

National Research University Higher School of Economics

*As a manuscript*

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**THE STAGES OF INTERNATIONAL MIGRATION  
AND THEIR IMPACT ON DIRECTIONS AND VOLUMES OF  
REMITTANCES**

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### **Motivation**

By the 21st century migration processes had become one of the most widely-spread patterns of globalization. Over the past 50 years world migrant stock has more than tripled: at present 295 mln people live in a country other than their country of birth (World Bank, 2023). This is equivalent to 3.7% of the world population. Despite the trends on deglobalization and regionalization after the crisis of 2008-2009 (Makarov, 2022), migration processes continue to expand all over the world amid various geopolitical, climatic and socio-economic factors (Lee, 1966; World Bank, 2016). Even the situation in 2021-2022 has also contributed to the increase in the number of migrants on global level.

Rising number of migrants eventually leads to the increase in international remittances (or personal transfers), i.e., to \$794 bln in 2022 (World bank, 2022). Remittance flows have been historically an important source of the revenues in the current account of the balance of payments and a supporting factor for the economy of many countries (especially – developing ones). On micro-level, remittances have been promoting welfare of both households and individuals (Chepel & Bondarenko, 2015; World Bank, 2023).

Over the past three years<sup>1</sup> remittances have become the most significant source of external financing for low- and middle-income countries (World bank, 2022). International mobility and international transfers are included into the UN Sustainable Development Goals (SDGs) agenda (Mosler & Laczko, 2022) and represent important tools to advance strategic global development priorities of the World Bank Group (World Bank, 2023). The key SDG target describing migration issues is 10.7, which urges economies to “facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies”<sup>2</sup>. The World Bank, on the other side, has been emphasizing the importance of migration issues since the 1970s, and almost every World Development Report has included migration, remittances or related processes in some or other way. The topic of the latest 2023 report called “Migrants, Refugees and Societies” is to explore how international migration management processes need to be structured in a manner, which is beneficial to all. The abovementioned circumstances encourage scientific community to deepen research of migration patterns and bilateral international transfers. However, most studies in this area are either focused

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<sup>1</sup> Excluding China - since 2015

<sup>2</sup> United Nations Sustainable Development Goals. Goal 10: Reduce inequality within and among countries. [URL]: <https://www.un.org/sustainabledevelopment/inequality/>

on micro-data only (i.e., based on surveys of migrants and/or households) or on country data, which does not take into account micro-level factors (Beine, Lodigiani & Vermeulen, 2012).

The relevance of this study is that it focuses on aggregated country-level modelling while also taking into account micro-level factors, i.e., the preferences of migrants to leave for a certain country (the latter highlights their behavioral patterns and, to some extent, determines the stages of migration cycle). This approach will enhance the existing approach of remittances modelling by far more accurately assessing the patterns of bilateral flows in the medium and long term and thus will make a significant contribution to the theory of migration.

### **Brief literature review**

The dynamics of bilateral international transfers is a complex process, which – in addition to the number of migrants abroad – is shuffled by both country-level factors, including demographic, macroeconomic, political, environmental, geographical and other conditions in the donor and the recipient states (Bondarenko, 2020; Makhlouf & Kasmaoui, 2018; Ratha & Shaw, 2007), as well as micro-level factors such as age and gender of the migrant (Kock & Sun, 2011), marital status, occupation, level of education and others (Buch et al., 2002; Ameudo-Dorantes & Pozo, 2003). At the same time, existing literature only partially covers the subject of research. It is crucial to reveal how socio-economic background of the migrant changes during certain periods of the migration cycle. Additionally, it is important to identify the psychological, economic and social challenges, which the migrant should overcome towards his/her complete adaptation in society, being able to change the status from a labor migrant to an established immigrant (Mukomel, 2011; Bondarenko, 2020).

These questions highlight the importance to study of the stages of migration. These stages are extremely significant in predicting changes of migrants' behavioral attitudes over time amid various external and internal factors (Pukhova et al., 2013; Bhugra & Becker, 2005; Bernard, Bell & Charles-Edwards, 2014; Zaslavskaya & Rybakovsky, 1987). The analysis of the stages of migration allows to find the patterns of a typical migrant's behavior during the migration cycle based on an analysis of migration processes "from the inside".

Some works analyze this topic when using quantitative and qualitative indicators of migrants' adaptation to live in the recipient country (Toth-Bos, Wisse & Farago, 2019; Bernardo et al., 2018; Zimmermann et al., 2017; Zhou, 2014; Yehuda-Sternfeld & Mirsky, 2014; Carrasco, 2010; Yoon & Lee, 2010; King et al., 2006; Doerschler, 2006; Zaslavskaya & Rybakovsky, 1987), the others use econometric modelling to find the determinants of making decision to migrate (De Jong, 2000; Nivalainen, 2004). However, most these works reflect migration cycle at the country level (when not taking into account bilateral trends) or at micro level (using survey data).

The present research analyzes the changes in the dynamics and directions of international bilateral transfers at various stages of migration. At the same time, the reasons for making a decision to migrate are not deeply analyzed, while the processes of return migration, re-migration and adaptation of refugees are out of research scope. The work is focused on analyzing the situation when migrants stay in a new country for a long time (i.e., they do not intend to come back home and do not move for any other country). In this case the process of migration abroad is cyclical, and migration cycle ends in the country of relocation – which has a significant impact on the dynamics and directions of personal transfers.

