Working Papers

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Abstract:

We estimate a multinomial logit model to explain the choice of transfer channel (formal services vs. informal operators or personal transfers) by 1139 pairs of migrants and recipients of remittances in Moldova in 2006. Explanatory variables include socioeconomic characteristics of the migrant and other household members, the pattern of migration (destination country, legal status, duration) and financial information (average amount and frequency of payments). Key reasons not to use a formal transfer channel include an emphasis on low transfer cost (rather than speed, convenience, or security), a migrant's irregular legal status in the host country, and short migration spells.

Keywords: migration, remittances, Moldova, transfer channel, money transfer operator, financial sector development

EL classification: F22, F24, O16

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1 Introduction[*]

In many developing and transition economies, remittances from labor migrants constitute a large share of households' disposable incomes. Economy-wide, remittances are often a major source of external finance that surpasses official development assistance and foreign direct investment. Nevertheless, cross-country studies of the combined impact of migration and remittances on domestic GDP growth find ambiguous effects (for a recent survey see Chami, Barajas et al. 2008). Clearly, migration and remittances sustain consumption but do not automatically lead to higher investment and output growth. Therefore, national governments, international financial institutions and other donors are now searching for policies that will harness remittances for the sustainable economic development of migrants' home countries.

The transfer channels used by migrants to send remittances home are one important area on which policy debates have focused. World-wide, a large proportion of remittances is transferred not through the banking system or established money transfer operators but through various informal channels. At the same time, there are several reasons why remittances sent through formal financial institutions (particularly banks) are more likely than informal transfers to promote economic development.

First, if recipients have remittances deposited into bank accounts or at least collect remittances from bank offices, this brings a growing number of individuals and households into regular contact with the formal financial sector (Spatafora, 2005). A range of banking services can be offered to the formerly unbanked and the availability of loanable funds will increase economy-wide, promoting financial development.

Second, greater use of formal transfer channels is likely to help reduce transfer fees. The provision of international payment services in developing countries with limited public infrastructure is bound to be subject to economies of scale and scope. Therefore, a larger

number of formal remitters would reduce the cost per transaction, permitting fees to be reduced as competition among suppliers intensifies.

Third, several commercial banks in developing countries have been able to securitize either future flows of remittances or their fee income from such transactions, allowing the banks to attain investment grade ratings, reduce borrowing costs, and expand lending (OECD, 2007). Such operations further promote financial sector development.

Finally, informal international transfer networks such as the Hawala system have at times been suspected of providing cover for money laundering or the financing of terrorism (Jost & Sandhu, 2000). Whatever the factual basis of such suspicions, authorities are likely to respond in ways that will disrupt the transfer of remittances. By contrast, transfers through established money transfer operators are transparent and therefore not subject to wholesale charges of criminal involvement.

In spite of the benefits derived from the use of formal transfer channels and a variety of government and donor policies encouraging their use, informal transfers are still prominent in many remittance-receiving countries. These include organized transfer services by third parties, such as the hawala system or other unregistered or unlicensed operators (minibus drivers, etc), as well as cash (foreign exchange) transported personally by migrants themselves, relatives, friends, etc. The persistence of informal transfers raises the questions of (i) what drives the choice of transfer channel by migrants and their families and (ii) whether policy interventions can or should be designed to promote the use of formal transfers.

In this paper we study the choice of transfer channels by households in Moldova. Migration is a mass phenomenon in Moldova; up to one in three households receives remittances, mostly from a current household member working abroad. The government is encouraging the use of formal transfer channels; remittances are not taxed and the necessary paperwork for money transfers to individuals (as opposed to businesses) is manageable. Nevertheless, in our 2006 data from a nationally representative household survey, only about one half of remitter-recipient pairs report that they use formal transfers as their predominant channel. Around one third rely on personal delivery of foreign exchange cash by the migrants themselves or other trusted individuals, while the rest use informal services such as minibus drivers and train conductors.

We conduct a multinomial logit analysis of the determinants of the choice of the predominant transfer channel for each remitter-recipient pair, focusing on three groups of explanatory variables: (i) socioeconomic characteristics of the migrant and the recipient household,

including education, gender, urban vs. rural, consumption level, migration networks at household location; (ii) characteristics of the migration process, such as the host country, legal residence status, and for how long the migrant stays abroad; and (iii) financial information, such as whether the household has a current bank account, whether remittances are sent regularly, and the primary motivation for choosing a particular channel (cost, speed, convenience, etc.). Based on the regression results, we discuss whether market failures or external effects have a large impact on household decisions and whether appropriate policy interventions can be designed.

This paper is structured as follows. In Section 2, we review broad trends in migration and remittances in Moldova. Section 3 describes our dataset. In Section 4, we review previous studies on the choice of transfer channel and provide descriptive statistics for key groups of migrants and their remittance behavior. In Section 5, we present our econometric model and in Section 6 we report our regression results. Section 7 discusses the policy implications of our analysis.


2   Labor Migration and Remittances in Moldova Since 1999

Although labor migration from Moldova is a mass phenomenon today, it is a fairly recent development. A good measure of the prevalence of migration is the number of Moldovans who work abroad while still belonging to a household in Moldova (Figure 1). The best information available suggests that there were roughly 50,000 Moldovans working abroad in 1999 on average, while in 2007 there were close to 350,000.[1] Since seasonal migration is substantial, the total number of migrants abroad within any 12-month-period is at least one third higher. According to balance of payments statistics, remittances have grown along with the number of migrants to more than one third of Moldova's GDP in 2007 (Figure 2). Also according to balance of payments statistics, somewhere between one half and two thirds of remittances are transmitted through formal channels (see Luecke, Omar Mahmoud, Pinger 2007 for a more detailed discussion of data quality and coverage).[2]

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[1] The Labor Force Survey, on which these estimates are based, was thoroughly revised starting from 2006, leading to a lower estimate of the number of migrants. To present an internally consistent picture in Figure 1, we have revised the pre-2006 data downward in line with the discrepancy between the "old" LFS and the 2004 Census on which the "new" LFS estimates from 2006 are based.

