Journal of Infrastructure, Policy and Development 2024, 8(16), 9390.
https://doi.org/10.24294/jipd9390

Article

Exploring the drivers of remittance flows to Vietnam in the context of globalization: Evidence from a survey of Vietnamese immigrants

Duong Minh Ngo[1,2], Phuong Dung Hoang[3], Norbert Bozsik[4,*]

[1] Doctoral School of Economic and Regional Sciences, MATE, 2100 Gödöllő, Hungary
[2] Banking Academy of Vietnam, Hanoi 10000, Vietnam
[3] Faculty of Marketing, NEU, Hanoi 10000, Vietnam
[4] Hungarian University of Agriculture and Life Sciences, 3200 Gyöngyös, Hungary
*** Corresponding author:** Norbert Bozsik, bozsik.norbert@uni-mate.huA

CITATION

Ngo DM, Hoang PD, Bozsik N. (2024). Exploring the drivers of remittance flows to Vietnam in the context of globalization: Evidence from a survey of Vietnamese immigrants. Journal of Infrastructure, Policy and Development. 8(16): 9390. https://doi.org/10.24294/jipd9390

ARTICLE INFO

Received: 29 September 2024
Accepted: 11 November 2024
Available online: 27 December 2024

Abstract: This study examines the microeconomic determinants influencing remittance flows to Vietnam, considering factors such as gender (SEX), age (AGE), marital status (MS), income level (INC), educational level (EDU), financial status (FS), migration expenses (EXP), and foreign language proficiency (LAN). The study analyzes the impact of these factors on both the volume (REM_VL) and frequency of remittance flows (REM_FR), employing ordered logistic regression on survey data collected from Vietnamese migrants residing in Asia, Europe, the Americas, and Oceania. The estimations reveal that migrants' income, age, educational level, and migration costs significantly positively influence remittance flows to Vietnam. Conversely, the financial status of migrants' families in the home country negatively impacts these flows. Gender and migration costs primarily influence the frequency of remittance transfers, but they do not have a significant effect on the volume of remittances. Although foreign language proficiency was introduced as a novel variable of the models, it does not demonstrate any significant impact in this study. Furthermore, the survey data and regression estimates suggest that two primary motivations drive remittances to Vietnam: altruistic motives and implicit loan agreements. This research contributes to a deeper understanding of remittance e behavior, particularly in the context of Vietnam's status as a major labor exporter. The findings provide valuable insights for policymakers and researchers seeking to optimize remittance flows and their impact on the Vietnamese economy. By understanding the complex interplay of factors influencing remittance behavior, policymakers can design effective strategies to support migrants and encourage increased remittance inflows, ultimately contributing to economic development and poverty reduction.

Keywords: remittance behavior; microeconomic determinants; Vietnamese immigrants; globalization; altruistic motives; implicit loan agreement

1. Introduction

Due to historical and socioeconomic factors, remittance transfers to Vietnam have experienced significant expansion over the past decade. According to the United Nations Department of Economic and Social Affairs (UNDESA), approximately 3.2 million Vietnamese individuals resided overseas in 2020, with 47% residing in North America, predominantly in the United States, 15% in Europe, 10% in Japan, 9% in China, 8% in Australia, and 5% in South Korea. Given its net annual migration rate of −0.8%, Vietnam primarily functions as a labor exporter, thus receiving a substantial influx of remittances (Integral Human Development, 2021). In 2022, Vietnam ranked third in the East Asia and Pacific Region and tenth worldwide in terms of remittances, receiving 19 billion USD, which accounted for

4.6% of GDP (KNOMAD, 2022). These figures are indicative of Vietnam's commendable efforts to attract remittances from overseas

When analyzing the three main sources of capital entering Vietnam from 2000 to 2006 remittances, foreign direct investment (FDI), and official development assistance (ODA), their volumes were remarkably comparable. Remittances and FDI had significant growth, whereas ODA saw a slow decrease after 2006. Since 2010, remittances have exceeded FDI in magnitude, becoming the primary foreign capital inflow into Vietnam, a trend that continues today. In comparison to ODA and FDI, remittances exhibit a more steadfast growth rate throughout the two-decade period from 2000 to 2020. These trends indicate the increasing significance of its position in Vietnam's economy.

Remittances have an important role in encouraging private investment, reducing unemployment, and increasing the earnings of the recipients. Remittances sent by migrant workers primarily benefit economically disadvantaged rural households, reducing the economic disparity between urban and rural areas and providing social advantages to many rural families. Remittances have a favorable impact on Vietnam's economic growth by serving as a source of investment, promoting economic advancement, and enhancing the balance of payments (Nguyen and Phan, 2023).

Given the noteworthy data concerning remittance inflows into Vietnam and their consequential importance for the domestic economy, the primary objective of this paper is to explore the determinants of remittance inflows into Vietnam from the perspective of Vietnamese migrants. The study aims to shed light on two key questions: (1) What factors influence the flow of remittances into Vietnam? and (2) What are the underlying motives behind the remittance behavior of Vietnamese individuals residing overseas?

The findings of this study, based on data from Vietnam, may offer valuable insights that can extend beyond the country's borders, contributing to the broader literature on remittance inflows. Vietnam's unique socioeconomic and historical context, combined with its status as a major labor exporter, makes it an interesting case study for understanding the dynamics of remittance flows. The country's rapid economic transformation, coupled with its significant reliance on remittances as a primary source of foreign capital, provides an important comparative basis for other developing nations experiencing similar migration patterns and economic challenges. By examining the determinants and motives of remittance behavior in the Vietnamese context, this paper may inform policies in other countries that depend heavily on remittances, offering lessons on maximizing the economic benefits of these financial flows.

