

**Determinants of remittance behavior among female marriage
immigrants in South Korea**

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Abstract: This study examines determinants of the propensity and level of remittances among female marriage immigrants in South Korea. We use a nationally representative survey dataset of registered foreigners. Adopting an extended altruism framework, we hypothesize a positive relationship between socioeconomic status and remittances and a negative association between duration of stay and remittances. We fit a double hurdle model to produce probit coefficients in one part and OLS results in the other part. The probability of sending remittances increases if the women are Vietnamese or Uzbek, work, and earn monthly income at certain levels. The level of remittance decreases with a larger household size but increases drastically with a higher level of income. In addition, our model confirms that there are indeed two different mechanisms for deciding whether to remit and level of remittance. An implication is that, through remittances, having economic power is likely to increase the chance of maintaining transnational ties with families in the origins. Theoretical and technical development is needed to fully account for the remittance behavior of marriage immigrants.

Key words: remittance, altruism, marriage immigrant, South Korea, double hurdle analysis

Word count: 6,821

Background

Most studies of factors that affect remittance behavior have been in the field of labor economics. One of the earlier but still dominant frameworks used to explain the mechanisms of remittance behavior is the altruism or self-interest approach (Lucas and Stark 1985). This framework is based on the question of whether immigrant workers remit according to altruistic motives, to help the family and relatives, or for their own

benefit, with the expectation they will receive inheritance or other assets upon their return. As an alternative, Lucas and Stark (1985) suggested the “tempered altruism” or “enlightened self-interest” approach, due to limitations of the altruism or self-interest approach in explaining remittance behavior. According to this approach, a contractual arrangement is formed between the migrant and the family in the place of origin.

Existing studies within these frameworks examine determinants of remittance behavior nearly exclusively among labor migrants in non-Asian contexts. Even though marriage immigrants participate in economic activities and maintain transnational networks, their remittance behavior has not gained much attention. There are few studies of the remittance behavior of marriage immigrants in Asia. B é danger, Linh, and Duong (2011) examine determinants of remittance behavior among 250 Vietnamese women married to men in other Asian countries through multivariate analysis. Supporting the altruism hypothesis, they find that the women’s individual socioeconomic characteristics, such as being employed, have determining effects on remittance. Some other studies suggest looking at gendered dimensions of remittance factors among marriage migrants in East Asia (e.g. the role of a daughter versus a son). In this perspective, migrant women negotiate between the roles of transnational daughter (of their natal family) and wife and mother (of their marital family), before sending transnational remittances (Yeoh et al. 2013; Thai 2012; H.-S. Kim 2015).

Remittances of female marriage-based immigrants in South Korea (hereafter “Korea”) have not been a topic of great interest mainly because foreign-born female immigrants have been framed as dependents of their husbands. Studies that exclusively

look at mechanisms of remittance behavior of migrant women married to Korean men, using a nationally representative studies are rare.

The current study aims to contribute to pre-existing literature in at least two ways. First, we extend the altruism framework to test if it holds up for marriage-immigrant women in Korea. Foreign-born individuals married to nationals of the destination country are likely to be permanent residents. Thus, it may be inappropriate to view female marriage immigrants through the lens of self-interest motives. It is unlikely that they expect inheritance from the household in the origin upon their returning home. We use a nationally representative survey of foreigners in Korea to test hypotheses for effects of selected socioeconomic variables and duration of stay on remittances. Second, we assume that there are two different mechanisms for deciding whether to remit and the level of remittances. To achieve this aim, we utilize a double hurdle modeling technique. Examining conditional and unconditional effects, we hope to further justify the use of the current model. We also highlight the need of a theoretical framework and technical development for understanding the remittances of female immigrants as economic actors.

Literature Review

Literature on remittance has been predominantly developed in the field of economics with a focus on labor migrants. Lucas and Stark (1985) made their eminent contribution to theoretical and empirical approaches for studying the remittance behavior of labor migrants, influencing many other studies. The framework of “pure altruism” posits that a migrant’s intention to remit and the level of remittance are based on the migrant’s altruistic feelings for the left-behind household. Therefore, a remittance decision depends on the origin household’s economic well-being, household shocks in the origin (illness,

natural disasters, agricultural failures, etc.), and the immigrant's income level, number of emigrants in the natal family, and duration of stay in the destination region (Hagen-Zanker and Siegel 2007).

In contrast, the "self-interest" approach suggests that the motive of sending remittance is potential benefits immigrant workers expect to receive upon their return to home countries. Investments through remittance may increase the chance for migrant workers to inherit their family assets (Lucas and Stark 1985). Thus, the higher the income of both the immigrants and receivers, the larger the remittances (Hagen-Zanker and Siegel 2007).

There are other approaches that are more or less similar or extended versions of the two theoretical frameworks (Glytsos 2002). Lucas and Stark (1985) suggested the "tempered altruism" or "enlightened self-interest" approach, as an alternative to the pure altruism or self-interest theory, due to limitations of the altruism or self-interest approach in explaining remittance behavior. According to this alternative approach, a contractual arrangement is formed between the emigrant and the family in the place of origin based on two components: investment and risk.