[2] These balance of payments data represent the sum of credit items in the compensation of employees and workers' remittances accounts. According to the methodology of the National Bank of Moldova, these estimates reflect electronic transfers through the banking system, including payments through money transfer operators (MTOs), as well as informally transmitted remittances.

Figure 1. Labor migrants, 1999-2008
(thousands; 1999-2005 adjusted)
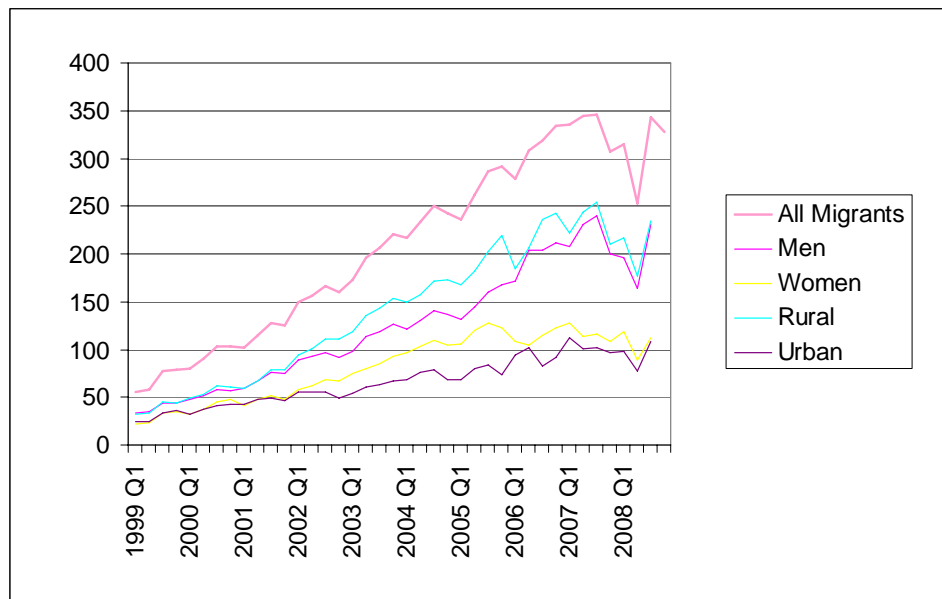
Source: National Bureau of Statistics, Labor Force Survey; authors'
calculations.

The migration literature distinguishes loosely between push factors (such as worsening living conditions at home) and pull factors (such as a growing awareness of migration opportunities) as possible determinants of the migration decision. In Moldova, mass labor migration was initiated by push factors. Moldova's GDP reached rock bottom in 1999, after a steep decline due to the disintegration of the former Soviet Union in 1991 and the 1992/1993 civil war in Moldova. Several developments came to a head around this time. Externally, the Russian crisis of 1998 caused demand for Moldova's agricultural exports to collapse. Domestically, a run-away government deficit became unsustainable and was eliminated through painful expenditure cuts. Furthermore, collectivized agriculture was finally privatized, leading to job losses at communal farms and a wide-spread return to small-scale and subsistence agriculture.

While most CIS countries registered an output collapse during the 1990s and a gradual recovery from 2000 onwards, structural change was particularly severe in Moldova. Under the Soviet planning system, the Moldovan economy had been heavily specialized in agriculture, enjoying both a protected market for its exports and subsidized energy imports. As a result, the share of agriculture in Moldovan GDP and employment was far higher in the mid-1990s than could possibly be sustained under market economy conditions. When Moldova's terms of trade finally did decline and stop-gap measures by the government were no longer effective, it became clear quickly that Moldovan agriculture could no longer provide gainful

Figure 2. Migrant remittances, 2000-2008
(US$ million; 2008 estimated)
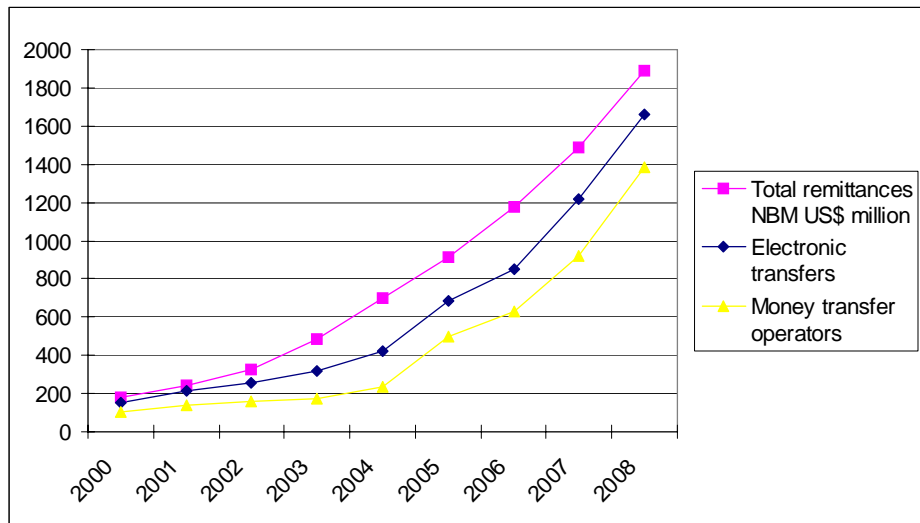
Source: National Bank of Moldova.

employment for a large proportion of the people in rural areas. Between 2000 and 2006, the agricultural labor force declined from more than 700,000 individuals to less than 400,000. Conversely, middle-aged men from rural areas with limited educational attainment became a prominent category of migrants during the early 2000s. They are typically employed, often seasonally, by the construction industry in CIS countries which accounted for 34 percent of all Moldovan migrants in 2006 (Luecke, Omar Mahmoud, Pinger 2007, Figure 3.2).

More recently, the profile of migrants has changed to include more women and younger adults. For many of these, pull factors, such as higher incomes and a broader range of employment opportunities abroad, are the primary motivation to migrate. They are also more likely to come from urban areas within Moldova and to plan to live abroad permanently. Apart from CIS countries, where 20 percent of Moldovan migrants were employed in sectors other than the construction industry in 2006, EU countries such as Italy and Portugal (30 percent) and other (relatively) high-income countries such as Turkey and Israel (12 percent) have become important destinations. Migration spells in EU countries tend to be longer than elsewhere because many Moldovan migrants first arrive through irregular channels and seek to stay put in the destination country until their status has been regularized (Luecke, Omar Mahmoud, Pinger 2007).