2. Literature review

The quantity of remittances sent by migrants is affected by their financial capability as well as their inclination to send funds to their country of origin. These motives are diverse based on the duration of migration (whether the migrants plan to live abroad for a short or extended period, temporarily or permanently), their familial situation, and their community ties (whether they migrated alone or with family members, and whether they maintain contact with their family in their home country). Several studies have focused on these primary motivations to determine the factors that influence remittance flows, including altruism, self-interest, and familial consensus.

2.1. Pure altruism

Existing literature highlights various factors influencing migrant workers' decisions to send remittances back to their home countries (Johnson and Whitelaw, 1974; Lucas and Stark, 1985). A prominent driver is altruistic concern, where migrants willingly transfer funds to support the living standards of their families back home, often covering necessities like food, education, and healthcare (Erdal and Borchgrevink, 2017). This motivation stems from a sense of filial responsibility and a desire to improve the well-being of their loved ones (Polat, 2021).

However, the level of remittances often adjusts to changing circumstances in the receiving households. As family members' income increases, their self-sufficiency reduces their need for financial support, leading to a decrease in remittance flows (Fonchamnyo, 2012; Heo and Kim, 2019; Javid and Hasanov, 2023; Polat, 2021; Sharma and Grote, 2018; Vacaflores, 2018). This is corroborated by empirical findings, with Simpson and Sparber (2019) demonstrating a 0.76%–0.84% decrease in remittances for every 1% increase in the per capita GDP of the receiving country. Interestingly, a study by Mahmud (2020) found that despite acknowledging the economic benefits of remittances, respondents in both Tokyo and Los Angeles highlighted their sense of responsibility as a primary driver, sending funds for their families' essential needs, including education and healthcare.

According to Biyase and Tregenna (2016), migrant workers' places of residence may have an impact on the amount of remittance they send home because urban areas may offer more employment opportunities and consequently generate higher remittance amounts than rural areas. Surprisingly, the educational level of the household head in the receiving country did not significantly impact the migrant's decision to send remittances, but it did affect the amount sent. Additionally, households with employed heads were found to receive less support compared to those with unemployed heads, potentially due to their existing income sources. Furthermore, the economic context of the receiving country influences remittance flows. Simpson and Sparber (2019) observed that remittances are directed more towards poorer countries, supporting the notion that they serve as a means for families to smooth consumption by employing a member abroad.

The strength of the migrant's connection to their home country is crucial. Studies suggest that prolonged stays abroad and limited opportunities for return visits can weaken family ties and reduce the altruistic motivation to send remittances (Sinning, 2007). In addition, research by Navita and Pal (2020) suggested that altruistic motivations remain relevant for remittances sent to both rural and urban households.

2.2. Pure self-interest

While altruism has been traditionally considered the primary driver of remittance flows, some research suggests the presence of significant self-interest motivations (Polat, 2021). This perspective posits that beyond altruistic concerns, migrants' financial interests also influence their remittance decisions, encompassing various forms of self-serving transfers.

Securing inheritances: One aspect of self-interest involves using remittances to secure future inheritances. As a descendant's actions can impact inheritance claims, migrants might send money with the expectation of receiving a larger share of family assets in the future. Supporting this notion, Lucas and Stark (1985) found that wealthier families received larger remittances from their migrant children. Additionally, agreements between migrants and their families regarding future asset division can further incentivize remittance sending as a means to gain favor with potential inheritors (Regmi and Tisdell, 2002).

Protecting assets: Remittances can also serve the self-interest of safeguarding existing assets in the home country. Lucas and Stark (1985) observed that migrants with property or businesses back home sent remittances to ensure proper monitoring and maintenance of these assets. Moreover, McCracken et al. (2017) suggested that while higher income in the destination country allows for greater remittance flows, lower income in the origin country can have ambiguous effects, potentially indicating a stronger influence of self-interest motives in such scenarios.

Favorable exchange rates: Polat (2021) proposed another self-interest factor: the exchange rate. When the home country's currency appreciates, it becomes more profitable for migrants to transfer their earnings as the transferred funds increase in value. This often leads to increased remittances used for physical investments back home. Consequently, higher exchange rates incentivize remittance sending based on self-interest motives.

Maintaining social ties and reputation: Migrants planning to return home might send remittances as investments to enhance their social standing and maintain ties with family. Glytsos (1997) observed that Greek citizens in Germany, motivated by the "return illusion", sent higher remittances compared to those settled in the United States and Australia, where the "permanent settlement syndrome" prevailed. Similarly, Mahmud (2020) found that respondents sent remittances for income-generating projects, suggesting that both migrants and their families view these transfers as a means to achieve social status and economic advancement.

2.3. Implicit family agreement: Co-insurance and loan

In their research on Botswana's migration, Lucas and Stark (1985) found that remittance intentions are influenced not only by altruism but also by a multitude of factors. They referred to the motives driven by implicit family obligations as "tempered altruism" or "enlightened self-interest". These terms were used to denote the value of remittance transfers resulting from a combination of both altruistic and self-interested motives. In other words, remittances are perceived as the product of bilateral agreements established out of mutual benefits between the emigrant and their family, such as reimbursement for migration-related education expenses or ensuring the protection of migrants against income losses in the host country.

