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

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

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Abstract

While the importance of international remittances has been recognized globally, understanding how public subsidies and the degree of individual altruism affect remittance behavior remains limited. Although international remittances were predicted to decline drastically in the early stages of the COVID-19 pandemic, remittance data proved that they were ultimately resilient to the anticipated negative shock of 2020. Potential reasons include altruistic motivations among migrants and economic stimulus programs in large economies; however, a detailed investigation from a micro-perspective is lacking and urgently needed. This study examines the impact of financial support in host and home countries. It also examines the individual impact of altruism on international remittances using unique data from foreign care workers in Japan. Our panel data estimation shows that emergency cash transfers from the host country positively affected migrant remittance amounts; however, no crowding-out effects were observed due to subsidies from home governments. The heterogeneous analysis also reveals that highly altruistic remitters were more likely to send money home after receiving cash transfers in the host country. The results support the claims of international organizations that the resilience of remittances was supported by altruism and public financial support during the pandemic.

Keywords: International remittance; Altruism; Japan; COVID-19; Cash transfers
JEL Codes: D91, I18, J61, O12, O19

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1. Introduction

Globally, a vast flow of international remittances occurs each year, with enormous economic benefits for receiving countries—especially developing countries. According to the World Bank (2020), current remittances to developing countries using formal channels reached approximately US$554 billion in 2019. This amount is four times larger than official development assistance (ODA) or about the same as the amount of foreign direct investment (FDI) provided to low- and middle-income countries. Therefore, international remittances are a potent engine of economic growth in developing countries.

Due to the recent importance of international remittances, researchers have investigated the motivations behind migrant workers' remittances to their home countries, both theoretically and empirically. Several conceptual frameworks used to analyze remittance behaviors are the altruism hypothesis (e.g., Funkhouser 1995; Lucas and Stark 1985), the exchange hypothesis (e.g., Cox et al. 1998), and the insurance hypothesis (e.g., Yang and Choi 2007). In addition, the researchers have explored a noteworthy phenomenon in remittance behavior known as "crowding-out effects," that is, the migrant is likely to 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[1] (e.g., Brown et al. 2014; Gerardi and Tsai 2014; Gibson et al. 2010; Jensen 2004; Kang and Sawada 2003; La and Xu 2017; Nikolov and Bonci 2020). Many studies have investigated whether these crowding-out effects occur with public transfers; however, the discussion is inconclusive because it depends on the policy context or targets (Nikolov and Bonci 2020). Thus, further studies are required in this area. Moreover, many of these empirical studies suffer from endogeneity problems in estimation and lack sufficient data to capture the main variables of their interests (Yang 2011). For example, the degree of individual altruism is an essential factor in some conceptual frameworks, such as the altruism hypothesis, but many studies assess the degree of altruism through indirect tests, such as using GDP size or family size as proxies due to the unavailability of data (Antoniades et al. 2018). This gives rise to the need for further investigation of the mechanisms underpinning international remittances.

The onset of the COVID-19 pandemic in early 2020 presented an opportunity to examine remittance motives in greater detail. Many countries implemented policies to restrict daily behaviors, such as introducing lockdown measures to circumvent the spread of the virus among citizens or strengthening border control to save citizens' lives. These non-pharmaceutical policy measures caused a severe global economic recession, and adverse shocks were expected to affect

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[1] Some studies suggest that social security programs such as CCT affect the decision to migrate (Adhikari and Gentlini 2018; Angelucci 2015; Hagen-Zanker and Himmelstine 2013; Stecklov et al. 2005).

international remittances. Because most countries implemented social security policies after the outbreak of COVID-19 (Gentilini et al. 2021) and at different points in time, we can study whether the effects of financial support on remittance behaviors differed between those provided in host countries and those in home countries.