Thus the Moldovan migrant population is highly diverse in terms of socioeconomic characteristics, migration patterns (seasonal vs. long-term), legal status at destination, and

access to formal financial services. This makes Moldova an interesting case to study the determinants of transfer channel choice at the household level.

3 Database: The 2006 IOM-CBSAXA Household Survey

The broad trends in migration and remittances since 1999 are captured fairly well by official data sources such as the Labor Force Survey and the balance of payments. However, national policymakers and the donor community have long perceived the need for richer data on the causes and effects of migration and the living conditions of migrants. In response, the Moldova offices of several international organizations (IOM, EU Food Security Program, IMF) commissioned the CBSAXA opinion research firm, in 2004, to conduct a nationally representative household survey that focused on the determinants and the welfare effects of migration and remittances at the household level. Under IOM auspices and with donor funding, the CBSAXA survey was repeated in a comparable format in 2006. In this chapter, we use information on transfer channel choice as well as migrant and household characteristics from the 2006 survey (henceforth: 2006 IOM-CBSAXA survey).

With a total sample size of close to 4,000 households, the survey was designed to be representative of Moldovan households at the national level (excluding the secessionist region of Transnistria), for each major geographic region (North; Center; South; Chisinau), and for each major type of locality (large cities: Chisinau and Balti; other towns; villages). The households to be interviewed were selected according to a systematic sampling scheme (for details, see Luecke, Omar Mahmoud, Pinger, 2007, Box 2.1). Compared with a stratified random sampling scheme, this quasi-random approach has the advantage of being cheaper to implement while generating results that are normally very similar to true random sampling. Due to resource restrictions and practical limitations (for example, poor households often have no telephone), households were selected according to the sampling procedure and interviewed on the spot, without advance information about the interview request. Nevertheless, the overall response rate was very high, with fewer than one in ten selected households not agreeing to be interviewed.

The questionnaire was designed with a view to avoiding sensitive questions as much as possible, for example by asking for qualitative information rather than exact data on income. This concern appears justified: When asked the inevitable question about the amount of remittances, only just over one half of those households that received remittances were willing to indicate an amount (Lücke, Omar Mahmoud, Pinger 2007). The questionnaire was

available in Romanian ("State Language of the Republic of Moldova") and Russian and may be obtained from the authors.

4 Migrant and Household Characteristics and the Determinants of Transfer Channel Choice

This section identifies household-level determinants of transfer channel choice in the existing literature and then presents descriptive information from our dataset on our dependent and explanatory variables. Unfortunately, the existing literature provides only limited guidance regarding the choice of explanatory variables for our regression analysis. Most papers are case studies of particular transfer corridors that informally discuss a wide variety of determinants, including the role of the macroeconomic environment (e.g. dual exchange rates), political instability, or a weak banking system (e.g. Buencamino, Gorbunov 2002). Since our analysis is based on household data for a single country at a single point in time, however, we cannot consider such variables that affect all Moldovan households in the same way. Furthermore, the few existing quantitative studies (including ours) have to contend with the lack of important information in most datasets such as cost estimates for each household for the use of different transfer channels. Instead, proxy variables such as rural vs. urban location are typically used to capture, for example, the relative ease of physical access to banks.

In large descriptive studies of the US-Mexico and Canada-Vietnam remittance corridors, Hernandez-Coss (2005; 2005a) classifies determinants under the headings of personal incentives, customer service incentives, and economic incentives. Personal incentives include anonymity/secrecy, cultural familiarity and personal contacts. For example, the anonymity or secrecy offered by informal services will matter to migrants who fear that formal channels may be connected with law enforcement or immigration authorities in the host country or transmit information to home country tax authorities. Customer service incentives include dispute resolution, accessibility, discrimination and reliability versatility/resilience. Economic incentives include speed, cost, secondary benefits and legal or regulatory environment.

Most other studies come up with less detailed lists of potential determinants. Based on a review of country experiences, Orozco (2003) asserts broadly that, among other factors, access to information, cultural practices, and educational and income status of the recipient and sender influence the choice of transfer method. In an econometric analysis, Amuedo-Dorantes and Pozo (2005) identify the migrant's legal status, sector of employment, family networks in the host country, and length of stay in the host country as important determinants.

Not surprisingly, many studies find a strong role for household preferences regarding key attributes of alternative transfer channels such as cost, convenience, speed, security, trust and familiarity (Buencamino and Gorbunov 2002; Orozco 2002; El-Qorchi, Maimbo et al. 2003; Bazenguissa-Ganga 2005; Freund and Spatafora 2005; Higazi 2005; Pieke, Hear et al. 2005) .

Our 2006 IOM-CBSAXA dataset covers 1139 bilateral relationships between a migrant and a recipient household (Table 1). Migrants in our sample are either current or former household members. While some households receive remittances from other migrants, these are typically one-off payments linked to life-cycle events such as baptisms, weddings, or funerals.

Table 1: Descriptive statistics for variables in multinomial logit regression

Variable	Formal remittances	Informal services	Personal transfers	Total
Total	544	220	375	1139
Education level of migrant (number)				
less than secondary compl.	24	8	20	52
secondary completed	183	70	140	393
vocational	218	82	138	438
university	115	50	67	232
Socioeconomic characteristics				
male migrant (number)	309	83	240	632
urban household (number)	164	62	123	349
average hh expenditures (MDL)	545	450	510	515
migration prevalence at loc. (percent)	15,2	15,9	15,2	15,3
Destination country (number)				
high income	204	131	41	376
other non-CIS	47	16	47	110
CIS	265	61	264	590
Migration attributes (number)				
Former household member	146	67	86	299
Legal residence in dest.	392	92	244	728
Abroad for < 1 year	245	59	237	541
Payment information				
household has bank account	96	18	28	142
remittences sent regularly	354	151	157	662
imputed remittances over previous 12 months (US$)	1180	1077	930	1077
Primary motive in channel choice (number)				
cost	12	48	35	95
speed	167	6	7	180
convenience	135	77	61	273
security	188	27	131	346
trust/ familiarity	40	60	132	232

Note: figures may not add up to totals because of missing values for some variables.

