International Migration Cycle and Its Effect on Remittance Flows

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Abstract

At present, according to the World Bank, the number of migrants (i.e. persons who live in a country other than their country of birth) is about 295 million people or 3.7% of the world population. At the same time, over the past 50 years, the number of migrants has more than tripled. The expansion of migration processes, as a rule, leads to an increase in the volume of remittances, both those sent by migrants to their family's homeland (to the migrants' donor country) and those received by the migrants themselves in the recipient country. This study examines the patterns of migration processes between the two countries (the migrants' donor country and the recipient country) and finds the three stages of migration cycle. The findings show that remittances depend on the stages of migration non-linearly. During the first stage, when migrants decide to migrate and start to leave the donor country for the recipient country, the volume of remittances sent by migrants to their homeland increases, and so does the volume of remittances in the opposite direction. During the second stage, when the recipient country becomes a key destination and the migrant diaspora expands significantly, the remittances sent by the migrants increase, while the received ones decrease or stagnate. During the third stage, when a degree of migrants' naturalization is high, the volume of remittances sent back decreases (due to the relocation of migrant families), while the received ones, on the contrary, start growing amid

the sale of assets in their homeland. Using data from the World Bank, the UN and central (national) banks, the research determines quantitative conditions for the transition from one stage to another based on the concentration of migration flows from the donor country and the share of migrants from specific donor country to the total number of migrants living in the recipient country. Additional findings show that in some cases, when migrants do not intend to live permanently in the recipient country, the volumes of the sent remittances continue to grow even amid very high concentration of migration flows.

1. Introduction

At the beginning of the 21st century, migration has become one of the most pervasive manifestations of globalization. The number of migrants has more than tripled in the last 50 years: currently, about 295 million people live in a country other than their country of birth (World Bank 2023), representing about 3.7% of the world's population. Rising migration is one of the main reasons for the increase in international (personal) remittances; the latter reached $794 billion in 2022 (World Bank 2022).

Remittances, in turn, have been historically an important source of support for the donor countries (Chepel and Bondarenko 2015). Throughout the last two years they have become the most important source of external financing for low- and middle-income economies (most of which are migrant-sending countries), surpassing foreign direct investment, official development assistance and portfolio investment flows (World Bank 2022). Eleven out of the seventeen Sustainable Development Goals (SDGs) of the United Nations (UN)[1] highlight the importance of international mobility and international remittances, while the World Bank Group considers them as vital tools for achieving strategic priorities for global development (World Bank 2023; Mosler and Laczko 2022).

Under these circumstances, there is rising attention of academic community to study the determinants of bilateral international remittances. However, most research in this area focuses either on micro data (i.e. based on surveys of migrants and/or households) or on country-level data, where the studies do not address micro-level factors (Beine, Lodigiani and Vermeulen 2012).

The modelling of bilateral remittances in this study is based on aggregate country data, yet it takes into account micro-level proxies, in particular migrants' preferences for leaving for a particular country (the latter characterizes their behavior and to some extent predetermines the stages of migration). Such approach allows us to enhance existing approaches for econometric modelling of remittances by more accurately assessing the specificities of bilateral personal remittance flows in the medium and long run. As such, this will contribute to the theory of migration.

[1] Including: SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 3 (Good health and well-being), SDG 4 (Quality education), SDG 5 (Gender equality), SDG 8 (Decent work and economic growth), SDG 10 (Reduced inequality), SDG 11 (Sustainable cities and communities), SDG 13 (Climate action), SDG 16 (Peace, justice and strong institutions), and SDG 17 (Partnership for the Goals).

2. Stages of International Migration and Remittances

The dynamics of bilateral international remittances is a complex phenomenon that, in addition to the number of migrants abroad, is influenced by both country-level factors of the donor and recipient countries, including demographic, macroeconomic, political, environmental, geographical and other conditions (Bondarenko 2020a; Makhlouf and Kasmaoui 2018; Ratha and Shaw 2007), and micro-level factors such as the migrant's age and gender (Kock and Sun 2011), marital status, occupation and level of education (Buch et al. 2002; Ameudo-Dorantes and Pozo 2003). However, the existing literature only partially addresses the subject of this study. It is important to understand the economic behavior and social position of migrants (and their households) at different stages of the migration cycle, as well as the psychological, economic and social hurdles they have to overcome in order to eventually adapt to society and move from labour migrant to settled immigrant (Mukomel 2011; Bondarenko 2020a).

The answers to these questions lie in the study of migration stages, which are key to predicting changes in migrants' behavioural attitudes over time and under the influence of external and internal factors (Pukhova et al. 2013; Bhugra and Becker 2005; Bernard, Bell and Charles-Edwards 2014; Zaslavskaya and Rybakovsky 1987). The analysis of these stages allows us to establish a characteristic model of adaptation of a typical migrant during the migration cycle, based on the analysis of migration processes "from the inside," and to determine their behaviour.

The theory of migration stages has been described in a number of studies, where the analyses were based on quantitative and qualitative indicators of migrants' adaptation process to life in the recipient country (Toth-Bos, Wisse and Farago 2019; Bernardo et al. 2018; Zimmermann et al. 2017; Zhou 2014; Yehuda-Sternfeld and Mirsky 2014; Carrasco 2010; Yoon and Lee 2010; King et al. 2006; Zaslavskaya and Rybakovsky 1987 and others) or regression modelling of migration decisions (De Jong 2000; Nivalainen 2004). Taking into account the studies of T. Zaslavskaya and L. Rybakovsky (1987) and Toth-Bos, Wiss and Farago (2019), we distinguish three stages of the migration cycle between two countries—a sending country and a migrant-receiving country (Table 1, p. 47)—in the so-called "international migration cycle." The stages of the international migration cycle are determined by migrants' behavioral preferences as to where best to go in order to maximize the efficiency of migration and minimize the risks.

Indicators of behavioral preferences are, in turn, (i) the country concentration of migration flows from the donor country (i.e. how many migrants went to a particular receiving country relative to the total number of those who left the country) and (ii) the share of the donor country's migrant diaspora relative to the total population of the receiving country. At the same time, the financial behavior of migrants changes significantly throughout the international migration cycle.

The international migration cycle begins when families decide to migrate internationally, and then migrants go abroad and establish (initially chaotically) the first communities in the new country (the receiving country). Migrants begin to arrive in the new country, establishing the first communities there and increasing the size of the migrant diaspora. The first stage usually involves some preparatory costs, and migrant

families contribute their savings to the migrant's move abroad (to cover transport and rental costs, at least initially). During this period, migration flows between the two countries are still developing and only a small number of migrants begin to leave their home country for the recipient country. However, despite the fact that the total income of the migrant diaspora abroad is not yet very high (due to the small number of migrants and their relatively low income levels), as the size of the migrant diaspora in the recipient country grows, the volume of international remittances sent by migrants and the volume of remittances received by migrants from their families as support increases.

In the second stage of international migration, when migrants choose a country to migrate to for some reason (social, cultural, economic, political, etc.), there is a shift in the priorities of choice towards a particular receiving country (i.e. a significant proportion of migrants go to that receiving country). During this period, there is a positive correlation between the time spent in the recipient country and the amount of remittances sent (Massey and Basem 1992; Díaz-Briquets and Pérez-López 1997; Brown 1997). A significant increase in the volume of remittances sent occurs, on the one hand, in the context of an increase in the number of migrants and the corresponding expansion of the migrant diaspora (quantitative factor) and, on the other hand, in the context of an increase in the income of each individual migrant due to improved adaptability, professional skills, education, etc. (qualitative factor). Given that the main reasons for migration are economic and that in most cases the family remains in the home country, migrants continue to support their relatives at this stage. At the same time, the volume of remittances received decreases or stagnates, as migrants are already able to provide for themselves abroad.

In the third stage of international migration, there is a high degree of "naturalization" of migrants within the recipient country, and migrants try to move their families, expand their migration networks and occupy a certain position in the host society (Bondarenko and Kharitonova 2023). This means that the migrant community in the new country has not only had time to adapt to the new life, but also to settle down, take root and to some extent integrate into local socio-economic processes. Meanwhile, the financial behavior of migrants (in the absence of significant social barriers) is characterized by a shift in their behavior towards intentions to stay permanently in the recipient country. As a result, migrants form a certain social stratum within the host population, the degree of their naturalization becomes very high, and their numbers become relatively stable.

Thus, the beginning of the third stage can be indicated by (i) the declining share of the migrant diaspora in the total population of the receiving country and (ii) the fact that the receiving country remains a major destination for migrants. At this point, for migrants who decide to stay abroad, migration is no longer a temporary phenomenon (such as labor migration) but a permanent one—a process of deeper assimilation of migrants takes place (Holst and Schrooten 2006).