Furthermore, although international organizations projected a bleak scenario for international remittances at the beginning of the pandemic, the total amount of remittances did not decline as much as expected. The causes and mechanisms of resilience should be investigated. In April 2020, the Migration and Remittances Team at the World Bank (2020) predicted that international remittances would decrease by approximately 20% due to the adverse effects on the income and employment of migrant workers. In addition, according to reports by the Asian Development Bank, including Park et al. (2020) and Kikkawa Takenaka et al. (2020), Asia has experienced the lowest regional growth outcome since 1961, which has had devastating effects on employment and income. Migrant workers were considered likely to be among the hardest-hit groups, with the total remittance to Asian countries expected to drop by $31–54 billion. However, one year later, the same team at the World Bank (2021a) published the actual results of international remittances, and although they were less than in 2019, the decline was much lower than projected. They estimated the total world remittance amounts in 2020 to be only 1.6% below those in 2019, with a 7.9% decrease observed in East Asia. This decrease was lower than during the global financial crisis in 2009, and surprisingly, the remittance amount in 2020 was still larger than the FDI into developing countries in the same year. The World Bank's team (2021a) suggests several potential reasons why international remittances remained resilient despite one of the biggest shocks experienced by the global economy.[2] Firstly, the World Bank claimed that migrants desired to help their families, who would more likely face a severe shock due to the pandemic in their home countries. Another important driver was that fiscal stimuli, such as cash transfers, especially by host countries, helped to support their economies and benefited migrants. While these explanations seem reasonable, they remain conjectural rather than based on rigorous research findings.

To understand the mechanisms of resilience in international remittances during a pandemic, this research examines the motives for international remittance by focusing on the effects of emergency subsidies in host and home countries and the degree of altruism measured directly using the dictator's game and psychological scales. We conducted an original online survey of

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

foreign care workers (FCWs) in Japan. We selected this population because there are several types of visas required to enter Japan as FCWs: professional and permanent-stay types or low-skilled and temporary stay types. Many theoretical and empirical studies suggest that temporariness in the host country (e.g., Merkle and Zimmermann 1992; Dustmann and Mestres 2010; Dustmann and Görlach 2016) strongly affects economic behaviors, including remittance behaviors. We evaluated the impact of visa status based on the possible duration of stay or skills on remittance using a sample of FCWs. In addition, the Japanese government implemented a one-time special cash payment program in 2020 to reduce the financial burden of the pandemic. This was an unconditional cash transfer to all registered residents in the country, regardless of nationality or visa type. As the program was implemented, we observed time variation in the distribution of cash payments depending on the municipalities in which they lived. This was because of a delay in logistics, which was randomly assigned to the recipients. We exploited such an exogenous time gap between recipients as a quasi-natural experiment to estimate the causal relationship between an unexpected increase in migrant incomes in host countries and international remittances. Furthermore, we collected detailed information on shocks experienced by their families left behind in their home countries, including the timing of any emergency subsidies received from their home governments during the pandemic and the timing of any adverse shocks, such as unemployment or COVID-19 infections. We used this information to examine whether the crowding-out effects of public subsidies exist. Another advantage of the original survey was that we directly inquired about individual altruism degrees using a psychological scale and the experimental format of the dictator's game. We added the results of each test to the model to quantify the importance of the degree of altruism in remittances. We constructed quarterly unit-based panel data and conducted estimations using fixed- and random-effect regression models with sample-clustered standard errors.

This analysis yielded interesting results. The estimation suggests that if migrants increase their income, their remittances also increase. Most importantly, the host country's emergency subsidy significantly increased the total amount of remittances received in the quarter. We did not find any impact of shocks experienced by home families (either positive or negative shocks) on remittance behavior, including the effects of public emergency subsidies received in home countries. This suggests that there is no crowding-out effect on remittances due to the public emergency subsidies received by home families. Moreover, although altruistic degrees ordinally do not affect remittance amounts, more altruistic migrants tended to increase their remittance amounts when they received Japan's public transfers. Furthermore, temporary visa holders are found to remit more than permanent visa holders, and this trend becomes greater on receipt of the subsidy by the host country.

This study contributes to the academic and practical strands of literature on the mechanisms of international remittances and migrant behavior. First, it provides more evidence of the motives behind international remittances. The unanticipated exogenous shock of COVID-19 provides an opportunity to study these motives. 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, with the exception of 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 can be adopted to evaluate altruistic degrees directly. Recently, recognition of the importance of non-cognitive skills in the labor market or development outcomes has grown (Guerra et al. 2014; Lindqvist and Vestman 2011). However, to our knowledge, few studies have examined the relationship between socio-emotional skills and remittances. Thus, estimates using the direct measures of individual altruism by socio-emotional skills can be used to explain the importance of non-cognitive skills in economic behavior among migrants in this research.[3]