Source: 2006 IOM-CBSAXA survey; authors' calculations.

Whatever transfer channels are used on such occasions would be of little relevance for the lion's share of remittances that come from current or former household members.

For each bilateral relationship we know the transfer channel that is predominantly used to send remittances. While the IOM-CBSAXA survey identifies approximately ten transfer channels in some detail, we group them into three broad categories:

(i)   formal services: bank transfer into a Moldovan bank account, money transfer operator (MTO), transfers through the Post office;

(ii)   informal (third-party) services: train conductor, minibus operator;

(iii)   personal transfers through migrants themselves, relatives, friends, or acquaintances.

According to the IOM-CBSAXA survey, formal services constitute the primary channel for just under one half of the migrant-recipient pairs (544 out of 1139). In value terms, the share of remittances to Moldova going through formal services is even higher because those migrant-recipient pairs who mainly use formal services report higher remittances (Table 1). Imputed remittances over the 12 months before the survey are US$ 1180 for households that mainly use formal services vs. US$ 1077 for informal services and US$ 930 for personal transfers.

Our two remaining categories of transfer channels both relate to informal transfers, i.e. the transmission of foreign exchange cash without official registration. In the case of informal services, a third party (such as a train conductor or minibus driver) delivers the payment for a fee. Informal services are the primary transfer channel in one fifth of cases in our sample. Policies that seek to promote formal transfer services will presumably target primarily such informal services provided by third parties.

Our third category is termed "personal delivery" and accounts for the remaining third of cases in our sample. Either migrants themselves, or relatives, friends, close acquaintances etc. deliver cash to the recipient. Obviously, personal delivery only works for those migrants who travel home frequently or have access to a social network that spans their home region and destination country. At the same time, where personal delivery is feasible, it may be difficult to induce migrants and recipients to move to using formal services, given the low cost and convenience of personal delivery.

Our category of formal transfer services could be criticized on the grounds that it lumps together bank transfers and transfers through money transfer operators (MTO). Specifically, it

might be argued that a bank transfer, which typically requires the use of bank accounts by both migrant and recipient, implies a higher level of financial sophistication and financial sector development than a transfer through an MTO. However, in Moldova, bank and MTO transfers are almost indistinguishable on the ground. Because of licensing requirements, foreign currency transactions are limited to commercial banks; MTOs must offer their services through commercial banks and, conversely, nearly all commercial banks offer the services of more than one MTO (Table 2). In fact, respondents in the IOM-CBSAXA survey were often unable to distinguish clearly between bank transfers; this is evident from the fact that many respondents without a bank account claimed that they used bank transfers as their primary transfer channel, which is plainly impossible.

From the point of view of promoting banking services and financial sector development, the Moldovan regulations that require MTO transfers to go through banks may have important advantages. Even without a bank account, recipients are in regular contact with commercial bank staff when they collect payments. For many, this may be a stepping-stone towards using a wider range of banking services, if and when the need arises. Therefore, our broad definition of formal services also makes sense from a policy point of view.

Drawing on the literature on the determinants of transfer channel choice, we identify three broad groups of variables from the CBSAXA dataset that we expect to contribute to an explanation of how migrants and recipients choose between formal services, informal services, and personal delivery:

    (i)   socioeconomic characteristics of the migrant and other household members;

    (ii)   the pattern of migration, e.g. destination country, legal status, duration;

    (iii)   financial information such as the amount and frequency of payments, financial sophistication as expressed through the use of banking services, preferences for key features of the various channels.

The descriptive statistics for our sample suggest that the choice of transfer channel is strongly correlated with the destination country and the resulting pattern of migration (Table 1). Migrants in high-income countries (mostly Italy and other EU member states) are more likely than others to use formal services: 54.3 percent of migrants in high-income countries use this channel (204 out of 376 migrant-recipient pairs), vs. less than 45 percent for the remaining countries. Migrants in high-income countries are also disproportionately frequent users of informal services: 34.8 percent of migrant-recipient pairs (131 out of 376), vs. less than 15 percent for the remaining countries. Migrants in CIS and other non-CIS countries, by contrast,

Table 2: MTO services offered by commercial banks, Moldova, January 2008

Name of bank	Balance sheet (MDL million 2006)	Number of locations /a	MTO services offered
Agroindbank	4830	91	Travelex, Private Money, Anelik, Western Union
Banca de Economii	3470	512	Western Union
Victoriabank	2629	16	Money Gram, Interexpress, Posta Rapida, Blizko, MIGOM, Contact
Mobiasbanca	1950	71	Western Union, Swift, Contact, Anelik
Moldindconbank	1800	50	Western Union, RUS-Express, Leader-VMT, STRADA ITALIA
Banka Sociala	1576	23	Western Union, Anelik, Unistream, Posta Rapida, Migom
Eximbank	1376	50	Money4family, Western Union, Posta Rapida, Privat Money, Getmoney to family, Xpress Money, UNISTREAM, Anelik, Leader, MIGOM, Contact
FinComBank	1182	31	SWIFT, WESTERN UNION, Anelik
BC Romana Chisinau	815	2	Travelex, Anelik, Posta Rapida
Investprivatbank	648	32	Unistream, Anelik, Posta Rapida, Western Union, MIGOM
Energbank	597	57	Western Union, Contact, Anelik, Unistream, Posta Rapida, Migom, Leader-VMT, InterExpress
Unibank	596	19	Western Union, Anelik, Unistream, Migom
Comertbank	292	1	Western Union
Universalbank	292	7	Anelik, Unistream, Money Gram, Leader, Interexpress, Posta Rapida, Uno Money Transfer
EuroCreditBank	180	23	Western Union, Anelik, Coinstar, Contact, UNIStream, Bystraya Pochta, Migom, Leader, Blizko
Notes: /a Branches, representative offices, agencies.			