In the third stage, the volume of remittances to the home country decreases. Any further motives for migrants to help remaining family members—parents or relatives—are in most cases based solely on altruistic motives or a sense of internal duty (Grigoryev et al. 2008). In addition, migrants begin to sell property and assets they have inherited and/or own in their home country (Morrow-Jones 1988; Analytical Centre 2016) in order

to buy property in the recipient country and stay there permanently. As a result, the decline in remittances received by migrants in the recipient country from their family in the donor country to support the migrant abroad, characteristic of the second stage, is partially (or in some cases fully) mitigated by an increase in remittances realised from the sale of assets.

This allows us to identify three key stages in the cash transfer cycle, each of which corresponds to a stage in the international migration cycle (Table 1, p. 47).

Table 1. Stages of migration processes and the cash transfer cycle

"The three stages of the migration process" (T. Zaslavskaya, L. Rybakovsky 1987)	Migration stages depending on the purpose of migration (Toth-Bos, Wisse and Farago 2019)	The international migration cycle (two-way flows at the country level)	Bilateral remittances cycle (two-way flows at the country level)
1. making the decision to migrate	1. pre-migration stage	1. decision to migrate, migration and formation of the first community in the recipient country	1. increase in remittances sent home and increase in remittances received by migrants (as temporary support)
2. migration	2. during migration stage	2. the recipient country becomes a *key destination* for migrants, the migrant diaspora continues to grow	2. increase in remittances sent home and decrease/stagnation in remittances received by migrants
3. adaptation / adaptability		3. high degree of naturalization among migrants, as evidenced by: (i) the recipient country remaining a key destination for migrants and (ii) the high proportion of the migrant diaspora in relation to the total population of the recipient country	3. decrease in net remittances against a background of (i) a fall in the amount of cash sent home and (ii) an increase in remittances received due to asset sales (as a result), which partially (or fully) offsets the decline in remittances received in the previous phase
	3. post-migration stage / repatriation		

Source: Compiled by the author; Zaslavskaya, Rybakovsky (1987); Toth-Bos, Wisse and Farago (2019).

A cross-country econometric analysis was conducted to test the above conclusions about the existence of three stages of the international migration cycle and three stages of the cash transfer cycle.

3. Research Method and Data

The modelling of remittances flows is carried out using a multivariate regression model based on panel data: index i represents the number of each observed recipient-donor country pair (e.g. Germany-Turkey in the case of Turks migrating to Germany or Russia-Belarus in the context of migration flows from Belarus to Russia), t is time expressed in years. The control variables are defined according to the literature review conducted (Makhlouf and Kasmaoui 2018; Ratha and Shaw 2007; Lueth and Ruiz-Arranz 2007; Schiopu and Siegfried 2006; Alper and Neyapti 2006; and Chami et al. 2003). The theoretical model of sent remittances (1) from the migrant recipient country is summarised as follows:

(1) $LSent_{it} = \beta_0 + \beta_1 lmstock_{it} + \beta_2 RecGrowth_{it} + \beta_3 DonGrowth_{it} + \beta_4 diffGDP_{it} + \beta_5 gini_{it} + \beta_6 lfx_{it} + \beta_7 ltrade_{it} + \beta_8 ldist_{it} + \beta_9 colony_{it} + \beta_{10} comlang_{it} + \beta_{11} RecCrisis_{it} + \beta_{12} DonCrisis_{it} + \varepsilon_{it}$

In model (1), the dependent variable — $LSent_{it}$ — is the logarithm of remittances sent from the migrant-recipient country to the migrant-donor country.

The remaining variables are independent variables, including: $lmstock_{it}$ — logarithm of the variable "number of migrants from the donor country living in the recipient country," $RecGrowth_{it}$ — real GDP growth of the migrant recipient country, $Dongrowth_{it}$ – real GDP growth of the migrant donor country, $diffGDP_{it}$ — the logarithm of the difference between GDP per capita at PPP of the recipient country and the migrant donor country, $gini_{it}$ — Gini coefficient of the migrant recipient country (standardised), lfx_{it} — logarithm of the cross rate of the currencies of the two countries (calculated through the cross rate to the US dollar), $ltrade_{it}$ — logarithm of bilateral trade volume of the two countries, $ldist_{it}$ — the logarithm of the distance between the key cities or agglomerations of the two countries, $colony_{it}$ — dummy variable, reflects the presence (1) or absence (0) of colonial ties between the two countries, $comlang_{it}$ — dummy variable, reflects the presence (1) or absence (0) of a single official language in both countries, $RecCrisis_{it}$ and $DonCrisis_{it}$ — dummy variables, reflect the years of GDP decline (1) of the recipient country and the migrant donor country, respectively, for other years – (0).

The model deliberately does not include the key interest rate of donor and recipient countries, due to the statistical peculiarities of calculating this indicator.[2] Also, we do not include inflation because of its high correlation with the exchange rate. A similar approach is followed in a number of other research papers – for example, in the ECB study by Shiopu and Siegfried (2006).

Modelling of the volumes of received remittances is carried out similarly to the approach described above in model (1). In generalized form, the theoretical model of received remittances (2) in the recipient country from the donor country is presented in the following form:

(2) $LReceived_{it} = \beta_0 + \beta_1 lmstock_{it} + \beta_2 RecGrowth_{it} + \beta_3 DonGrowth_{it} + \beta_4 diffGDP_{it} + \beta_5 gini_{it} + \beta_6 lfx_{it} + \beta_7 ltrade_{it} + \beta_8 ldist_{it} + \beta_9 colony_{it} + \beta_{10} comlang_{it} + \beta_{11} RecCrisis_{it} + \beta_{12} DonCrisis_{it} + \varepsilon_{it}$

In model (2), the dependent variable — $LReceived_{it}$ — is the logarithm of remittances received by the migrant-recipient country from the migrant-donor country.

[2] Key rates changed significantly after the transition to the Jamaican monetary system and then underwent significant changes as countries merged into regional groupings or, conversely, as one country split into two or more independent states, or as the currency moved from a floating to a fixed exchange rate or vice versa. Therefore, in the context of analyzing a large number of countries of the world in the long run, a significant rate increase/decrease is not always an indicator of the business cycle in the economy. In addition, in most countries of the world, key interest rate statistics are available only from the 1990s onwards, which limits the sample.

Migration stage variables

For the research issue, we examine migration stages, which we define based on (i) the proportion of migrants who left the donor country for a migrant-recipient country of the total number of migrants who left (variable $shareleav_{it}$) and (ii) the proportion of migrants from the donor country to the total population of the recipient country (variable mig_pop_{it}). Both of these variables help determine the significance of the recipient country to migration from the donor country compared to the other countries. In order to test the assumption of non-linear nature of the relationship between the volumes of remittances sent at different stages of migration, we also test the following variables: $shareleav2_{it}$, $shareleav3_{it}$ – square and cube of the variable $shareleav_{it}$, respectively, as well as mig_pop2_{it} and mig_pop3_{it} – respectively the square and cube of the variable mig_pop_{it}.

Considering the above six variables, we augment model (1) and obtain the following form of the sent cash transfer model (3):

(3) $$LSent_{it} = \beta_0 + \beta_1 lmstock_{it} + \beta_2 RecGrowth_{it} + \beta_3 DonGrowth_{it} + \beta_4 diffGDP_{it} + \beta_5 gini_{it} + \beta_6 lfx_{it} + \beta_7 ltrade_{it} + \beta_8 ldist_{it} + \beta_9 colony_{it} + \beta_{10} comlang_{it} + \beta_{11} RecCrisis_{it} + \beta_{12} DonCrisis_{it} + \beta_{13} shareleav_{it} + \beta_{14} shareleav2_{it} + \beta_{15} shareleav3_{it} + \beta_{16} mig\_pop_{it} + \beta_{17} mig\_pop2_{it} + \beta_{18} mig\_pop3_{it} + \varepsilon_{it}$$

In turn, complementing model (2), the model of received cash remittances (4) will look as follows:

(4) $$LReceived_{it} = \beta_0 + \beta_1 lmstock_{it} + \beta_2 RecGrowth_{it} + \beta_3 DonGrowth_{it} + \beta_4 diffGDP_{it} + \beta_5 gini_{it} + \beta_6 lfx_{it} + \beta_7 ltrade_{it} + \beta_8 ldist_{it} + \beta_9 colony_{it} + \beta_{10} comlang_{it} + \beta_{11} RecCrisis_{it} + \beta_{12} DonCrisis_{it} + \beta_{13} shareleav_{it} + \beta_{14} shareleav2_{it} + \beta_{15} shareleav3_{it} + \beta_{16} mig\_pop_{it} + \beta_{17} mig\_pop2_{it} + \beta_{18} mig\_pop3_{it} + \varepsilon_{it}$$

The study uses data from the World Bank, UN, IMF, and Mayer and Zignago (2011). There is no single database on annual flows of bilateral remittances in the long run, so we used the approach of Schiopu and Siegfried (2006), who examined statistics on bilateral remittances in European countries and used data from central (national) banks as a reference. In the present study, we searched the websites of 115 central (national) banks around the world for data on bilateral remittances (secondary income debit and credit of the current account balance of payments or remittances) and found relevant statistics over the long term in Austria, the UK, Germany, the Netherlands, Russia, and the US.[3]

Despite the constraints mentioned above, the present sample fulfils the objectives of this study.