Second, it contributes to the assessment of COVID-19 and the effect of subsequent financial support on remittances. As mentioned at the beginning of the paper, international organizations anticipated the devastating impact of COVID-19 on international remittances based on the understanding that migrants would suffer from unemployment or job insecurity (Borjas and Cassidy 2020; Honorati et al. 2020; Jewers and Orozco 2020) or the host economy would stagnate (Murakami et al. 2021). The impact evaluations, conducted shortly after the outbreak of COVID-19, also suggest that remittances were negatively impacted (e.g., Gupta et al. 2021; Mobarak and Vernot 2020) because of the redundancy of jobs or border restrictions imposed in many countries. However, as the World Bank (2021a) and Kpodar et al. (2021) suggest, international remittances were resilient to the adverse shock of the pandemic. Shimizutani and Yamada (2021) used household surveys to find that remittance-dependent households were more resilient during the pandemic because of the quick recovery of remittances. However, there are only a few microeconomic-founded explorations that establish any conclusive mechanism for understanding remittances during the pandemic. As this research directly examined the remittance behaviors of migrants during the pandemic in this unique survey, we provide a more refined picture of the "resilience" of international remittance.

Finally, this study analyzes the economic behavior of migrants from Asian countries, who account for 40% of global migrants (IOM 2017). Many studies on economic behavior among migrants are

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[3] Regarding non-cognitive skills on migrant behavior, many studies have focused on the impact of those skills on the decision or intention to migrate (e.g., Bütikofer and Peri 2021; Groenewold et al. 2012; Jaeger et al. 2010; Shuttleworth et al. 2020; Tabor et al. 2015).

concentrated in the United States or Europe because of policy contexts or data availability. The Japanese government has launched the policy measures regarding foreign workers in recent decades and has issued various visas, including temporary ones. While the literature examines the macroeconomic impacts of migrants on the national economy (e.g., Nakamura 2010), there are few micro-empirical analyses of migrants' behavior (Ramstetter 2016). Our study is the first to analyze remittance behavior among foreign workers in Japan, including temporary visa holders, based on primary data. Explicating the economic behavior of migrants from Asian countries is beneficial for policymaking in the development of this region and the generalization of research on remittances.

The remainder of this paper is organized as follows. Section II describes the context of this study. Section III illustrates the hypotheses with an explanation of some concepts. 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.

2. Contexts

FCWs in Japan

In recent decades, Japan has been facing the challenge of a rapidly aging society, with the pace of change occurring the fastest globally. This trend is expected to continue until the mid-21st century (Vogt 2018). Accordingly, the demand for elderly care services has increased. According to the Ministry of Health, Labour and Welfare in Japan (MHLW), although the number of users in elderly-care services was 1.49 million in 2000, that number had increased by 4.87 million in 2019, a growth of about 3.3 times in just 20 years (MHLW 2016 2019a). The expansion of the demand for elderly care services has led to a chronic labor shortage in this industry. To cope with the shortage of workers, the Japanese government has opened the door to recruiting FCWs and has allowed working visas since the latter half of the 2000s.

First, the government decided to issue visas for candidates of certified care workers from countries that had signed the Economic Partnership Agreement (EPA) with Japan in 2008, becoming the first policy to allow FCWs. The partner countries were Vietnam (accepted from FY2008), the Philippines (accepted from FY2009), and Indonesia (accepted from FY2014). To enter Japan with an EPA visa, they need to have graduated from nursing schools or obtain qualifications as certified care workers in their home countries. Although they are not required to obtain the nationally certified qualification of care workers in Japan on arrival, they need to return to their home country after four years if they do not pass the Japanese examination. If they pass, EPA visa

holders are allowed to stay in Japan permanently. After passing the exam, their families (partners 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 visa types for FCWs, issuing a professional visa called "Nursing Care." For this visa type, applicants are required to pass the exam to qualify as Japanese nationally certified care workers at the time of entry. Most Nursing Care visa holders have graduated from a professional school in Japan to obtain their qualifications. As with the case of the successful examinees among the EPA visa holders, Nursing Care visa holders are permitted to stay in Japan permanently. Because they have been certified care workers since their entry, 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 to the elderly care industry by introducing the "Technical Intern Trainee program." The government launched this program in 1993 to transfer the skills and knowledge cultivated in Japan to developing countries. Under the scheme, corporations, sole proprietors, and other businesses in Japan have formed employment relationships with foreign trainee interns. More than 270,000 foreign trainees have worked in various industries, such as agriculture, fishery, manufacturing, tourism, and architecture. This is one of the most extensive training programs globally (OECD 2016). In 2017, the government added elderly care as a job category in the Technical Intern Training program. Unlike the two previous visa policies that focused on professional workers, they were not required to take an exam as certified care workers in Japan. Since they are expected to transfer the skills they learn in Japan to their home countries, they are permitted to stay for a maximum of five years from their date of entry into Japan. In addition, they are not allowed to be accompanied by family members on this visa.

