How Altruism Works during a Pandemic: Examining the Roles of Financial Support and Degrees of Individual Altruism on International Remittance

Nobuyuki Nakamura - The University of Tokyo
Email: 8311270699@edu.k.u-tokyo.ac.jp

Aya Suzuki - The University of Tokyo
Email: ayaszk@k.u-tokyo.ac.jp.

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Nobuyuki Nakamura* & Aya Suzuki†

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While the importance of international remittance has been recognized globally, understanding how public subsidies and the degree of individual altruism affect remittance behavior is still limited. Although the COVID-19 pandemic has severely affected the global economy and international remittances were expected to be devastatingly affected at the early stage of the pandemic, some international organizations indicate that it was finally resilient to the negative shock in 2020. Altruistic motivations among migrants or economic stimuli in large economies are raised as potential reasons; however, a detailed investigation from a micro-perspective is urgently needed. Given the altruism hypothesis in remittance motives, this study examines the impact of financial support in host and home countries and individual altruism on international remittance using unique data from foreign care workers in Japan. Our panel data estimation shows that the emergency cash transfers from the host country affect their remittance amounts positively; however, we do not observe any crowding-out effects due to subsidies from the home government. The heterogeneous analysis also reveals that highly-altruistic remitters are more likely to send money to their homes after receiving cash transfers in the host country. Our results partially support the altruism hypothesis and justification of international organizations.

Keywords: International remittance; Altruism; Japan; COVID-19; Cash transfers

JEL code: D91, I18, J61, O12, O19

* Corresponding author: Ph.D student (Department of International Studies, Graduate School of Frontier Sciences, The University of Tokyo, Japan). Research Fellow (Japan Society for the Promotion of Science).
Address: Environment Bldg. 706, 5-1-5 Kashiwanoha, Kashiwa-shi, Chiba, 277-0882, Japan.
Phone: +81471364850 Email: 8311270699@edu.k.u-tokyo.ac.jp
† Professor (Department of International Studies, Graduate School of Frontier Sciences, The University of Tokyo, Japan).
Email: ayaszk@k.u-tokyo.ac.jp.

I. Introduction

In a contemporary global society, the vast flow of international remittances is observed, and its effects are enormous, especially in developing countries. According to the World Bank (2020), the current remittances to developing countries using formal channels were approximately US$ 554 billion in 2019. This amount is four times larger than the official development assistance or the same level as foreign direct investment (FDI) into low- and middle-income countries. Therefore, international remittance is a potent engine for economic growth in developing countries.

In response to such a significant trend in international remittance, researchers have investigated the motivations behind migrant workers' remittances to their home countries, both theoretically and empirically. One of the solid theoretical hypotheses is called the "altruism hypothesis" (Funkhouser, 1995; Lucas & Stark, 1985), and whether such a theoretical concept exists in remittance behavior has been discussed in many studies (e.g., Azizi, 2016, 2019; Kananurak & Sirisankanan, 2018; Lim & Morshed, 2015; Mallick, 2017). In the altruism hypothesis, migrants would transfer money to their family left behind in the home country to maximize household members' utilities. As this is a rational argument, experts have investigated the mechanism of this hypothesis or compared it with other hypotheses including exchange hypothesis (e.g., Cox et al., 1998) or insurance hypothesis (Yang & Choi, 2007). One noteworthy logic in this hypothesis is that the migrant would reduce the quantum of remittances to their homes if the household in the home country increases their pre-transfer income. For example, if households receive public transfers such as conditional cash transfers (CCTs) or pensions, private transfers would be crowded out (e.g., Brown et al., 2014; Gerardi & Tsai, 2014; Gibson et al., 2010; Jensen, 2004; Kang & Sawada, 2003; La & Xu, 2017; Nikolov & Bonci, 2020)[1]. Many studies have investigated whether these crowding-out effects occur with public transfers; however, the discussion is not conclusive because it depends on the policy context or targets (Nikolov & Bonci, 2020). Thus, further studies are required in this area. Moreover, while the foundations of this hypothesis are drawn from the income of migrants or households left behind and the degree of altruism, it is difficult to test the hypothesis itself because of the endogeneity in the estimation. Yang (2011) suggests that exploring the causal relationship in the motives of remittances, to rule out other motivations, is complex and poses significant challenges for researchers. Additionally, although the degree of individual altruism is an

[1] Some studies suggest that the social security program such as the CCT affects the decision to migrate itself (Adhikari & Gentlini, 2018; Angelucci, 2015; Hagen-zanker & Himmelstine, 2013; Stecklov et al., 2005).

essential factor in the altruism hypothesis, the literature assesses the degree of altruism by indirect tests, using GDP size or family size as proxies, because of unavailability of data (Antoniades et al., 2018). These findings support the need for further investigation into the mechanisms of international remittance.

While the importance of international remittance and the investigation of the mechanism have been claimed globally, the onset of COVID-19 pandemic from early 2020 has presented an opportunity to examine the hypothesis on remittance motives in greater detail. Many countries have implemented policies to restrict daily behaviors, such as lockdown measures, to circumvent the spread of the virus among citizens, or to strengthen border control to save citizens' lives. These non-pharmaceutical policy measures caused severe economic recession globally, and adverse shocks were expected to affect international remittances. At the beginning of the pandemic, international organizations projected the worst scenario on international remittances. The Migration and Remittances Team in the World Bank (2020), which was reported in April 2020, implied the expectation for international remittances to decrease by approximately 20% due to the adverse effects on income and employment of the migrant workers. In addition, according to reports by the Asian Development Bank including Park et al. (2020) and Kikkawa Takenaka et al. (2020), drastically negative effects are seen on employment and income in Asia because of the lowest regional growth outcome since 1961. Migrant workers might be among the hardest-hit groups, with the total remittance to Asian countries expected to drop by US$ 31-54 billion. However, one year later, the same team at the World Bank (2021) published the actual results of international remittance, and they upwardly revised the diminution in 2020 compared to 2019, in contrast to their projection. They estimated the total world remittance amounts in 2020 as only 1.6% below those in 2019, and they observed a 7.9% decrease, even in East Asia. This diminution range was lower than that during the global financial crisis in 2009, and surprisingly, the remittance amount in 2020 was larger than the FDI into developing countries in the same year. The World Bank's team (2021) suggests the potential reasons for international remittance to be resilient to the most considerable shock we have experienced[2]. As the first cause, migrants have desired to help their families who will more likely face the severe shock of the pandemic at home countries; they remitted more than expected. In other words, the altruism of home households motivated their remittance, which interfaces with the altruism hypothesis. Another important driver is that fiscal stimuli, such as cash transfers, especially by host

[2] The Migration and Remittances Team in the World Bank (2021) also raised the shift in capital flows from informal to formal channels (e.g., cand-carry to digital device) as another possible reason to be resilient. Furthermore, macroeconomic factors (e.g., weaken oil price or non-depreciation of the currency) or idiosyncratic factors by country or regions are essential factors for a variance in remittance between regions.

countries, have maintained their economies and benefitted even migrants. While these explanations seem reasonable, these are conjectures rather than results based on rigorous research. Moreover, if the altruism hypothesis is supported as a motive of remittance, studying the effects of financial support in both host and home countries during the pandemic on remittance behaviors is needed, because most countries have implemented social security policies after the outbreak of COVID-19 (Gentilini et al., 2021). As most countries have implemented social protection policies and at different points in time, these differences to examine migrants' motivations to send remittances can be exploited.

This research explicates the motives of international remittance by exploring the impact of emergency subsidies in host and home countries and the direct measure of the degree of altruism on international remittance. We analyzed whether the altruism hypothesis is valid during the pandemic. We conducted an online-based original survey of foreign care workers (FCWs) in Japan to test the hypotheses. We selected this sample group because there are several types of visas to enter Japan as FCWs, classifying these migrants into professional and permanently-stayed type or low-skilled and temporarily-stayed type. Many theoretical and empirical pieces of literature suggest that temporariness in the host country (e.g., Dustmann & Mestres, 2010; Dustmann & Görlach, 2016) or skill composition (e.g., Adams, 2009) strongly affects economic behaviors, including remittance behaviors, and their remittance behaviors from various types of migrants can be evaluated. In addition, the Japanese government implemented a one-time special cash payment program in 2020, an unconditional cash transfer to all registered residents in the country, regardless of their nationality or visa-type, in order to relax the financial burden among the citizens in the event of economic recessions caused by the pandemic. As the program was implemented, a variation in the timing of distributing cash to citizens was observed depending on the municipalities where they lived. This was due to a delay in logistics, which was randomly assigned to the recipients. We exploited such an exogenous time gap between the recipients as a quasi-natural experiment to explicate the causal relationship between an unexpected increase in income in host countries and international remittances. Furthermore, in the survey, detailed information about their families left behind in their home countries is obtained, including the timing of receiving any emergency subsidies from their home governments during the pandemic or the timing to experience any adverse shocks such as unemployment or infections by COVID-19. We used this information to test the effects of shocks to their families in home countries on the remittance behavior of respondents, demonstrating the crowding-out effects. Another advantage of the original survey was that we

directly inquired about the individual altruism degrees using the psychological scale and the experimental format for the dictator's game, which are almost unavailable in the existing research. We added the results of each test in the model to quantify the importance of altruism degrees in remittance, which was an integral factor in the altruism hypothesis. We evaluated the impact of each variable on international remittance, constructed quarterly unit-based panel data, and estimated it using fixed and random effect regression models with the sample-clustered standard error.

The analysis yielded some interesting results. The estimation suggests that if migrants increase their income, their remittance amount also increases. Most importantly, the host country's emergency subsidy significantly increased the total remittance amounts in the quarter when they received it. We did not find any impact of either positive or negative shocks in home families, including the crowding-out effects of receiving public emergency subsidies. Additionally, although the altruistic degrees themselves do not affect the remittance amount from the random-effects regression, their remittance amount will robustly increase if the highly-altruistic migrants receive Japan's public transfers. Moreover, temporary visa holders usually remit more than permanent visa holders, and such a trend becomes more decisive in the pandemic or on the reception of the subsidy by the host country. The findings suggest that the altruism hypothesis is partially observed during the pandemic, although crowding-out effects do not appear. The cash transfer intervention in Japan influences their remittance mainly among highly altruistic group, and the degree of altruism impacts only when it interacts with the policy interventions in the host country. Thus, altruistic motives with subsidies by host countries are crucial drivers of international remittance during the pandemic. In addition, we confirm that the temporariness in the host country affects economic behaviors among migrants; thus, the duration of stay should be considered for migration research and policy designs.