### **Object and subject of the research**

The object of the study reflects migration and cash transfers.

The subject of the study is the relationship between the stages of migration and the volumes of international personal transfers.

### **Research purpose**

The purpose of the study is to characterize the stages of the cycle of international migration from the donor country to the recipient country and to determine how these stages affect the volumes and directions of bilateral international money transfers.

The abovementioned goal predetermines the following:

1. To characterize the specifics of migration processes;
2. To identify the key factors that determine the dynamics and directions of bilateral personal transfers at the micro- and country- levels;
3. To clarify the concept of the international migration cycle and analyze how personal transfer flows change at each stage of the cycle (based on literature review and analysis of historical data);
4. To aggregate all the available data on bilateral transfers from Central (national) banks of various countries into a single database of bilateral money transfers;
5. To analyze the dynamics of cash transfers depending on the degree of migrants' adaptation in the territories of settlement (case of recipient-donor countries, i.e., Germany – Poland, Germany – Turkey, Russia – Belarus, Russia – Turkmenistan);
6. To conduct a regression analysis identifying the impact of changes in migration patterns on the total volume of money transfers sent from a migrant recipient country to a migrant donor country and vice versa;
7. To interpret the results and to determine the conditions for the transition from one stage

of the international migration cycle to another one.

## **Methodology**

Analysis of the influence of migration patterns on the dynamics and directions of remittances is based on existing literature (Makhlouf & Kasmaoui, 2018; Ratha & Shaw, 2007; Lueth & Ruiz-Arranz, 2007; Schioppa & Siegfried, 2006; Alper, 2005; and Chami et al., 2003). The theory of migration cycle is focused on the studies of Tot-Bos, Wiss and Farago (2019) and Zaslavskaya and Rybakovsky (1987).

The present research analyzes publications and normative documents of international and local organizations, as well as statistical databases. Key publications include the World Bank and KHOMAD Annual Migration and Remittances Factbook and Migration and Development Brief, as well as the OECD's Annual International Migration Outlook. In addition to the publications above, the PhD research uses analytical reports of the G20, the OECD, the World Bank, the UNCTAD, the IMF, the European Central Bank (ECB) and national research agencies (and institutions) of different countries. In terms of cash transfers, the research uses documents of the IMF, the UN, the World bank and the Central (national) banks of various countries.

There is no single database on annual bilateral cash transfer flows in the long run, so we use the approach of Schioppa & Siegfried (2006). The study uses the statistics of bilateral cash transfers in European countries provided by Central (national) banks. The present research uses the same approach, so 115 websites of Central (national) banks around the world were closely monitored for the availability of data on bilateral cash transfers (debit and credit of the secondary income of the current account balance or cash transfers or remittances). The relevant information in the long run was available in the following countries only:

- Austria: National Bank of Austria – Oesterreichische Nationalbank indicator – debit and credit of the balance of secondary income of the current account of the balance of payments;
- Great Britain: Bank of England – Bank of England, indicator – debit and credit of the balance of secondary incomes of the current account of the balance of payments;
- Germany: 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: Netherlands bank – De Nederlandsche Bank, indicator – debit and credit of the balance of secondary income of the current account of the balance of payments;
- Russia: Bank of Russia, indicator – Cross-border transfers of individuals (residents and non-residents);

- USA: Bureau of Economic Analysis, indicator – international transactions (secondary account).

Despite the limitations above, this sample appears to be adequate to achieve the purposes of the study. The sample includes data on 221 donor countries and 218 recipient countries from 1972 to 2021, however the years differ depending for individual bilateral flows, and the data are not available for all country pairs. The total number of all bilateral cash transfer flows is 596.

The database of the study includes statistics from the World Bank, the IMF, the OECD, the KHOEMA, the CEPII, the UN, data from the article by Mayer and Zignago (2011), as well as some data from the banks indicated above determining cash transfers. The present research was carried out using a set of basic general scientific methods (generalization, induction, deduction, classification, modeling).

Chapter 2 provides analysis for bilateral migration flows to Germany and Russia as recipient countries of remittances, and from Poland, Turkey, Belarus and Turkmenistan as migrant donor countries. There were described four case studies of bilateral channels: Germany-Poland, Germany-Turkey, Russia-Belarus and Russia-Turkmenistan. The analysis confirmed the existence of three stages of migration.

Chapter 3 uses the ordinary least squares method to perform econometric modelling, as well as methods for analyzing panel data. The objective of the empirical analysis is to identify the key factors influencing bilateral flows of international transfers, including the dependence of bilateral flows of transfers on the cycle of international migration.

To determine the phase of the cycle the study uses the data on how many migrants leave the donor country for the recipient country (as a share of the total migration outflow from the donor country and as a share of the total population in the recipient country). In the context of an empirical analysis, the "sent" transfers are transfers *from the migrants' recipient country to the donor country* (when migrants send cash transfers to their home country), while "received" transfers are those that the *migrants' recipient country gets from the donor country*.