Source: commercial bank websites, January 2008; authors' compilation.

rely much more on personal transfers (more than 40 percent, vs. 10.9 percent in high-income countries).

These findings reflect the prevailing pattern of migration. Migrants in CIS countries are often abroad seasonally; personal transfer is therefore a feasible option for them, and they use it extensively. In fact, of the 541 migrants who staid abroad for less than one year, 237 (or 43.8 percent) use personal transfers. By contrast, migrants in high-income countries often have illegal residence status (EU) and therefore stay away from Moldova for years on end; therefore, they need to send money through third parties rather than carry it home themselves, and they often end up using informal services because of their undocumented status.

These patterns are closely related to the cost of reaching the destination country: in 2006, first-time migrants to the EU paid up to € 4,000 for transport to their destination where they would typically live for several years as undocumented residents; by contrast, travel from Moldova to Moscow (visa-free for Moldovan citizens) could be as cheap as US$ 100 (Luecke, Omar Mahmoud, Pinger 2007). However, Moldovan migrants in the EU also tend to view their living conditions abroad more favorably than migrants in the CIS; they enjoy higher earnings and send larger remittances.

In the IOM-CBSAXA survey respondents were also asked to indicate the main reason for choosing their primary transfer channel. The answers provide insights into the preferences that underlie the decision-making by migrants and other household members. Of those who use formal services (542 migrant-recipient pairs), 30.8 percent (167 cases) cite speed as their main reason for this choice, vs. less than 3 percent of those using other channels. Users of informal services stress cost advantages (22 percent vs. less than 10 percent of those using other channels) and convenience (35.3 percent vs. less than 25 percent). Similarly, personal transfers are chosen especially often for reasons of trust and familiarity. Conversely, relatively few migrant-recipient pairs choose formal services because of their cost or familiarity, or informal services because of speed or security, or personal transfers because of speed or convenience.

While this descriptive information is suggestive, it does not allow us to identify systematically the impact of each potential determinant on the choice of the transfer channel. In the following section, we use a multinomial logit regression model to conduct a more thorough analysis.

5 Econometric Model

The purpose of our econometric analysis is to explain the choice of transfer channel (formal services or informal services or personal transfers) on the basis of migrant and household characteristics. Thus our dependent variable (the chosen transfer channel) is categorical and standard regression techniques are not applicable. Furthermore, we are dealing with a nominal dependent variable because our categories follow no natural order (as opposed to, say, size classes for a particular product which run from smallest to largest). As discussed in the preceding section, our potential explanatory variables are all case-specific, i.e. for each migrant-recipient pair the variables take the same value for all three possible choices. For example, we know the migrant's level of education and can assess its impact on the choice of

transfer channel. However, we do not know the cost that the particular migrant-recipient pair would incur using each of the three channels, which will often differ across households. Thus we have no alternative-specific data for each case, but only case- (migrant-recipient-pair) specific data.

The appropriate regression model under these circumstances is the multinomial logit or probit model. Formally (Amuedo-Dorantes, Pozo 2005; Long and Freese 2006), the model may be described starting from the notion that a migrant-recipient pair (i =1….n) derives utility U_{ij} from using a given transfer channel j (j = 1 for formal services, j = 2 for informal services, j = 3 for personal transfers). U_{ij} depends deterministically on a set of explanatory variables X_i and coefficients β_j as well as on a random component:

$$U_{ij} = V_{ij} + \varepsilon_{ij} = \beta_j' X_i + \varepsilon_{ij}, \quad (1)$$

where V_{ij} is the deterministic and ε_{ij} the random component of the utility function.

The probability of migrant i choosing transfer channel j is equal to the probability of U_{ij} being the largest among $U_{i1},...U_{i3}$. Hence

$$P_{ij} = \text{Prob}(Y_i = j) = \text{Prob}(U_{ij} > U_{ik}) = \text{Prob}(\varepsilon_{ij} - \varepsilon_{ik} \le \beta_j' X_i - \beta_k' X_i), \quad (2)$$

where k = 1…3 and $k \ne j$.

The specific form of the model depends on the distribution of the error terms. If we assume that the error terms are distributed according to a Type I extreme value distribution and are independent across alternatives j, the multinomial logit model results. For normally distributed error terms, which may be correlated across alternatives, the multinomial probit model is obtained. In our analysis we use the multinomial logit model because (i) the multinomial probit model is computationally burdensome and the estimates are typically very similar to the multinomial logit model (Long and Freese, 2006, p. 276) and (ii) we find that the assumption of uncorrelated error terms across alternatives (also known as IIA: independence of irrelevant alternatives; see below) is not rejected by our data.[3]

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[3] It is worth noting that although the multinomial probit model in principle allows for correlated error terms across alternatives, its implementation in Stata software (mprobit command) assumes IIA and therefore offers no value added over the multinomial logit model (mlogit command; Long and Freese, 2006, p. 275).

When the multinomial logit model is estimated, one alternative needs to be chosen as the base outcome and coefficient estimates are calculated in relation to that base outcome (for a detailed discussion, see Long and Freese, 2006, p. 228). However, the choice of the base outcome affects only the parameterization of the model, not the predicted probability of migrant-recipient pair i choosing channel j:

$$P_{ij} = \mathrm{Prob}(Y_i = j) = \frac{\exp(\beta_j' x_i)}{\sum_{k=1}^{3} \exp(\beta_k' x_i)}. \quad (3)$$

In our analysis, we choose formal services as the base outcome because we are particularly interested in finding out what renders individuals more likely to choose transfer channels other than formal services. Formal services are arguably the most desirable from the point of view of fostering financial development. Once we understand why some individuals do not use them, we can consider the benefits and costs of possible policy interventions to strengthen incentives to use formal services.

As the coefficients from multinomial logit regressions are difficult to interpret, we present our regressions results in the form of relative risk ratios between for unit changes in each explanatory variable:

$$\frac{P_{ij}}{P_{ik}} = \exp(\beta_j' x_i), \quad (4)$$

where $j = k$ is the base outcome (formal services in our case). For example, a relative risk ratio of 0.5 for the male migrant dummy variable (male = 1, female = 0) and informal services implies the following (cf. Table 3 below): if the migrant is male rather than female, this reduces by one half the ratio of the probabilities that informal services vs. formal services (base outcome) are used.