Regarding risks, a co-insurance agreement on sending and receiving remittances can alleviate unemployment-related hardships or other risks in the destination country and economic risks in the origin country. This kind of agreement is mutually beneficial for both immigrants and their household members in origin regions (Lucas and Stark 1985). For example, immigrants who are going through a prolonged unemployment period may ask the household in the home country for monetary support. Similarly,

family members in the agricultural sector may expect support from emigrant(s) to deal with crop failures.

A contractual agreement can be also based on the idea of “loan payment” for human capital investments and financial help for migration expenses made for a migrant worker by the household (Lucas and Stark 1985; Poirine 1997). Migrants are willing to compensate their family members for the monetary support the family has provided for their education in the home country or for initial settlement in the destination country. This agreement is implicit between an immigrant and the family members. Basic assumptions of the loan payment approach include regular remittances (and thus no decay in remittances) and that the remittance amount is dependent on the amount of familial investment.

The theories above are based on studies of remittance behavior among labor immigrants. In general, female immigrants married to a national of another country are considered “foreign-brides” or dependents of the husband’s household, not independent individuals participating in economic activities. Nevertheless, there are a few studies that explore the remittance behavior of female marriage immigrants through the lenses of altruism or self-interest or with a whole new approach.

Through a household survey in Vietnam, Bđanger, Linh, and Duong (2011) find that Vietnamese female marriage immigrants contribute to their natal families through remittances. Moreover, their individual characteristics such as economic participation, age, and duration in the receiving country are more important determinants of probabilities of remittances than their origin household characteristics, such as the

poverty level back home. The study results support the altruism theory, finding insufficient evidence for the self-interest theory.

A few other studies look into how gender and other dimensions affect remittances. Yeoh et al. (2013) argue in their ethnographic work on 30 Vietnamese female marriage migrants married to Singaporean men that these migrants assume multiple social and gender roles in their transnational family settings. Sending remittances to their left-behind families requires the female immigrants to negotiate their roles between their natal and marital families. Similarly, in an analysis of in-depth interviews, Kim (2015) argues that for Vietnamese marriage immigrants in Korea, a remittance is an outcome of the negotiation between different roles, expectations, and duties generated from both of natal and marital families. Sending remittances may be a form of paying back what migrants owe and therefore fulfilling familial obligations.

To date, there has been little theoretical or technical development in research on the remittance behavior of female immigrants married to a national in Korea. Previous research on such topic has used data that are not necessarily nationally representative. Remittance behaviors have been closely examined in the studies of Kim (2015) and Yun (2017), based on in-depth interviews of female marriage immigrants in Korea. Further, a study by Jang (2010) uses participant observation and interview methods to study remittance behaviors of emigrants in Vietnam. When it comes to quantitative studies, the remittance behavior of female marriage immigrants in Korea is discussed as a side topic or in a small section, as in Lim (2005), Seol et al. (2005), and Y. Kim, Lee, and Hwang (2016). Existing Korean studies suggest a potential decay in remittances or less frequent

remittances with a longer stay in Korea and among certain ethnicities (Yun 2017; Y. Kim, Lee, and Hwang 2016).

Moreover, a national-level survey dataset with immigrants' transnational characteristics (e.g., interactions with origin households or socioeconomic information on the origin households) has not been developed. This might have limited possibilities for quantitative research on remittances.

Commonly Used Determinants of Remittances

Common micro-level determinant variables of the decision to remit and the level of remittance used in previous research on labor migrants are largely divided into two types: characteristics of natal families¹ and characteristics of immigrants in destination regions. Immigrants' individual characteristics in destination contexts include employment status, income, duration of stay, education, age, ethnic origin, marital status, household size, and intentions to return (OECD 2006; Carling 2008; Lianos and Cavounidis 2010).

Employment status has varying outcomes in different studies. Being employed yields a positive effect on the propensity to remit in Hoti (2015), as well as on the amount of remittances in Holst and Schrooten (2006) and Jena (2016). However, Menjivar et al. (1998) shows that for Salvadoran and Filipino immigrants who work in Los Angeles, the number of hours worked does not have significant effects on either the remittance propensity or the level of remittances.

According to the altruism theory, income should have a positive effect on remittances. On average, earning a higher income is shown to be positively related to remittance behavior (Niimi, Pham, and Reilly 2009; Menjivar et al. 1998). Massey and

Basem (1992) find that for immigrants in Mexican communities in the U.S., the amount of income earned during their stay in the U.S. is not significant for their remittance propensity, but is positively related to the amount they remit.

Under altruism assumptions, the remittance decay hypothesis suggests that there are initially low remittances, followed by an increase in remittances after immigrants' adjustment period, and then an eventual decline (Grieco 2004). This inverted U-shape pattern of remittance has been tested multiple times with different results. For instance, Brown (1997) finds that for the Tongan community the time effect was not significant on remittances, while for the Western Samoan community the effect was positive at the 0.10 level. Meanwhile, González-Ferrer, Beauchemin, and Serrano (2015) show that Senegalese men do not necessarily reduce their propensity to remit after the adjustment period while Senegalese women do. Bettin and Lucchetti (2016) find an inverted U-shape time effect on the remittance propensity using a sample from the German Socio-Economic Panel (SOEP). Indeed, there is room for further discussion of the effect of time on remittances.