Research has shown that remittances are motivated not only by altruism but also by a range of other factors. Cox (1987) has argued that the exchange motive, such as reimbursement for education or travel expenses, plays a significant role in shaping remittance behavior. Biyase and Tregenna's (2016) study further supports the idea that remitting may also serve debt repayment or exchange objectives. These findings suggest that remittance behavior is shaped by a complex set of motives that reflect both self-interest and family commitments.

To begin, the implicit co-insurance arrangement is an instrument employed by migrants and their families to cover the financial risks of moving. This arrangement relies on the assumption that migrants who cannot afford the initial fees of moving are able to depend on their families to provide the required finances. This early support from their families can help minimize the uncertainty that comes with relocation. In turn, once located in the host nation, migrants are expected to offer financial support to their families back home. This approach is more effective when migrants have access to stable employment with adequate pay. Migrants' financial assistance can help their families in the homeland improve their living conditions and make high-risk investments for bigger returns. Remittances, according to Stark (1991), may be viewed as a way for migrant families to diversify their income streams, minimizing the risk of financial insecurity.

The implicit loan agreement approach comprises three distinct stages, as identified by Lucas and Stark's (1985) empirical investigation. The first stage involves remittances being regarded as a repayment of an implicit loan taken out by the migrant to cover the costs associated with migration. In the second stage, migrants transfer funds to support the education of their younger family members, thus preparing them for eventual migration. The third stage involves emigrants sending remittances back to their home country before returning to their families, thereby concluding the cycle. The subsequent generation of migrants then begins the repayment of the implicit loan to creditors who were previous migrants and had already returned to their homeland. Lucas and Stark's (1985) research found a positive correlation between the number of educational terms completed by migrants and their children and the number of remittances transferred, providing support for the implicit loan arrangement concept. Consistent outcomes are reported in the studies conducted by Sharma and Grote (2018) as well as Simpson and Sparber (2019).

2.4. Other determinants

In addition to the aforementioned drivers of remittance flows, there exist various socioeconomic and demographic factors that may influence the propensity of migrants to remit. Specifically, Biyase and Tregenna's (2016) research demonstrates that household size and gender of the head of household have both beneficial short-term effects and detrimental long-term effects on the frequency and volume of remittances received. Furthermore, Bauer and Sinning (2005); Cox et al. (1987); de la Briere et al. (2002) and Mohammed (2022) have provided empirical evidence demonstrating that age and employment status are significant determinants of migrant savings and remittance behavior.

Scholarly research has explored the role of gender in migrant remittance behavior. While some studies suggest that female migrants have stronger family ties and remit more funds compared to men (Osaki, 1999), others indicate that male migrants send larger amounts due to gender wage inequalities (Semyonov and Gorodzeisky, 2005). De la Briere et al. (2002) conducted a study on the remittance motives of male and female migrants, utilizing two separate models. The first model focused on insurance for dependents in the home country, while the second model centered on investments for future inheritances. The authors' findings highlight gender disparities in remittance behavior, with female migrants prioritizing the health of their families and male migrants only responding to this concern when they are the sole migrant in their families. Overall, research suggests that gender is an important factor that influences remittance behavior among migrants.

Sharma and Grote (2018) investigated the association between various migrant characteristics and their remittance decisions. They found that age, marital status, and years of schooling all significantly influenced remittance behavior. Age was positively correlated with the likelihood of remitting. This suggests that older migrants, with potentially established families and stable jobs, are more likely to send money back home. Marital status also played a role, with married migrants exhibiting a higher propensity to remit. This finding is unsurprising, considering that many migrants aim to support spouses and families left behind in rural areas. Furthermore, there is a positive correlation between the migrant's level of education (in years) and the likelihood that they will remit funds. According to Bettin and Lucchetti (2016), the level of education of migrants has a positive influence on their propensity to remit. However, the years of education of migrants have a negative, nonlinear effect on this tendency.

The influence of gender on remittance behavior adds another layer of complexity to understanding household financial dynamics (Mahmud, 2020). Studies suggested that male and female migrants may have distinct approaches to remittances, potentially challenging the notion of a unified household remittance strategy. Niimi et al. (2008) posited that while female migrants might have greater financial resources, they tend to send lower remittance amounts compared to males. However, both genders seem motivated by similar goals, with altruistic and risk-mitigation purposes being key drivers. Research by Simpson and Sparber (2019) suggested a negative correlation between the number of females in the migrant household and the total remittance amount. Their findings indicate that an additional female in the household, regardless of age, can lead to an 18% decrease in remittance flows. On the other hand, Sharma and Grote (2018) presented a contrasting perspective, arguing that migrant gender does not significantly influence remittance decisions or amounts.

3. Empirical method

The determinants of remittance transfers are influenced by a group of micro-factors that determine the motivation and purpose of remittance. Empirical data reveals that the micro-factors influencing the desire to remit are dependent on the expatriate's family situation, educational level, and length of stay abroad (OECD, 2006). According to Swamy's (1981) research, the number of depositors and their income can explain up to 90% of a country's variance in remittance flows. This phenomenon may be explained using sociological and anthropological theories that investigate remittance depositor behavior. The group of micro-factors that influence remittance flows can be categorized into three subgroups as follows: (1) variables relating to remitters' anthropological features, including gender, age, marital status, and relationship with recipients; (2) factors related to remitters' sociological features, including migration time, educational background, occupation, and salary; and (3) factors related to their family's features. As a result, the study's empirical model is primarily comprised of these three categories of factors, with the main form equation being:

$$REM = f\,(S, A, C)$$

where: REM represents the amount of foreign remittance to Vietnam, S represents the sociological features of the Vietnamese immigrants, A represents their anthropological features of them, and C represents the features of their family.