Econometric modeling of the sent transfers is carried out using a multifactorial regression model based on panel data: the index  $i$  reflects the number of each observed pair of countries migrants' recipient-donor (for example, Germany-Turkey in the case of migration of Turks to Germany or Russia-Belarus in the context migration flows from Belarus to Russia), while  $t$  is the time (in years). Control variables are defined according to a literature review (Makhlouf & Kasmaoui, 2018; Ratha & Shaw, 2007; Lueth & Ruiz-Arranz, 2007; Schiopu & Siegfried, 2006; Alper, 2005; and Chami et al., 2003).

In a generalized form, the theoretical model of sent cash transfers (1) from the migrants' recipient country is presented as follows:

$$(1) \quad LSent_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it}$$

Meanwhile, the model of received cash transfers (2) has the following form:

$$(2) \quad LReceived_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it}$$

In model (1), the dependent variable  $LSent_{it}$  is the logarithm of cash transfers sent from a recipient country of migrants to a migrant donor country, and in model (2)  $LReceived_{it}$  is the logarithm of cash transfers, which are received by a migrants' recipient country of from a donor country,  $\varepsilon_{it}$  is an error in both models. The constant and the error include individual effects of country pairs. The dependent variables have logarithmic specification, confirmed by the results of the Paul Zarembka test (a special case of the Box–Cox test).

The matrix of independent variables  $X_{it}$  is specified as follows:

$$X_{it} = \beta_1 lmstock_{it} + \beta_2 RecGrowth_{it} + \beta_3 Dongrowth_{it} + \beta_4 diffGDP_{it} + \beta_5 gini_{it} + \beta_6 lfx_{it} + \beta_7 ltrade_{it} + \beta_8 ldist_{it} + \beta_9 colony_{it} + \beta_{10} comlang_{it} + \beta_{11} RecCrisis_{it} + \beta_{12} DonCrisis_{it},$$

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

As part of the research question, we also consider migration stages, which we determine based on i) the share of migrants who left the donor country for the recipient country to the total number of migrants who left (variable  $shareleav_{it}$ ) and ii) the share of migrants from the donor country to the total population living in the recipient country (variable  $mig\_pop_{it}$ ). These two variables allow to determine the significance of the recipient country for migration from the donor country in comparison with the other countries.

Brief descriptive statistics of the variables are provided below (Table 1); including both the initial values of the variables (neither logarithmic nor squared / cubed), as well as the variables directly used in the model.

Table 1

**Descriptive statistics of variables**

Variable	Brief description*	Total	Average	St. dev	Min	Max
sent	Transfers sent from RC to DC, \$mln	12 269	398	1 246	0	17 332
lsent	<i>sent</i> logarithm	11 542	2,9	3,2	-7,6	9,8
received	Transfers received in RC from DC, \$mln	12 123	387	1 233	0	17 332
lreceived	<i>received</i> logarithm	11 406	2,9	3,2	-7,6	9,8
mstock	number of migrants in RC from DC, people	29 800	75 098	441 186	0	1,20E+07
lmstock	<i>mstock</i> 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 (by PPP) RC and DC, thousand int. \$	17 132	0,0	18,8	-145,4	145,4
gini_std	Gini coefficient of RC	10 685	37,2	8,0	15,0	75,0
fx	Cross exchange rate between DC and RC	27 320	3,90E+08	1,11E+10	0,0**	6,35E+11
lfx	<i>fx</i> logarithm	27 320	0,0	3,9	-27,2	27,2
trade	Bilateral trade volume of DC and RC (export + import), \$mln	16 284	15 714	48 868	0,0**	664 642
ltrade	<i>trade</i> 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	<i>ldist</i> logarithm	29 000	8,3	1,0	4,1	9,7
colony	Mutual colonial ties (1)	29 000	0,08	0,27	0	1
comlang	Mutual language of communication (1)	29 000	0,06	0,23	0	1
RecCrisis	Year of falling GDP (1) RC	29 800	0,17	0,37	0	1
DonCrisis	Year of falling GDP (1) DC	29 800	0,17	0,37	0	1
shareleav	share of migrants who leave DC for RC, %	28 923	3,35	10,90	0	98,3
shareleav2	<i>shareleav</i> squared	28 923	1 30,1	671,8	0	9 656,4
shareleav3	<i>shareleav</i> cubed	28 923	7 199,1	50 669,4	0	948 899,3
mig_pop	share of migrants from the DC to the total population of the RC, %	29 000	0,3	1,3	0,0	21,7
mig_pop2	<i>mig_pop</i> squared	29 000	1,7	16,5	0,0	469,7
mig_pop3	<i>mig_pop</i> cubed	29 000	19,9	262,1	0,0	10 181,1

Note. \* RC – migrants' recipient country, DC – migrants' donor country, \*\*less than 0,0001

Source: author's calculations using STATA14

To test the assumption about the non-linear nature of the relationship between the volumes of sent and received transfers at different stages of migration, we also test the following variables:  $shareleav2_{it}$ ,  $shareleav3_{it}$  are the square and cube of the  $shareleav_{it}$  variable, respectively, while  $mig\_pop2_{it}$  and  $mig\_pop3_{it}$  are respectively the square and cube of the  $mig\_pop_{it}$  variable. The model deliberately does not include the key rates in donor and recipient countries due to the statistical peculiarities of calculating this indicator. There is no inflation in the model as well due to its high correlation with the exchange rate. A similar approach is taken in a number of other research papers, such as the ECB study by Shiopu and Siegfried (2006).