[3] National Bank of Austria (Oesterreichische Nationalbank): indicator — debit and credit of the secondary income balance of the current account of the balance of payments; Bank of England: indicator — debit and credit of the secondary income balance of the current account of the balance of payments; German Federal Bank (Deutsche Bundesbank): indicator — debit and credit of the balance of secondary income of the current account of the balance of payments; Netherlands Bank (De Nederlandsche Bank): indicator — debit and credit of the balance of secondary income of the current account of the balance of payments; Bank of Russia: indicator — cross-border transfers of individuals (residents and non-residents); Bureau of Economic Analysis: indicator — international transactions (secondary account).

We use data for 221 donor and 218 recipient countries between 1972 and 2021; however, years do vary across individual bilateral flows and not all country pairs data is available. The total count of all bilateral cash transfer flows is 596 (see Appendix 1). Brief descriptive statistics of the variables are summarized below (see Table 2, p. 50); both the raw values of the variables (without logarithm and without squaring or cube) and the variables used in the model are presented here.

Table 2. Descriptive statistics of variables

Variable	Brief description*	Total	Cf. value	St. off.	Min. value	Max. value
sent	Sent remittances from RC to DC, $mln	12,269	398	1 246	0	17,332
lsent	*sent* logarithm	11,542	2.9	3.2	-7.6	9.8
received	Received remittances to RC from DC, $mln	12,123	387	1 233	0	17,332
lreceived	*received* logarithm	11,406	2.9	3.2	-7.6	9.8
mstock	number of migrants to the RC from the DC, people	29,800	75,098	441,186	0	1.20E+07
lmstock	*mstock* logarithm	17,897	7.7	3.8	0.0	16.3
RecGrowth	Economic growth RC, %	26,672	2.7	5.2	-64.0	150.0
DonGrowth	Economic growth DC, %	26,688	2.7	5.2	-64.0	150.0
diffGDP	Difference in GDP per capita at PPPs of RC and DC, thousand international dollars	17,132	0.0	18.8	-145.4	145.4
gini_std	Gini coefficient RC	10,685	37.2	8.0	15.0	75.0
fx	Cross currency exchange rate of DC and RC	27,320	3.90E+08	1.11E+10	0.0**	6.35E+11
lfx	*fx* logarithm	27,320	0.0	3.9	-27.2	27.2
trade	Bilateral trade volume of RC and DC (exports + imports), $mln	16,284	15,714	48,868	0.0**	664,642
ltrade	*trade* logarithm	16,284	6.9	3.3	-9.8	13.4
dist	Distance between countries, km	29,000	6,123	4,283	60	16,774
ldist	*ldist* logarithm	29,000	8.3	1.0	4.1	9.7
colony	There are colonial ties (1)	29,000	0.08	0.27	0	1
comlang	There is a common language of communication (1)	29,000	0.06	0.23	0	1
RecCrisis	Year of GDP decline (1) RC	29,800	0.17	0.37	0	1
DonCrisis	Year of GDP decline (1) DC	29,800	0.17	0.37	0	1
shareleav	share of migrants who left DC for RC, %	28,923	3.35	10.90	0	98.3
shareleav2	*shareleav*	28,923	130.1	671.8	0	9,656.4
shareleav3	*shareleav* cube	28,923	7,199.1	50,669.4	0	948,899.3
mig_pop	share of migrants from DC to the total RC population, %	29,000	0.3	1.3	0.0	21.7

Variable	Brief description*	Total	Cf. value	St. off.	Min. value	Max. value
mig_pop2	*mig_pop* square	29,000	1.7	16.5	0.0	469.7
mig_pop3	*mig_pop* cube	29,000	19.9	262.1	0.0	10,181.1

Note: *RC - recipient country, DC - donor country, **number lower than 0.0001
Source: Author's calculations using the STATA14 package

The dataset is an unbalanced panel, i.e. many country pairs do not have statistics for all periods—this is due to the statistical characteristics of the data. In this paper, the dataset is presented in a wide panel format, where the number of time periods (t) is far smaller than the number of observation units (*i*), i.e. *i*>*t* (the number of country pairs is more than 430, periods range from two to 60 years).

Multicollinearity is technical: high correlation is characteristic of the variables $shareleav_{it}$ and its derivatives, as well as for the variable mig_pop_{it} and its derivatives (Table 2, p. 50).

4. Econometric Modelling

In the first stage of the study, end-to-end regressions (ordinary least squares method, OLS), fixed-effect (FE) panel regressions and random-effect (RE) panel regressions were constructed for models (1), (2), (3) and (4) and tests were performed.

For all models in the Breusch-Pagan test, p-level<0.01, so the main hypothesis is dismissed. Thus, random-effects regression describes our data better than end-to-end regression. The Wald and Hausman tests showed that the fixed-effect regression is more preferable, which is expected since specific country pairs were chosen for the study and their composition did not change year to year. However, there are three fixed variables in the regression that do not vary over time, $ldist_{it}$, $colony_{it}$ and $comlang_{it}$ which were eliminated from the fixed-effect regression. Therefore, due to the invariance of dummy variables, here and further we consider both fixed and random effects regressions (because, unlike fixed-effects regression, the latter allows us to estimate coefficients with time-invariant variables). As for stationarity testing, it is not required in this paper as we use panel data in a wide format, and in the context of panel data, the stationarity problem is specific to long panel datasets when the number of time periods (t) is greater than the number of observation units (i), i.e. t>i (Wooldridge 2015). See Table 3 (p. 51) and Table 4 (p. 53) for the modelling results.

Table 3. Modelling results: volumes of sent remittances

	[1a] fe lsent	[1b] re lsent	[1c] re lsent	[3a] re lsent	[3b] re lsent	[3c] re lsent	[3d] fe Lsent
lmstock	0.149***	0.173***	0.160***	0.152***	0.136***	0.120***	0.111***
	(0.0124)	*(0.0116)*	*(0.0119)*	*(0.0127)*	*(0.0131)*	*(0.0134)*	*(0.0139)*
RecGrowth	-0.00620	-0.00694	-0.00839*	-0.00872*	-0.00906*	-0.00904*	-0.00706

	[1a] fe lsent	[1b] re lsent	[1c] re lsent	[3a] re lsent	[3b] re lsent	[3c] re lsent	[3d] fe Lsent
	(0.00499)	*(0.00496)*	*(0.00497)*	*(0.00498)*	*(0.00497)*	*(0.00495)*	*(0.00498)*
DonGrowth	-0.0262***	-0.0247***	-0.0250***	-0.0252***	-0.0258***	-0.0262***	-0.0273***
	(0.00405)	*(0.00403)*	*(0.00402)*	*(0.00403)*	*(0.00403)*	*(0.00401)*	*(0.00403)*
diffGDP	-0.00693***	-0.00317*	-0.00274	-0.00287	-0.00314*	-0.00375**	-0.00766***
	(0.00227)	*(0.00194)*	*(0.00194)*	*(0.00194)*	*(0.00194)*	*(0.00193)*	*(0.00226)*
gini	0.0367***	0.0197***	0.0235***	0.0225***	0.0224***	0.0236***	0.0381***
	(0.00617)	*(0.00522)*	*(0.00541)*	*(0.00541)*	*(0.00540)*	*(0.00539)*	*(0.00614)*
lfx	-0.0134*	-0.0205***	-0.0208***	-0.0200***	-0.0212***	-0.0202***	-0.0135*
	(0.00753)	*(0.00732)*	*(0.00730)*	*(0.00732)*	*(0.00730)*	*(0.00728)*	*(0.00750)*
ltrade	0.688***	0.678***	0.670***	0.675***	0.673***	0.673***	0.685***
	(0.0173)	*(0.0146)*	*(0.0150)*	*(0.0151)*	*(0.0151)*	*(0.0150)*	*(0.0174)*
RecCrisis	-0.0618	-0.0620	-0.0667*	-0.0682*	-0.0694*	-0.0722*	-0.0655
	(0.0410)	*(0.0411)*	*(0.0410)*	*(0.0411)*	*(0.0411)*	*(0.0409)*	*(0.0409)*
DonCrisis	-0.0406	-0.0403	-0.0453	-0.0495	-0.0545	-0.0530	-0.0489
	(0.0405)	*(0.0406)*	*(0.0406)*	*(0.0407)*	*(0.0406)*	*(0.0404)*	*(0.0404)*
ldist			-0.133*	-0.140*	-0.126*	-0.115	0
			(0.0757)	*(0.0749)*	*(0.0751)*	*(0.0753)*	*(.)*
colony			0.831***	0.796***	0.743***	0.776***	0
			(0.262)	*(0.264)*	*(0.265)*	*(0.265)*	*(.)*
comlang			0.658**	0.656**	0.617**	0.486*	0
			(0.293)	*(0.289)*	*(0.290)*	*(0.291)*	*(.)*
shareleav				0.00668**	0.0250***	0.0446***	0.0397***
				(0.00286)	*(0.00632)*	*(0.0105)*	*(0.0115)*
shareleav2					-0.000338***	-0.00134***	-0.00133***
					(0.0000908)	*(0.000375)*	*(0.000421)*
shareleav3						0.00000997***	0.00000993**
						(0.00000361)	*(0.00000418)*
mig_pop				-0.0315	0.176***	0.653***	0.737***
				(0.0322)	*(0.0707)*	*(0.110)*	*(0.118)*
mig_pop2					-0.0183***	-0.141***	-0.154***
					(0.00548)	*(0.0221)*	*(0.0229)*
mig_pop3						0.00696***	0.00747***
						(0.00121)	*(0.00124)*
cons	-4.083***	-3.688***	-2.709***	-2.630***	-2.651***	-2.709***	-3.959***
	(0.229)	*(0.220)*	*(0.640)*	*(0.634)*	*(0.635)*	*(0.636)*	*(0.229)*
N – number of observations *(country pairs and periods)*	4868	4868	4863	4852	4852	4852	4852