The components of these subgroups on foreign remittances are detailed below:

- The gender of remittance depositors (SEX): is widely acknowledged as an important anthropological factor that significantly affects remittance flows. However, the existing empirical evidence on the extent to which men or women are more likely to transfer remittances is highly variable. According to Semyonov and Gorodzeisky (2005), men, particularly those who are married, are more likely to send larger amounts of money back home due to their familial obligations to support their parents, spouse, and children. On the other hand, some studies suggest that female migrants have stronger ties with their families in their home country and thus are more inclined to remit more money (Osaki, 1999).
- The age of remittance depositors (AGE): is positively correlated with remittance flows, indicating that older depositors tend to send more money to their home country (Bauer and Sinning, 2005; Sharma and Grote, 2018). Several reasons may explain this finding. Firstly, as depositors grow older, they may accumulate more income and have a more stable financial situation while working abroad, resulting in a higher exchange rate and a greater amount of money sent back home to support their families or invest in properties. Secondly, older depositors are often married and may bear greater responsibility for supporting their families in their homeland, particularly if they are migrant workers. Consequently, they may send more money home to assist their families. Finally, depositors who reach a certain age may develop a stronger attachment to their homeland, a desire to help more relatives in their home country, and consequently remit more money.
- The marital status of remittance depositors (MS): is a crucial determinant in their decision to transfer funds. Both theoretical arguments and empirical evidence suggest that married depositors are more likely to remit money to their relatives, especially their spouses, and children, with greater frequency and amount compared to unmarried individuals (Mannan and Farhana, 2014). Nevertheless, if the depositors are married and living with their family members

overseas, they are less inclined to send remittances back to their home country (Loschmann and Siegel, 2015).

- The level of income of remittance depositors (INC): has been posited to have a positive effect on both the magnitude and frequency of remittances. This is grounded in theoretical considerations that suggest that depositors with higher incomes are better equipped to send money back to their home country due to the greater resources and opportunities at their disposal. Empirical research conducted by Cox (1987); Cox et al. (1998); Lucas and Stark (1985); and Laniran and Adeniyi (2015) has provided support for this theoretical framework, demonstrating a positive relationship between depositor income and the volume of remittances sent to family and relatives in the home country.
- The educational level of remittance depositors (EDU): has been theorized to positively influence their income and, by extension, their ability to send more remittances to their home country (Sharma and Grote, 2018). According to Loschmann and Siegel (2014), higher education levels tend to be associated with higher incomes, which in turn can lead to more frequent and larger remittance flows.
- The financial status of the migrants' family (FS): The relationship between a migrant's family financial status and the volume of remittances they send back has been a subject of considerable academic inquiry. Fonchamnyo (2012) and Biyase and Tregenna (2016) suggest that migrants may display heightened altruism by sending larger sums of money to their financially vulnerable families back home. Conversely, Hoddinott (1994) and Regmi and Tisdell (2002) posit that a migrant may have a strategic incentive to send larger remittances to a financially secure family to secure future inheritances.

Apart from the conventional determinants, contemporary research on remittance flows in Vietnam indicates that the volume of remittances may be influenced by various factors, including the cost associated with migration and the migrant's foreign language proficiency. More specifically:

- The expenses of migration (EXP): serve as a significant financial obligation for Vietnamese migrants seeking employment opportunities abroad, especially those engaged in labor exports. From a theoretical perspective, it stands to reason that higher migration costs would entail larger remittance outflows from migrants to their home country.
- Proficiency in a foreign language (LAN): constitutes a determining factor influencing the earnings of workers and, consequently, affecting the remittance flows to Vietnam.

The study aims to explore the effects of microeconomic incentives on both the volume of remittances (REM_VL) and the frequency of the remittances (REM_FR). The research model is expressed in the form of the following formulas:

$$REM\_VL = \beta0 + \beta1\ SEX + \beta2\ lnAGE + \beta3\ MS + \beta4\ INC + \beta5\ EDU + \beta6\ LAN + \beta7\ EXP + \beta8\ FS + \varepsilon ij \quad (1)$$

$$REM\_FR = \beta0 + \beta1\ SEX + \beta2\ lnAGE + \beta3\ MS + \beta4\ INC + \beta5\ EDU + \beta6\ LAN + \beta7\ EXP + \beta8\ FS + \varepsilon ij \quad (2)$$

The study applies ordered logistic regression because both the dependent variables and several independent variables are either ordinal or have a natural ordering. Ordered logistic regression is particularly suitable when the outcome variable has more than two categories with a meaningful order. This regression technique allows for the modeling of the relationship between the ordered dependent variable and independent predictors, while taking into account the ordering of the variables. It is a suitable choice when the assumption is that the effect of a predictor on the outcome is consistent across the different levels of the dependent variable (Williams and Quiroz, 2020).

4. Data

The present study is based on a survey conducted by the authors to gather information on Vietnamese immigration. The analysis attempts to collect survey data using the snowball sampling approach. Sedgwick (2013) suggests that this method is suitable for study designs facing challenges in reaching the survey respondents. The research team initially reached out directly to migrants who are personally acquainted with or relatives of the team members to conduct surveys. The study recommends further engagement of survey participants in spreading the survey to more Vietnamese migrants to increase the participant group and ensure the accuracy of the survey results.