This study contributes to the academic and practical strands of literature on the mechanisms of international remittance and migrant behaviors. First, the work provides more evidence on the mechanism of motives for international remittance, especially in the altruism hypothesis. We exploit the unanticipated exogenous shock to study the motivations behind international remittance. Furthermore, many studies explore the effects of altruistic degrees on private transfers using indirect measures, such as income level or the number of family members, except for Antoniades et al. (2018) and Aida and Sawada (2016), who used the dictator's game score to measure altruistic degrees. One of the benefits of this research is that socio-emotional skill measures from psychological and experimental formats are adopted to evaluate altruistic

degrees directly. Recently, the importance of non-cognitive skills has grown in labor market outcomes or development outcomes (Guerra et al., 2014; Lindqvist & Vestman, 2011). However, to the best of our knowledge, there are few studies on socio-emotional skills and remittances. Thus, the estimates using the direct measures of altruism by socio-emotional skills help explain the importance of non-cognitive skills on economic behavior among migrants in this research[3].

Second, this study contributes to the assessment of COVID-19 and its subsequent financial support for remittances. As we mentioned at the beginning of the paper, the international organizations had anticipated the devastating impact of COVID-19 on international remittances because migrants would have been lost (Borjas & Cassidy, 2020; Honorati et al., 2020; Jewers & Orozco, 2020) or the host economy would stagnate (Murakami et al., 2021). In addition to the simulation, the immediate impact evaluations after the outbreak of COVID-19 suggest that the remittances were negatively impacted in the case of migrants and the livelihoods of dependent households (e.g., Gupta et al., 2021; Mobarak & Vernot, 2020) because of the redundancy of jobs or the impossibility of entering host countries. However, as the World Bank (2021) and Kpodar et al. (2021) imply, international remittance was resilient to the adverse shock of the pandemic because of the motivation to help families in home countries or the fiscal stimulus in host countries. Shimizutani and Yamada (2021) used household surveys and found that remittance-dependent households were more resilient in the pandemic because of the quick recovery of remittances. However, a conclusive mechanism for remittances during the pandemic is missed because there are few microeconomic-founded explorations. As this research directly enquired of remittance behaviors of migrants during the pandemic in the unique survey, we provide more refined pictures on the "resilience" of international remittance.

Finally, this paper provides an analysis of the economic behavior among migrants from Asian countries, which account for 40% of global migrants (IOM, 2017). Many studies on economic behavior among migrants are concentrated in the United States or Europe because of policy contexts or data availability. Above all, the Japanese government has launched some migration policies in recent decades, and the government has issued various visas, including temporary types. While the literature mainly examines the macroeconomic impacts on the national economy (e.g., Nakamura, 2010), there are few micro-empirical analyses on migrants' behavior (Ramstetter, 2016). To address this research gap, this study used a unique

[3] About the non-cognitive skills on migrant's behaviors, many studies focus on the impact of those skills on the decisions or intentions to migrate.(e.g., Bütikofer & Peri, 2021; Groenewold, 2012; Jaeger et al., 2010; Shuttleworth et al., 2020; Tabor et al., 2015)

dataset collected from migrant workers in Japan and is recognized as the first study to analyze the remittance behaviors among foreign workers, including temporary visa holders in Japan. Explicating the economic behaviors of migrants from Asian countries is beneficial for policymaking in the development of this region and generalization of the research on remittances.

The remainder of this chapter is organized as follows. Section II describes the context of this study. Section III illustrates our hypotheses using the conceptual framework. Section IV reports the details of our data collection, and Section V discusses the estimation strategies employed. Section VI presents the estimation results, and Section VII concludes the paper.

II. Contexts

FCWs in Japan

Japan has been facing the challenge of a rapidly aging society in recent decades, and its pace is the fastest globally. This trend is expected to continue until the mid-21st century (Vogt, 2018). While such a trend has accelerated, the demand for elderly care services has increased. Although the number of users in elderly-care services was 1.49 million in 2000, that number increased by 4.87 million in 2019, which was 3.3 times larger in about 20 years, according to the Ministry of Health, Labour and Welfare in Japan (MHLW) (2016, 2019a). The expansion of demand for elderly care services causes a chronic labor shortage in this industry. In order to alleviate the shortage of workers, the Japanese government has opened the door for recruiting the FCWs and has allowed working visas since the latter half of the 2000s.

Firstly, the government has allowed for issuing visas for candidates of national certified care workers from countries that signed the Economic Partnership Agreement (EPA) since 2008, as the first policy to accept FCWs. The partner countries are Vietnam (Accepted from FY2008), the Philippines (Accepted from FY2009), and Indonesia (Accepted from FY2014). In order to enter Japan with the EPA visa, they need to have graduated from nursing school or obtained a qualification of certified care workers in their home countries. Although they are not required to obtain the national certified qualification of care workers in Japan at their entries, they need to return after four years if they do not pass the exam in Japan. That is, if they pass, the EPA visa holders are allowed to live in Japan permanently. After passing the exam, their families (partner or children) can also follow the EPA visa holder to Japan.

In 2017, nine years after the introduction of the EPA visa, the government expanded the visa types for FCWs issuing a professional visa called “Nursing care.” In this visa type, visa applicants are required to pass the exam to qualify as Japanese national certified care workers at the time of entry. Most Nursing care visa holders once have studied abroad to graduate from the professional school in Japan, and they obtain the qualification. As with the case of the successful examinees among the EPA visa holders, the visa holders of nursing care are permitted to stay in Japan permanently. Since they have a qualification of certified care workers at the beginning to issue visas, other family members are also allowed to migrate to Japan.

In the same year, the government decided to expand its policy scheme for foreign trainees called the “Technical Intern Trainee (TIT) program” to the elderly care industry. The government launched the TIT program in 1993 to transfer skills and knowledge cultivated in Japan to developing countries. Under the TIT scheme, corporations, sole proprietors, and other businesses in Japan form employment relationships with TITs. More than 270,000 foreign trainees have worked in various industries, such as agriculture, fishery, manufacturing, tourism, and architecture. This program is one of the most extensive programs in the world (OECD, 2016). The government added elderly care as one of the job categories in the TIT program in 2017. Unlike the two previous visa policies that focused on professional workers, they are not required to take an exam of certified care workers in Japan. As they are expected to transfer the skills that they learn in the host country’s industry into their home countries, they are permitted to stay for maximum five years from their date of entry into Japan. In addition, they are not allowed to accompany their family members through this visa.

The most recent policy change for migration policies in Japan is that the introduction of a visa termed “Specified Skills,” which began in 2019 to satisfy the chronic shortage of the labor force for various job categories in the country. The holders of this visa are able to stay for up to five years. If TITs are willing to stay in Japan for more than five years, they can shift to the Specified Skills visa; thus, TITs can extend their stay for a maximum of 10 years to work in Japan with two visas. Although the government requires considerable knowledge of or experience in the specified industry fields, workers under the Specified Skills visa who aim to engage in elderly care do not need the national qualification of certified care workers. They are also not allowed to have family accompany them, as in the case of TITs.

Table 1 summarizes the classification of each visa. Currently, more than 21,000 workers are engaged in the industry as FCWs with each visa status. Although the Japanese government has accepted

foreign workers in various industries, we have some reasons for targeting FCWs as the sample. One is that we can evaluate the differences in visa types within the same industry on economic behavior, which is rarely seen in other industries. While each visa has specific traits such as a requirement for qualification, language skills, possibility to have their families accompany them, or the objective of each scheme, four visas into two types can be classified: permanent and professional visas (EPA and nursing-care) and low-skilled and temporary visas (TIT and Specific skilled). Some studies suggest that the possible duration of stay in the host country based on job-related skills or the policies in the destination may affect the economic outcomes differently among immigrants (e.g., Dustmann & Görlach, 2016). Such a classification in the visa schemes within the same industry, in which the coverage of basic tasks such as nursing care or supporting daily lives of users is almost the same among the FCWs, allows us to differentiate the effects of the temporariness of stay in the host country on remittance behaviors[4].

Second, we recruited the samples from FCWs more easily than those who engaged in other industries. One difficulty in implementing this research is that we do not have any personal information for foreign workers, while migrant workers have recently worked in various industries in Japan, including agriculture and manufacturing. As we explain the recruitment methods in Section IV, we exploited the open data of elderly care facilities' list from the MHLW and some rosters, and we advertised and recruited the survey samples via the facilities. Moreover, Mitsubishi UFJ Research and Consulting Co. (MUFJ) implemented large-scale surveys in 2019 and 2020 for FCWs, which were supported and funded by the MHLW[5]. We could compare the characteristics of the samples with their reports and check for possible biases.

COVID-19 and social security in Japan

After the first positive case of COVID-19 was confirmed on January 16, 2020, the Japanese government implemented some policy measures to control infection among citizens. One of the most potent measures was announcing the state of emergency, which the government held from April 2020 to May 2020, from

[4] The income generally increases if the FCWs obtain the qualification of national certified care workers. We control the income in the estimation.

[5] Source: MUFJ Research consulting. (2020). *Research report on the current situation about the acceptance of FCWs (in Japanese)*. Retrieved at November 26, 2021 from https://www.murc.jp/wp-content/uploads/2020/04/koukai_200422_3.pdf. // MUFJ Research consulting. (2021). *Research report on the current situation about the acceptance of specified-skilled FCWs (in Japanese)*. Retrieved at November 26, 2021 from https://www.murc.jp/wp-content/uploads/2021/04/koukai_200423_14.pdf

January 2021 to March 2021, and from April 2021 to September 2021. Under this statement, the government instructed the citizens to avoid unnecessary outdoor activities except for activities of essential workers. Companies or stores were asked to close their businesses, including restricting the organization of big events in stadiums or concert halls, and forcing the firms to supply emergency items such as medical equipment or foods. Different from the lock-down measures conducted in other countries, the Japanese government implemented "request-based" quarantine measures and compliance because, in Japan, there is no law that allows the government to restrict the citizen's or the firm's behaviors; however, most citizens obeyed the government's policies during the state of emergency, companies or the campus' closed their offices, which was adequate for managing the impact of the COVID-19 pandemic.

Some non-pharmaceutical policy implementations, such as the stay home measures, caused economic recession and raised the risk of worsening national income or household economy. Thus, the government decided to implement the one-time unconditional cash payment called the special cash payment program on April 20, 2020, during the 1st phase of the state of emergency to mitigate any adverse impacts of the pandemic and to stimulate consumption (Ando et al., 2020). One of the attractive traits of this cash transfer was that the government distributed cash to all residents registered in the Basic Resident Registration System on April 27, 2020, regardless of gender, age, household income, and nationality. That is, the FCWs who had registered by that day were also the targets of this cash payment. The amount of this cash payment was JPY 100,000 (approximately US$ 950), and the cash was deposited to the bank account of the household head, which meant that most FCWs received the money themselves. To receive this subsidy, the nationals had to apply to the municipality offices, which controlled the distribution of cash payments via the internet or by mail. Although this was an application-based scheme, according to the Ministry of Internal Affairs and Communications (MIC) (2021), 99.4% of the national households finally received cash payments. Although the government announced the payment scheme in April 2020, the payment timing largely depended on each municipality where the applicants lived and registered. As we mentioned, while each municipality office is responsible for subsidizing the payment to each household, coverage of the population, capacity, and management skills of each local government deeply affected the process of the distribution (Kaneda et al., 2021). Although the MIC (2021) suggested that all of the municipality offices informed the residents about the procedure by May 2020, started the application procedure by June 2020, and about 70% of residents received special cash payments by the same month, the variation in transfer timing was considerable across

the cities. The relatively smaller villages, towns, or several big cities such as Kumamoto (95%), a city in Kyushu Island, or Sapporo (93%) had transferred cash to more than 90% of their citizens by June. However, as some municipalities, especially many big cities, delayed the cash payment process, most residents could not receive the payment by June. For example, only 3% in Osaka, 7% in Nagoya, 5% in Chiba, a city in the Greater Tokyo Area, and 23% in Yokohama received payment at the end of June (The Mainichi, 2020). All municipalities finally completed their payments by March 2021 (MIC, 2021).