*The main hypothesis of the research:* The bilateral migration cycle makes statistically significant influence on the volumes of sent and received remittances. This relationship is a non-linear one.

### Main findings

1. *The dynamics of bilateral transfers between a migrants' donor country and a recipient country depends not only on country (aggregated) data, but also on the specifics of migration processes at the micro level;*

The studies of the international migration cycle (Table 2) by Tot-Bos, Wisse & Farago (2019) and Zaslavskaya and Rybakovsky (1987) were supplemented by the analysis i) on bilateral flows of migration and personal transfers at the country level, and ii) on changing migrants' behavioral attitudes amid rising number of people leaving for a particular country.

Table 2

#### Migration stages and the cycle of international migration

International migration cycle (Bilateral country-level flows)	«Three-stage migration process» (T. Zaslavskaya, L. Rybakovsky, 1987)	Migration stages depending on the purpose of migration (Toth-Bos, Wisse & Farago, 2019)
1. Making a decision to migrate, migration itself and the formation of the first migrants' communities in the recipient country	1. Making a decision to migrate	1. pre-migration stage
2. The recipient country becomes a key destination for migrants, the migrant diaspora continues to grow	2. Migration	
3. The high degree of naturalization of migrants, as evidenced by: i) the recipient country remains a key destination for migrants and ii) the high share of the migrant diaspora to the total population of the recipient country	3. Adaptation / survivability	2. during migration stage
		3. post-migration stage / repatriation

Source. Compiled by the author, T. Zaslavskaya & L. Rybakovsky, 1987, Toth-Bos, Wisse & Farago (2019)

The stages of the international migration cycle are determined by the behavioral preferences of migrants towards specific country in order to maximize the efficiency of migration and minimize risks. Indicators of behavioral preferences are i) the country concentration of migration flows from the donor country and ii) the naturalization of migration (i.e., the share of the migrant diaspora of the donor country in the total population of the recipient country). The context of “naturalization” does not refer only to the acquisition of the citizenship or allegiance of a new country, but it rather reflects “socio-economic” or “cultural” naturalization (Ong et al., 1996). As migrants naturalize, they try to bring their closest relatives, family/friends/acquaintances to a recipient country, expand migration networks and occupy a certain position in the society

(Bondarenko & Kharitonova, 2023). If naturalization is high and migrant networks are well-developed, the financial behavior of migrants (in the absence of significant social barriers) is characterized by the transformation of their behavior towards intentions to finally stay in the recipient country and to encourage their families to relocate.

## ***2. Migration processes at the country level pass through three stages of the migration cycle.***

During the first stage migrants begin to go abroad and to form the first community in the recipient country. Migration to the recipient country is not massive. During the second stage, the recipient country becomes a key destination for migrants, and the migrant diaspora expands. During the third stage, there is a high degree of naturalization of migrants, as evidenced by the facts that i) the recipient country remains a key destination for migrants, and ii) there is a high share of the migrant diaspora in the total population of the recipient country. The existence of all the three stages of the international migration cycle is confirmed both in the context of the analysis of aggregated data (international migration from China to the United States) and on the basis of an in-depth study of the specifics of migration from a donor country to a recipient country using the example of Poland-Germany and Turkey-Germany migration flows, Belarus-Russia, and Turkmenistan-Russia.

## ***3. The dynamics of sent and received personal transfers changes throughout the three stages of the migration cycle***

Simulation results for models (1) and (2) are calculated using four methods of regression analysis – spatial, random-effects, fixed-effects, and Hausman-Taylor regression. The standard errors of random-effects and fixed-effects panel regressions are robust. The modeling process includes the choice of the lagged independent variables. The best regression metrics have been received under the following lagged variables: GDP growth ( $RecGrowth_{it}$ ,  $DonGrowth_{it}$ ), FX rate ( $lfx_{it}$ ), bilateral trade volume ( $ltrade_{it}$ ), as well as dummy variables for crisis years ( $RecCrisis_{it}$ ,  $DonCrisis_{it}$ ). The best regressions were calculated using the Hausman-Taylor method of econometric modelling, which, on the one hand, allows to solve the problem of time-invariant independent variables, and on the other hand, allows to take into account endogeneity<sup>3</sup> between the variables in the model.

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<sup>3</sup> Endogenous variables are the following: the number of migrants ( $lmstock_{it}$ ), the difference in GDP per capita of the donor country and the recipient country ( $diffGDP_{it}$ ), the Gini index ( $gini_{it}$ ), and the indicators of migration stages, i.e. the share of migrants who left the donor country for the recipient country ( $shareleav_{it}$ ) and its derivatives ( $shareleav2_{it}$ ,  $shareleav3_{it}$ ), as well as the share of migrants from the donor country to the total population living in the recipient country ( $mig\_pop_{it}$ ) and its derivatives ( $mig\_pop2_{it}$ ,  $mig\_pop3_{it}$ ). All these variables to some extent have bilateral impact on the dependent variable and/or to each other.