The most recent policy change for the measures on foreign workers in Japan is the introduction of a visa termed "Specified Skilled Worker," which began in 2019 to satisfy the chronic shortage of skilled labor in the labor force for various job categories across the country. The holders of this visa can stay in Japan for up to five years. If foreign interns under the Technical Intern Trainee scheme are willing to stay in Japan for more than five years, they can shift to Specified Skilled Worker visas; thus, the foreign trainee interns 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 Skilled Worker visa who aim to engage in elderly care do not need to hold the national qualification of certified care workers. They are also not allowed to have family accompanying them, as in the case of the Technical Intern Trainee scheme.

Table 1 summarizes the classification of each visa. More than 21,000 workers with visa status are currently engaged in the industry as FCWs. In this study, we selected FCWs among migrants in various industries for two reasons. First, we can evaluate the differences in visa types within the same industry on economic behavior, which is rarely observed in other industries. While each visa has specific traits such as a requirement for qualification, language skills, the possibility of having their families accompany them, and the objective of each scheme, the four visas can be classified into two types: permanent and professional visas (EPA and Nursing Care), and temporary and low-skilled visas (Technical Intern Trainee and Specific Skilled). Some studies suggest that the possible duration of stay in the host country based on job-related skills or policies in the destination may affect economic outcomes differently among immigrants (e.g., Dustmann and 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 the daily lives of users is the same among FCWs, allows us to differentiate the effects of the temporariness of stay in the host country on remittance behaviors.[4]

The second reason is the ease of recruiting respondents, as we have more information available on where these FCWs are working relative to migrant workers in other industries. A major difficulty in implementing this type of research is the lack of a comprehensive list of migrant workers in Japan. As we explain in Section IV, we first utilized the open data of elderly care facility lists from the MHLW and some rosters and recruited the survey participants via these facilities. Moreover, Mitsubishi UFJ Research and Consulting Co. (MUFJ) implemented large-scale surveys for FCWs in 2019 and 2020, which were supported and funded by the MHLW.[5] This report allowed us to compare the characteristics of the samples with their reports and check for 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 policy measures to control the infection among citizens. One of the most potent measures was announcing the state of emergency, which the government implemented in three periods from April 2020 to May 2020, January 2021 to March 2021, and April 2021 to September 2021. Under this statement, the government instructed citizens to avoid

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[4] If the FCWs obtain the qualification of national certified care workers, their income generally increases. We control the income in the estimation.
[5] Sources: MUFJ Research consulting. (2020). *Research Report on the Current Situation about the Acceptance of FCWs (in Japanese)*.
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)*. https://www.murc.jp/wp-content/uploads/2021/04/koukai_200423_14.pdf.

unnecessary outdoor activities, except for those 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 firms to supply emergency items such as medical equipment or food. In contrast to the lockdown measures conducted in other countries, the Japanese government implemented "request-based" quarantine measures and compliance because Japanese law does not allow the government to restrict citizens' or firms' behaviors. However, most citizens complied with the government's policies during emergencies. Companies and campuses closed, steps that proved adequate to manage the impact of the COVID-19 pandemic.

Some non-pharmaceutical policies, such as stay-home measures, caused an economic recession and increased the risk of reducing the national income or damaging the household economy. Thus, the government decided to implement a one-time unconditional cash payment called the special cash payment program on April 20, 2020, during the first phase of the state of emergency. This was designed 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 sex, age, household income, or nationality. That is, FCWs who had registered by that day also received the payment of about JPY100,000 [approximately US$ 950 (in April 2020)] per person. To receive this subsidy, applications via the Internet or by mail had to be made to municipal offices, which were in charge of disbursing this payment, and the cash was deposited into the bank account of the household head, which meant that most FCWs received the money. Although this was an application-based scheme, according to the Ministry of Internal Affairs and Communications (MIC) (2021), 99.4% of national households received a payment. The capacity and management skills of each local government considerably affected the disbursement process and timing (Kaneda et al. 2021). All municipality offices informed the residents of the procedure by May 2020 and started the application procedure by June 2020, with about 70% of residents receiving special cash payments by the same month. (MIC 2021). While some municipalities, such as Kumamoto (95%) and Sapporo (93%), had transferred cash to more than 90% of their citizens by June, others delayed the cash payment process. For example, only 3% of residents in Osaka, 7% in Nagoya, 5% in Chiba, and 23% in Yokohama had received payments at the end of June (The Mainichi 2020). All municipalities had completed their payments by March 2021 (MIC 2021).