The payment timing is almost random among the cities where citizens live regardless of their economic status or location. The samples also experienced a difference in the reception timing of the payment according to the survey. We exploited the exogenous variation in cash payment as a quasi-natural experiment to test the remittance mechanism. Kaneda et al. (2021) and Kubota et al. (2021) also used this exogenous variation as their treatment for consumption responses in Japan, as the natural experiment. Kaneda et al. (2021) evaluated the impact of cash transfers on household consumption using high-frequency data from financial management smartphone apps. They implied an immediate positive response to consumption among the recipients, and the magnitude of the treatment varies across the characteristics. Kubota et al. (2021) also investigated the impact of cash payments on household consumption using a unique panel of 2.8 million bank accounts, and they observed an immediate increase in spending during the week of payments. However, to the best of our knowledge, we did not find any research on the impacts of unconditional cash transfers in host countries, including this policy scheme, on migrants' remittances.

COVID-19 and social security in home countries

Developing countries in Asia, who send FCWs to Japan, have also struggled with the pandemic, and the governments have made efforts to stop infection among the citizens. Although there is variance among the countries, some countries such as the Philippines and Indonesia have experienced a rapid expansion of the infections, and some strict lockdown measures have been implemented in response to the pandemic. The International Monetary Fund (IMF, 2020) suspected significant adverse effects on low-income households in developing countries, such as critical unemployment. Moreover, they suggest that the accomplishment of measures reducing extreme poverty, since the 1990s, would be damaged by a severe economic recession. Nakamura and Suzuki (2021) also found that the online search volume related with job security such as the

queries “job” or “income” had dramatically escalated after the enforcement of the lockdown measures in Indonesia, the Philippines, and Vietnam.

As Gentilini et al. (2021), a review document published by the World Bank, have tracked and summarized, most countries have introduced some social protection measures to save citizens’ lives globally, such as cash or in-kind transfers, labor protection, including wage subsidies or insurance support. For example, Vietnam, which is relatively successful in controlling infection, has provided support for VND 1-1.8 million (App. US$ 44-79) per month with a finite period, mainly for workers who lost jobs or were suspended from their jobs. Moreover, social assistance beneficiaries would receive VND 500,000 (App. US$ 22) per person between April and June, 2020. Indonesia, a country that has experienced severe epidemics, has expanded the beneficiaries of the CCT program (Program Keluarga Harapan) from 9 million households to 10 million households (15% of the entire population) and doubled the benefit level for three months [IDR 600,000 (App. US$ 42) from April to June 2020, and IDR 300,000 afterward]. In addition, the country introduced a new unconditional cash transfer program called BLT Dana Desa, which has continued until December 2021. Local governments also provided in-kind food assistance and cash assistance to beneficiaries who were outside the scope of previous programs. The government launched a wage subsidy program or program to train unemployed workers. The Philippines also adopted a unique subsidy program after the outbreak of COVID-19. In the Emergency Subsidy Program, the government paid PHP 5,000-PHP 8,000 (App. US$ 100-160) for two months, to 18 million households out of 24 million households in the nation. These are mainly the recipients of the CCT program called Pantawid Pamilyang Pilipino Program. The payment for the residents in the severely restricted area of quarantine was made again in May and September 2020. The government has also provided financial support to unemployed workers, farmers, and healthcare workers. Other countries that sent FCWs to Japan such as Myanmar, China, and Nepal also implemented financial support or social assistance during the pandemic, especially for poor people or households facing adverse shocks. In contrast to the case in Japan, which provided a universal subsidy to all the residents in the country, social assistance in developing countries was provided exclusively for nationals in trouble. Among the sample in this research, 21 respondents acknowledged the receipt and timing that households in home countries received public emergency subsidies.

III. Conceptual framework & Hypotheses

The altruism hypothesis is an outstanding concept of the motives for international remittance. This hypothesis has been theoretically investigated by Barro (1974) and Becker (1974), followed by Lucas and Stark (1985), Cox (1987), Funkhouser (1995), and Stark (1995). Apart from the altruism hypothesis, there are some other microeconomic theories for the motives of remittance such as exchange motives, functioning as a contractual agreement with households (Cox et al., 1998; Lucas & Stark, 1985), investment motives, functioning as increasing the household income (Ilahi & Jafarey, 1999), or insurance motives, as an insurance when the negative shocks appear (Yang & Choi, 2007; Batista & Umblijs, 2016). Also, the remittance will play a role of the income smoothing in the households left behind disregarding whatever the motives are (e.g., Amuedo-Dorantes & Pozo, 2011). Although some literatures observe the altruism motive for international remittance under the interconnection with other conceptual hypotheses such as the exchange or self-interest hypothesis (e.g., Cox et al., 1998; Cox et al., 2004) or familial motives, including insurance or their strategic hypothesis (e.g., Foster & Seiler, 2001; Agarwal & Horowitz, 2002), the altruism hypothesis is recognized as the theoretical core of motivation in international remittance, and many studies have tested altruistic motives for international remittance (Azizi, 2016, 2019; Bouoiyour & Miftah, 2015; Kananurak & Sirisankanan, 2018; Mallick, 2017). The crowding-out effect, which is a critical implication of the altruism hypothesis, has also been investigated in various studies. Some studies have supported crowding-out effects on private transfers by the recipient of public financial support [e.g., Jensen (2004) in South Africa; Brown et al. (2014) in Fiji & Tonga; Kang & Sawada (2003) in the Republic of Korea; Gerardi & Tsai (2014) in Taiwan]. Other studies suspect that the crowding-out effects are modest or minor [e.g., Gibson et al. (2010) in China, Indonesia, Papua New Guinea and Vietnam; Lim & Morshed (2015) in 122 developing countries]. Some studies also show that the crowding-out effects heterogeneously appear in a specific group depending on some characteristics such as low-income or rural locations where the family lives (e.g., Albarran & Attanasio (2003) in Mexico; La & Xu (2017) in VietNam). Nikolov and Bonci (2020) conducted a systematic review of impact evaluation for crowding-out effects on private transfers by public subsidies, suggesting that the effects depend on policy contexts such as social assistance, pension programs, or country setting, although the effects are observed to varying degrees.

In the altruism hypothesis, the utility of a migrant and the household at home is written as follows (Funkhouser, 1995; Stark, 1995; Rapoport & Docqier, 2006)[6]:

$$U_m\ (C_m, C_h) = \ (1\ -\ \beta_m)V_m(C_m) + \beta_m U_h(C_h, C_m)$$
$$U_h\ (C_h, C_m) = \ (1\ -\ \beta_h)V_h(C_h) + \beta_h U_m(C_m, C_h)$$

Each agent's utility is a function of his/her own felicity from consumption *C* and the other's utility. The individual altruism degree β_i determines the weight of each factor. Solving these utility functions, the migrant's utility function is expressed as follows:

$$U_m\ (C_m, C_h) = \ (1\ -\ \gamma_m)V(I_m\ -\ T) + \gamma_m V(I_h\ +\ T)$$

where $\gamma_m = \frac{\beta_m(1-\beta_h)}{1-\beta_m\beta_h}$; however, in this research, the unilateral altruism from the migrant is considered. Therefore, we assume that $\gamma_m = \beta_m$. *I* is the pre-transferred income, and *T* represents the private transfer. By solving this model to maximize utility with respect to the transfers *T*, it is cleared that the remittance will increase when the migrant's income increases, and or when the migrant's degree of altruism increases. On the other hand, when the pre-transferred household income increases, private transfers decrease. From this intuition, one testable implication is whether the transfer would decline if the household in the home country receives some public transfers such as CCTs, that is, the crowding-out effect. However, as we mentioned, the existing papers have no coherent results regarding any crowding-out effects (La & Xu, 2017; Nikolov & Bonci, 2020). In addition, the effects of emergency aid in disasters or in unordinary times on crowding out effects are ambiguous. Moreover, it is difficult to directly evaluate the degree of altruism because of the lack of data availability; therefore, we aim to scrutinize the impacts of altruism types among migrants.

Although some international organizations initially anticipated a dramatic decrease in international remittances at the onset of the COVID-19 because of economic recession, the magnitude of diminution has become relatively more minor than expected in 2020 (World Bank, 2021; Kpodar et al., 2021). They entail that the reason for relatively small decline was due to migrants' desire to help their families and the fiscal

[6] We rely on the solution of the model shown in Rapoport and Docqier (2006).

stimulus by each country motivate international remittances during the pandemic. If these justifications are correct, the motives of international remittance would strongly rely on the altruistic hypothesis. For example, if the income of migrants increases by unanticipated positive income shock (emerrgency subsidy), private transfers from migrants are expected to increase. Moreover, when households in the home country decrease their income due to negative shocks such as unemployment, the migrants are expected to remit more because their remittance would work as an income smoothing. Furthermore, highly altruistic migrants are expected to increase their remittances more than others. Besides, if household income in home countries increases due to positive shocks, such as receiving public subsidies from governments, private transfers from migrants are expected to decrease. Applying this logic to the context, we set the following hypotheses:

Hypothesis 1: If migrants' income increases due to a positive shock (i.e., receiving a special cash payment in Japan) or their family experiences a negative shock to their income (e.g., unemployment or infection by COVID-19), the migrants will increase their private transfers.

Hypothesis 2: If the home family of migrants faces positive shocks (i.e., the home government's financial support in the pandemic), the migrants will decrease their private transfers.

Moreover, we tested the effects of individual altruistic degree using unique data from psychological and experimental scales, which are explained in the next section, on the international remittance amount. From the theoretical concepts and diagnosis by the World Bank, we set the following hypothesis.

Hypothesis 3: Highly altruistic migrants remit more to their families, and their magnitude increases during the pandemic.

Recent literature suggests that the permanency of stay in host countries affects the economic behaviors of migrants (e.g., Chabé-Ferret et al., 2018; Collier et al., 2018; Dustmann & Görlach, 2016; Dustmann & Mestres, 2010; Yang, 2008), including remittance behaviors. Above all, temporary migrants tend to remit to their home countries more than permanently placed migrants because they expect future utilities or earnings, such as investment in home countries. The samples, the FCWs in Japan, allow us to

compare the economic behaviors of both temporary and permanent migrants as discussed in the Context section. Therefore, we set the following hypothesis:

Hypothesis 4: Migrants who hold temporary visas (i.e., the TIT visa or the Specified skills visa) remit more than the permanent visa holders (i.e., the EPA visa or the nursing-care visa).