In the family loan payment theory, the education level of an immigrant indicates the degree of investments made by the household during the pre-immigration period. In some studies, migrants' education has a positive effect on the propensity of remitting, while in other studies the effects are negative or not significant. For example, Bettin and Lucchetti (2016) find that migrants' levels of education have a positive effect on the propensity to remit, but their years of education have a negative nonlinear effect. Similarly, Niimi, Pham, and Reilly (2009) report a positive effect from having obtained a higher level of education. In contrast, Hoti (2015) does not find any significant effects of

education in his study of Kosovo emigrants' remittance behavior. Meanwhile, Bartolini (2015) shows that highly educated individuals remit less compared to those with lower levels of education.

Age seems to be positively related to remittances (Carling 2008), but in a nonlinear fashion in Holst and Schrooten (2006) and Menjívar et al. (1998). However, it has a negative effect on remittance in Bartolini (2015). Ethnic or national origin, in general, is a source of variation in remittance likelihoods (Clark and Drinkwater 2007) or amounts (Bartolini 2015; Lianos and Pseiridis 2014). A larger household size for an immigrant in the destination region is associated with a smaller amount of remittance (Lianos and Pseiridis 2014; Holst and Schrooten 2006). Living with a spouse is usually negatively associated with remittances (Soltero 2009; Carling 2008; Vanwey 2004), but it shows a positive effect in Lianos and Pseiridis (2014). Having a foreign spouse is shown to be associated with a lower amount of remittance (Bartolini 2015).

There is not a guarantee that these frequently used determinants will work for marriage immigrant women in the same ways that they do for migrant workers. Indeed, foreign-born women married to Korean nationals are likely to live in Korea permanently unless they experience marital disruption or other serious unstable circumstances. In contrast, according to Batista and Umblijs (2016), migrant workers send a larger amount of remittance especially when they are under temporary contract with higher wage risks. Moreover, those migrants tend to remit to people with greater monetary resources in the origin (Batista and Umblijs 2016). Alternatively, they may save money and return home with funds or equivalent goods accumulated during the stay (Glytsos 2002). In either of

the two circumstances above for migrant workers, the framework of self-interest may be a better tool for explanation.

Furthermore, it is not likely that only a single motive explains the remittance behavior of an immigrant (Rapoport and Docquier 2006). While we stay away from the self-interest approach, we adopt a “tempered altruism” approach with repayment (family loan payment or repayment) motives included.² This approach may provide the most appropriate framework for our study sample and dataset. We generate three hypotheses relevant to the current study:

1. Being employed and having a higher income are positively associated with the level of remittances, controlling for the other variables (altruism).
2. The longer the duration of stay, the smaller the amount of remittances, controlling for the other variables (altruism).
3. Education received in the home country is positively associated with the level of remittances, controlling for the other variables (repayment).

Methodology

Data and Sample Description

The present study uses the microdata set from the *2017 Survey on Immigrants' Living Conditions and Labour Force* (KOSIS 2017), a nationally representative survey of registered foreigners and naturalized persons living in Korea. Sampling weights are included as an adjustment to the stratified simple random sampling. The data structure is cross-sectional in its nature. The total sample size of this survey data is 14,000, a 1.2% sample of the total registered foreigners as of 2017. For our study purposes, however, we

only use the data of foreign-born females who are married to Korean nationals at the time of the survey. The study sample consists of 1,962 female immigrants on a spousal visa or who have been naturalized and married to a male Korean national. This survey dataset is crucial for the current study because it has not only the remittance information (participation, level of remittance, and frequency) for people with foreign origin, but also their demographic, socioeconomic, and marital family characteristics.

A continuous dependent variable is obtained indicating the level of annual remittances converted into U.S. dollars. A zero outcome means that a person did not remit during the last year. Explanatory variables are retrieved as following based on previous literature: ethnic origins, age, duration of stay, number of household members, education, employment status, employment status of the spouse, and monthly income. Due to data limitations, characteristics of the households in the country of origin are not available. A basic description of the variables of the dataset for the current study is presented in **Table 1**.

[Table 1 about here]

Migrant women in the sample are divided into four categories by ethnic (national) origin: Korean Chinese, Han Chinese, Vietnamese, and Uzbek. There are larger proportions of remitters among the Vietnamese (35%) and the Uzbek (46%) compared to migrants from China (14%).³ Conditional on sending remittances, average amounts of remittances differ depending on ethnic background. In our sample, Han Chinese women send the smallest amount of remittances, and Uzbeks send the largest.

Age seems to be negatively associated with the percentage of migrants who remit and average remittance levels (See **Table 1**). In terms of duration, the percentage of

remitters and the average amount of remittance for migrants who stay in Korea for 5 to 10 years are larger than they are for migrants in other duration categories. While the percentage of remitters rarely fluctuates across the numbers of household members, the average amounts of remittances decrease with additional household members. A negative association seems to prevail between education and both the percentage of remitters and average levels of remittances.