As noted above, the multinomial logit model assumes independence of irrelevant alternatives (also known as the red bus/ blue bus problem; cf. Long and Freese, 2006, p. 243). This assumption implies that adding or deleting alternatives does not affect the odds among the remaining alternatives. For example, the odds of using formal vs. informal services are assumed to be the same independent of whether there exists a third option, i.e. personal transfers. This is equivalent to stating that if personal transfers were (hypothetically) eliminated, those individuals who previously used personal transfers would use formal and informal services in the same proportion as all other migrant-recipient pairs in the sample.

This assumption may be plausible if the alternatives are defined to be sufficiently different in the views of the decision-makers. In our hypothetical example, the use of personal transfers is feasible if a migrant either travels to Moldova often enough or has access to a network of other migrants from the same region in Moldova. Now if personal transfers were somehow eliminated, there is no strong reason why those who previously used them would shift overwhelmingly to either formal or informal transfers; they might well make this choice in similar proportions as the rest of the population.

For the IIA assumption to hold, it has to be possible to eliminate (hypothetically) any one option without affecting the odds between the remaining alternatives. Accordingly, the validity of the IIA assumption for a given dataset and definition of alternatives can be assessed through a Hausman specification test in which one alternative is dropped at a time and the results of each such restricted model are compared to full model (cf. Table 3 below). Long and Freese (2006, p. 244) discuss several implementation issues with the Hausman test and a similar Small-Hsiao test; in our analysis, we use a robust procedure recently implemented under the Stata suest command that takes care of these issues. The test statistics confirm that we can safely assume IIA for our model (bottom of Table 3).

6 Multinomial Logit Regressions

Our multinomial regression model explains the choice of transfer channel (formal services, informal services, personal transfers) through the independent variables described in Section 4 (Table 3). Our first specification (1) uses all explanatory variables introduced in Section 4 except the primary motive for choosing the transfer channel; our second specification (2) adds the dummy variables that describe the primary motive. We report relative risk ratios (as explained in Section 5 above) along with the significance levels of the associated coefficients.

We consider the impact of the "primary motive" variables separately to account for a possible ambiguity in the phrasing of the corresponding survey question. The survey asks "What do you think has been the main reason for (…) to use this channel?" with the answer options given in Table 2. We take the response to indicate the primary motive that has guided the decision on the transfer channel. However, from the phrasing of the question we cannot exclude the possibility that some respondents in fact indicated what they saw as the main advantage of the chosen channel.

A comparison of specifications (1) and (2) shows that adding the "primary motive" variables adds considerably to the explanatory power of the model, with the Pseudo R^2 going from 0.161 to 0.307. Relative risk ratios for informal services and the "primary motive" dummies such as speed, convenience, etc. are all significantly below 1. To interpret these relative risk ratios, recall that the default for the "primary motive" dummy variables is cost. For example, a unit increase in the "speed" dummy variable (to which the relative risk ratio refers) implies that speed, rather than cost, is now the primary motive. Given the relative risk ratio (rrr) of 0.005, the likelihood that informal services are chosen, relative to the likelihood that formal services are chosen, is now only 0.5 percent of its former level when cost was the primary motive.

Table 3: Regression results (multinomial logit) - Transfer channel choice

	(1)	(2)
Base outcome	Formal services	Formal services
Informal services	Relative risk ratios	
Education (default: second. not completed)		
secondary completed	0,445 **	0,340 **
vocational	0,436 **	0,339 **
university	0,468 *	0,287 ***
Socioecon. characteristics		
male migrant	0,504 ***	0,443 ***
urban household	0,935	0,904
average hh expenditures (MDL 100)	0,959 *	0,952 *
migration prevalence at loc.	2,373	1,282
Destination country (default: CIS)		
high income	1,876 ***	1,861 **
other non-CIS	1,016	0,931
Migration attributes		
Former household member	1,195	1,395
Legal residence in dest.	0,278 ***	0,301 ***
Abroad for < 1 year	0,648 **	0,548 **
Payment information		
household has bank account	0,386 ***	0,388 ***
remittences sent regularly	1,292	1,420
total remittances over prev. 12 months	1,000	1,000
Primary motive in channel choice (default: cost)		
speed		0,005 ***
convenience		0,112 ***
security		0,033 ***
trust/ familiarity		0,325 ***

Table 3 (continued): Regression results (multinomial logit) - Transfer channel choice

	(1)		(2)	
Personal transfers	Relative risk ratios			
Education (default: second. not completed)				
secondary completed	0,592		0,396	**
vocational	0,606		0,403	**
university	0,693		0,386	**
Socioecon. characteristics				
male migrant	0,990		0,884	
urban household	1,104		1,041	
average hh expenditures (MDL 100)	1,011		1,013	
migration prevalence at loc.	0,264		0,099	*
Destination country (default: CIS)				
high income	0,238	***	0,271	***
other non-CIS	0,890		1,003	
Migration attributes				
Former household member	0,736		0,753	
Legal residence in dest.	0,692	**	0,878	
Abroad for < 1 year	1,683	***	1,557	**
Payment information				
household has bank account	0,693		0,625	
remittences sent regularly	0,310	***	0,310	***
total remittances over prev. 12 months	1,000		1,000	
Primary motive in channel choice (default: cost)				
speed			0,015	***
convenience			0,131	***
security			0,200	***
trust/ familiarity			0,956	
Number of observations	1034		1034	
Pseudo R²	0,161		0,307	

Hausman test of IIA assumption (Ho)
based on SUR model (STATA command: suest)

Degrees of freedom		16			20	
Omitted alternative	Chi²	P > Chi²	Evidence		P > Chi²	Evidence
Formal services	14,4	0,566	for Ho	25,9	0,170	for Ho
Informal services	16,4	0,425	for Ho	24,2	0,236	for Ho
Personal transfers	16,7	0,403	for Ho	25,8	0,173	for Ho

Legend: * p<.1; ** p<.05; *** p<.01

Less formally speaking, in choosing between informal services and formal services (our base outcome), migrants and their families are more likely to opt for informal services if they are primarily concerned about cost, rather than speed, convenience, security or trust/ familiarity. Similarly, in choosing between personal transfers and formal services (second part of Table 3), they are more likely to opt for personal transfers if they are primarily concerned about cost, rather than speed, convenience or security (rrr below 0.2). If they are primarily

concerned about trust/ familiarity rather than cost, this does not affect the relative probabilities of choosing personal transfers vs. formal services (rrr close to 1).