IV. Data collection

To test the hypotheses, we conducted an original online survey to obtain detailed information about FCWs, including remittance information and the degree of individual altruism, which are not found in the secondary data. In this section, we explain the sampling method, the format and contents of the questionnaire, and the details of the data.

Sampling method

As we did not find the personal information of each FCW in-country, we recruited the respondents via the elderly care facilities where the FCWs are employed. As the MHLW publishes data about the names and addresses of all elderly care facilities in public, we selected facilities from this list and sent the letters to them asking for their cooperation in the research. To choose the facilities, we used three methods of approaching to the FCWs and recruited respondents robustly. First, the MHLW has published the number of successful examinees who passed the exam of certified care workers among the EPA visa holders every year. In those lists, the MHLW discloses the names of the facilities of each successful applicant as well. We extracted 436 elderly care facilities from those lists during FY2012, when the first exam taken by the foreign applicants had been held, to FY2020. Second, we searched for news articles or websites of facilities that had introduced FCWs in the country. As a result, we found 168 additional facilities that employed FCWs, apart from those chosen by the first method. Although we can approach the FCWs using the first and second methods, we assume that the number of facilities is relatively small. Thus, as the third method, we randomly selected elderly care facilities from the open data by the MHLW, which we introduced. According to the lists of successful candidates of certified care workers used in the first method and the statistics about the nursing-

care visa holders by the Immigration Services Agency of Japan, we found that the visa holders of "EPA" and "Nursing-care" are concentrated in some specific prefectures, especially the metropolis such as Tokyo or Osaka. Our field observations find that the facilities in the metropolis are popular among FCWs because of the relatively higher wage or amenity of the cities. Moreover, elderly care facilities that have employed the EPA or nursing-care visa holders are likely to hire other visa holders, such as TITs or Specified Skills, because the facilities have a well-organized recruitment system for FCWs. Thus, we randomly selected an additional 3,936 facilities exclusively in the top 10 prefectures[7] on the number of the "Nursing-care" visa-holders from the most recent statistics offered by the Immigration Services Agency of Japan, to efficiently advertise the survey to FCWs. Finally, we mailed the notice regarding the survey to 4,540 facilities in Japan in August and September 2021.

We sent the letters to the Japanese staff, such as the manager or the person in charge of the employment of FCWs in each care facility by postal mail and asked them to circulate the attached fliers about recruiting the respondents of the survey for the FCWs[8]. In the flier, we described the objectives and abstracts of the survey, the information of honorarium, and the contacts of the help desk written in easy Japanese. The respondents could access the online survey using the URL or QR code displayed in the flier. We offered a mobile coupon equivalent to JPY 500 (App. US$ 5) to the respondents for reward if they answered all the questions in the survey. We set this price for the honorarium because the minimum hourly wage in Japan is about JPY 1,000, and we expected respondents to finish each survey in approximately 30 minutes.

Survey procedure

We implemented this original survey using an online survey platform[9] to minimize measurement errors and logistic costs and to easily access the survey for FCWs during the pandemic. As the target samples were of a relatively younger age (73.6% were in their 20s according to MUFJ reports), we assumed that they did not have any hesitation to use digital gadgets such as smartphones and computers. Moreover, MHLW(2019b) has provided guidance for employing FCWs to the facilities and asked to secure the living environment in which

[7] Top 10 prefectures include Osaka, Tokyo, Chiba, Hyogo, Saitama, Fukuoka, Kanagawa, Mie, Tokushima and Aichi. Tokyo, Chiba, Saitama and Kanagawa are located in the Greater Tokyo Area, Osaka and Hyogo are in Keihanshin metropolitan area, and Aichi and Mie are in Chūkyō metropolitan area. Tokushima is in Shikoku Island and Fukuoka is the economic center of the Kyushu Island.
[8] The distributed flyer is displayed in the Appendix.
[9] We exploit Zoho survey in this research.

the FCWs can communicate easily with their home families, such as installing wi-fi facilities in their dormitories or supporting the subscription of mobile phone services. Thus, an online-based survey was reasonable for this study. We conducted the survey using an easy-Japanese questionnaire [N4-N5 level (Beginner's level) in the Japanese-Language Proficiency Test[10]] because all FCWs are required to master their Japanese level at least at the N5 level as a given. However, we found a variation in Japanese skills among the FCWs in a preliminary survey conducted at an elderly care facility in Tokyo in July 2021. Therefore, the survey was revised under the supervision of an expert in Japanese education for foreigners. Moreover, we added some translated-keywords to the relatively difficult terms in the questions for the respondents to easily understand our intentions, which are also supervised by native speakers. At the beginning of the questionnaire, we announced that the respondents were allowed to answer the questions with the help of other fluent Japanese speakers if they could not understand the questions well. As a result, more than 76% of the respondents felt it easy or relatively easy to answer the questionnaire in the survey.

One of the caveats in the online surveys is that the respondents do not answer as diligently as the researchers expected, and these samples decrease the validity of the survey. Many surveys in social science, such as psychology, adopt a methodological tool called the instructional manipulation check (IMC) in the questionnaire (Oppenheimer et al., 2009). In the IMC, a researcher asks respondents to confirm that they have read an instruction on the questionnaire using the style and formats similar to other questions, for example, in the Likert scale questions. For instance, the message "Please click the button 'No' in this question" was raised while making the respondents read the relatively long question, regardless of the contents of the questions, and the respondents were expected to answer "No" if they read the question precisely. The questionnaire prepared three IMCs in the middle part of the questionnaire. Given the random error by mistyped answers, we regarded them as valid samples if they correctly answered more than two IMCs.

Questionnaire

The questionnaire comprised four parts. In the first part, we asked the respondents about socio-economic characteristics such as the types of visas, entry date into Japan, age, and gender. In addition, the respondents

[10] Japanese-Language Proficiency Test (JLPT) is a standardized test to evaluate Japanese proficiency for non-native speakers. It evaluates the language knowledge, reading ability, and listening ability. JLPT consists of five level tests from N5 (the most basic level) to N1 (the most Advanced Level), and each level is passed if a taker scores higher than the qualifying score.

shared their experiences before coming to Japan, including education and work experience in home countries or loan experiences for migration. Regarding income information, we inquired about the average monthly income in the Japanese currency before and after COVID-19. The second part covers household information in home countries, such as household composition, assets, infection or unemployment experience during the pandemic, and the frequency of contact with the respondent. As with the those of respondents, we enquired about their average monthly income in home currencies before and after COVID-19. Next, we questioned the details of the remittance behavior. We asked them about their quarterly total remittance amount in Japanese currency and the most frequently used remittance method from the 1st quarter in 2019 to the 2nd quarter in 2021. We did not ask about the weekly or monthly data on remittance because the lengthy surveys have a risk of biased answers because of response fatigue (Ambler et al., 2021). Furthermore, annual data are likely to neglect the seasonal effects on remittance behavior. Thus, we believe that it is the best option, for the research, to obtain quarterly data.

The final part of the questionnaire consisted of games and questions to check the degree of altruism. We provided two different questions to test altruism. The first was a self-reporting scale based on past engagements in altruistic behavior developed by Rushton et al. (1981), which is popularly used in the context of psychology. In the original scale by Rushton et al. (1981), the respondents rated the frequency with which they engaged in 20 specific behaviors on a Likert scale from never did (0 pts.) to did very often (4 pts.). One of the caveats of the original scale is that some specific behaviors in the scale are context-specific, which are strongly influenced by western culture, e.g., “I have bought 'charity' holiday cards deliberately because I knew it was a good cause.” We selected ten specific behaviors among those in the original scale and considered common behaviors across the countries (Table 2). While the pandemic has led to behavioral changes among people, such as refraining from physical contact with other people, we concern about the difficulty to evaluate the degree of altruism based on the experiences after the pandemic, such as helping to carry a stranger’s belongings. Therefore, we enquired about their altruistic experiences before they came to Japan or before the pandemic began. As for this altruism scale in the data, we summed the total scores from each behavior, and the total score was divided by the maximum point (40 pts.) to standardize the index.

The other index is from the dictator’s game to detect individual altruism, which is commonly used in experimental economics (Engel, 2011). In this game, the enumerators offer the setting to give some money to the respondents, and they ask whether the respondents will give that money to someone else and if yes,

then how much. The values that the respondents raised are regarded as their altruism degree. In a typical setting, two participants, e.g., college students, directly joined this game, and the researchers evaluated how much money they gave to the opponent. However, we could not create such an environment in an online survey. Moreover, some studies suggest that the results of a dictator's game may be influenced by the closeness to the opponents, such as family members or an anonymous person who has similar characteristics to the respondents or the asymmetry of information about the receipt of money (Ambler, 2015; Ben-Ner & Kramer, 2011; Torero & Viceisza, 2015). To address these concerns, we provide the dictator's game with two opponents in two situations, that is, four games in total, in this survey. In the first case, we showed a fictitious woman as their opponent. We provided "her profile" with her photo as follows: "She is an FCW and lives in Japan. She earns the same salary as you, and her tasks in the elderly care facility are also the same as yours." We assume that we produce a setting similar to that of the ordinary dictator's game in person. In addition, two situations are provided in this fictitious case: one is that the woman knows that the respondent receives money, and the other is that the woman does not know that the respondent receives money in order to cope with the issue regarding information asymmetry. In the second case, we conducted the game in a situation where the opponents were the respondent's family in their home countries. Similar to the first case, we offered two situations regarding information asymmetry: the family knows, or the family does not. We asked how much the respondents would pay to the other person if we gave JPY 10,000 for them in all games. We aggregated the price raised in each game and divided it by the maximum value (JPY 40,000) to standardize the index for the dictator's game.

We tested individual altruism using two methods, because they have both pros and cons. As for the self-reported psychological altruism scale, we could evaluate that their altruism was not influenced by the pandemic, but it might depend on their cultural contexts or the situation in which the respondents were in. Furthermore, altruism can be estimated experimentally using the dictator's game, but we cannot deny the influence of the pandemic on the results; we comprehensively evaluated the degree of altruism using two scales[11].

[11] We find that there is no significant difference on the altruism degrees between temporary or permanent visa group (see. Table A1).

Data

After collecting the questionnaire, we processed data cleaning and constructed panel data based on the quarter units of each respondent. As mentioned in the section on the survey procedure, we limited the samples that passed more than two IMCs in the dataset. Although we collected data from 218 samples in the online survey, 200 respondents passed the criteria on the IMC; thus, we used these 200-samples in the research. To construct the panel data, we created quarter-level time panels from the first quarter of 2019, or the quarter that each respondent entered Japan if they entered after the second quarter in 2019, to the second quarter in 2021. Therefore, we obtained 1,508 observations from 200 samples in the dataset.