Almost half of those who work remit, while only 9% of those who do not work remit. Being employed is associated with larger average remittance amounts. Monthly income categories have a more complex distribution of remitters and levels of remittance. The lowest income level is related to the lowest percentages and average amounts of remittances. A little less than 50% of immigrant women earning income in the next two higher categories send remittances. The largest remittances are sent by women in the highest income range.

For a more intuitive understanding of the data, we visualize preliminary results analyzed by major indicators. In **Figure 1**, the chart for probability of remittance by duration shows an upward pattern during the period from 0 to 10 years for all ethnic groups, with the overwhelmingly higher probabilities for Vietnamese women for all periods. Amounts of remittances fluctuate throughout the three periods. There is an upward trend for Uzbeks with an increase of 2,000 USD throughout the whole period, while for Vietnamese women the amount of change is smaller.

The analysis by education tells us that there are variations by ethnic origin in the remittance behavior among the sample population. The probabilities of remittance for the Vietnamese are the highest followed by the Uzbek across educational levels except

college or above. Those who have obtained college-level education or above have the smallest probabilities of remittance. Nonetheless, the probabilities analyzed by education in general are not as high (all less than 10%) as those plotted against by other variables. In terms of the total amount of remittance, ethnic variations still exist. Korean Chinese immigrants send the largest amount of remittances among the people with junior high school education or less. Especially for those in the primary or less category, there is a 2,500-dollar difference between the Korean Chinese and the Vietnamese. Among those with the junior high education, the Korean Chinese and the Chinese send the largest amounts. Even though the propensity of remittances among female immigrants from China is the lowest, they send the largest amounts of remittances. The Vietnamese and the Uzbek send steady amounts of remittances across educational levels, compared to immigrants from China.

In **Figure 2**, the probability of Vietnamese women sending remittances is about 33% among those who work versus about 20% among those who do not work. For other ethnic categories, probabilities of remitting are only a little higher when immigrants work. In terms of amounts of remittances, for all of ethnic groups the average remittances are higher for immigrants who are working compared to those not working, except for Chinese women.

Regarding monthly income, the larger the monthly income, the smaller the probability of remittance for all ethnic groups. In contrast, for all ethnic groups, the amounts of remittances tend to increase as the monthly income increases. This suggests that income has a negative effect on the decision to remit, while it has an opposite effect on the level of remittance.

[Figure 1 and 2 about here]

Double Hurdle Model

Approaches such as logistic model (See Brown 1997; Bđanger, Linh, and Duong 2011) and probit model (Cragg 1971; Brown and Jimenez-Soto 2014) have been used to model the participation in remitting. To deal with a censored, limited dependent variable, tobit models (Tobin 1958) have also been widely used to model the level of remittance due to their simplicity and utility (Wooldridge 2008). Censoring zero observations as “corner solutions,” it assumes that the same mechanisms are at work for the decision to remit and the level of remittance. Recently, alternative specification techniques such as double hurdle modeling have been used in order to more appropriately deal with zero observations in remittances (Burke 2009; Croissant, Carlevaro, and Hoareau 2018).

Double hurdle models, sometimes called two-tier, two-part, or two-stage models gained popularity after they were used by Cragg (1971). The advantage of a double hurdle model is that two different processes are fit in one model, in this case the decision to remit (probit equation) and the level of remittance (OLS equation). Double hurdle models have several different forms such as the sample selection model, the so-called “Heckman model” (Heckman 1979), Cragg’s “double hurdle model” (Cragg 1971; Burke 2009), and the “two-part model.” A Heckman model adjusts the potential non-random selection of a sample with an inverse Mills ratio (equivalent to an extra variable added in the OLS regression equation for adjusting errors caused by non-random selection). A two-part model technique (Belotti et al. 2015) in this study is similar to Cragg’s double hurdle model except that there is no assumption about the relationship between the errors of binary outcomes and the OLS regression outcomes (Belotti et al. 2015). Further, it

allows an easy extraction of marginal and conditional and unconditional effects (Belotti et al. 2015) for more intuitive interpretations. Specifically, an unconditional effect is an average change associated with each predictor variable in amount of remittance including both zero and positive outcomes. Conditional effects are only obtained for non-zero amount. Large differences between unconditional and conditional effects further justify our use of a double hurdle model.

In the first part, the probability of sending remittance is fitted as shown below.

$$R = x_i\beta + u, \quad u \sim N(0, 1) \quad (1)$$

$$Prob[R > 0 | x_i] = Prob(x_i\beta + \varepsilon > 0 | x_i) = \Phi(x_i\beta)$$

In equation (1), Φ is the cumulative normal density distribution function. Then, the second hurdle function is set up with a logged dependent variable as below,

$$\ln(T) = x_i\beta + v, \quad v \sim N(0, \sigma^2) \quad (2)$$

where $T > 0$

In equation (2), x_i is a vector of predictor variables, β parameters to be estimated, and σ the standard deviation. The term x_i can be either different or the same in (1) and (2). Our model utilizes the same vector of independent variables. The dependent variable outcome, the level of remittance, follows a log-normal distribution and guarantees positive values. We expect that predictors affecting the participation in remittance and the level of remittance are different (Piracha and Saraogi 2012).