	[1a] fe lsent	[1b] re lsent	[1c] re lsent	[3a] re lsent	[3b] re lsent	[3c] re lsent	[3d] fe Lsent
i - number of observations *(country pairs)*	441	441	440	436	436	436	436
R2 within	0.382	0.381	0.382	0.382	0.385	0.391	0.392
R2 overall	0.645	0.671	0.689	0.693	0.691	0.689	0.650
R2 between	0.701	0.720	0.733	0.740	0.739	0.738	0.707

Note. Standard errors are indicated in brackets. Dependent variable is $lsent_{it}$. ***/**/* - significance of coefficient estimates at 1%/5%/10% levels, respectively. (.) - eliminated (excluded) variables in fixed-effect regression

Source: Author's calculations using the STATA14 package

Regressions with fixed [1a] and random effects [1b] reflect model (1) without accounting for invariant variables, while regression [1c] is a panel regression with random effects that accounts for the $ldist_{it}$, $colony_{it}$ and $comlang_{it}$. Regressions [3a], [3b], [3c] are panel regressions with random effects of model (3), regression [3d] is a panel regression with fixed effects of model (3)—here the invariant variables have been excluded from the model.

Table 4. Modelling results: volumes of remittances received

	[2a] fe lreceived	[2b] re lreceived	[2c] re lreceived	[4a] re lreceived	[4b] re lreceived	[4c] re lreceived	[4d] fe lreceived
lmstock	0.128***	0.139***	0.125***	0.155***	0.137***	0.128***	0.127***
	(0.0130)	*(0.0120)*	*(0.0123)*	*(0.0131)*	*(0.0135)*	*(0.0138)*	*(0.0145)*
RecGrowth	-0.0179***	-0.0178***	-0.0193***	-0.0177***	-0.0180***	-0.0180***	-0.0168***
	(0.00521)	*(0.00518)*	*(0.00519)*	*(0.00518)*	*(0.00516)*	*(0.00516)*	*(0.00518)*
DonGrowth	-0.0179***	-0.0211***	-0.0215***	-0.0215***	-0.0224***	-0.0226***	-0.0193***
	(0.00419)	*(0.00417)*	*(0.00417)*	*(0.00415)*	*(0.00415)*	*(0.00415)*	*(0.00417)*
diffGDP	-0.00141	-0.00582***	-0.00555***	-0.00582***	-0.00605***	-0.00641***	-0.00219
	(0.00239)	*(0.00200)*	*(0.00200)*	*(0.00199)*	*(0.00198)*	*(0.00198)*	*(0.00238)*
gini	0.0375***	0.0316***	0.0359***	0.0356***	0.0353***	0.0357***	0.0376***
	(0.00640)	*(0.00532)*	*(0.00553)*	*(0.00551)*	*(0.00549)*	*(0.00549)*	*(0.00637)*
lfx	0.0136*	0.0163**	0.0163**	0.0136*	0.0117	0.0121	0.00929
	(0.00814)	*(0.00786)*	*(0.00784)*	*(0.00782)*	*(0.00780)*	*(0.00780)*	*(0.00810)*
ltrade	0.770***	0.731***	0.721***	0.712***	0.709***	0.708***	0.751***
	(0.0182)	*(0.0150)*	*(0.0153)*	*(0.0154)*	*(0.0153)*	*(0.0153)*	*(0.0182)*
RecCrisis	-0.114***	-0.125***	-0.130***	-0.123***	-0.125***	-0.127***	-0.113***
	(0.0433)	*(0.0434)*	*(0.0435)*	*(0.0433)*	*(0.0433)*	*(0.0432)*	*(0.0431)*
DonCrisis	-0.0302	-0.0469	-0.0516	-0.0438	-0.0496	-0.0486	-0.0289
	(0.0423)	*(0.0424)*	*(0.0424)*	*(0.0423)*	*(0.0422)*	*(0.0422)*	*(0.0420)*

	[2a] fe lreceived	[2b] re lreceived	[2c] re lreceived	[4a] re lreceived	[4b] re lreceived	[4c] re lreceived	[4d] fe lreceived
ldist			-0.143**	-0.137*	-0.123*	-0.118*	0
			(0.0734)	*(0.0725)*	*(0.0723)*	*(0.0722)*	*(.)*
colony			0.862***	1.137***	1.080***	1.096***	0
			(0.256)	*(0.258)*	*(0.258)*	*(0.258)*	*(.)*
comlang			0.545*	0.592**	0.549**	0.479*	0
			(0.287)	*(0.283)*	*(0.282)*	*(0.282)*	*(.)*
shareleav				-0.0195***	0.00652	0.0199*	0.0264**
				(0.00292)	*(0.00657)*	*(0.0109)*	*(0.0121)*
shareleav2					-0.000455***	-0.00110***	-0.00123***
					(0.0000944)	*(0.000381)*	*(0.000434)*
shareleav3						0.00000632*	0.00000700*
						(0.00000363)	*(0.00000430)*
mig_pop				-0.0132	0.180***	0.418***	0.308***
				(0.0330)	*(0.0727)*	*(0.114)*	*(0.125)*
mig_pop2					-0.0171***	-0.0787***	-0.0633***
					(0.00568)	*(0.0231)*	*(0.0241)*
mig_pop3						0.00348***	0.00288**
						(0.00126)	*(0.00130)*
cons	-4.792***	-4.116***	-3.056***	-3.206***	-3.204***	-3.221***	-4.641***
	(0.239)	*(0.224)*	*(0.621)*	*(0.615)*	*(0.613)*	*(0.611)*	*(0.239)*
N – number of observations *(country pairs and periods)*	4784	4784	4779	4767	4767	4767	4767
i - number of observations *(country pairs)*	437	437	436	432	432	432	432
R2 within	0.402	0.401	0.402	0.407	0.412	0.413	0.414
R2 overall	0.625	0.634	0.666	0.672	0.670	0.671	0.627
R2 between	0.715	0.724	0.743	0.748	0.747	0.748	0.715

Note. Standard errors are indicated in parentheses. Dependent variable is $lreceived_{it}$. ***/**/* - significance of coefficient estimates at 1%/5%/10% levels, respectively. (.) - eliminated (excluded) variables in fixed-effect regression

Source: Author's calculations using the STATA14 package

Regressions with fixed [2a] and random effects [2b] reflect model (2) without accounting for invariant variables, while regression [2c] is a panel regression with random effects accounting for $ldist_{it}$, $colony_{it}$ and $comlang_{it}$. Regressions [4a], [4b],

[4c] are panel regressions with random effects of model (4), regression [4d] is a panel regression with fixed effects of model (4)—here invariant variables were excluded from the model.

All coefficients before explanatory variables in the regression equations above are in line with expectations.

5. Regression Analysis Results Interpretation

Share of migrants who left the donor country in favor of the recipient country

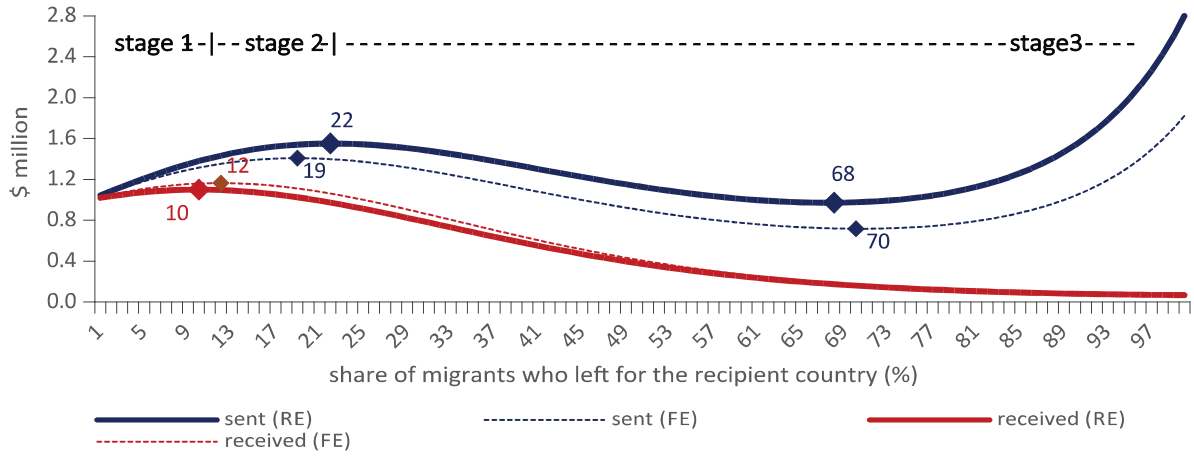

Figure 1. Modelling of bilateral flows of international remittances ($ million) depending on the share of migrants who left the donor country in favor of the recipient country (%)

Note. The diamonds indicate function extrema. The maximum value of the share of migrants who left for the recipient country is 98.3%.

