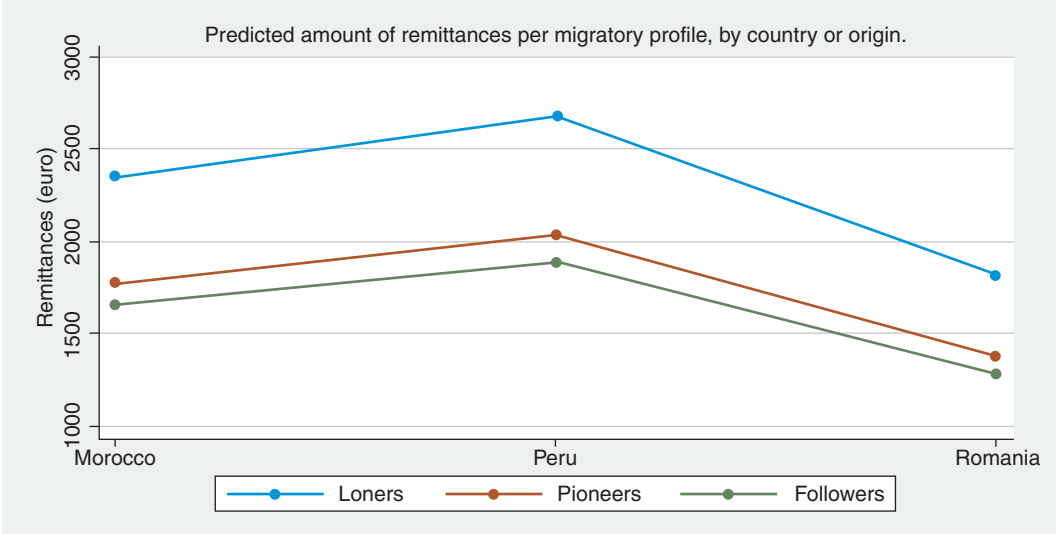
The significant difference in the amount of remittances associated with being either *Loner*, *Pioneer* or *Follower* (Figure 7) tells us that it is not only each single variable, while everything else is kept constant, to be associated with the amount of remittances, but that also complex migration profiles help us in distinguishing the remittance behavior of a sample of selected working and remitting migrants.

TABLE 4: Chi2 test on migration profile (base: Loner)

(1)	[remittances]2.pioneer =	0
(2)	[remittances]3.follower =	0
	chi2(2) =	18.4
	Prob > chi2 =	0.0001

Indeed, migrants who are living and working in Italy alone, without any members of the nuclear family in the country of destination, are remitting significantly more than both Pioneers and Followers, as they both have family members in Italy who supposedly require migrants to address more expenses in Italy and to leave remittances for a residual part of their savings. Loners are those who have not yet formed a family in Italy and who engage in more transnational behaviors to keep alive their family network abroad: they might be either repaying their families for the efforts made to start the migration process, or to be preparing a family reunification process or, on the contrary, their return at origin after having earned a prefixed amount of money. As we showed, Pioneers and Followers have a similar family spatial distribution between Italy and the country of origin and they also look similar in the amount of remittances

FIGURE 7: Predictive amount of remittances (calculated on model 3)



sent as they have few relatives at home and, in particular, virtually no children left behind.

Moreover, also in the last model specification, differences across the three national communities remain significant. As visually summarized by Figure 7, Peruvians remit more on average than Moroccans and Romanians taking other variables at their means. The difference is big enough that Peruvian Followers not only surpass their Moroccan and Romanian counterparts but also have level of remittances comparable to Moroccan Pioneers and Romanian Pioneers and Loners. As said, these cross-country differences might be due to unobserved variables which characterize the three sub-samples. Indeed, we are not able to test the effect of different return intentions, which are likely to impact the level of economic engagement at origin, and we do not have measures of physical mobility. Those who can travel more often and easily to the origin countries because of shorter geographical distance (Romanians and Moroccans) or thanks to legal provision on free mobility within the EU (Romanians) are plausibly more likely to bring money and consumption goods during their journeys, decreasing the need for remittance transfer in comparison with transoceanic migrants (Peruvians).