Figures 1-3 show the distribution of the sample in this data on their visa type, nationalities, and prefectures that the respondents are currently residing in. Regarding the visa type, although the largest sample belongs to TIT (40%), it is almost equally distributed between permanent visa holders (EPA and nursing-care) and temporary visa holders (TIT and Specified skills). As for the nationalities, we observed that more than 82% of the samples were from three countries that signed an economic partnership agreement with Japan [Vietnam (48%), Indonesia (17%), and the Philippines (19%)]. Other countries were also from Asia, such as Myanmar and China. Although many samples were concentrated in large metropolitan areas, data from suburban or rural areas across the country was also collected[12].

Table 3 presents the summary statistics for this dataset. The data are mainly composed of female FCWs (84%), and they are relatively young. On average, they have already stayed for more than two and a half years, and about 80% believe in a religion and are single. They have an education degree equivalent to the completion of high school in their home countries on average, and one-third passed the national qualification exam of certified care workers in Japan. 72.5% received special cash payments from the Japanese government because some respondents migrated to Japan after May 2020, and were thus outside the subsidy targets. Their households left behind in home countries are composed of approximately five members, and 41% of them engage in farming. During the pandemic, 21.5% had received emergency support from the governments in home countries, and some family members of 7% of households were infected by SARS-CoV-2.

[12] These variations in the samples are similar to those of the data that we find in a large-scale survey by MUFJ research and consulting, which refers to the footnote 5.

Regarding the income of respondents[13], the income of households,[14] and the remittance amount by the respondents, we converted those estimated by each local currency into the PPP-adjusted price[15] to consider the difference in the cost of living between countries. Regarding income information, we only enquired of the average value before and after the pandemic with consideration given to the volume of the questions. We treated the 1st quarter to 4th quarter in 2019 as the ex-ante period of COVID-19 and 1st quarter in 2020 to 2nd quarter in 2021 as the ex-post period. We substituted the average values of before and after the pandemic into the value of each quarter in the panel dataset. We observed that the average PPP-converted respondent's income increased after the pandemic has begun, but the average PPP-converted household income decreased. Regarding remittances, more than 90% of the respondents made remittances to their home countries, and they remit approximately US$ 1,000 in PPP-value in each quarter. Figure 4 represents the average trend of the remittance among the visa-holders, which is classified by the permitted stay period. Although we observed that the remittance amounts among the permanent visa holders were more significant until the 2nd quarter in 2019, temporary visa holders' share surpassed this afterward. This tendency was also observed during the pandemic.

V. Estimation strategy

This research evaluates the motives of international remittances during the pandemic and the impact of financial support in host and home countries on remittances. As mentioned, we constructed quarterly respondent-unit panel data comprising 1,508 observations of 200 samples in this research. Each respondent had 10 quarters (1st quarter in 2019 to 2nd quarter in 2021) at maximum, which was dependent on the entry timing into Japan for the respondents. The model is represented as follows:

[13] Some respondents stated their monthly income as being less than US$ 877 (≒JPY100,000), which is below the minimum income for FCWs in Japan. Although they may receive in-kind income such as housing or meals, we cannot deny the measurement error. Thus, we estimate models trimming these extreme low-income respondents and find that the results are still informative. The results are available upon request.

[14] About the income of the households left behind, we observe some missing values because the respondent do not know the exact value. we substitute the average value of each country in each period into missing value. We calculate the average price from other samples in the dataset about the respondents from Vietnam, Indonesia, Philippines, Myanmar, and China. As for the respondents from Nepal, Sri Lanka, Korea, and Kyrgyz, where the number of the respondents are few, we substituted average price from the data produced by CEIC (https://www.ceicdata.com/en/indicator/annual-household-income-per-capita). Other countries' respondents has no missing values.

[15] We adopted the PPP conversion factor, private consumption (LCU per international US$) from the databank by the World Bank (https://data.worldbank.org/indicator/PA.NUS.PRVT.PP) for the calculation on each income value.

$$log(Remit)_{i,q} = \beta_1 COVID19_q + \beta_2 Homesubsidy_{i,q} + \beta_3 Hostsubsidy_{i,q} + \beta_4 Negativeshock_{i,q} + \beta_5 log(Hostincome)_{i,q} + \beta_6 log(Homeincome)_{i,q} + \rho_i + \sigma_q + \mu \quad (1)$$

where $log(Remit)_{i,q}$ is the log-converted total remittance amount in the q'th quarter for a migrant i (PPP-values) as the outcome of the model. $COVID19_q$ denotes 1 if the quarter q is on or after the 1st quarter in 2020 (5th quarter). $Homesubsidy_{i,q}$ equals 1 if i'th households in the home country receive the government's subsidy in q'th quarter and $Hostsubsidy_{i,q}$ is a dummy variable based on if i'th sample received the special cash payment by the Japanese government in q'th quarter or not[16]. $Negativeshock_{i,q}$ is denoted as 1 if the ith households in home countries face any negative shocks (unemployment or infection) on and after the q'th quarter. Furthermore, each $log(Hostincome)_{i,q}$ and $log(Homeincome)_{i,q}$ represents the log-converted average monthly income (PPP) in the q'th quarter of the i'th sample or i'th household.

First, we estimated this model by fixed effect regression to check the impacts of time-variant variables; thus, we included the panel fixed effects ρ_i and the time fixed effects (quarter variables) σ_q to control for bias by omitted variables. Second, we estimated the model using random effects regression to evaluate the effects of time-invariant variables. Instead of the panel fixed effects ρ_i, we included control variables X in Eq. (1) such as visa types (=1 if temporary visa), altruistic experience scale, dictator's game scale, gender (=1 if female), age, nationality (reference is Vietnam), religion status (= 1 if conforming to a religion), marriage status (=1 if married), farming by households, and loan experience. Above all, we would like to check the effects of temporariness in the host country and the degree of altruism in the random effects regression.

Furthermore, we conducted a robustness check using the interaction variables with time-invariant variables such as the degree of altruism and the temporary stay visas with the fixed-effects model as follows.

$$log(Remit)_{i,q} = \beta_1 COVID19_q + \beta_2 Homesubsidy_{i,q} + \beta_3 Hostsubsidy_{i,q} + \beta_4 Negativeshock_{i,q} + \beta_5 log(Hostincome)_{i,q} + \beta_6 log(Homeincome)_{i,q} + \beta_7 TV_{i,q} * TI_i + \rho_i + \sigma_q + \mu \quad (2)$$

[16] Some respondents who received special cash payment did not remember when they received subsidies. In these cases, we hypothesized that they received the payment by June 2020 (i.e., in the 2nd quarter in 2020) because more than 70% of households in Japan had already received cash at that time. However, this estimation may hold risk of measurement errors. Thus, we estimated the models, excluding the samples who did not remember the timing of cash payment in Japan, and found that the main results are still informative. The results are available upon request.

where β_7 captured the interaction effects of time-variant variables and time-invariant variables. This study tested the effects of COVID-19, the timing of cash payment received in home and host countries, or the degree of altruism, including the altruistic experience scale and dictator's game scale and temporariness. Through this robustness check, we aimed to explain the mechanism between the policy implications and individual traits of remittance. We used the respondent-clustered standard error for all the estimations. In addition, we report 95% confidence intervals.

VI. Results

Primary analysis

Based on equation (1), we first estimated the fixed-effects regression model. The results are presented in Table 4. As shown in columns (1) and (2), we did not observe any significant results of COVID-19 outbreaks on remittance. Therefore, the results reveal that the FCWs are not likely to increase or decrease the actual remittance amount because of the pandemic, although some international organizations have projected a dramatic decrease in international remittances at the beginning of the pandemic. One of the reasons may be that the employment of FCWs has been maintained even during the pandemic, unlike tourism or restaurant industries, although emergency declarations or stay-at-home measures may negatively affect remittance among FCWs. On the one hand, when migrants receive special cash payments by the Japanese government, the results suggest that they increase their remittance by about 79%. Moreover, the results show that remittances increase if the income of the respondents increases. From the estimation, if migrants increase their income by 1%, their remittance amounts increase by 0.26%. These results imply that the altruism hypothesis partially functions as migrants share their income with their family in their home countries. On the other hand, we did not find any significant results for the effects of subsidy in home countries and the income in home households from the fixed effects regressions, as shown in columns (1) and (2). Therefore, we did not confirm any crowding-out effects from the sample in the fixed-effect regression. Moreover, the results suggest that the remittance amount did not change after the home household faced negative shocks such as infection or unemployment. This is not applicable to the intuition that the remittance is considered to be a function as the insurance of the home country households (e.g., de la Brière et al., 2002; Yang & Choi,

2007). Thus, of the hypotheses presented in Section III, although we found that Hypothesis 1 is partially confirmed in terms of cash payment in the host country, we rejected Hypothesis 2 from the fixed effects estimation.

Columns (3) and (4) show the estimation results of the random effect regression. Although we observed almost the same tendency as the fixed effect regression analysis on each variable, the home household income negatively and significantly affected the remittance amounts, that is, if the home household income increased by 1%, the remittance would decrease by 0.1%. This result coincides with the altruism hypothesis. One merit of random effect regression estimation is that we can measure the impacts of time-invariant effects. The results suggest that the remittance amount is larger for temporary visa holders (TIT or specified skills) than permanent visa holders (EPA or nursing-care). One of the reasons is that temporary visa holders cannot accompany their family members in Japan, so the international remittance amounts are also larger. Moreover, as some studies (e.g., Djajić & Vinogradova, 2015; Dustmann & Mestres, 2010; Yang, 2006) have suggested, the economic behaviors among temporary migrants, such as those related to remittances, are different from those of permanent migrants because they modify their remittances based on target-earning or the life-time utility maximization after return. In addition, skill composition may affect the remittance amount (Adams, 2009). That is, the results also show a difference in behavior from the permanent form of migration. Regarding the altruism scale, we did not observe the effects of the behavior itself; thus, remittance behavior may not be influenced by altruism itself. In addition, if the respondents bore a debt for coming to Japan, the results imply that they increased their remittance. Therefore, while we demonstrate Hypothesis 4 regarding temporariness, we reject a part of Hypothesis 3 about altruism.