**Results of econometric modelling – Hausman-Taylor regression –  
personal transfers sent**

variable	type	lsent	lsent	lsent	lsent	lsent
lmstock	END/time	0,134*** (-0,013)	0,115*** (-0,0134)	0,106*** (-0,0134)	0,108*** (-0,0136)	0,0995*** (-0,0137)
L.RecGrowth	EXO/time	0,00117 (-0,00487)	0,001 (-0,00485)	-0,000342 (-0,00484)	0,00108 (-0,00485)	-0,000269 (-0,00484)
L.DonGrowth	EXO/time	-0,0283*** (-0,00436)	-0,0297*** (-0,00436)	-0,0291*** (-0,00435)	-0,0301*** (-0,00436)	-0,0295*** (-0,00435)
diffGDP_th	END/time	-0,00551** (-0,0022)	-0,00591*** (-0,0022)	-0,00634*** (-0,00219)	-0,00590*** (-0,0022)	-0,00633*** (-0,00219)
L.lfx	EXO/time	-0,0172** (-0,00701)	-0,0186*** (-0,00699)	-0,0180*** (-0,00696)	-0,0185*** (-0,00698)	-0,0180*** (-0,00696)
gini_std	END/time	0,0361*** (-0,00595)	0,0359*** (-0,00593)	0,0366*** (-0,00591)	0,0363*** (-0,00593)	0,0370*** (-0,00591)
L.ltrade	EXO/time	0,683*** (-0,0164)	0,679*** (-0,0164)	0,678*** (-0,0163)	0,678*** (-0,0164)	0,677*** (-0,0163)
L.RecCrisis	EXO/time	-0,0157 (-0,0416)	-0,0236 (-0,0415)	-0,0303 (-0,0413)	-0,0243 (-0,0415)	-0,031 (-0,0413)
L.DonCrisis	EXO/time	-0,0960** (-0,0422)	-0,0977** (-0,0421)	-0,0958** (-0,0419)	-0,0974** (-0,0421)	-0,0954** (-0,0419)
ldist	EXO/invar.	0,00637 (-0,134)	0,00706 (-0,135)	0,0133 (-0,136)	0,0125 (-0,134)	0,019 (-0,135)
colony	EXO/invar.	0,928** (-0,375)	0,854** (-0,379)	0,849** (-0,382)	0,878** (-0,377)	0,874** (-0,379)
comlang_off	EXO/invar.	0,786* (-0,412)	0,720* (-0,416)	0,648 (-0,419)	0,676 (-0,414)	0,602000 (-0,417)
shareleav	END/time	0,00582* (-0,00311)	0,0297*** (-0,00666)	0,0250*** (-0,00669)	0,0510*** (-0,0113)	0,0471*** (-0,0113)
shareleav2	END/time		-0,000445*** -0,0000955	-0,000439*** -0,0000952	-0,00139*** -0,000417	-0,00142*** -0,000415
shareleav3	END/time				0,00000961** -0,00000414	0,00000997** -0,00000412
mig_pop	END/time	-0,031 -0,0353	0,192** -0,0765	0,680*** -0,116	0,187** -0,0765	0,678*** -0,116
mig_pop2	END/time		-0,0190*** -0,00566	-0,141*** -0,0225	-0,0189*** -0,00566	-0,142*** -0,0225
mig_pop3	END/time			0,00683*** -0,00122		0,00688*** -0,00122
_cons		-4,180*** -1,137	-4,053*** -1,147	-4,084*** -1,153	-4,078*** -1,141	-4,110*** -1,147
N – число наблюдений (странов. пары и периоды)		4840	4840	4840	4840	4840
i – число наблюдений (странов. пары)		438	438	438	438	438
sigma_u		2,107	2,128	2,143	2,115	2,129
sigma_e		0,637	0,635	0,633	0,635	0,632
rho		0,916	0,918	0,92	0,917	0,919
Wald_chi2		3393,9	3437,4	3482	3451	3496,7

Note. Standard errors are in parentheses. The dependent variable is  $lsent_{it}$ . \*\*\*/\*\*/\* - the significance of the assessment of the coefficients, respectively, at 1%/5%/10% levels. END – endogenous variable, EXO – exogenous variable, invar. – variable that does not change over time (invariant), time – variable that varies over time