Coefficients of the Double Hurdle Model

We report raw coefficients of the independent variables in both parts of the model. **Table 2** displays the model coefficients of the double hurdle model. For the probit equation part

on the left, Vietnamese, Uzbek, employment, and the two income level variables are statistically significant. Being Vietnamese or Uzbek increases the probability of sending a remittance. Those who are employed compared to those who are not have a higher propensity of remittance, as expected. In terms of monthly income, those whose income is in the first range or the second range have higher probabilities of sending remittances compared to those whose income is in the reference category. Meanwhile, duration of stay and level of education are not significantly related to the probability of remittances, which is different from our expectations.

[Table 2 about here]

We fit an OLS regression model for the level of remittance in the second part. Because it follows a log-normal distribution, it is difficult to directly interpret the effects of variables. However, it is safe to say that having a household member of 4 or above is negatively associated with levels of remittance. This result accords with one of the altruistic determinants; having a marital family of a larger size would discourage immigrants from sending more money to their families in the origin. Next, all of the income categories have positive signs increasing in magnitude, compared to the reference category. This result is also expected based on altruistic assumptions. Against our expectation, duration of stay and education effects turn out to be insignificant.

The mechanisms for participation in remittance and the level of remittance are different, as we assumed. For the participation in remittance, ethnic background, monthly income, and employment status are important determinants, while number of household members and monthly income are significant determinants of level of remittance. Indeed,

female marriage immigrants in Korea seem to overcome two different hurdles, namely, whether they will remit and how much they will remit.

Table 2 does not show any significant effect of the length of stay in Korea; there is no sign of a decay effect or an inverted U-shape of remittances through time, as was suggested from the altruism assumption that the longer the duration of stay, the smaller the amount of remittances. To double check if there are effects of duration, we produced another set of model results, with the original reference category switched to the category of the longest duration. The result was similar. In addition, we do not find support for education effects, critical characteristics in the repayment assumption that the more educated the migrant, the larger the remittances. This result leads to an implication that there are hidden factors influencing remittances of female marriage immigrants, undiscovered in our current study setting.

Marginal Effects of Independent Variables

An advantage of using a double-hurdle model is that we can easily generate marginal effects from both parts of the model for a more intuitive understanding of the results. We present average marginal effects of the first part of the model (probit results) in **Table 3**.

In the probit part, average marginal effects of being Vietnamese and Uzbek are a 19% and 35% increase, respectively, in remittance probabilities, compared to being Korean Chinese. This tells us that ethnic variation exists in the propensity to remit. For those who work, a 13% increase in remittance is expected, compared to those who do not work. The propensity of remitting tends to increase by a 23% and 32% for those whose income is in the second and third ranges, respectively, compared to those in the reference category. These two economic indicators boost the chance of remitting on average,

except for the last income category. Having an income in the highest range does not necessarily encourage or discourage the female marriage immigrants to remit.

We now show marginal effects of the OLS regression results (See **Table 3**). Each conditional effect tells us the average increase or decrease in the amount of non-zero remittances by an independent variable. In contrast, an unconditional effect is the overall effect of each variable on the amount of remittances ranged from zero to the highest. We compare conditional and unconditional marginal effects of the OLS part of the model.

[Table 3 about here]

Having a household size of four or above is associated with a reduction in remittance levels by about 1,035 USD for the conditional model and 686 USD for the unconditional model, compared to the reference category. This means that the marginal effect of having a large family in Korea is greater when the decisions to remit and the amount of remittances are considered to occur separately, as compared to when they are considered to occur in just one process.

Compared to the reference range, earning a monthly income in the first range on average increases the remittance level by about 1,554 USD (conditional) and 1,229 USD (unconditional), while earning an income in the second range increases the remittance level to a greater degree by about 4,693 USD (conditional) and 3,597 USD (unconditional). Notably, the highest income range is associated with a greatest increase in remittances by 6,551 USD (conditional) and 4,095 USD (unconditional) on average (See **Table 3**).

The large differences between conditional effects and unconditional effects shown in **Table 3** tell us that overall marginal effects of independent variables on levels of

remittances including zero amounts are lower than those on non-zero remittances. This supports our argument that there are different mechanisms for the decision to remit and the decision as to the level of remittance conditional on remitting. Levels of remittances are determined as a second hurdle that female marriage immigrants need to overcome based on another set of factors different from the first hurdle.

Discussion and Concluding Remarks

It has been more than two decades since large numbers of foreign-born women began to arrive in South Korea for marriage purposes. Because of the structural gender imbalance in the marriageable population, cross-border marriages between Korean men and foreign-born women are likely to continue occurring (D.-S. Kim 2006, 2012; Abel and Heo 2018). Adaptation of these female immigrants to Korean society has been a topic of interest to the Korean government. However, their adaptation in economic activities has not attracted much attention. They are still not widely considered as economic actors, despite their participation in the labor market. We suggest an alternative to a simplified view of immigrant women as wives or daughter-in-laws. We explore how their economic status in Korea is associated with their remittance behavior. Further, remittances are not only financial support for their families in the home countries, but also a way of maintaining their transnational ties with those family members. These women may still need to negotiate with their marital family members concerning their remittances. However, they are more likely to have their say with respect to their own incomes.