Beginning in March 2022, the questionnaire was distributed to Vietnamese migrants. Subsequently, through the efforts of survey participants, it was extended to their acquaintances and familial connections who were living in Vietnamese communities across Europe, Asia, America, and Oceania throughout the period until June 2022. At the end of this period of four months, a total of 239 surveys that were finished in their entirety were collected.

Multiple perspectives exist on the optimal sample size for multivariate regression studies. Green (1991) outlined precise criteria for establishing the minimum sample size in this situation. He suggested that for a model with M independent variables, a minimum sample size of 50 + 8 M is needed to evaluate the overall fit of the model (F-statistic, R-squared). The minimal sample size recommended for analyzing the impact of each independent variable independently is 104 + M. For our investigation with 7 independent variables, the criteria indicate minimal sample sizes of 106 and 111, respectively. Suhr (2006) posited that a study's survey with N questions (items) should maintain a sample-to-item ratio of no less than 5:1. Given that our questionnaire comprises a total of 16 questions (including 9 questions related to both dependent and independent variables and 7 other general questions), the sample size for this study should not fall below 80 to adhere to this recommendation. Hair et al. (2018) introduced the sample-to-variable ratio, suggesting a minimum ratio of 5 observations for each independent variable. However, they express a preference for higher ratios, such as 15:1 or 20:1. This study, which includes 7 independent variables, meets the requirement of having a sample size of over 140 observations by applying a ratio 20:1. Based on the comparison of these hypotheses, we suppose that the sample size of 239 is suitable for this research.

The variables in the survey questionnaire were encoded, and the values are shown in **Table 1**.

The survey data represents responses from Vietnamese migrants all over the world, with a substantial majority of the responses coming from European countries such as Germany, Hungary, and the Czech Republic. Other places, including as East Asian nations, Russia, and Australia, have also drawn a significant number of Vietnamese migrants, including Viet Kieu, migrant laborers, and students. However, the poll was not well received in the United States and Malaysia, both of which are prospective destinations for Vietnamese immigrants.

Table 1. Encoded values and actual value of variables in the questionnaire.

Encoded value	**0**	**1**	**2**	**3**	**4**
REM_VL (Annually)	0 EUR	Under 2400 EUR	From 2400 to under 3600 EUR	From 3600 to under 4800 EUR	4800 EUR or higher
REM_FR (Times per year)	0	1–2	3–4	5–8	9 or more
SEX	Female	Male			
MS	Single/Divorce/Separated/Widow	Married			
INC (annually)		Under 12,000 EUR	From 12,000 to under 24,000 EUR	24,000 EUR or higher	
EDU		High school	Associate's degree	Bachelor's degree or higher	
LAN		Intermediate	Advanced	Proficient	
EXP		Under 3500 EUR	From 3500 to under 5000 EUR	5000 EUR or higher	
FS		Poor	Middle	Rich	

Source: Authors' compilation.

Table 2 shows the survey findings, which include descriptive statistics for the 239 observations. The REM_VL variable has a minimum value of 1 and a maximum of 4, with a median of 2 and a standard deviation of 1.07. This suggests that, on average, remittances sent by migrants are moderately distributed, with some variation in the amounts transferred.

The REM_FR variable displays a median of 2, indicating that Vietnamese migrants typically send money home 3–4 times annually. While 4% of respondents remitted money 9 or more times per year, the majority sent money 3–4 times (43%) or 5–8 times (20%) per year. Notably, 33% of respondents sent money only 1–2 times per year.

In addition, it is crucial to consider specific demographic details when examining the datasets. The majority of survey participants fell between the ages of

20 and 40 years. Additionally, over half of the respondents were married, and a significant portion of the sample had a monthly income exceeding 1000 EUR.

Table 2. Descriptive statistics (*n* = 239).

Variables	Minimum	Maximum	Median	Std. Deviation
REM_VL	1	4	2	1.07
REM_FR	1	4	2	0.84
SEX	0	1	1	0.50
AGE	21	43	30	6.58
MS	0	1	1	0.50
INC	1	3	2	0.76
EDU	1	3	3	0.75
LAN	1	3	3	0.63
EXP	1	3	3	0.57
FS	1	3	2	0.53

Source: Authors' calculation.

5. Results & discussion

Following data processing, early assessments will include doing an assumption check to detect possible model defects. After addressing any discovered issues, the study will then do regression on the two dependent variables, REM_VL and REM_FR, to assess the relevant determinants influencing them.

5.1. Model fit test

Model fit tests help us evaluate whether the specified model appropriately captures the underlying structure of the data. In this context, the log-likelihood test is often used to compare the likelihood of the specified model to that of the null model. The null model represents a baseline or simplified model, typically one that assumes no relationship between the independent variables and the dependent variable. By comparing the log-likelihood values of the specified model and the null model, we can determine if the inclusion of explanatory variables significantly improves the model's ability to explain the data. A higher log-likelihood value for the specified model compared to the null model suggests a better fit, indicating that the model is more effective in capturing the data's patterns (van Opheusden et al, 2020) (See **Table 3**).

Table 3. Log-likelihood test.