Source: author's calculations.

To identify the stages of the bilateral migration cycle, we plotted remittances against the variable $shareleav_{it}$ and its derivatives ($shareleav2_{it}$ and $shareleav3_{it}$) using the data from the above regression analysis and calculated[4] the extrema of functions [3c], [3d], [4c], [4d], which will allow us to determine the conditions of transition from one stage of bilateral migration to another. The functions reflect the dependence of the volumes of sent remittances ($LSent_{it}$) to the share of migrants who left the recipient country ($shareleav_{it}$).

In turn, transition from the second to the third stage occurs when the share of migrants leaving for a particular recipient country starts to exceed 19-22%. The third

[4] The equations are constructed with other things being equal, ceteris paribus. Since both dependent variables $LSent_{it}$ and $LReceived_{it}$ are natural logarithms of the original variables $Sent_{it}$ and $Received_{it}$, for graphical interpretation all four functions were respectively transformed through the inverse exponential function e^x. The range of acceptable values of the variable $shareleav_{it}$ is from 0 (migrants did not go to the recipient country) to 100 (all migrants from the donor country go to the recipient country).

stage of the bilateral migration cycle, however, has a more complex structure than we previously assumed. From the beginning of the third stage, there is indeed a decline in outward remittances to the donor country from the recipient country, while the decline in outward remittances slows down (probably due to capital flows in the form of asset sales). However, in country pairs with a very high country concentration of migration (i.e., where more than 68-70% of the total number of migrants leave for a particular recipient country[5]), further migration intensification leads to an increase in sent remittances (Figure 1, p. 55). We attribute this to cases where mass migration from the donor country to the recipient country is a consequence of well-established channels for temporary employment abroad and the inability (or unwillingness for a variety of reasons) of migrants to change their place of residence.[6]

Proportion of migrants from the donor country in relation to the total population of the recipient country

In order to identify the stages of the bilateral migration cycle, similarly to the approach described above, we plotted remittances against the variable mig_pop_{it} and its derivatives mig_pop2_{it} and mig_pop3_{it} using data from the above regression analysis and calculated[7] the extrema of functions [3c], [3d], [4c], [4d], which will allow us to determine the conditions of transition from one stage of bilateral migration to another. Equations were also constructed, all other things being equal, ceteris paribus, based on the calculated coefficients of the equations (Table 3, p. 51, Table 4, p. 53).

The analysis revealed that during the first and second phases, the share of migrants who reside in the recipient country among its total population does not exceed 3-3.4% (Figure 2, p. 57).

During this period, the volume of sent remittances grows (migrants send money home), while the volume of received remittances grows initially at a high rate (the first stage of migration, the family supports the migrant at first) and then virtually does not grow (the second stage of migration).

Then, as the share of the migrant population in the recipient country increases, there is a transition to the third stage. Here the volume of remittances sent begins to decrease. Received remittances also decrease at first, but their rate of decrease is significantly lower

5 This is, for example, fundamentally characteristic of migration from Mexico to the United States, and from Kyrgyzstan, Tajikistan and Turkmenistan to Russia. This situation was also observed for the migration of Turks to Germany in the 1980s.

6 This may also be related to the growth of entrepreneurial activity of migrants at home, i.e. when transfers start to have an investment character rather than being aimed at supporting the welfare of relatives, but this character of transfers is usually reflected not in the current but in the capital account of the country's balance of payments and is not the subject of this study.

7 Since both dependent variables $LSent_{it}$ и $LReceived_{it}$ are natural logarithms of the original variables $Sent_{it}$ и $Received_{it}$, For graphical interpretation, all four functions were respectively transformed through an inverse exponential function e^x. The range of permissible values of the variable mig_pop_{it} is from 0 (migrants do not live in the recipient country) to 22 (maximum share of migrants from a certain country in relation to the population of the recipient country—was typical of Russian migrants in Estonia in the 1980s and 1990s and Kazakhstan in the 1970s).

than that of sent remittances, and as a result net remittances become negative.

This also confirms the complex nature of the third stage. In countries with a very high concentration of migrants from a particular country (i.e. where the share of migrants in the population exceeds 10.5-12%[8] of the total population) further growth of the migrant diaspora leads to an increase in the volume of remittances, both sent and received (Figure 2, p. 57). The growth in the volume of received remittances is evidence of mass relocation of the population abroad. Probable reasons for the growth in the volume of sent remittances are presented in the paragraph above (for example, the growth of entrepreneurial activity and/or the impossibility or lack of desire to leave for permanent residence).

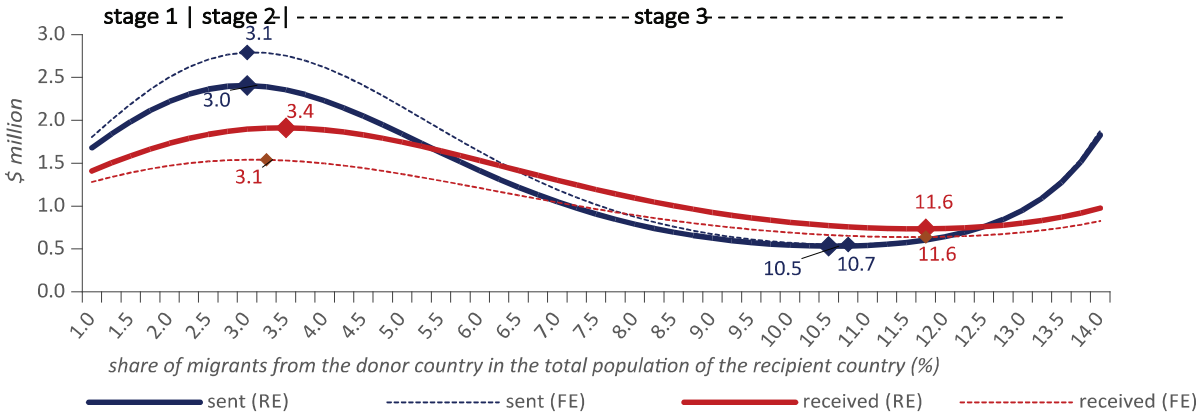

Figure 2. Modelling of bilateral international transfer flows ($ million) depending on the share of migrants from the donor country in the total population of the recipient country (%)

Note. The diamonds indicate function extrema. The maximum value of the share of migrants from the donor country in the total population of the recipient country is 21.7%

Source: author's calculations

6. Quantitative Conditions of Migration Phases and Country Examples

These calculations allow us to undestand (Table 5, p. 58) how the degree of adaptation of migrants in the recipient country (which is determined by the cycle of international migration) transforms the patterns of migrants' financial behaviour.

The estimated conditions (Table 5, p. 58) allow us to identify the stages of bilateral migration for different country pairs and the years of transition from one stage to the other. In the context of the share of migrants in the recipient country, however, the essential question of the population ratio of the two countries remains. If the countries in a country pair have roughly the same population size, the conditions of the variable mig_pop_{it} to determine the stages of migration will be representative (in the sample, the median of the ratio of the population of the donor country to

[8] This is, for example, fundamentally characteristic for migration to Russia from Kazakhstan, Estonia, Latvia, and Ukraine.

the population of the recipient country is equal to one, because for almost every country pair there is an inverse country pair: for example, for DEU/TUR—migration of Turks to Germany there is a pair TUR/DEU—migration of Germans to Turkey). If the population of the donor country significantly exceeds the population of the recipient country, the stages of the migration cycle may be shifted downwards, and upwards in the opposite case.

Total number of country pairs for which data is available ($shareleav_{it}$ and mig_pop_{it}) from 1972 to the present for a period of more than one year is 570. Based on the above conditions, 493 pairs are still in the first stage of migration (Appendix 3). As an example, we highlight the following recipient-donor pairs: Argentina-United States, Austria-Slovakia, Bulgaria-Germany, UK-India (despite the increasing share of migrants from India in the total population of the UK in recent years), etc.