4 CONCLUSIONS

This paper discussed the role of the household and family structure in determining the amount of remittances sent by migrants, taking into account their migration history and the transnational distribution of their nuclear families.

Making use of a new and quite rich dataset on migrants residing in Turin, the analysis tried to outline the key determinants of remittances. In particular, it provided evidence for working migrants from three traditional labor-exporting countries—Morocco, Peru, and Romania—which represent three of the main origin countries for migrants in Italy both in terms of population and remittances. Notwithstanding the data limitations which derive from the cross-sectional structure of the sample, its geographical scope and the restrictive selection criteria, the depth and breadth of the original questionnaire allowed a detailed analysis of migrants' demographic and socio-economic characteristics, their level of labor market integration, their savings and remittances behaviors.

Our research question revolved around the role of migration history, the family spatial distribution in determining the amount of remittances sent each year by working migrants. In order to test the specific role of family structures and networks across borders, we identified three distinct migratory profiles—the Loners, the Pioneers, and the Followers—characterized by the timing and sequence of the migration event with respect to the rest of the nuclear family. Our profiles proved to behave differently with regards to remittances: migrants alone at destination, with no members of the nuclear family in Italy, remit significantly more than both pioneers and followers, who on the contrary have to address higher expenses in Italy to support their relatives. Hence, the spatial distribution of migrants' nuclear families between Italy, the origin country and eventually third countries, and the composition of their household in Italy help explain the variation in the amount of remittances, in accordance with other empirical studies (Ulku 2012; Nziramasanga and Yoder 2013; Marchetti and Venturini 2014). Family reunification processes, especially of children left behind, alter the transnational distribution of relatives and the related framework of migrants' obligations (Ambrosini 2013).

Cross-country differences appear to be non-negligible: other things being held constant, Peruvians remit more than Moroccans and Romanians on average, and we know from the original research that they are also more constant, as they remit small amounts at high frequencies (The World Bank 2014). The combination of results by country of origin and by migratory profiles resonates with the type and history of migration in Italy and specifically in Turin, with regards to the three observed nationalities (Pastore, Salis, and Villosio 2013). Indeed, in comparison with the rest of the sample, Moroccans are characterized by both a wider presence of male migrants alone—who have not yet formed a family—and of Pioneers, who had the time to pursue family reunification after settlement thanks for their long presence in Italy. Although this paper does not engage with the impact of the economic crisis on remittances (see Bartolini and Castagnone 2015 for a detailed analysis on this), we know that Peruvians are more concentrated in occupations (qualified jobs in the domestic and health care services) which have been less hit by the economic crisis than the construction and industry sectors where more Romanian and Moroccan, especially male, workers are employed.

Reasons for these significant cross-country differences are also likely to be found in variables

which we do not observe directly from our survey data. Remittance decisions, consistently with what we describe in our analysis, are connected to the life cycle of migrants and to their plans in terms of settlement or return: those with temporary migration plans, who are not engaging in family reunification processes and who plan to return home after a definite period of time, are more likely to invest more in keeping economic and social relationships with their origin household and to send more remittances (Dustmann and Mestres 2010; Delpierre and Verheyden 2014). Also, the literature suggests that return plans are adjusted when professional prospects change and family formation choices are done by migrants. A further element which could help in explaining the national differences in size of remittances is the feasibility of physical mobility for migrants of different origins. The geographical distance, the existence and accessibility of various means of transportation (not only airplanes, but also cars, buses, ferry-boats, and trains) make the difference in determining how often migrants can visit their origin countries. Hence, those who can more often travel home because of shorter geographical distance and cheaper means of transportation (Romanians and Moroccans) or thanks to the free mobility provisions within the EU (Romanians) can easily bring with them money and durable goods, decreasing the need for money transfers which is higher for transoceanic migrants (Peruvians).