Overall then, of the possible primary motives for choosing the transfer channel, only concern about the cost of transfers will draw migrants and their families away from formal services towards either informal services or personal transfers. A preference for speed, convenience, and security will all draw migrants and their families towards using formal services. If they are primarily concerned about trust/ familiarity, this will draw them away from informal towards formal services, but will not affect their decision as between personal transfers and formal services. In assessing possible policy conclusions from these findings (see Section 7 below), we will take into account that of 1126 migrant-recipient pairs with data on "primary motive", only 95 were primarily concerned about cost (Table 1).

A comparison of Specifications (1) and (2) shows that that the relative risk ratios for the remaining explanatory variables are fairly robust to the inclusion of the "primary motive" variables. Although some magnitudes and significance levels change, the broad picture does not. Turning to the role of education first, if the migrant has at least completed secondary school (which some rural migrants have not), informal services and personal transfers are less likely to be used (rrr below 0.5 for informal services and equal to 0.4 and lower for personal transfers under Specification 2). Apparently the least educated migrants are reluctant to use formal financial institutions, which appears plausible. At the same time, this effect is limited to migrants who have not completed secondary school; among those who have at least completed secondary school, there is no effect of a higher education level on transfer channel choice (the rrr are almost the same for completed secondary school, vocational and university education). Also, since only 52 out of 1115 migrants in the sample had not completed secondary school, this effect is limited to a small group of mostly old, rural migrants.

Regarding other socioeconomic characteristics of the migrant and the household, only a few relative risk ratios reflect statistically significant coefficients. In particular, male migrants are only half as likely as female migrants to use informal services relative to formal services (rrr close to 0.5), with no such effect for personal transfers relative to formal services. It is difficult to see how gender as such could have such a large impact on transfer channel choice. As gender is correlated with other explanatory variables, particularly the pattern of migration, there may be collinearity among explanatory variables which causes the seeming gender effect.

Specifically, informal services are widely used in the EU where the share of women among Moldovan migrants is higher than in the CIS. In part, this probably reflects the illegal residence status of many Moldovan migrants in the EU. Furthermore, the cost of formal transfer services tends to be higher in the EU than in the CIS where competition among money transfer operators serving Moldovan (and other) migrants has intensified in recent years and fees have been cut. Many of the MTOs listed in Table 2 are active mostly in CIS countries.

As expected, being a migrant in a high-income country (typically the EU) rather than in the CIS almost doubles the likelihood of using informal services, relative to formal services (rrr around 1.9). By contrast, the likelihood of using personal transfers, relative to formal services, is reduced by more than two thirds (rrr below 0.3). The very limited use of personal transfers, which is also apparent from Table 1, probably reflects (i) the lower density of Moldovan migrants in the destination cities (compared to, say Moscow) and the consequent absence of networks of friends and relatives from the same region in Moldova; and (ii) the need for migrants, especially with illegal residence status, to stay in the host country for long periods without being able to return.

Also as expected, legal residence in the destination country (rather than illegal residence) reduces by about two thirds the likelihood of using informal services relative to formal services (rrr equal to 0.3 or lower). At the same time, legal residence status has no strong effect on the use of personal transfers relative to formal services.

Those who are abroad for less than one year, often as seasonal workers, are less likely than those who are abroad for longer periods to use informal services, relative to formal services (rrr equals 0.65 or less). At the same time, they are more likely to use personal transfers, relative to formal services, presumably because many will be able to carry remittances back home themselves (rrr equals 1.6 or higher).

Thus the explanatory variables that are related to the migration pattern show plausible and expected effects that coincide in large measure with the gender-based travel and work patterns. This may explain the large gender effect on the use of informal vs. formal services.

Among the finance-related explanatory variables, households with (rather than without) a bank account are much less likely to use informal relative to formal channels (rrr below 0.4). This variable raises a possible simultaneity problem because households may open a bank account precisely to use formal transfer services. However, we have not been able to find good instrumental variables that would enable us to deal with this issue formally. Those who

send money regularly (at least four times per year) are two thirds less likely to use personal transfers (rrr equals 0.3).

7 Policy Implications

Our regression analysis has identified several important reasons why approximately one half of the Moldovan migrants and their families in our sample do not use formal transfer channels. Migrants who mostly use informal services are more likely to be in high-income countries (mostly the EU), reside in the host country illegally, remain abroad for periods longer than one year, not have a bank account, and care primarily about the cost of the transfer (rather than speed, convenience, security, or familiarity). Migrants who rely mostly on personal transfers are more likely to be in CIS countries, remain abroad for less than one year, not send remittances regularly, and care primarily about the cost of the transfer (rather than speed, convenience, or security).

Some of these determinants suggest the presence of distortions that can potentially be reduced through appropriate policy measures. Other determinants reflect migration patterns such as seasonal or irregular migration that will probably cause some migrants to use personal transfers or informal services irrespective of the wider institutional and policy environment. The main starting points for policy interventions are the cost of money transfers, the treatment of irregular migrants in host countries, and the linkage between remittances and financial sector development.

Although the fees for international money transfers have declined substantially in recent years, transfer costs continue to play a large role in the choice of the transfer channel. According to Sander et al. (2005), fees paid by Moldovan migrants varied widely between 1 percent and 20 percent of the amount sent, with substantially lower fees for informal channels in many cases. As fees often include a fixed per-transaction component, smaller amounts incur a relatively higher fee. The IOM-CBSAXA survey includes only limited information that refers to the fees actually paid for the selected transfer channel, rather than for a wider range of options that might be available to the particular migrant-recipient pair.