Table 5. Estimated conditions of the international migration cycle and the remittance cycle

	The international migration cycle	Cycle of bilateral cash remittances	Share of migrants who left for the recipient country (%)	Share of migrants from the donor country in the population of the recipient country (%)
1	Making the decision to migrate, migration and the formation of the first community in the recipient country	Increase in remittances sent home and increase in cash remittances received by migrants (as temporary support)	Less 10–12%	Less 3.0–3.4%
2	The recipient country becomes a *key destination* for migrants, the migrant diaspora continues to grow	Increase in remittances sent home and decrease/stagnation in remittances received by migrants	From 10–12% up to 19–22%	
3	High degree of naturalisation of migrants, as evidenced by: (i) the recipient country remaining a key destination for migrants and (ii) a high proportion of the migrant diaspora in relation to the total population of the recipient country	A decline in net remittances as a result of (i) a fall in repatriated cash and (ii) an increase in remittances received due to the sale of assets (as a result), partially (or fully) offsetting the decline in remittances received in the previous phase.	From 19–22% and above	From 3.0–3.4% and above

Source: Compiled by the author

Transition from the first to the second stage is observed in the following recipient-donor country pairs: Austria-Czech Republic (second stage since 2010), United States-Singapore (since 2010), Germany-Switzerland (since 2000), United States-India (since 2000), Germany-Estonia (since 1990), Germany-Latvia (since 1990), Germany-Spain (since 2000), Austria-Slovenia (since 2000).

Finally, the following recipient-donor country pairs have gone through three stages of migration since: United States-China (the second stage started in the 1990s and the third in the 2010s), Mexico-United States (the second stage started in the 1990s and the third in the 2010s), Germany-Turkey (the latter went through the first two stages in the

1960s) and others.

The analysis revealed that Russia has been a third-stage recipient country with the countries of the former USSR as migrant donors (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Latvia, Moldova, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan) for many years (Russia is a priority country for migration for more than 40% of people leaving these countries). At the same time, officially published trends of remittances start to show patterns of the third stage of the migration cycle only during the last ten to twenty years, and not yet for all countries—this is probably a consequence of the specifics of migration processes during the USSR period, the uncertainty in the economic situation during the 1990s, restrictions on personal remittances that were in force in the territories of many former USSR member countries in the 1990s to early 2010s, statistical subtleties and specifics of migration from individual countries. For example, the majority of migrants from Uzbekistan are typically labour migrants with the purpose of earning money to improve their financial situation (and the welfare of their family) in their home country, rather than moving to Russia for permanent residence (Bondarenko 2020a). In this case, the volume of sent remittances continues to grow even as the share of departing migrants to the recipient country increases.

7. Conclusion

This study is a continuation of a series of studies on migration cycles and the modelling of remittance flows.

Bilateral migration processes (between a donor country and a recipient country) follow a three-stage process. In the first stage, the decision to migrate is made and the first communities are established in the recipient country. In the second stage, the recipient country gradually becomes a key destination for migrants and the migrant diaspora expands. In the third stage of the migration cycle, there is a high degree of naturalization of migrants, as evidenced by the fact that the recipient country remains a key destination for migrants and the share of the migrant diaspora in the total population of the recipient country becomes high.

The dependence of remittances on the migration cycle is non-linear. To analyze the flows of remittances, econometric modelling of the volumes of (i) remittances sent from the recipient country to the donor country and (ii) remittances received by the recipient country from the donor country was carried out. A synthesis of the existing literature shows that the modelling of remittances is mainly based on country-wide statistics, but does not include microeconomic parameters. In the present study, the stages of the migration cycle are included in the models of remittances sent and received, together with the main macroeconomic parameters. The inclusion of these variables in the model provides a more accurate assessment of the specificity of financial flows between countries: in the case of both sent and received remittances, the model allowed us to identify the non-linear nature of the dependence of remittances on the migration cycle. In the third stage of migration, after a significant increase in the migrant diaspora in the recipient country (also in the context of it becoming a priority destination for migration), there is a decrease in remittances sent from the recipient country to the home

country and an increase in personal remittances in the opposite direction.

The proxies for the stages of the migration cycle — i) the share of migrants from the donor country in the total population of the recipient country and ii) the share of those leaving the donor country for a given recipient country — allow us to assess the conditions of transition from one stage to another.

In stages one and two, the share of migrants from the donor country in the total population of the recipient country is low, less than 3.0-3.4%. In the first stage, the share of those leaving the donor country for a given recipient country does not exceed 10-12%, personal remittances sent from the donor country to the recipient country increase, and remittances received also increase. In the second stage, more and more migrants decide to go to a specific destination country, and the concentration of those leaving ranges from 10-12% to 19-22%. The volume of personal remittances sent from the receiving country to the donor country continues to grow, while the volume received begins to decline or stagnate. In the third stage, the share of those leaving for a given country begins to exceed 19-22%, while at the same time the share of migrants relative to the population of the receiving country increases. In the third stage, econometric analysis suggests that the volume of personal remittances sent home by migrants actually declines.

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Appendix 1 Bilateral remittances

Donor country (below)	Recipient country											
	Russia	Germany	United States	Austria	UK	Japan	Netherlands	Switzerland	India	Brazil	China	Others
Russia		2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	2006–2021	Note 5
Germany	1992–2021		1972–2021	1972–2021	1972–2007	1972–2021	1972–2021	1972–2021	1972–2021	1972–2021	1972–2021	Note 6
United States	2006–2021	1972–2012		1995–2021	1999–2021	2003–2021	2004–2021		2003–2021	2003–2021	2003–2021	Note 7
Austria	2006–2021	1972–2021	1995–2021		1995–2021		1995–2021	1995–2021				Note 8
UK	2006–2021	1972–2008	1999–2021	1995–2021		1999–2021		1999–2021	1999–2021	1999–2021	1999–2021	Note 9
Japan	2006–2021	1972–2021	2003–2021		1999–2021		2004–2021					
Netherlands	2006–2021	1972–2021	2004–2021	1995–2021		2004–2021						
Brazil	2006–2021	1972–2021	2003–2021		1999–2021							
Canada	2006–2021	1972–2013	2003–2021		1999–2021							
China	2006–2021	1972–2021	2003–2021		1999–2021							
France	2006–2021	1972–2021	2003–2021	1995–2021								
India	2006–2021	1972–2021	2003–2021		1999–2021							
Italy	2006–2021	1972–2021	2003–2021	1995–2021								
Switzerland	2006–2021	1972–2021		1995–2021	1999–2021							
Argentina	2006–2021	1972–2021	2003–2021									
Australia	2006–2021	1972–2021	2003–2021									
Belgium	2006–2021	1982–2021	2003–2021									
Croatia	2006–2021	1992–2021		1995–2021								
Hungary	2006–2021	1972–2021		1995–2021								
Luxembourg	2006–2021	1972–2021	2003–2021									
Mexico	2006–2021	1972–2021	2003–2021									
Poland	2006–2021	1972–2021		1995–2021								
Romania	2006–2021	1972–2021		1995–2021								
Singapore	2006–2021	1972–2021	2003–2021									
Slovenia	2006–2021	1992–2021		1995–2021								
Spain	2006–2021	1972–2021		1995–2021								
Others	Note 1	Note 2	Note 3	Note 4								

Notes.

1 Cash remittances to Russia in the period 2006-2021. From the following countries: Afghanistan, Albania, Algeria, American Samoa, Andorra, Angola, Anguilla, Antigua and Barbuda, Armenia, Aruba, Azerbaijan, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cayman Islands, Central African Republic, Chad, Chile, Colombia, Cook Islands, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Curaçao, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, DR Congo, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, French Guiana, French Polynesia, Gabon, Georgia, Ghana, Gibraltar, Greece, Greenland, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Iceland, Indonesia, Iran, Iraq, Ireland, Isle of Man, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mayotte, Mexico, Micronesia, Moldova, Monaco, Mongolia, Montenegro, Montserrat, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands Antilles, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Niue, Norfolk Island, North Korea, Northern Mariana Islands, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of the Congo, Romania, Rwanda, Saint Helena, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, South Sudan, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Thailand, Togo, Tokelau, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caicos Islands, Tuvalu, Uganda, Ukraine, UAE, United Kingdom, Uruguay, United States, Uzbekistan, Vanuatu, Venezuela, Vietnam, Virgin Islands (UK), Virgin Islands (United States), Wallis and Futuna Islands, Yemen, Zambia, Zimbabwe.