Model 1: REM_VL	Model 2: REM_FR
$\chi^2(13) = 408.15$	$\chi^2(13) = 279.96$
p-value < 0.001	p-value < 0.001

Source: Authors' calculation

The p-values for both models are less than 0.001, indicating that the models provide a statistically significant improvement over the null model. They indicate that both models have a good fit and are statistically significant, providing strong evidence that the factors included in each model are meaningful predictors for remittance behavior.

5.2. Multicollinearity

One way to detect multicollinearity is to use the variance inflation factor (VIF), which measures the degree of correlation between each predictor variable and the other variables in the model. A high VIF value indicates that the corresponding variable is highly correlated with the other predictors, and may need to be removed from the model to improve its accuracy and reliability (Montgomery et al., 2012) (See **Table 4**).

Table 4. Collinearity statistics.

Independent variables	**VIF index**	
	REM_VL	**REM_FR**
AGE	2.92	2.45
EDU	1.70	1.87
INC	1.09	1.30
MS	2.15	1.82
LAN	1.56	1.32
EXP	1.04	1.02
SEX	1.20	1.12
FS	1.27	1.08

Source: Authors' calculation.

All of the VIF indices are less than 5, suggesting that the model does not violate the multicollinearity issue.

5.3. Proportional odds assumption test

Table 5 presents the result of the proportional odds assumption test.

The proportional odds assumption is a key assumption in ordinal regression models, which posits that the relationship between each pair of outcome categories is the same, meaning that the coefficients for the predictors are consistent across all thresholds of the dependent variable. In other words, the effect of a predictor on the likelihood of being in a higher versus lower category is assumed to be constant across all outcome levels. Violations of this assumption can lead to biased estimates and incorrect conclusions. To test the validity of the proportional odds assumption, the study applies the Brant test, which evaluates whether the coefficients in the ordinal regression model differ across the outcome categories. The results of this test will help to determine if the assumption holds and, if necessary, guide toward alternative modeling approaches (Williams and Quiroz, 2020).

Table 5. Brant test.

Variable	df	Model 1: REM_VL		Model 2: REM_FR	
		χ^2	***p*-value**	χ^2	***p*-value**
Overall	26	−48.7	> 0.05	−4.53	> 0.05
AGE	2	2.88	> 0.05	4.92	> 0.05
EDU2	2	0.02	> 0.05	0	> 0.05
EDU3	2	0	> 0.05	0	> 0.05
INC2	2	1.26	> 0.05	0	> 0.05
INC3	2	0	> 0.05	0	> 0.05
MS1	2	0.12	> 0.05	0.7	> 0.05
LAN2	2	0	> 0.05	0	> 0.05
LAN3	2	0	> 0.05	0	> 0.05
EXP2	2	0.33	> 0.05	0	> 0.05
EXP3	2	1.27	> 0.05	0	> 0.05
SEX1	2	2.25	> 0.05	0.62	> 0.05
FS2	2	3.19	> 0.05	0.26	> 0.05
FS3	2	5.12	> 0.05	0	> 0.05

Source: Authors' calculation.

The Brant test results indicate that both models, along with their independent variables, exhibit *p*-values exceeding 0.05, implying that the assumptions about the proportional odds are not violated.

5.4. Regression results & discussion

This study employed ordered logistic regression to analyze models 1 and 2, and the results are presented in **Table 6**.

Table 6. Regression results.

Variable	Model 1: REM_VL		Model 2: REM_FR	
	Coefficient	**Confidence intervals (2.5%; 97.5%)**	**Coefficient**	**Confidence intervals (2.5%; 97.5%)**
AGE	1.24	(0.13; 0.31) ***	1.28	(0.16; 0.34) ***
EDU2	15.86	(1.25; 4.40) ***	2.33	(−0.60; 2.37)
EDU3	250.53	(3.77; 7.47) ***	11.14	(0.80; 4.12) **
INC2	18.25	(1.74; 4.25) ***	5.09	(0.62; 2.70) **
INC3	354.02	(4.29; 7.63) ***	54.07	(2.62; 5.45) ***
MS1	0.72	(−1.43; 0.66)	0.92	(−0.98; 0.81)
LAN2	0.31	(−3.54; 2.04)	0.78	(−2.50; 2.89)
LAN3	0.57	(−2.96; 2.66)	0.61	(−2.82; 2.69)
EXP2	2.95	(−0.70; 2.99)	0.70	(−2.21; 1.57)
EXP3	7.50	(0.20; 3.99) *	1.68	(−1.33; 2.49)
SEX1	3.04	(0.39; 1.86) **	1.14	(−0.54; 0.80)
FS2	0.05	(−4.04; −1.90) ***	0.19	(−2.53; −0.80) ***
FS3	0.02	(−5.61; −2.52) ***	0.18	(−2.98; −0.54) ***

*: p-value < 0.05; **: p-value < 0.01; ***: p-value < 0.001
Source: Authors' calculation.

The experimental findings indicate that SEX is positively associated with both dependent variables, but it is only statistically significant for the quantity of remittances. This suggests that gender does not have a significant impact on the number of remittances sent, however, male migrants tend to transfer more funds than female migrants. This phenomenon may be explained by the heavy financial obligations that Vietnamese male migrants hold towards their families, which include not only their wives and children, but also their parents, siblings, and other family members. Consequently, male migrants may send more money back home to meet their familial responsibilities. In contrast, female migrants are less likely to transfer money to their families due to their comparatively lighter family obligations as compared to males. Additionally, women are generally better at managing and saving money. It corresponds with the empirical findings by Semyonov and Gorodzeisky (2005), and Sinning (2007). It is also consistent with what Niimi, Pham, and Reilly (2008) proposed concerning the role of gender in the remitting behaviors of Vietnamese people who are living overseas.