Payment timing was almost random among the cities where citizens lived, regardless of their economic status or location.[6] Our survey also revealed that the timing of payments varied among the respondents. We exploit the exogenous variation in cash payments as a quasi-natural experiment to test the remittance mechanism. Kaneda et al. (2021) and Kubota et al. (2021) used this exogenous variation as a treatment for consumption responses in Japan as a natural experiment. Kaneda et al. (2021) evaluated the impact of cash transfers on household consumption using high-frequency data from financial management smartphone applications. They found an immediate and positive response to the subsidy to consumption among recipients, and the magnitude of the treatment varied depending on the characteristics of the citizens. Kubota et al. (2021) also investigated the impact of cash payments on household consumption using a unique panel of 2.8 million bank accounts. They observed an immediate increase in spending during the week of the payment. However, to the best of our knowledge, the impact of unconditional cash transfers in host countries on migrant remittances has not yet been studied.

COVID-19 and social security in home countries

Developing countries in Asia that send FCWs to Japan also struggled with the pandemic, and governments made efforts to stop infection among citizens. The measures taken by these countries varied. For example, countries such as the Philippines and Indonesia experienced a rapid expansion of infections and implemented strict lockdown measures. The International Monetary Fund (IMF 2020) predicted significant adverse effects due to the pandemic on low-income households in developing countries, such as serious unemployment levels. Moreover, they claimed that severe economic recession might hinder efforts to achieve international goals to reduce extreme poverty. Nakamura and Suzuki (2021) also found that the online search volume related to job security, such as the queries "job" or "income," escalated dramatically after the enforcement of the lockdown measures in Indonesia, the Philippines, and Vietnam.

In a review document published by the World Bank prepared by Gentilini et al. (2021), most countries have introduced some social protection measures to save citizens' lives globally, such as cash or in-kind transfers and labor protection, including wage subsidies or insurance support. For example, Vietnam, which was relatively successful at controlling infection, provided support of VND1–1.8 million (approximately US\$44–79) per month for a finite period, mainly for workers who lost jobs or were suspended from their jobs. Moreover, social assistance beneficiaries would receive VND500,000 (US\$22) per person per month between April and June 2020. Indonesia, a country that experienced severe epidemics, expanded the beneficiaries of the

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[6] To confirm the randomness of the payment timing, we regressed the timing of subsidy receipt on the respondents' characteristics and the regions they live and find no statistically significant relationship between these variables (Table A1).

CCT program (Program Keluarga Harapan) from nine million households to 10 million households (15% of the entire population) and doubled the benefit level for three months (IDR600,000 (US$42) from April to June 2020, and IDR300,000 afterward). In addition, the country introduced a new unconditional cash transfer program called BLT Dana Desa, which continued until December 2021. Local governments also provided in-kind food assistance and cash assistance to beneficiaries outside the scope of previous programs. The government launched a wage subsidy program or a 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 PHP5,000–PHP8,000 (US$100–160) for two months to 18 million households out of 24 million households in the nation. These were mainly recipients of the CCT program called the Pantawid Pamilyang Pilipino Program. The payment for residents in the severely restricted quarantine area was made again between May and September 2020. The government 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 and households facing adverse shocks. In contrast to Japan, which provided a universal subsidy to all residents in the country, social assistance in developing countries was provided exclusively for nationals in trouble. Among the sample in this study, 21 respondents acknowledged the receipt and timing that households in their home countries received public emergency subsidies.

3. Concepts & Hypotheses

Many researchers have attempted to elucidate the motives for remittances, and some theoretical hypotheses have been discussed: the altruism hypothesis (Barro 1974; Becker 1974; Lucas and Stark 1985; Cox 1987; Funkhouser 1995; Stark 1995; Azizi 2016, 2019; Bouoiyour and Miftah 2015; Kananurak and Sirisankanan 2018; Mallick 2017), exchange hypothesis (Lucas and Stark 1985; Cox et al. 1998; Cox et al. 2004), investment hypothesis (Ilahi and Jafarey 1999), and insurance hypothesis (Foster and Rosenzweig 2001; Agarwal and Horowitz 2002; Yang and Choi 2007; Batista and Umbljis 2016). Further, remittances may play a role in income smoothing in households left behind, disregarding any motives (e.g., Amuedo-Dorantes and Pozo 2011).