Heterogenous analysis

We conducted a heterogeneous analysis using the interaction variables for time-invariant variables (altruism degree and temporary status) and time-variant variables (COVID-19 shock and subsidy from host and home countries) based on Eq.(2). Table 5 presents the results of the heterogeneous analysis. We also show the results of F-test of related variables captured in the fixed-effect regression. Columns (1) – (3) show the interaction effects of the COVID-19 shock and time-invariant factors. We detected some positive effects for the effects with temporary status at the 10% significance level. While the effect of temporary status

originally has a positive effect on random effect estimations in columns (3) and (4) in Table 4, temporary visa holders multiply their remittances during the pandemic by approximately 97%. On the one hand, regarding altruism degrees, the interaction variables with the psychological scale in altruism represent positive effects at the 10% significance level in Column (2). In this model, the COVID-19 effects show a significant negative sign for the remittance amount, but the interaction effect with the altruism experience scale overwhelms the negative effects. Moreover, although we do not observe any significant effects in the altruism experience scale for the random effects estimation in columns (3) and (4) in Table 4, the interactions suggest that the altruism degree functions well after the outbreak of the pandemic. Although insignificant, we observed a positive tendency for the interaction effects with the dictator's game degree (Column (3)). Regarding the interaction effects with the emergency subsidies in the home country, we did not find any significant effects for all interaction variables, for which we confirmed no crowding-out effects [Columns (4)–(6)]. Regarding the interaction with the timing of receiving special cash payments, we also observed the same trend as the heterogeneous estimation of COVID-19 shocks [Columns (7)–(9)]. In other words, temporary visa holders or respondents with higher altruistic experience increased their remittance amount at the time of the receipt of subsidies by the host country. While we found significant effects of receiving the subsidy by host country in the base estimation shown in Table 4, the effects are insignificant after including the interaction variables. When we decomposed the policy effects of unconditional cash transfers in Japan, the positive results on remittance may be attributed to the respondents with a specific type. In addition, similar to the interpretation in the heterogeneous analysis of COVID-19 shocks, altruistic people are likely to increase their remittances after receiving unexpected income. The interaction with the dictator's game is also positive, but still insignificant. Therefore, we partially support Hypotheses 3 and 4 in Section III from the analysis.

VII. Conclusion

This research explored the relationship between financial support during the pandemic and individual altruism degrees with international remittance behaviors using cases from FCWs employed in Japan. The analysis uncovers that the FCW's income and the cash payment implemented by the Japanese government prompted more amount of remittances by FCWs. However, we did not observe the effects of positive or

negative shocks, for households in the home country, on the remittance, which means that there are no crowding-out effects after receiving the public subsidies in the home country. Moreover, the heterogeneous analysis suggests that the individual altruism degree functioned to promote remittance just after receiving financial support from the host government. The analysis suggests that motives based on the altruism hypothesis are partially observed during the pandemic. Furthermore, the assumption on the role of altruism to maintain international remittance to be resilient, proposed by the World Bank (2021), is supported.

Although the results imply that the altruism hypothesis is supported in part during the pandemic, we did not detect any crowding-out effects, which are often observed after the enforcement of social security services (e.g., Nikolov & Bonci, 2020). There are several reasons for this result. First, as they enhanced their desire to help their families in the challenging situation caused by the pandemic, and while the magnitude of damage and the end of the pandemic remains ambiguous, the migrants did not decrease their remittance amount even among households in the home countries receiving emergency support. Another hypothesis for insignificance of home country subsidy is because the amount transferred by home governments is too small for migrants and their households to compensate for their uncertain risks or recovery of social welfare. The results may cast another question on the efficiency and effectiveness of public support in developing countries, which should be studied in the future.

Furthermore, the findings indicate that the Japanese government's economic stimulus was spent on international remittances among migrants. The government aimed to facilitate recovery of the national economy and to stimulate the consumption among the citizens during the recession by the pandemic. Some studies (Hattori et al., 2021; Kaneda et al., 2021; Kubota et al., 2021) found positive impacts of such a "cash-infusion" policy on the consumption. However, we found unintended side effects for the transfers given the "no strings attached" approach for the cash use among the migrants, which served as an "indirect" financial aid on the livelihood in developing countries. Although there is still controversy about the equipment of the conditions in public cash transfers regarding its objectives, effects, ethics, targets or costs (Hanna & Olken, 2018; Gentlini et al., 2020), the research produces insightful results for public cash transfers in the upcoming globalization context.

The heterogeneous analysis also provides critical messages on research and policymaking. Using the psychological and experimental scales, we estimated how individual altruism influences remittance behaviors and found that the altruism scale itself does not work in remittance behaviors, but the policy

implementation to transfer cash strongly affects remittance among highly-altruistic migrants. This direct test on altruistic motives will be beneficial for explicating the remittance mechanism because it is challenging to capture these decomposed effects. Moreover, taking advantage of the samples that various visa type holders cohabit in one industry, we explored the effects of temporariness and skills on remittance behavior. The results support that tentative visa holders behave differently in their economic behavior in host countries, including remittance behavior (Dustmann & Görlach, 2016). The possible duration of stay in host countries should be deeply considered in research and migration policy design.

Although the investigation provides informative evidence for international remittances during the pandemic, we note some limitations to the research. First, the generalization of the findings should be carefully investigated in the future because the samples are relatively small and are from one industry in one country. We selected the FCWs as the sample because of the advantages of the various visa types within the industry and easy access to the respondents. In contrast, during the pandemic, the elderly care industries might be less severely impacted by the recession than other industries such as tourism or restaurant industries in Japan (Miyakawa et al., 2021). Job security in the elderly care industry may affect remittance behaviors among foreign workers. Furthermore, the Japanese government has not implemented strict lockdown measures, as in other countries. The difference in policy interventions would influence the migrant's economic behavior. Furthermore, we conducted a one-time survey for this research using an online format because of an unexpected pandemic. Although we designed the details of the survey for respondents to answer easily and concisely, as explained in Section IV, the retrospective-based survey may pose a risk of measurement error (Beegle et al., 2012; Gibson & Kim, 2010; Sawada et al., 2019). Nevertheless, the findings contribute to a better understanding of the mechanism of motives for international remittances; above all, the findings cast light on the relationship between public and private transfers in unordinary times. Although we could not evaluate whether the remittance contributes to alleviation of the income volatility in home as we do not have the consumption data, Amuedo-Dorantes & Pozo (2011) and Yang & Choi (2007) imply that their remittance would contribute to the income smoothing in highly insecure times. These findings can be used to improve migration research and policy design on social securities in both developing and developed countries.

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Tables & Figures

Table 1. Classification of the visa categories

	EPA	Nursing care	TIT	Specified Skilled
Classification	High skilled immigrant workers (Permanent migrants)		Low skilled immigrant workers (Temporary migrants)	
Purpose of System	Acceptance for the purpose of acquiring national qualification of certified care workers (enhance international cooperation)	Acceptance of foreign workers in specialist/technical areas	Transfer of skills from Japan to another country (international contribution	Acceptance of foreign nationals with specific expertise/skills to address labor shortage
Year of start	2008	2017	2017	2019
# of visa holders	3,820 (in Dec 2020)	1,714 (in Dec 2020)	12,068 (in Mar 2021)	3,947 (in Sep 2021)
Need a qualification of national qualified care workers	No need but they aim to pass exam	Need	No need	No need
Duration to stay	Permanent after pass the exam (4 years if fail exam)	Permanent	Max. 5 years (Able to renew to Specified")	Max. 5 years
Min. JLPT level	N3	N2	N4	N5
Accompanying with family	No (Permitted after pass)	Yes	No	No

Note) Edited by the authors. Source from MHLW (2019b) for the description of each visa. Source from Immigration Services Agency of Japan (EPA, Nursing care & Specified Skilled) and Organization for Technical Intern Trainee (TIT) about the number of each visa holders. Japanese-Language Proficiency Test (JLPT) is a standardized test to evaluate Japanese proficiency for non-native speakers. It evaluates the language knowledge, reading ability, and listening ability. JLPT consists of five level tests from N5 (the most basic level) to N1 (the most Advanced Level), and each level is passed if a taker gets higher score than the threshold.

Table 2. Selected questions in Rushton et al. (1981)’s scale

1. I have given directions to a stranger
2. I have made change for a stranger.
3. I have given money to a charity.
4. I have done volunteer work for a charity.
5. I have helped carry a stranger's belongings.
6. I have allowed someone to go ahead of me in a lineup.
7. I have let a neighbor whom I didn't know too well borrow an item of some value to me.
8. I have voluntarily looked after a neighbor's pets or children without being paid for it.
9. I have offered to help a handicapped or elderly stranger across a street
10. I have offered my seat on a bus or train to a stranger who was standing.

Note) We select the questions from Rushton et al. (1981)’s scale about individual altruism. We asked the respondents to rate their frequency of each experience from 0 (Never) to 4 (Very often).