Source: author's calculations using the STATA14

**Results of econometric modelling – Hausman-Taylor regression –  
personal transfers received**

variable	type	lreceived	lreceived	lreceived	lreceived	lreceived
lmstock	END/time	0,124*** (-0,0132)	0,104*** (-0,0136)	0,100*** (-0,0137)	0,100*** (-0,0139)	0,0959*** (-0,014)
L.RecGrowth	EXO/time	-0,00868* (-0,00499)	-0,00876* (-0,00497)	-0,00938* (-0,00498)	-0,00868* (-0,00497)	-0,00932* (-0,00497)
L.DonGrowth	EXO/time	-0,00832* (-0,0045)	-0,0102** (-0,00451)	-0,00989** (-0,00451)	-0,0104** (-0,00451)	-0,0101** (-0,00451)
diffGDP_th	END/time	-0,00315 (-0,00227)	-0,00345 (-0,00227)	-0,00366 (-0,00227)	-0,00346 (-0,00227)	-0,00368 (-0,00227)
L.lfx	EXO/time	0,0106 (-0,00742)	0,00861 (-0,0074)	0,00883 (-0,00739)	0,00866 (-0,00739)	0,00889 (-0,00739)
gini_std	END/time	0,0377*** (-0,00605)	0,0374*** (-0,00603)	0,0377*** (-0,00603)	0,0376*** (-0,00603)	0,0379*** (-0,00603)
L.ltrade	EXO/time	0,767*** (-0,0169)	0,762*** (-0,0168)	0,761*** (-0,0168)	0,761*** (-0,0169)	0,760*** (-0,0168)
L.RecCrisis	EXO/time	-0,123*** (-0,0431)	-0,131*** (-0,043)	-0,135*** (-0,043)	-0,132*** (-0,0429)	-0,135*** (-0,0429)
L.DonCrisis	EXO/time	0,0594 (-0,0434)	0,0559 (-0,0432)	0,0568 (-0,0432)	0,0567 (-0,0432)	0,0576 (-0,0432)
ldist	EXO/invar.	0,112 (-0,136)	0,108 (-0,137)	0,11 (-0,137)	0,112 (-0,137)	0,114 (-0,137)
colony	EXO/invar.	1,290*** (-0,388)	1,221*** (-0,391)	1,214*** (-0,389)	1,236*** (-0,392)	1,229*** (-0,39)
comlang_off	EXO/invar.	0,548 (-0,425)	0,48 (-0,428)	0,446 (-0,427)	0,451 (-0,429)	0,4160000 (-0,428)
shareleav	END/time	-0,0155*** (-0,00315)	0,0136** (-0,00689)	0,0114* (-0,00694)	0,0284** (-0,0117)	0,0266** (-0,0117)
shareleav2	END/time		-0,000516*** (-0,0000989)	-0,000514*** (-0,0000989)	-0,00116*** (-0,000422)	-0,00117*** (-0,000421)
shareleav3	END/time				0,0000065 (-0,000004)	0,0000067 (-0,00000416)
mig_pop	END/time	-0,0123 (-0,0362)	0,160** (-0,0787)	0,389*** (-0,12)	0,157** (-0,0787)	0,389*** (-0,12)
mig_pop2	END/time		-0,0148** (-0,00582)	-0,0717*** (-0,0232)	-0,0148** (-0,00582)	-0,0724*** (-0,0232)
mig_pop3	END/time			0,00318** (-0,00126)		0,00322** (-0,00126)
_cons		-5,501*** (-1,159)	-5,321*** (-1,166)	-5,322*** (-1,162)	-5,341*** (-1,168)	-5,342*** (-1,164)
N – число наблюдений (странов. пары и периоды)		4756	4756	4756	4756	4756
i – число наблюдений (странов. пары)		433	433	433	433	433
sigma_u		2,107	2,122	2,113	2,125	2,116
sigma_e		0,652	0,649	0,649	0,649	0,649
rho		0,913	0,914	0,914	0,915	0,914
Wald_chi2		3750,2	3802,4	3816,4	3805	3819,4

Note. Standard errors are in parentheses. The dependent variable is  $lreceived_{it}$ . \*\*\*/\*\*/\* - the significance of the assessment of the coefficients, respectively, at 1%/5%/10% levels. END – endogenous variable, EXO – exogenous variable, invar. – variable that does not change over time (invariant), time – variable that varies over time

Source: author's calculations using the STATA14

During the first stage, both personal transfers sent to the homeland as far as the received ones increase (the latter if the result of temporary support). During the second stage, the volume of personal transfers sent continues to grow, while remittances received start to decline or stagnate. During the third stage net transfers decrease amid: i) a drop in the volume of transfers sent home due to the relocation of the family (or extended family) to the recipient country (Table 3) and ii) an increase in transfers received (Table 4) due to sale of assets, which partially (or completely) offsets the decline in the volume of transfers received from the previous stage.

To determine directions of the dynamics of transfers, the model is using the volumes of bilateral flows of international transfers (both sent and received) depending on i) the share of migrants who leave the donor country for the recipient country and ii) the share of migrants from the donor country in the total number the population of the recipient country.

The calculations allow to calculate (Table 5), how adaptation of migrants in the recipient country (which is determined by the cycle of international migration) transforms the patterns of financial behavior of migrants and affects bilateral personal transfers.