The recently established World Bank database "Remittance Prices Worldwide" lists mid-2008 fees including exchange rate premiums for many remittance corridors, including Russia to Moldova but no other flows to Moldova.[4] However, fees for transfers from Italy and

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[4] Website: http://remittanceprices. worldbank.org/

elsewhere in Western Europe to Eastern Europe are probably broadly representative of the options available to Moldovan migrants. Typically, transfer fees from Western Europe are much higher than from Russia to Moldova (5 to 15 percent vs. 1.5 to 5 percent). This observation probably explains why informal channels are used widely from high-income countries to Moldova but not from CIS countries.

Furthermore, across corridors originating in Western Europe, the fee level seems to be lower if specialized service providers (say, those active only in a particular region) compete with the established market leaders (Western Union and MoneyGram). Competition appears to be even more lively in the market for transfers from Russia. Even though information in the World Bank database is not fully representative, the fee differences across providers within particular corridors as well as across corridors with (presumably) similar cost structures are astonishing. These observations suggest that by fostering competition in high-cost locations, transfer fees could be brought down and the recipients' welfare gains from remittances enhanced. Recent initiatives in several remittance sending countries to increase the transparency of fee structures and enhance competition are therefore highly appropriate.

Within Moldova, the large number of active money transfer operators (MTOs) suggests that there is a fair degree of competition in the market for international transfers which has helped to bring down transfer fees (cf. Table 2). MTOs are obliged to operate through commercial banks. While this rule makes it easier to offer other banking services to recipients of remittances and may thereby facilitate financial sector development, there is an inherent risk that it may limit competition in the market for international transfers.

That risk is enhanced by the fact that the one commercial bank that controls more than half the banking presence in the country (branches, representative offices, agencies) cooperates only with a single MTO, in contrast to most other commercial banks. Presumably the restrictions on the independent conduct of international transactions by non-bank entities such as MTOs or even credit unions reflect a desire for tight prudential control in a country where financial markets are not yet mature and the legal order is only emerging. However, the desire for close oversight should be balanced against the need, on welfare grounds, to enhance competition in the oligopolistic commercial banking sector and in the market for international transfers in particular.

Our regression analysis shows that irregular residence status makes it less likely that migrants will use formal transfer channels. While it is now an established principle that financial institutions have to "know their customers", it is not clear that this should prevent them from

serving irregular immigrants whose presence is nevertheless tolerated by host country authorities, to the point where many such immigrants may qualify for legal residence after a few years in the host country. Regulations that allow irregular immigrants to identify themselves using home country documents without fear of deportation might attract migrants away from informal transfer services which are, by their very nature, less transparent than formal channels.

Regarding the linkage between remittances and financial development, Rios Avila and Schlarb (2008) show through an econometric analysis based on the 2006 IOM-CBSAXA survey that remittances provide an incentive to use more banking services; in particular, households with migrants are significantly more likely to own a bank account. At the same time, the share of "banked" households at 11 percent of all households is much lower than the share of households that receive remittances. As remittances will often not be spent immediately and many migrant households have considerable amounts of savings, there would appear to be room for households to be offered more financial services, starting with current and savings accounts. The fact that money transfer operators in Moldova have to work exclusively through commercial banks should make it easier for banks to reach migrants and their families. As recipients come to pick up their remittances, they become more familiar with their bank and are exposed to the marketing of banking services. While internationally comparable data are scarce, the limited information available (Claessens 2006) suggests that in many developing and transition countries the share of households using formal financial institutions is similarly low.

While more can and should be done to promote formal transfer services for remittances, both in remittance-sending countries and in Moldova, the fact that just under half of all migrant-recipient pairs use formal channels represents an important achievement. In value terms, the market share of formal services is probably even higher because higher payments are more likely to go through formal channels (which is not fully reflected in the dataset because higher remittances in particular are under-reported). The wide-spread use of formal transfer services is mirrored by the financial deepening that has occurred in Moldova since 1999 (Figure 3). Although most Moldovans had their savings wiped out in the aftermath of the dissolution of the Soviet Union and the level of financial literacy remains low, confidence in banks is returning and the ratio of bank account balances to GDP has quadrupled from 1999 to 2008, with especially strong increases for individual (rather than business) accounts.

Figure 3. Average balance on bank accounts, by type, 1999-2008
(per cent of GDP)
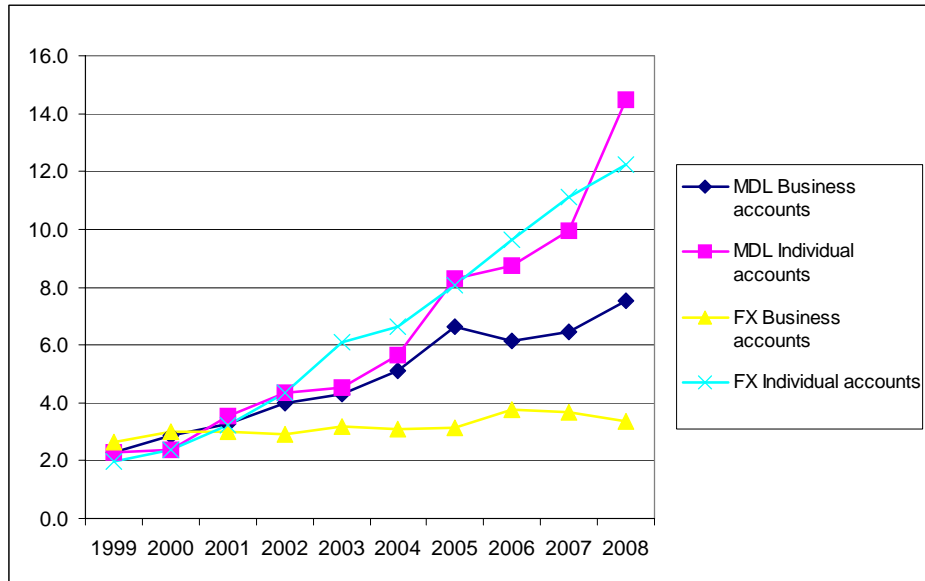
Source: National Bank of Moldova; National Bureau of Statistics;
authors' calculations.

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