Furthermore, the research indicates that the financial situation of the family of the remittance sender is also a crucial variable that demonstrates a statistically significant association with both dependent variables (*p*-values < 0.001). This finding is consistent with the research conducted by Fonchamnyo (2012) and Biyase and Tregenna (2016), which suggests that the economic well-being of a migrant's family can significantly influence the flow of remittances. Fonchamnyo (2012) posits that migrants tend to remit more money when their family's economic circumstances are relatively disadvantaged, indicating that the remittance behavior of migrants is not solely driven by personal financial considerations but also influenced by their familial and social ties.

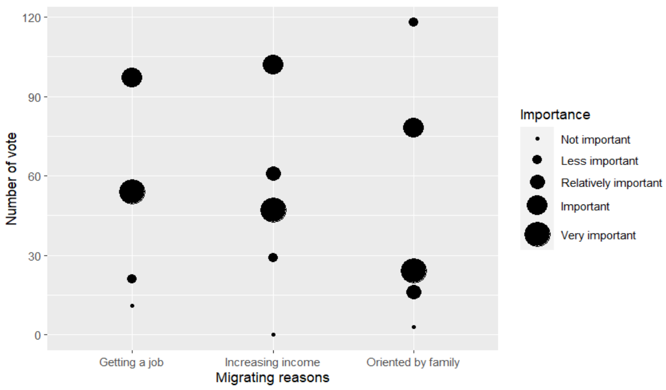

Figure 1. The importance of migrating reasons (unit: number of votes; total votes: 239).

Source: Conducted by the study's survey.

The experimental findings of the SEX and FS variables indicate that Vietnamese migrants living overseas are inclined to send money to their families and relatives in their home country, primarily because their family's financial situation is not particularly affluent. A majority number of Vietnamese households in rural areas have a relatively low income (Nguyen et al., 2015). These results suggest that the remittance flows into Vietnam are more influenced by altruistic motives than the purpose of inheriting properties (pure self-interest). This conclusion is further corroborated by the survey data conducted by the authors, which is presented in **Figure 1**.

The majority of research participants recognize the possibility of increasing their income and career options as critical or extremely important, whereas up to 50% say that migration is less family-oriented. These data show that migrants are driven mostly by personal desires instead of familial duties. As a result, the motivation to send money back to their family is mostly self-motivated rather than affected by familial pressures. When migrants find a stable job and experience an improvement in their income, they may feel obligated to transfer money back to Vietnam to help their families, especially if their relatives are having financial difficulties.

The variable INC demonstrates a positive relationship between Viet Kieu's wages and both dependent variables. It is clear that Vietnamese expatriates have a tendency to transfer increasing sums of money to their families when their income levels rise. This finding is consistent with the earlier practical studies by researchers such as Cox (1987), Cox et al. (1998), Lucas and Stark (1985) and Laniran and Adeniyi (2015). Furthermore, the coefficients of AGE show positive and statistically significant impacts in both of the empirical models examined. Particularly, the empirical findings indicate that Vietnamese migrants who are older and currently living overseas are more likely to send larger quantities of money to their home country. This observation is consistent with the findings of Bauer and Sinning (2005) regarding immigrant populations in Germany, which posit a significant relationship between age and the remittance behavior of migrants, as well as their propensity to save. Similarly, it has been established that the level of education has a significant positive effect on both the size and frequency of remittances, with a level of significance of 1% and 5%, respectively. It appears that highly educated migrants can secure better employment opportunities, leading to higher incomes and subsequently, greater remittance flows to Vietnam. This finding is in line with the research conducted by Loschmann and Siegel (2014), which provides further support for the positive relationship between education and remittance behavior among migrants.

The variables AGE, INC, and EDU, which have been found to be statistically significant, can be attributed to several possible explanations. Firstly, it is likely that Vietnamese migrants who have resided abroad for an extended period and have attained higher levels of education and income may develop emotional ties to their home country and wish to support their family members in their place of origin. In this regard, the behavior of remittances can be influenced by altruistic motives. However, an alternative explanation is that as their sources of income increase over time, these migrants may be incentivized to invest in Vietnam through remittances as a means of diversifying their asset portfolios and protecting their property.

Our empirical analysis reveals that migration costs exceeding 5000 EUR significantly impact the volume of remittances sent at the 5% significance level. However, no statistical significance was observed for the number of remittances. This implies that migrants are more likely to send higher amounts of money to their families in Vietnam if they face substantial migration costs. Furthermore, our study included a survey that explored the sources of financing for migration, as presented in **Figure 2**.