Table 5

**Estimated terms of the international migration cycle and bilateral personal transfers' cycle**

<b>№</b>	<b>International migration cycle (Bilateral country-level flows)</b>	<b>Bilateral personal transfers' cycle</b>	<b><math>share_{leav}_{it}</math></b>	<b><math>mig\_pop_{it}</math></b>
1.	Making a decision to migrate, migration itself and the formation of the first migrants' communities in the recipient country	Rising both transfers sent home and received by migrants in a host country	Less than 11-12%	Less than 3,0-3,5%
2.	The recipient country becomes a key destination for migrants, the migrant diaspora continues to grow	Rising transfers sent home and declining/stagnating transfers received by migrants	From 11-12% to 20-30%	
3.	The high degree of naturalization of migrants, as evidenced by: i) the recipient country remains a key destination for migrants and ii) the high share of the migrant diaspora to the total population of the recipient country	Decreasing net transfers amid: i) a drop in the volume of funds sent home and ii) an increase in transfers received due to the sale of assets (as a result), which partially (or completely) offsets the decline in the volumes of received transfers of the previous stage	From 20-30% and over	From 3,0-3,5% and over

Source. Compiled by the author

The abovementioned estimated terms allow us to determine the stages of bilateral migration cycle for different country pairs in different years. Yet, in the context of the share of migrants in the host country, there is a significant question on the ratio of the population in the two countries. If the two countries have approximately the same population, the conditions of the variable  $mig\_pop_{it}$  will be the most representative. If the population of the donor country significantly

exceeds the population of the recipient country, then the stages of the migration cycle can be shifted down (and vice versa).

**4. If migrants do not aim to leave the home country for permanent residence abroad, but rather use migration as a temporary way to earn money, a high concentration of migration flows from the donor country may not lead to a decrease in the volume of sent transfers;**

For migrants from some countries (for example, considering migration from Uzbekistan to Russia), in general, labor migrants intend to earn money in order to improve their financial situation (and the well-being of their family) in their homeland, rather than moving to permanent residence in Russia (Bondarenko, 2020).

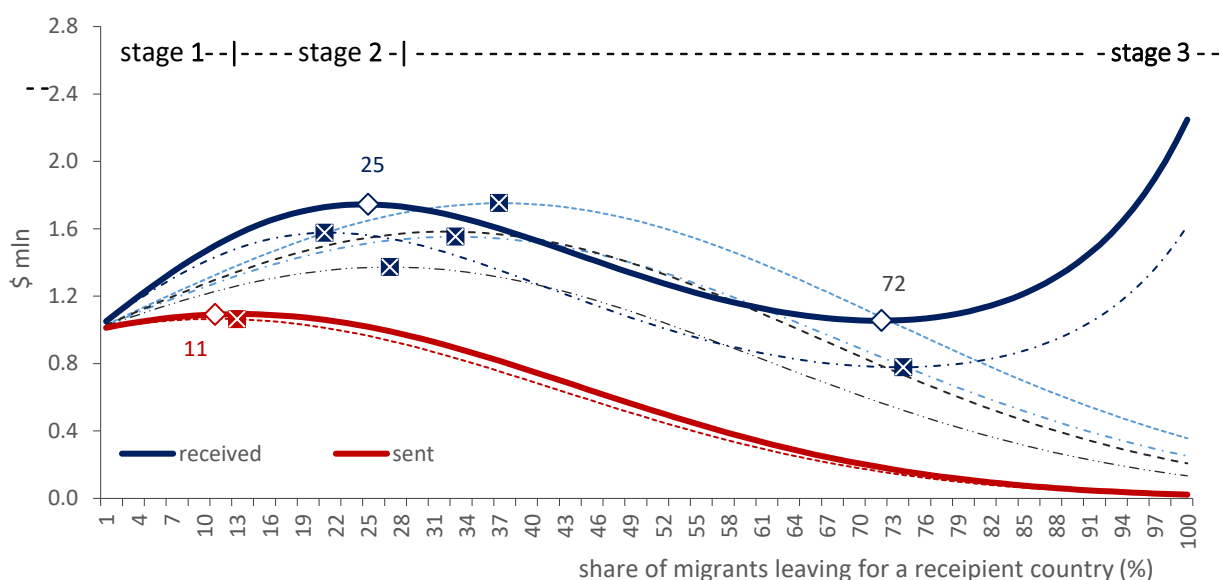


Figure 1. Modeling of bilateral flows of international transfers (\$ mln) depending on the share of migrants who leave the donor country for the recipient country (%)

Note. The rhombuses denote the extrema of the functions with the best parameters. The squares indicate the extrema of other significant functions.

Source: author's calculations

Such patterns of flows are an exception; in this case, the volumes of sent transfers continue to grow even at the third stage (Figure 1), with rising share of migrants leaving for the recipient country.

**5. The calculations let i) to identify key recipient-donor country pairs at various stages of the migration cycle and ii) to determine the further dynamics of bilateral cash transfers.**

The total number of country pairs with the data on  $shareleav_{it}$  and  $mig\_pop_{it}$  available from 1972 up to now is 570. Considering the abovementioned calculations, 537 pairs are still at

the first stage of migration. For example, Argentina - USA, Austria - Slovakia, Bulgaria - Germany, UK - India (despite the increase in the share of migrants from India in the total UK population in recent years), etc.

The transition from the first to the second stage is seen in the following recipient-donor country pairs: Austria - Czech Republic (2nd stage - since 2010), USA - Argentina (since 1972), Germany - Switzerland (since 2000), USA - India (since 2000), Germany - Estonia (since 1990), Germany - Latvia (since 1990), Germany - Spain (since 2000), Austria - Slovenia (since 2000).