The current study applies an extended altruism approach to analyze the remittance behavior of female marriage immigrants in Korea. Using a nationally representative survey dataset, we attempt to examine determinants of their remittance behavior, based

on altruism and repayment motives. We move away from the self-interest approach in this study. Individuals in our study population are semi-permanent or permanent residents rather than labor migrants who tend to return to their home country after some time. We fit a double hurdle model, assuming that there are two different mechanisms for the decision to remit and the decision as to the amount of remittances. Indeed, we confirm through our analysis that the two processes (or two hurdles to overcome) are determined by different factors. This is further justified with the large difference between the unconditional and conditional effects results.

The effect of income on remittance levels appears as expected based on the altruistic assumption; it positively affects the remittance behavior. Both of the length of marriage immigrants' stay in Korea (another altruistic determinant supposed to have a negative effect) and educational level (a repayment determinant supposed to have a positive effect) appear to be trivial in our study. This means that a new theoretical approach is needed to explain the behavior of immigrants who go to another country for purposes other than temporary labor migration.

We recognize that transnational characteristics related to households in home countries may enable us to explore dynamics behind remittance patterns even further. This is not done in our current study because the dataset is restricted to individual characteristics relevant to the migrant's lives in Korea. Further, as the studies on female marriage migrants in Asia with a gender role approach reveal, their remittance might depend on family roles, the obligations that daughters have to their families back home, or other marital family dynamics that we were unable to capture, such as negotiations with marital family members.

Nevertheless, we have taken a step forward exploring the rarely studied topic of remittance behavior among female marriage immigrants in Korea. Suggestions for future research are to further develop questionnaires capturing more transnational characteristics, such as household economic status and the presence of other emigrants in the natal family. Further, future researchers may need to theorize context-specific frameworks that are different from those for labor migrants in order to study immigrant women's transnational interactions.

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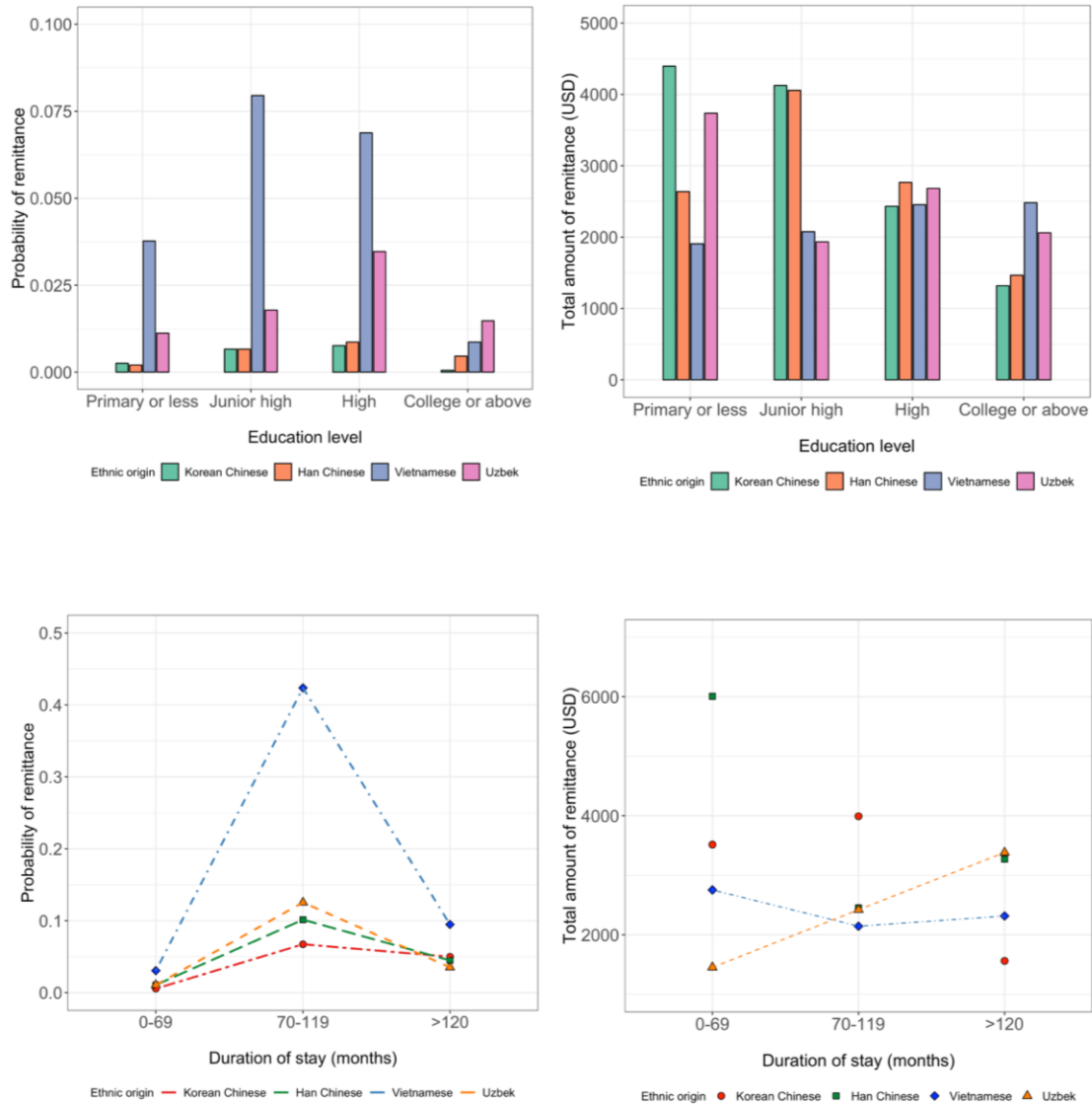
Notes