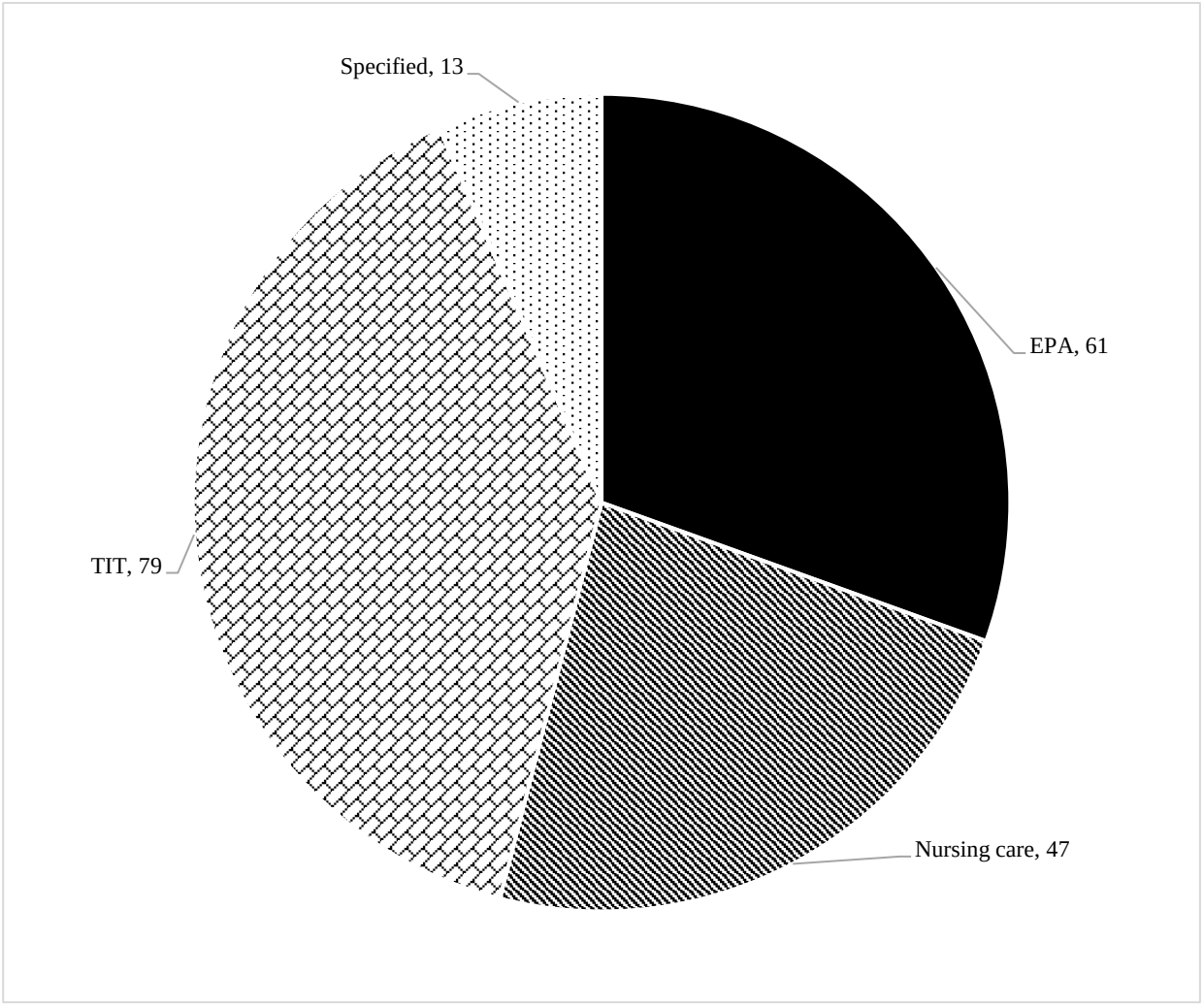

Figure 1. Distribution of Visa types

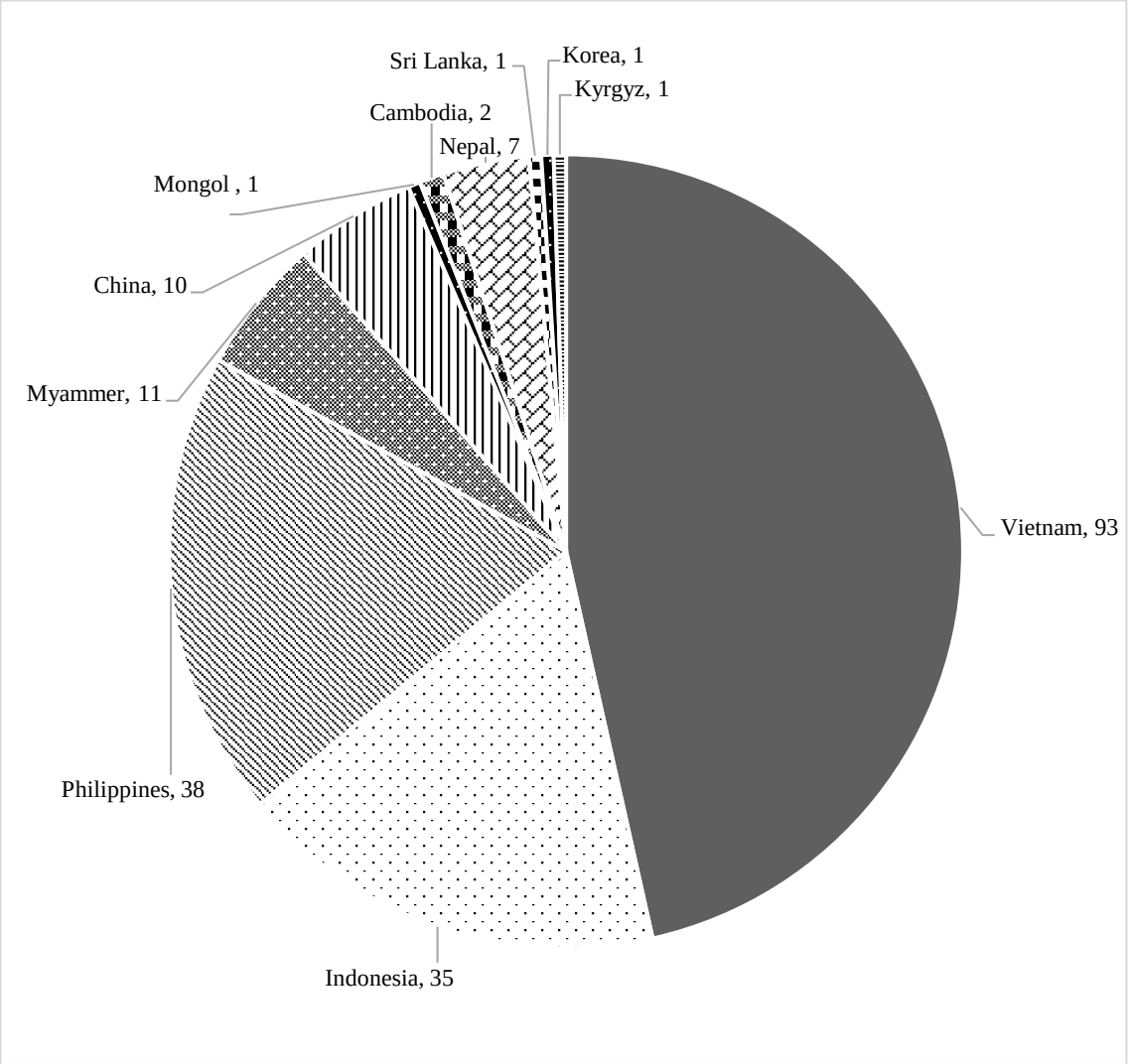

Figure 2. Distribution of nationalities

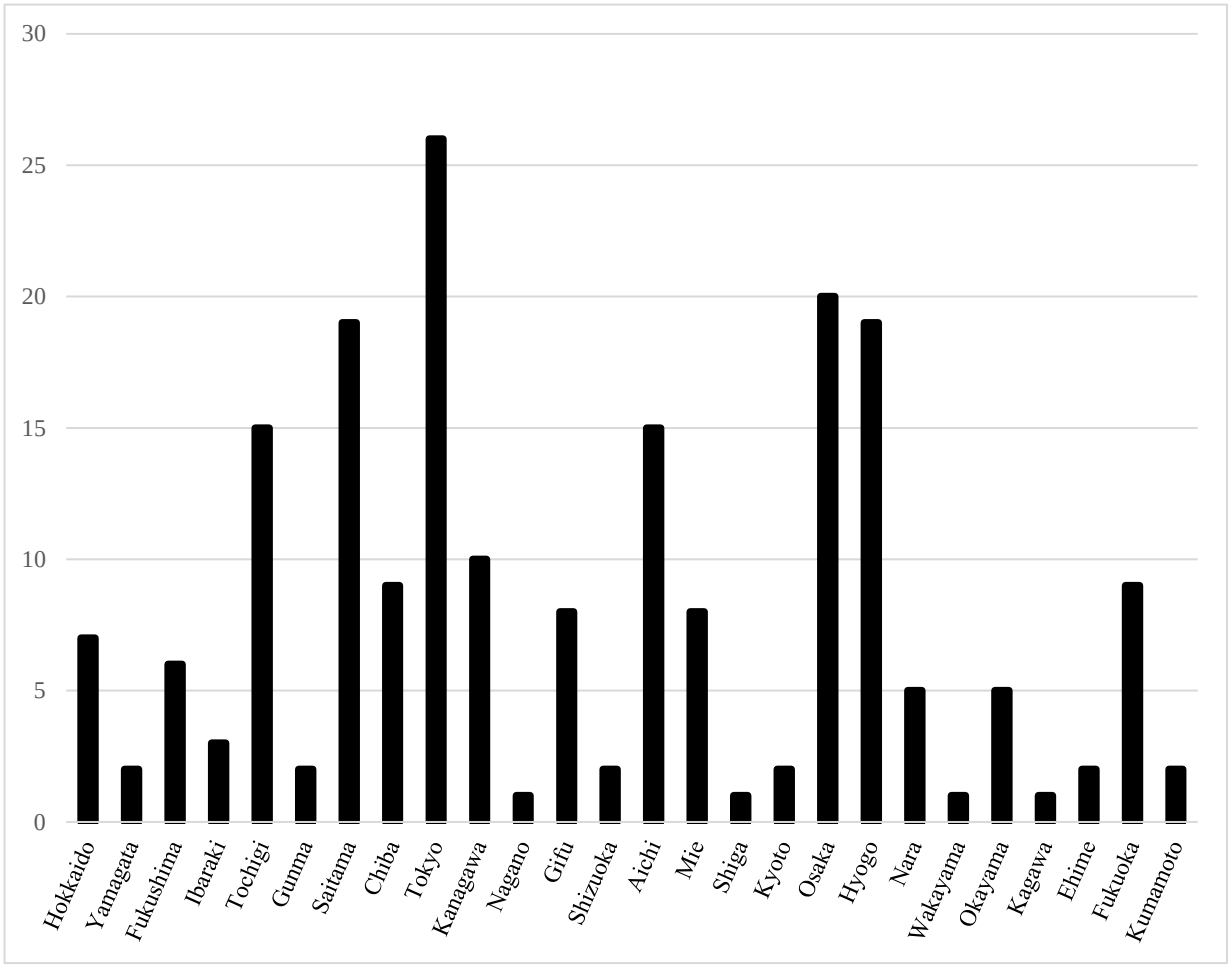

Figure 3. Distribution of current living prefectures (Unit: respondents)

Table 3. Descriptive statistics

Panel A: Respondent self	Obs	Mean	Std. Dev.
Gender (=1 if Female)	200	0.84	0.368
Age	200	27.715	4.433
Staying duration (Days by Jul 1 2021)	200	956.8	737.693
Religion (=1 if Yes)	200	0.78	0.415
Marriage (=1 if Yes)	200	0.175	0.381
School (years at home country)	200	13.32	2.832
Visa status (=1 if Low-skilled type)	200	0.46	0.500
Has a certification	200	0.33	0.471
Lives in metropolis (= 1 if Yes)	200	0.59	0.493
Has a loan (= 1 if Yes)	200	0.44	0.498
Monthly Income in 2019 (= 1 if Yes)	146	1256.586	410.370
Monthly Income in 2020-2021 (PPP-adjusted USD)	200	1352.673	382.226
Infected by COVID-19 (= 1 if Yes)	200	0.05	0.218
Receive a subsidy by Japanese government (= 1 if Yes)	200	0.725	0.448
Altruism based on psychological scale(Max=1, Min=0)	200	0.465	0.234
Altruism based on dictator game(Max=1, Min=0)	198	0.413	0.280
IMC score (Max=3, Min=2)	200	2.735	0.442
Panel B: Households	**Obs**	**Mean**	**Std. Dev.**
Household size	200	4.97	2.045
# of room	197	3.030	1.660
Engage in farming (= 1 if Yes)	200	0.41	0.493
Receive any subsidy in home countries (= 1 if Yes)	200	0.215	0.412
Ever infected by COVID-19 (= 1 if Yes)	200	0.07	0.256
Monthly Income in 2019 (PPP-adjusted USD)	200	1714.51	2908.533
Monthly Income in 2020-2021 (PPP-adjusted USD)	200	1480.045	2802.426
Income sources	200	1.445	0.663
Monthly contact with respondents in 2019	146	9.692	9.855
Monthly contact with respondents in 2020-21	200	10.82	10.393
Panel C: Remittance (Quarter-unit)	**Obs**	**Mean**	**Std. Dev.**
Remit (Quarterly total: PPP-adjusted USD)	1,508	1033.628	1479.616
Log_Remit	1,508	4.752	3.271