Finally, the following pairs of recipient-donor countries went through the three stages of migration: Mexico - USA (stage 2 began in the 1990s, and stage 3 in the 2010s), Germany - Turkey (the latter passed the first two stages in the 1960s), Canada - Great Britain and others. The study also reveals that Russia as a recipient country with the countries of the former USSR as donors of migrants (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Latvia, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan) is at the third stage of migration for many years (Russia is a priority country for migration for more than 40% of people leaving these countries).

### **Contribution**

This study contributes to the scientific literature on the specifics of migration processes (in particular, the stages of migration) and remittances. There are several limitations of the study. First, they are associated with the availability and quality of statistics on migration and remittances, which limits the sample of countries and study periods in different country pairs. Further, there are limitations in modeling – for example, in analyzing an unbalanced panel of data and determining the duration of migration stages. In addition, there is the problem of determining the type of migration and its composition for all country pairs - for example, because temporary or fundamental factors undoubtedly affect the results of the analysis. Finally, there remains the issue of country differences – the stages of migration and their conditions can differ significantly depending on specific country pairs.

However, the general conclusions of this work allow to expand the theory of migration and provide a fundamental basis for further research. Despite the increased attention of the economic discussion to the bilateral transfers, there are no empirical works in the literature where, along with country variables, the model includes variables that somehow reflect the stages of migration.

1. The study clarifies the concept of three stages of the international migration cycle, as evidenced by the results of a retrospective analysis of migration flows from donor countries to recipient countries (from Poland and Turkey to Germany, from Belarus and Turkmenistan to Russia);

2. There has not been any single international database of annual flows of bilateral cash transfers in the long term, so this study makes contribution towards generating an united database of bilateral personal transfers from 1972 to 2021, following the ECB approach (Schiopu & Siegfried, 2006).
3. An updated model of bilateral personal transfers is proposed, taking into account the impact of the migration cycle;
4. The research develops a concept of a bilateral personal transfers' cycle, the stages of which correspond to the stages of the international migration cycle;
5. Mathematical calculations and graphical analysis of the regression results allow to quantitatively determine the conditions for the transition from one stage of the migration cycle to another.

### **Practical importance of research results**

While collecting statistics for the study, there appeared the need for creating a unified methodology for recording and collecting data on migration flows in the world, as well as creating a unified database of bilateral personal transfers. For Russia, the US, Germany, Austria, the Netherlands, and the UK the sample for bilateral transfers needs to be expanded. For the rest of the world, it is recommended to provide data on bilateral international transfers (for example, as an extension of the balance of payments statistics).

The results of the study can be taken into account by the World Bank, the IMF and the UN when forecasting the dynamics of personal transfers. The results of this study can be applied while formatting migration policies in different countries of the world – especially in country pairs at the second and the third stages of migration. In the context of Russia, the results of the study can be used by the Ministry of internal affairs of the Russian Federation when developing reforms of migration policy, by the Russian government when carrying out reforms in the demographic policy of the country (including in the part of the National Project "Demography"), as well as by the Bank of Russia when forecasting the parameters of the current account of the balance of payments.

### **Approbation of research results**

The author presented the studies of the research in the field of migration at the scientific conference "International conference on Time Series and Forecasting - 2018" at the University of Granada (Spain). In September 2023 the results of the work were presented at the Russian Economic Congress (REC-2023) at session 14.10.1 International problems of migration on



September, in Yekaterinburg. The materials of the PhD research were used when teaching courses for undergraduate students of the Faculty of World Economy and International Affairs at the HSE University "Introduction to the World Economy" and "Modern Problems of the World Economy", and the minor "Global Business Environment".

The author has published five papers on the topic of the study in publications from the List of Journals, a total volume of 7.8 p.l. - ("International Organisations Research Journal", "Spatial Economics", "Regional Research of Russia", "Journal of the New Economic Association" and "Sovremennaya Evropa "). Additionally, one paper was published in the journal "Contemporary world economy" of the Department of World Economy, Faculty of World Economy and International Affairs, HSE University.

### **List of author's original articles**

*Articles published in journals indexed in the databases Scopus and/or Web of Science:*

Bondarenko K., Kharitonova N. (2023) Well-being of Immigrants in Germany: Country of Origin and Income Convergence // *Sovremennaya Evropa* – [Electronic resource]. URL: <http://ras.jes.su/seu/s020170830021418-0-1> (circulation date: 08.08.2022).

Bondarenko K. A. (2021) Labor Migration from Uzbekistan: A Family and Community Promoted Big Bang // *Regional Research of Russia*, Vol. 11, No. 2, pp. 276–287. © Pleiades Publishing, Ltd.

Bondarenko K. (2020) The Impact of the COVID-19 Pandemic: The Case of Remittance Recipient Countries. *International Organisations Research Journal*, vol. 15, no 3, pp. 109–128 (in English). DOI: 10.17323/1996-7845-2020-03-04

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*Article published in high-level journals of the HSE University:*

Chepel S., Bondarenko K. (2015) Is the External Labor Migration an Economic Growth Factor: Econometric Analysis and Policy Implications for the CIS Countries // *Journal of the New Economic Association*. Vol. 4. no 28. pp. 142-166.

*Article published in other journals:*

Bondarenko K. (2023) International Migration Cycle and its Effect on Remittance Flows // *Contemporary world economy*. Vol. 1. no 2. pp. 46-74.