- ¹ Characteristics related to natal families in countries of origin commonly include household income, family assets, perceived financial situation, communication with the emigrant, remittance history, and presence of another emigrant (Carling 2008; Bøđanger, Linh, and Duong 2011; Hagen-Zanker and Siegel 2007). However, these characteristics are not further discussed in this paper due to their unavailability in our current dataset.
- ² There might be cases where the self-interest framework partly explains the behavior of some immigrants. Using the networks and resources, some female immigrants bring their husbands to their home countries in order to start a new business. However, we will put aside this possibility because we do not have variables in our dataset to explain transnational characteristics.
- ³ Even though there are larger sample sizes of the Vietnamese (1,077) and Uzbek (336) in our dataset than the Korean Chinese (241) and Han Chinese (308), it is likely that the actual proportions are different from those of our study sample. The original survey dataset sampled the entire population of registered foreigners in Korea. However, only female marriage immigrants are included in our sample.

Table 1. Differentials in remittance behavior by major predictor variables

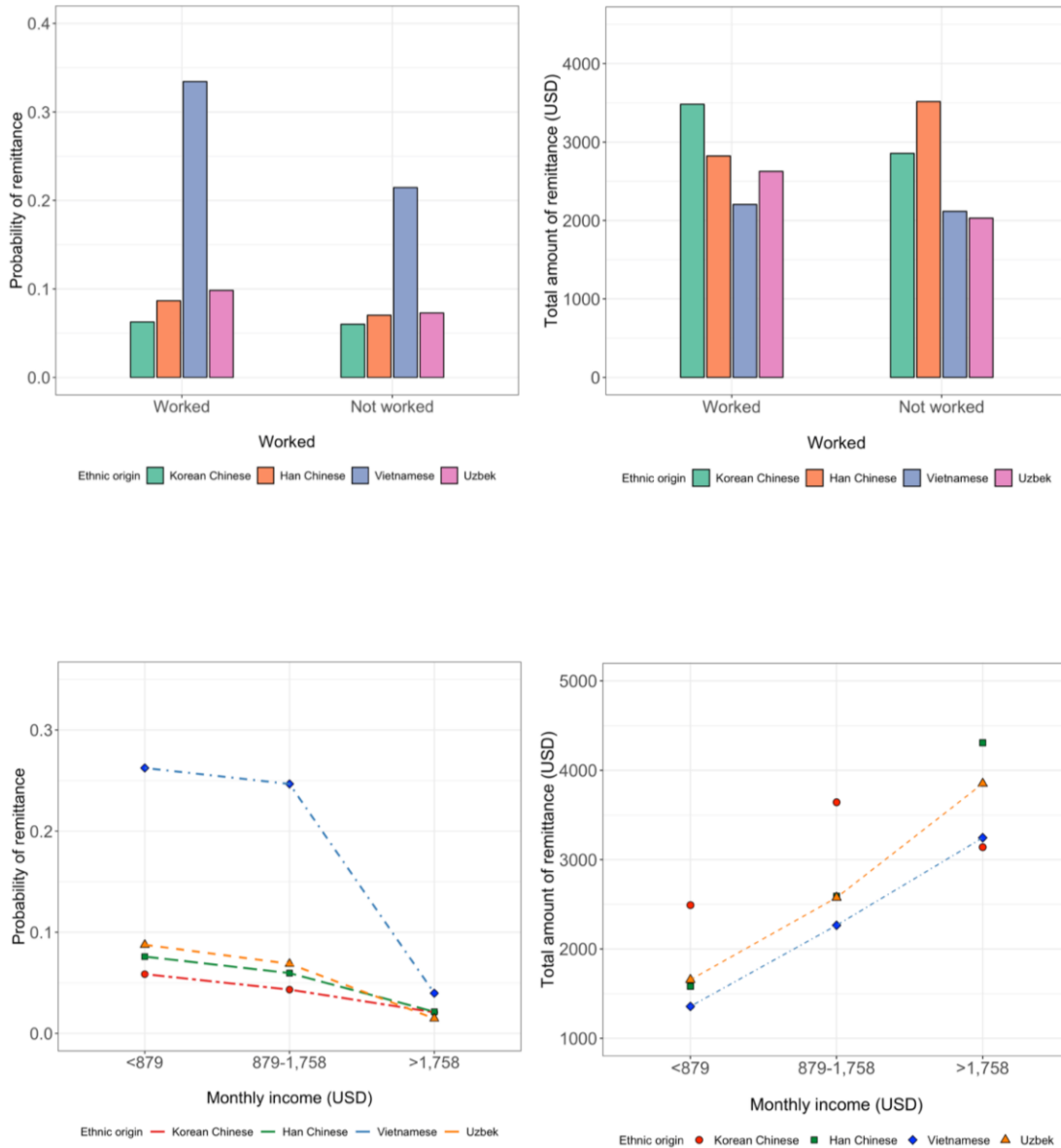
Variables (categories)	Remittance (yes=1) percentage (%)	Average amount of remittance (USD)
Observations	1,962	613
Ethnic Origin		
Korean Chinese	14	470
Han Chinese	14	401
Vietnamese	35	779
Uzbek	46	1,167
Age		
Age 19 to 39	34	795
Age 40 to 49	21	573
Age 50 or above	14	461
Duration of stay		
0 to 69 months	30	757
70 to 119 months	33	777
120 months or above	25	662
Education		
Primary or less	40	980
Junior high	33	758
High school or above	28	684
Household members		
1 to 2	32	1,311
3	34	740
4 or above	30	619
Work status		
Worked	48	1,148
Not worked	9	191
Husband's work status		
Worked	32	728
Not worked	28	540
Monthly income		
Below 879 USD	13	197
879 to 1,757 USD	49	1,195
1,758 to 2,636 USD	49	1,626
2,637 USD or above	23	1,275