The empirical evidence on micro motives to remit should then be combined with considerations on more long-term, institutional drivers of remittances with regard to the economic and policy environment in the origin and destination countries which might hinder or foster remittances at the macroeconomic level (World Bank Group 2015). Our results resonate with the overall Italian context of migrant integration and economic transnationalism which is (still) a 'basic' one (Ambrosini 2013, 632) where remittance flows are consistent with a relatively new migration history and a strong although decreasing transnational family distribution. Further research could connect this type of economic transfers with other ('advanced') levels of transnationalism, which pertain more to the sphere of entrepreneurship and/or symbolic belonging to the origin country.

REFERENCES

Åkesson, Lisa. 2011. "Remittances and Relationships: Exchange in Cape Verdean Transnational Families." *Ethnos* 76 (3): 326–47.

Ambrosini, Maurizio. 2013. "Migration and Transnational Commitment: Some Evidence from the Italian Case." *Journal of Ethnic and Migration Studies* 40 (4): 619–37.

Azam, Jean-Paul, and Flore Gubert. 2006. "Migrants' Remittances and the Household in Africa: A Review of Evidence." *Journal of African Economies* 15 (suppl 2): 426–62.

Baio, Gianluca, Gian Carlo Blangiardo, and Marta Blangiardo. 2011. "Center Sampling Technique in Foreign Migration Surveys: A Methodological Note." *Journal of Official Statistics* 27 (3): 451–65.

Banca d'Italia. 2014. "Le Rimesse Verso L'estero Degli Immigrati in Italia." July 7. http://www.bancaditalia.it/statistiche/rapp_estero/rimesse.

Bartolini, Laura, and Eleonora Castagnone. 2015. *Remittances and the Economic Crisis: Evidence from the Greenback 2.0 Survey in Italy.* Greenback Working Paper 1. Washington, D.C.: The World Bank.

Brown, Richard P. C., Jørgen Carling, Sonja Fransen, and Melissa Siegel. 2014. "Measuring Remittances through Surveys: Methodological and Conceptual Issues for Survey Designers and Data Analysis." *Demographic Research* 31 (41): 1243–74.

Carling, Jørgen. 2008. "The Determinants of Migrant Remittances." *Oxford Review of Economic Policy* 24 (3): 581–98.

———. 2014. "Scripting Remittances: Making Sense of Money Transfers in Transnational Relationships." *International Migration Review* 48 (September): S218–62.

Carling, Jørgen, and Kristian Hoelscher. 2013. "The Capacity and Desire to Remit: Comparing Local and Transnational Influences." *Journal of Ethnic and Migration Studies* 39 (6): 939–58.

Castagnone, Eleonora, Tiziana Nazio, Laura Bartolini, and Bruno Schoumaker. 2014. "Understanding Transnational Labour Market Trajectories of African-European Migrants. Evidence from the MAFE Survey." *International Migration Review* 48 (4).

Cingolani, Pietro, and Roberta Ricucci. 2013. *Le Collettività Di Origine Nordafricana in Piemonte, Tra Continuità E Cambiamento.* Turin: FIERI. http://www.integrazionemigranti.gov.it/ricerche/Documents/IRES%202013/Focus%205_integrazione%202013.pdf.

Cox, Donald, Zekeriya Eser, and Emmanuel Jimenez. 1998. "Motives for Private Transfers over the Life Cycle: An Analytical Framework and Evidence for Peru." *Journal of Development Economics* 55 (1): 57–80.

Delpierre, Matthieu, and Bertrand Verheyden. 2014. "Remittances, Savings and Return Migration under Uncertainty." *IZA Journal of Migration* 3 (1): 22.

Dustmann, Christian, and Josep Mestres. 2010. "Remittances and Temporary Migration." *Journal of Development Economics* 92 (1): 62–70.

Erdal, Marta Bivand. 2012. "Who is the money for? Remittances within and beyond the household in Pakistan." *Asian and Pacific Migration Journal* 21 (4): 437–58.

Fondazione Moressa. 2013. *Rapporto Annuale Sull'economia Dell'immigrazione—Edizione 2013, Tra Percorsi Migratori E Comportamento Economico.* Bologna: Il Mulino.

Guarnizo, Luis Eduardo. 2003. "The Economics of Transnational Living." *International Migration Review* 37 (3): 666–99.