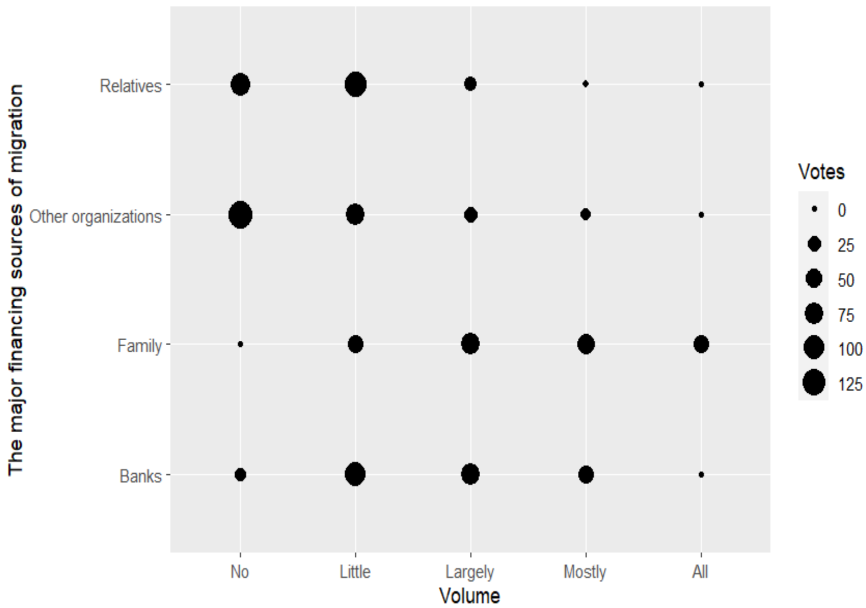

Figure 2. The major financing sources of migration (unit: number of votes, total votes: 239).

Source: Conducted by the study's survey.

The financing of migration costs can be observed to primarily come from two sources, namely family and bank loans. As a result, remittance flows to Vietnam may be influenced by the exchange motive, which is linked to an implicit loan arrangement. Initially, due to the inability to cover migration costs, these expenses will be covered by the migrant's family through implicit agreements. As life after migration stabilizes and the financial situation of the migrants improves, they tend to send money to Vietnam to assist their families in repaying their previous loans and enhancing their daily living conditions. Furthermore, this enables other members of the family to access high-quality services as well.

6. Conclusion

We conducted a detailed analysis of data acquired from a survey of Vietnamese expatriate groups residing in Asia, Europe, America, and Oceania as part of our investigation into two research queries. To analyze the dependent variables of remittance amount (REM_VL) and remittance frequency (REMIT_FR), we used the ordered logistic regression to build two distinct models. Our empirical findings suggested that remittance flows to Vietnam were significantly influenced by a variety of independent factors, including the migrant's income level, gender, age, level of education, family status in their place of origin, and migration expenditures. The status of the migrant's family in their place of origin had a negative impact on international remittances to Vietnam, whereas the remaining factors had a favorable impact.

Our data show that there are two distinct drivers of remittance behavior among Vietnamese migrants: the altruistic incentive and the implicit loan arrangement. While there is the possibility of investment incentives, more evidence is needed to support this claim.

Even though the survey yielded valuable data from countries with large Vietnamese populations, such as Germany, Hungary, the Czech Republic, Japan, South Korea, and Taiwan, there were limited responses from the United States and Malaysia, two countries where Vietnamese migrants are also prevalent. This may have implications for the study's findings. In addition, the investigation primarily focused on the influence of microeconomic factors on remittance flows to Vietnam and, thus, on the migrants' motives for sending money home. However, the lack of consideration given to macroeconomic factors might have resulted in the neglect of certain motives or given rise to their underestimation.

This study significantly contributes to the field by examining the factors influencing remittance inflows to Vietnam from the perspective of Vietnamese migrants. Unlike previous research, which often focused on isolated factors, this study delves into a broader range of microeconomic motives, including altruism, exchange, and self-interest. Additionally, the study incorporates under-explored variables such as migration expenses and foreign language proficiency, which are highly relevant to the Vietnamese migrant experience. By addressing these gaps, this research offers a more comprehensive understanding of how specific microeconomic factors shape remittance behavior within the Vietnamese context. This study underscores the complex nature of remittance behavior, particularly in a country like Vietnam, which is a major labor exporter. By providing insights into the socio-economic dynamics influencing Vietnamese migrants' remittance decisions, this research contributes to the broader literature on remittances and offers valuable implications for policymakers and researchers.

The findings of this study have significant practical implications for policy and program development aimed at optimizing remittance flows. Policymakers can utilize these insights to design strategies that support migrants in maintaining and increasing their remittance contributions, such as providing incentives that align with migrants' motivations. Additionally, by understanding the altruistic and exchange-driven motives behind remittance behavior, Vietnam can implement programs that strengthen economic ties between migrants and their families, thereby enhancing the impact of remittances on domestic economic growth and poverty reduction.

Considering the limitations of the current study, conducting further research on a larger scale and collecting sufficient data from all countries with a significant Vietnamese migrant community would enable a comprehensive analysis of the factors influencing remittance flows to Vietnam. Furthermore, future investigations could simultaneously examine both microeconomic and macroeconomic factors to uncover all underlying motives behind Vietnamese expats' remittance behavior. Building on the findings of the present study, future research could explore approaches to attract remittances more efficiently and devise macroeconomic policies that optimize the advantages of this capital source.

Author contributions: Conceptualization, DMN and NB; methodology, DMN; software, DMN; validation, DMN, PDH and NB; formal analysis, DMN; investigation, DMN; resources, DMN; data curation, DMN; writing—original draft preparation, DMN and PDH; writing—review and editing, DMN and NB; visualization, DMN; supervision, NB; project administration, DMN; funding acquisition, DMN, PDH and NB. All authors have read and agreed to the published version of the manuscript.

Acknowledgments: This study is supported by the Doctoral School of Economic and Regional Sciences and Institute of Agricultural and Food Economics of Hungarian University of Agriculture and Life Sciences. Authors would like to express gratitude to prof. Lóránt Dénes Dávid for his contribution to this research.

Conflict of interest: The authors declare no conflict of interest.

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