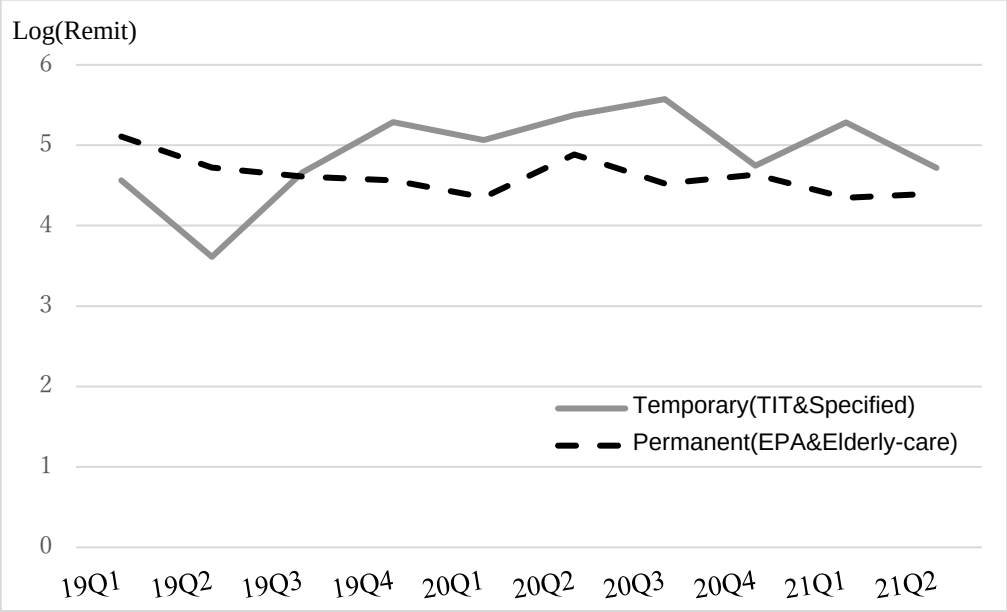

Figure 4. Remittance trend by each visa type

Table 4. Results (Primary analysis)

	Y= Log-converted remit amount in quarter			
	Fixed effect		Random effect	
	(1)	(2)	(3)	(4)
COVID-19 term	-0.219	-0.277	-0.328	-0.375
	(0.313)	(0.322)	(0.314)	(0.321)
	[-0.836,0.399]	[-0.912,0.357]	[-0.944,0.287]	[-1.005,0.254]
Received any subsidy in home countries for this quarter		0.2		0.152
		(0.461)		(0.455)
		[-0.709,1.110]		[-0.741,1.045]
Received public subsidy in Japan for this quarter		0.554**		0.558**
		(0.200)		(0.202)
		[0.160,0.948]		[0.163,0.953]
Face with any negative shock in home		-0.035		-0.09
		(0.447)		(0.369)
		[-0.916,0.847]		[-0.814,0.634]
Log_Income of respondent		0.257**		0.374**
		(0.095)		(0.133)
		[0.071,0.444]		[0.113,0.635]
Log_Household income in home		-0.042		-0.109+
		(0.070)		(0.055)
		[-0.180,0.096]		[-0.217,0.000]
Low skilled care workers			1.339***	1.368***
			(0.375)	(0.370)
			[0.604,2.073]	[0.643,2.094]
Altruism based on psychological scale			0.377	0.325
			(0.705)	(0.708)
			[-1.005,1.759]	[-1.062,1.713]
Altruism based on dictator game			0.308	0.175
			(0.513)	(0.520)
			[-0.697,1.313]	[-0.844,1.195]
Gender (=1 if Female)			0.129	0.078
			(0.504)	(0.481)
			[-0.858,1.116]	[-0.865,1.020]
Age			0.086+	0.073
			(0.048)	(0.048)
			[-0.008,0.179]	[-0.021,0.167]
= 1 if has a religion			-0.613	-0.61
			(0.409)	(0.414)
			[-1.415,0.188]	[-1.421,0.200]
= 1 if get married			-0.15	-0.103
			(0.413)	(0.407)
			[-0.958,0.659]	[-0.901,0.695]
Engage in farming/fishing in home			0.182	0.178
			(0.358)	(0.352)
			[-0.520,0.884]	[-0.512,0.869]
Loan when coming to Japan			0.649*	0.590+
			(0.327)	(0.334)
			[0.008,1.290]	[-0.066,1.245]
Constant	4.848***	3.335***	0.964	-0.493
	(0.279)	(0.872)	(1.487)	(1.880)
	[4.297,5.399]	[1.615,5.055]	[-1.950,3.878]	[-4.179,3.192]
R-squared (between)	0	0.0028	0.0207	0.0088
R-squared (Overall)	0.0028	0.0083	0.0177	0.0108
N	1508	1508	1489	1489

Note) + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. Robust-standard error in parenthesis. 95% CI in bracket.
Column (1) & (2) are estimated by fixed effects regression. Column (3) & (4) are estimated by random effects regression. All estimations are controlled by time (Quarter-unit) effects. In column (3) & (4), the home country effects are also controlled.

Table 5. Results (Heterogenous analysis)

	Y= Log-converted remit amount in quarter								
	X=COVID-19 phase			X=Home subsidies			X=Host subsidies		
Time invar var	Temporary	Altruism (Psychology)	Altruism (Dictator)	Temporary	Altruism (Psychology)	Altruism (Dictator)	Temporary	Altruism (Psychology)	Altruism (Dictator)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
X	-0.446	-0.914+	-0.584	-0.044	-1.397	0.932+	0.182	-0.452	0.44
	(0.345)	(0.501)	(0.413)	(0.521)	(1.090)	(0.525)	(0.261)	(0.386)	(0.307)
	[-1.127,0.236]	[-1.903,0.075]	[-1.398,0.230]	[-1.072,0.983]	[-3.546,0.752]	[-0.104,1.968]	[-0.333,0.697]	[-1.212,0.309]	[-0.164,1.045]
X* Time	0.680+	1.376+	0.671	0.843	3.499	-1.532	0.881*	2.164**	0.254
Invariant Var	(0.356)	(0.827)	(0.629)	(1.012)	(2.124)	(1.006)	(0.354)	(0.743)	(0.544)
	[-0.023,1.382]	[-0.255,3.007]	[-0.570,1.911]	[-1.152,2.838]	[-0.690,7.687]	[-3.515,0.451]	[0.183,1.579]	[0.699,3.630]	[-0.819,1.328]
R-squared	0.006	0.006	0.003	0.003	0.004	0.002	0.006	0.007	0.002
Joint-sig (2 related vars)	0.138	0.1774	0.3585	0.6573	0.2213	0.1763	0.0006	0.0006	0.0226
p-value of the model	0.010	0.004	0.035	0.0089	0.0074	0.0172	0.000	0.001	0.027
N	1508	1508	1489	1508	1508	1489	1508	1508	1489

Note) + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. Robust-standard error in parenthesis. 95% CI in bracket. All columns are estimated by fixed effects regression. All estimations are controlled by COVID-19 effects, Dummy of Received any subsidy in home countries for this quarter, Dummy of Received public subsidy in Japan for this quarter, Dummy whether the households face with any negative shock, Log-converted Income by respondents, Log-converted household income in home left behind and time (Quarter-unit) effects. For brevity, we only show the related variables.

Appendix

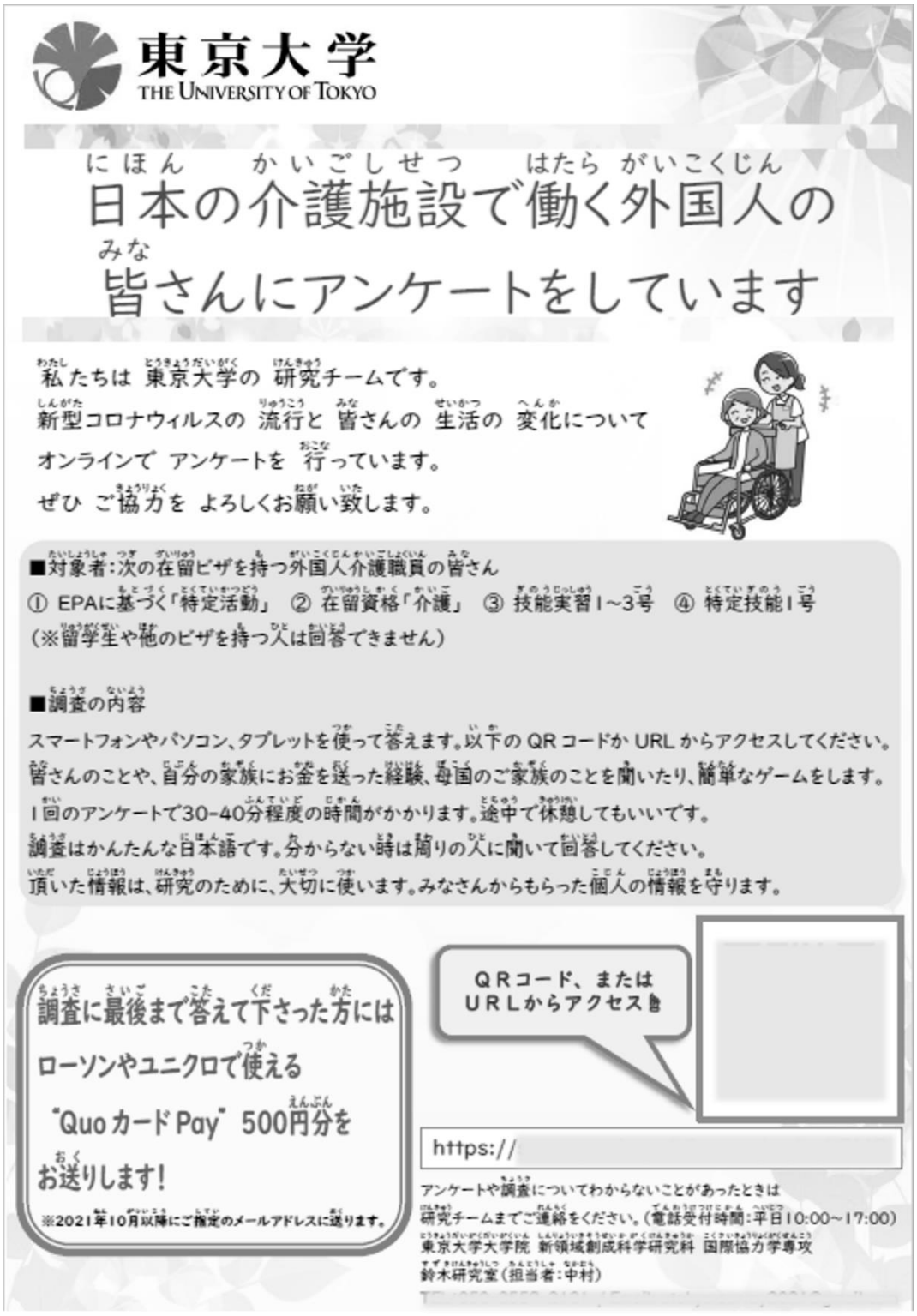

Figure A1. Distributed flier (Some parts are concealed)

Table A1. Summary statistics (Altruism degree by visa group)

	Permanent	Temporary	p-value
Altruism (Psychology)	0.468	0.466	0.945
Altruism (Dictator)	0.433	0.390	0.290