Hagen-Zanker, Jessica, and Melissa Siegel. 2007. *The Determinants of Remittances: A Review of the Literature.* Working Paper MSGoG/2007/WP003. Maastricht University.

Hilbe, Joseph M. 2014. *Modeling Count Data.* Cambridge: Cambridge University Press.

Lucas, Robert E. B., and Oded Stark. 1985. "Motivations to Remit: Evidence from Botswana." *Journal of Political Economy* 93 (5): 901–18.

Marchetti, Sabrina, and Alessandra Venturini. 2014. "Mothers and Grandmothers on the Move: Labour Mobility and the Household Strategies

of Moldovan and Ukrainian Migrant Women in Italy." *International Migration* 52 (5): 111–26.

Markova, Eugenia, and Barry Reilly. 2007. "Bulgarian Migrant Remittances and Legal Status: Some Micro-Level Evidence from Madrid." *South-Eastern Europe Journal of Economics* 5 (1): 55–69.

Mazzucato, Valentina. 2011. "Reverse Remittances in the Migration–development Nexus: Two-Way Flows between Ghana and the Netherlands." *Population, Space and Place* 17 (5): 454–68.

Nziramasanga, Mudziviri, and Jonathan Yoder. 2013. "The Check in the Mail: Household Characteristics and Migrant Remittance from the US to Mexico." *Applied Economics* 45 (8): 1055–73.

Pastore, Ferrucio, Ester Salis, and Claudia Villosio. 2013. "L'Italia e l'immigrazione 'low cost': fine di un ciclo?." *Mondi Migranti* 1 (19).

Posel, Dorrit. 2001. "How Do Households Work? Migration, the Household and Remittance Behaviour in South Africa." *Social Dynamics* 27 (1): 165–89.

Rapoport, Hillel, and Frédéric Docquier. 2006. "The Economics of Migrants' Remittances." In *Handbook of the Economics of Giving, Altruism and Reciprocity,* edited by Serge-Christophe Kolm and Jean Mercier Ythier, 2:1135–98. Applications. Elsevier.

Ratha, Dilip. 2007. Leveraging Remittances for Development. Policy Brief. Migration Policy Institute. http://dilipratha.com/index_files/Ratha-Remittances-Oslo-February2007.pdf.

Ratha, Dilip, Supriyo De, Ervin Dervisevic, Christian Eigen-Zucchi, Sonia Plaza, and Kirsten Schiettler. 2014. *Migration and Remittances: Recent Developments and Outlook—Special Topic: Forced Migration.* 23. Migration and Development Brief. Washington, D.C: The World Bank. http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief23.pdf.

Ratha, Dilip, and Sanket Mohapatra. 2007. "Increasing the Macroeconomic Impact of Remittances on Development." *Development Prospects Group Note, The World Bank,* November. http://dilipratha.com/index_files/G8Berlin.pdf.

Sinning, Mathias. 2007. *Determinants of Savings and Remittances: Empirical Evidence from Immigrants to Germany.* Discussion Paper No. 2966. Bonn: IZA.

Thai, Hung Cam. 2014. *Insufficient Funds: The Culture of Money in Low-Wage Transnational Families.* Stanford University Press.

The World Bank. 2014. *Migrants' Remittances from Italy—International Remittances and Access to Financial Services for Migrants in Turin, Italy.* Greenback 2.0 Report. Washington, D.C. https://remittanceprices.worldbank.org/sites/default/files/migrants_remittances_italy.pdf.

Ulku, Hulya. 2012. "Remitting Behaviour of Turkish Migrants: Evidence from Household Data in Germany." *Urban Studies* 49 (14): 3139–58.

UNDP. 2014. *Human Development Report 2014—Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience.* United Nations Development Programme.

World Bank Group. 2015. *Global Economic Prospects,* January 2015: Having Fiscal Space and Using It. Washington, D.C.: The World Bank. http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2015a/pdfs/GEP15a_web_full.pdf.

Yang, Dean. 2011. "Migrant Remittances." *The Journal of Economic Perspectives* 25 (3): 129–51.