Figure 1. Probability of remittance and average amount of remittance by education and duration of stay



Note: In the plot for average amount of remittance by duration of stay, remittance levels with observations fewer than 20 are not connected with lines.

Figure 2. Probability of remittance and average amount of remittance by employment and monthly income



Note: In the plot for average amount of remittance by monthly income, remittance levels with observations fewer than 20 are not connected with lines.

Table 2. Double hurdle model analysis of remittance decision and remittance level

Variables	First part (Probit)		Second part (OLS regression)	
	b	s.e.	b	s.e.
Ethnic origin (ref: Korean Chinese)				
Han Chinese	-0.02	0.23	0.01	0.23
Vietnamese	0.70**	0.22	-0.11	0.22
Uzbek	1.26**	0.22	-0.02	0.22
Age (ref: Age 19 to 39)				
Age 40 to 49	-0.06	0.22	0.31	0.19
Age 50 or above	0.35	0.33	-0.14	0.28
Duration of stay (ref: <69 months)				
70 to 119 months	0.15	0.21	-0.15	0.22
120 months or above	-0.23	0.26	-0.45	0.26
Education (ref: Primary or less)				
Junior high	0.17	0.22	-0.19	0.17
High school or above	-0.16	0.20	0.01	0.18
Household members (ref: 1 or 2)				
3	-0.21	0.22	-0.19	0.16
4 or above	-0.36	0.22	-0.52**	0.15
Work status (ref: Not worked)				
Worked	0.54*	0.23	-0.18	0.15
Husband's work status (ref: Not worked)				
Worked	0.19	0.21	-0.18	0.17
Monthly income (ref: Below 879 USD)				
879 to 1,757 USD	0.87**	0.20	0.66**	0.12
1,758 to 2,636 USD	1.17**	0.27	1.16**	0.16
2,637 USD or above	0.14	0.32	1.70**	0.42
(Constant)	-1.98**	0.39	7.71**	0.36
Observations	1,962		613	
Pseudo R ² / R ² adjusted	0.24		0.26	
Wald χ^2 / F Statistic	216.66**		8.59**	

Note 1: *p<0.05; **p<0.01.

2: The amount of remittance is log-transformed.

Table 3. Marginal effects of independent variables on remittance decision and remittance level

Variables	First part (Probit)	Second part (OLS regression)	
	Marginal effect	Unconditional effect	Conditional effect
Ethnic origin (ref: Korean Chinese)			
Han Chinese	0.00	-0.42	2.32
Vietnamese	0.19**	366.67	459.08
Uzbek	0.35**	826.70*	990.65*
Age (ref: Age 19 to 39)			
Age 40 to 49	-0.01	242.71	411.63
Age 50 or above	0.09	107.31	100.28
Duration of stay (ref: -69 months)			
70 to 119 months	0.04	-21.19	-62.28
120 months or above	-0.06	-444.18*	-681.14*
Education (ref: Primary or less)			
Junior high	0.04	-45.85	-104.85
High school or above	-0.04	-115.87	-157.76
Household members (ref: 1 or 2)			
3	-0.05	-281.67	-424.88
4 or above	-0.09	-686.19**	-1,035.25**
Work status (ref: Not worked)			
Worked	0.13*	239.93	297.23
Husband's work status (ref: Not worked)			
Worked	0.04	-21.89	-69.96
Monthly income (ref: Below 879 USD)			
879 to 1,757 USD	0.23**	1,228.85**	1,553.62
1,758 to 2,636 USD	0.32**	3,597.18**	4,692.72
2,637 USD or above	0.04	4,096.38	6,551.38

Note 1: Amounts of remittance that have been log-transformed are now re-transformed to raw values in dollars.

2: Significance levels are provided for marginal effects. Significance levels of the original regression coefficients in **Table 2** and those of the marginal estimates in **Table 3** can differ.