2 Cash remittances to Germany between 1972 and 2012 (unless otherwise stated) from the following countries: Bulgaria, Cyprus, Denmark, Estonia, Finland, Greece, Iceland, Ireland (1973-2018), Latvia (1992-2021), Lithuania (1992-2021), Liechtenstein (1995-2021), Malaysia, Malta, Morocco, Norway, Portugal, Sweden, Turkey;

3 Cash remittances to the United States between 2003 and 2021 from the following countries: China, Hong Kong SAR, South Africa, South Korea, Taiwan SAR, Venezuela;

4 Cash remittances to Austria in the period 1995-2021 from the following countries: Czech Republic and Slovakia;

5 Cash remittances from Russia in the period 2006-2021 to the following countries: Afghanistan, Albania, Algeria, American Samoa, Andorra, Angola, Anguilla, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, Central African Republic, Chad, Chile, China, Colombia, Comoros, Cook Islands, Costa Rica, Croatia, Cuba, Curaçao, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Djibouti, Dominica, Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Eswatini, Ethiopia, Fiji, Finland, France, French Guiana, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece,

Greenland, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong SAR, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Isle of Man, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mayotte, Mexico, Micronesia, Moldova, Monaco, Mongolia, Montenegro, Montserrat, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands Antilles, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Niue, Norfolk Island, North Korea, Northern Mariana Islands, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of the Congo, Romania, Russia, Rwanda, Saint Helena, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, South Sudan, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syria, Taiwan SAR, Tajikistan, Tanzania, Thailand, Togo, Tokelau, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caicos Islands, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Vanuatu, Vatican City, Venezuela, Vietnam, Virgin Islands (British), Virgin Islands (U.S.), Wallis and Futuna, Western Sahara, Yemen, Zambia, Zimbabwe.

[6] Cash remittances from Germany between 1972 and 2012 (unless otherwise stated) to the following countries: Argentina, Australia, Belgium (1982-2021), Bulgaria, Canada (1992-2013), Croatia, Cyprus (1992-2021), Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland (1993-2018), Italy (1992-2016, 1993-2018), Latvia (1992-2013, 1992-2001, 1992-2021), Liechtenstein (1995-2021), Lithuania (1992-2021), Luxembourg, Malaysia, Malta, Mexico, Morocco, Norway, Poland, Portugal, Romania, Singapore, Slovenia (1992-2021), Spain (1972-2016, 1992-2003, 1992-2016), Sweden, Turkey (1992-2021), United Kingdom (1993-2018);

[7] Cash remittances from the United States between 2003 and 2021 to the following countries: Argentina, Australia, Belgium, Mexico, Hong Kong SAR, Taiwan SAR, Singapore, South Africa, South Korea, Venezuela;

[8] Cash remittances from Austria in the period 1995-2021 to the following countries: Croatia, Czech Republic, France, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain;

[9] Cash remittances from the UK in the period 1999-2021 to the following countries: Canada, Hong Kong SAR.

Appendix 2. Correlation matrix

	lsent	lreceived	lmstock	RecGrowth	DonGrowth	diffGDP	lfx	gini	ltrade	RecCrisis	DonCrisis	ldist	colony	comlang	shareleav	shareleav2	shareleav3	mig_pop	mig_pop2	mig_pop3
lsent	1,0000																			
lreceived	0,8401*	1,0000																		
lmstock	0,7230*	0,6559*	1,0000																	
RecGrowth	-0,0738*	-0,0359*	-0,1421*	1,0000																
DonGrowth	-0,0376*	-0,0727*	0,0225*	0,1398*	1,0000															
diffGDP	0,0736*	-0,0767*	0,1594*	-0,0441*	0,0464*	1,0000														
lfx	-0,0232	0,0252*	0,1431*	-0,0926*	0,0930*	0,3083*	1,0000													
gini	-0,2150*	-0,0855*	-0,1966*	-0,0778*	-0,0003	-0,2338*	0,0362*	1,0000												
ltrade	0,8006*	0,7996*	0,6609*	-0,0352*	-0,0334*	-0,0062	0,0016	-0,3249*	1,0000											
RecCrisis	-0,0306*	-0,0362*	0,0136	-0,7062*	-0,1378*	-0,0114	0,0595*	0,2030*	-0,0590*	1,0000										
DonCrisis	-0,0371*	-0,0308*	-0,0694*	-0,1374*	-0,7047*	0,0105	-0,0597*	0,0418*	-0,0584*	0,1640*	1,0000									
ldist	-0,4020*	-0,4067*	-0,3808*	0,0345*	0,0358*	0,0019	0,0014	0,4404*	-0,3484*	0,0340*	0,0329*	1,0000								
colony	0,2405*	0,2342*	0,4112*	-0,0130	-0,0087	-0,0067	0,0043	-0,0780*	0,1338*	-0,0059	-0,0062	-0,2934*	1,0000							
comlang	0,3112*	0,3055*	0,2652*	0,0021	0,0060	-0,0062	0,0042	-0,0584*	0,2601*	-0,0245*	-0,0241*	-0,1144*	0,2255*	1,0000						
shareleav	0,3843*	0,2434*	0,5198*	-0,0299*	0,0127	0,1696*	0,0033	-0,0850*	0,2697*	0,0017	-0,0165*	-0,1942*	0,4246*	0,1965*	1,0000					
shareleav2	0,2571*	0,1401*	0,3703*	-0,0154	0,0137	0,1414*	0,0010	-0,0187	0,1571*	0,0040	-0,0089	-0,1042*	0,3174*	0,1018*	0,9236*	1,0000				
shareleav3	0,2007*	0,1037*	0,2901*	-0,0077	0,0124	0,1218*	0,0039	0,0008	0,1215*	0,0006	-0,0066	-0,0638*	0,2225*	0,0676*	0,8040*	0,9638*	1,0000			
mig_pop	0,2223*	0,2187*	0,3345*	-0,0103	-0,0250*	0,0302*	0,0332*	-0,0951*	0,1218*	-0,0202*	0,0239*	-0,2116*	0,4700*	0,1751*	0,1731*	0,1241*	0,1035*	1,0000		
mig_pop2	0,1014*	0,1025*	0,1956*	-0,0049	-0,0217*	-0,0041	0,0248*	-0,0476*	0,0384*	-0,0121	0,0252*	-0,1164*	0,3280*	0,1059*	0,0708*	0,0310*	0,0179*	0,9102*	1,0000	
mig_pop3	0,0739*	0,0727*	0,1438*	-0,0011	-0,0221*	-0,0048	0,0195*	-0,0367*	0,0196	-0,0102	0,0259*	-0,0842*	0,2503*	0,0811*	0,0433*	0,0106	0,0008	0,7965*	0,9679*	1,0000

Note. * - significance of coefficient estimates at 10% level, respectively.

Source: author's calculations using STATA14 package

Appendix 3. Recipient-donor country pairs in the first stage of migration since 1972

Russia-Montenegro	Russia-Serbia	Russia-Angola	Russia-Republic of Congo
Russia-Gibraltar	Russia-Guinea	Russia-Guatemala	Russia-Mauritania
Russia-Mauritania	Russia-Niger	Russia-Nicaragua	Russia-Qatar
Russia-Saudi Arabia	Russia-Singapore	Russia-Tajikistan	Russia-British Virgin Islands
Russia-Vanuatu	Russia-Turks and Caicos Islands	Russia-Andorra	Russia-Malaysia
Argentina-Germany	Argentina-Russia	Argentina-US	Armenia-Russia
American Samoa-Russia	Antigua and Barbuda-Russia	Australia-Germany	Australia-Russia
Australia-US	Austria-Switzerland	Austria-Germany	Austria-Spain
Austria-France	Austria-United Kingdom	Austria-Hungary	Austria-Italy
Austria-Netherlands	Austria-Poland	Austria-Romania	Austria-Russia
Austria-Slovakia	Austria-US	Azerbaijan-Russia	Burundi-Russia
Belgium-Germany	Belgium-Russia	Belgium-US	Benin-Russia
Burkina Faso-Russia	Bangladesh-Russia	Bulgaria-Germany	Bulgaria-Russia
Bahrain-Russia	Bosnia and Herzegovina-Russia	Belize-Russia	Bermuda-Russia
Bolivia-Russia	Brazil-Germany	Brazil-United Kingdom	Brazil-Russia
Brazil-US	Barbados-Russia	Brunei-Russia	Botswana-Russia
CAR-Russia	Canada-Germany	Canada-Russia	Switzerland-Germany
Switzerland-United Kingdom	Switzerland-Russia	Chile-Russia	China-Germany
China-UK	China-Russia	China-United States	C te d'Ivoire-Russia
Cameroon-Russia	Congo, DR-Russia	Republic of Congo-Russia	Colombia-Russia
Cape Verde-Russia	Costa Rica-Russia	Cuba-Russia	Cura ao-Russia
Cayman Islands-Russia	Cyprus-Germany	Cyprus-Russia	Czech Republic-Austria
Czech Republic-Russia	Germany-Argentina	Germany-Australia	Germany-Belgium
Germany-Brazil	Germany-Canada	Germany-China	Germany-Cyprus
Germany-Finland	Germany-France	Germany-UK	Germany-India
Germany-Ireland	Germany-Iceland	Germany-Japan	Germany-Liechtenstein
Germany-Morocco	Germany-Mexico	Germany-Malta	Germany-Malaysia
Germany-Russia	Germany-Singapore	Germany-Sweden	Germany-US
Djibouti-Russia	Dominica-Russia	Denmark-Germany	Denmark-Russia
Dominican Republic-Russia	Algeria-Russia	Ecuador-Russia	Egypt-Russia
Eritrea-Russia	Spain-Austria	Spain-Germany	Spain-Russia
Estonia-Germany	Ethiopia-Russia	Finland-Germany	Finland-Russia
Fiji-Russia	France-Austria	France-Germany	France-Russia
France-US	Micronesia-Russia	Gabon-Russia	UK-Austria
UK-Brazil	UK-Canada	UK-Switzerland	UK-China
UK-Germany	UK-India	UK-Japan	UK-Russia
Ghana-Russia	Gibraltar-Russia	Guinea-Russia	Guinea-Bissau-Russia
Equatorial Guinea-Russia	Greece-Germany	Greece-Russia	Grenada-Russia
Greenland-Russia	Guatemala-Russia	Guam-Russia	Guyana-Russia

Hong Kong SAR, China-United States	Honduras-Russia	Croatia-Austria	Croatia-Germany
Croatia-Russia	Haiti-Russia	Hungary-Austria	Hungary-Germany
Hungary-Russia	Indonesia-Russia	Isle of Man-Russia	India-Germany
India-UK	India-Russia	India-US	Ireland-Germany
Ireland-Russia	Iran-Russia	Iraq-Russia	Iceland-Germany
Iceland-Russia	Italy-Austria	Italy-Germany	Italy-Russia
Italy-US	Jamaica-Russia	Jordan-Russia	Japan-Germany
Japan-UK	Japan-Netherlands	Japan-Russia	Japan-US
Kenya-Russia	Cambodia-Russia	Kiribati Russia	Korea-Russia
Korea-US	Kuwait-Russia	Lao PDR-Russia	Lebanon-Russia
Liberia-Russia	Libya-Russia	Liechtenstein-Russia	Sri Lanka-Russia
Lesotho-Russia	Lithuania-Germany	Luxembourg-Russia	Luxembourg-US
Latvia-Germany	Macao SAR, China-Russia	Morocco-Germany	Morocco-Russia
Monaco-Russia	Madagascar-Russia	Maldives-Russia	Mexico-Germany
Mexico-Russia	Marshall Islands-Russia	North Macedonia-Russia	Mali-Russia
Malta-Germany	Malta-Russia	Myanmar-Russia	Montenegro-Russia
Mongolia-Russia	Northern Mariana Islands-Russia	Mozambique-Russia	Mauritania-Russia
Mauritius-Russia	Malawi-Russia	Malaysia-Germany	Malaysia-Russia
Namibia-Russia	New Caledonia-Russia	Niger-Russia	Nigeria-Russia
Nicaragua-Russia	Netherlands-Austria	Netherlands-Germany	Netherlands-Japan
Netherlands-Russia	Netherlands-US	Norway-Germany	Norway-Russia
Nepal-Russia	New Zealand-Russia	Oman-Russia	Pakistan-Russia
Panama-Russia	Peru-Russia	Philippines-Russia	Palau-Russia
Papua New Guinea-Russia	Poland-Austria	Poland-Germany	Poland-Russia
Puerto Rico-Russia	DPRK-Russia	Portugal-Germany	Portugal-Russia
Paraguay-Russia	French Polynesia-Russia	Qatar-Russia	Romania-Austria
Romania-Germany	Romania-Russia	Russia-Aruba	Russia-Afghanistan
Russia-Angola	Russia-Albania	Russia-Andorra	Russia-UAE
Russia-Argentina	Russia-American Samoa	Russia-Antigua and Barbuda	Russia-Australia
Russia-Austria	Russia-Burundi	Russia-Belgium	Russia-Benin
Russia-Burkina Faso	Russia-Bangladesh	Russia-Bulgaria	Russia-Bahrain
Russia-Bahrain	Russia-Bosnia and Herzegovina	Russia-Belize	Russia-Bermuda
Russia-Bolivia	Russia-Brazil	Russia-Barbados	Russia-Brunei
Russia-Brunei	Russia-Botswana	Russia-CAR	Russia-Canada
Russia-Switzerland	Russia-Chile	Russia-China	Russia-C te d'Ivoire
Russia-Cameroon	Russia-Congo, DR	Russia-Republic of Congo	Russia-Colombia
Russia-Costa Rica	Russia-Cuba	Russia-Cayman Islands	Russia-Cyprus
Russia-Czech Republic	Russia-Germany	Russia-Djibouti	Russia-Dominica
Russia-Denmark	Russia-Dominican Republic	Russia-Algeria	Russia-Ecuador
Russia-Egypt	Russia-Eritrea	Russia-Spain	Russia-Ethiopia

Russia-Finland	Russia-Fiji	Russia-France	Russia-Micronesia
Russia-Gabon	Russia-UK	Russia-Ghana	Russia-Guinea
Russia-Guinea	Russia-Guinea-Bissau	Russia-Equatorial Guinea	Russia-Greece
Russia-Grenada	Russia-Greenland	Russia-Guatemala	Russia-Guam
Russia-Guyana	Russia-Honduras	Russia-Croatia	Russia-Haiti
Russia-Hungary	Russia-Indonesia	Russia-India	Russia-Ireland
Russia-Iran	Russia-Iraq	Russia-Iceland	Russia-Israel
Russia-Italy	Russia-Jamaica	Russia-Jordan	Russia-Japan
Russia-Kenya	Russia-Cambodia	Russia-Kiribati	Russia-Korea
Russia-Kuwait	Russia-Laos PDR	Russia-Lebanon	Russia-Liberia
Russia-Libya	Russia-Liechtenstein	Russia-Sri Lanka	Russia-Lesotho
Russia-Luxembourg	Russia-SAR Macao, China	Russia-Morocco	Russia-Monaco
Russia-Madagascar	Russia-Maldives	Russia-Mexico	Russia-Marshall Islands
Russia-Mongolia	Russia-Mali	Russia-Malta	Russia-Myanmar
Russia-North Macedonia	Russia-Northern Mariana Islands	Russia-Mozambique	Russia-Mauritania
Russia-Mauritius	Russia-Malawi	Russia-Malaysia	Russia-Namibia
Russia-New Caledonia	Russia-Niger	Russia-Nigeria	Russia-Nicaragua
Russia-Netherlands	Russia-Norway	Russia-Nepal	Russia-New Zealand
Russia-Oman	Russia-Pakistan	Russia-Panama	Russia-Peru
Russia-Philippines	Russia-Palau	Russia-Papua New Guinea	Russia-Poland
Russia-Puerto Rico	Russia-DPRK	Russia-Portugal	Russia-Paraguay
Russia - French Polynesia	Russia-Qatar	Russia-Romania	Russia-Rwanda
Russia-Saudi Arabia	Russia-S o Tom and Principe	Russia-Solomon Islands	Russia-Singapore
Russia-Senegal	Russia-Sudan	Russia-El Salvador	Russia-San Marino
Russia-Somali	Russia-Sierra Leone	Russia-Slovakia	Russia-Slovenia
Russia-Sweden	Russia-Eswatini	Russia-Seychelles	Russia-Syria
Russia-Chad	Russia-Togo	Russia-Thailand	Russia-East Timor
Russia-Tonga	Russia-Trinidad and Tobago	Russia-Tunisia	Russia-Turkey
Russia-Tanzania	Russia-Uganda	Russia-Uruguay	Russia-United States
Russia-Venezuela, RB	Russia-Virgin Islands (United States)	Russia-Vietnam	Russia-Vanuatu
Russia-Samoa	Russia-Yemen	Russia-South Africa	Russia-Zambia
Russia-Zimbabwe	Rwanda-Russia	Saudi Arabia-Russia	Sao Tome and Principe-Russia
Senegal-Russia	Singapore-Germany	Singapore-Russia	Singapore-US
Solomon Islands-Russia	Sierra Leone-Russia	El Salvador-Russia	San Marino-Russia
Somalia-Russia	Serbia-Russia	South Sudan-Russia	Sudan-Russia
Slovakia-Austria	Slovakia-Russia	Slovenia-Austria	Slovenia-Germany
Slovenia-Russia	Sweden-Germany	Sweden-Russia	Eswatini-Russia
Seychelles-Russia	Syria-Russia	Turks and Caicos Islands-Russia	Chad-Russia
Togo-Russia	Thailand-Russia	East Timor-Russia	Tonga-Russia
Trinidad and Tobago-Russia	Tunisia-Russia	Turkey-Germany	Turkey-Russia

Tuvalu-Russia	Tanzania-Russia	Uganda-Russia	Uruguay-Russia
United States- Virgin Islands - Russia	Venezuela, RB-Russia	Venezuela, RB-United States	British Virgin Islands-Russia
United States-Russia	Vietnam-Russia	Vanuatu-Russia	Samoa-Russia
Yemen-Russia	South Africa-Russia	South Africa-United States	Zambia-Russia
Zimbabwe-Russia			