While many motivations exist for international remittances within the micro determinants of remittances (Lucas 2006), we can categorize these motives in two general ways: the "instrumental" motives (i.e., support for the family left behind; savings for investments; and insurance for the future return) and "intrinsic" motives (i.e., pure altruism, warm glow, and self-interest possibly arising from repeated interactions) (c.f., Dustmann and Görlach 2016). In this study, we focus on

the latter framework owing to data constraints. First, we considered individual altruism as an intrinsic motive. Traditionally, economics has assumed that rational actors are selfish actors, but recent research has emphasized altruism in their economic behaviors, such as donations (Andreoni and Payne 2013). In the context of remittances, individual altruism is also a crucial component of the motives behind it because migrants may consider not only the utility of the migrant themselves but also the utility of the families left behind for their behavior (Rapoport and Docqier 2006). For example, in the altruism hypothesis—one of the theoretical frameworks of remittance—migrants' degree of altruism contributes to their remittance. Some empirical studies also study the presence of altruistic motives for international remittance in relation to other conceptual hypotheses, such as the exchange or self-interest hypothesis or familial motive (e.g., Cox et al. 1998; Agarwal and Horowitz 2002).

Various methods have been used to measure altruism. As for the direct measures, in behavioral economics, economists often have employed the dictator's game to evaluate individual altruism (Engel 2011; Levitt and List 2007; Vesterlund 2015; Andreoni and Bernheim 2009). In the lab-based dictator game, a respondent is simply given an endowment and asked how much of the endowment they would like to give to an anonymous recipient (Vesterlund 2015). This is an ultimatum game with no opponent's rejection (Camerer and Ho 2015). The researchers captured the respondents' preferences for giving by the amount they provided. While more than 60% of respondents tend to offer roughly 20% of the endowment on average (Levitt and List 2007), some characteristics, such as the traits of the respondents or social distance from opponents, are known to affect the results (Engel 2011). In addition to the dictator's game, recent economic literature has adopted a psychological scale based on the respondent's experiences to capture the degree of altruism among decision-makers (e.g., Capra et al. 2021).

In the discussion of individual altruism, there are several motivations for altruistic behaviors, including "pure altruism" and "warm glow" (Andreoni 1990; Carpenter and Myers 2010; Kuroishi and Sawada 2019). While the utility of decision-makers is based on the final output of giving in the pure altruism context, the utilities of those motivated by warm-glow tend to increase by the act of giving itself (Crumpler and Grossman 2008). If a player's altruistic behavior is motivated by a warm glow, they are unlikely to provide a transfer amount as high as that of a player motivated by pure altruism (Andreoni 1990).

Second, another strand of literature has investigated the relationship between public financial support and remittances, leading to a discussion of the crowding-out effect. Some studies have supported crowding-out effects on private transfers by recipients of public financial support [e.g., Jensen (2004) in South Africa; Brown et al. (2014) in Fiji and Tonga; Kang and Sawada (2003)

in the Republic of Korea; Gerardi and Tsai (2014) in Taiwan]. Other studies suspect that crowding-out effects are modest or minor [e.g., Gibson et al. (2010) in China, Indonesia, Papua New Guinea, and Vietnam; Lim and Morshed (2015) in 122 developing countries]. Some studies also show that crowding-out effects heterogeneously appear in a specific group depending on some characteristics, such as low-income or rural locations where the family lives [for example, Albarran and Attanasio (2003) in Mexico; La and 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 settings, although the effects are observed to varying degrees. As many governments provided financial support to affected households during the COVID-19 pandemic, both in developed and developing countries, this research investigates how these policies affected migrants' remittance behavior using micro-level data. The crowding-out effects of emergency aid due to disasters or unordinary times have rarely been examined. This study is also the first to explore the impact of unconditional cash transfers in host countries on migrant remittances.

Although some international organizations initially anticipated a dramatic decrease in international remittances at the onset of COVID-19 due to the economic recession, the magnitude of diminution was relatively less than expected in 2020 (World Bank 2021a; Kpodar et al. 2021). They argue that the relatively small decline was due to migrants' desire to help their families. Moreover, the fiscal stimulus, especially by large economies, motivated international remittances during the pandemic. However, these justifications remain conjectural because it is possible to consider several scenarios in this situation. For example, while private transfers from migrants are expected to increase with the receipt of emergency subsidies in host countries, we could expect crowding-out effects if families in their home countries increase their income due to positive shocks, such as receiving public subsidies from the government. Moreover, when households in the home country decrease their income due to negative shocks such as unemployment, migrants are expected to remit more because their remittances would work as income smoothing. Furthermore, as the World Bank claimed, highly altruistic migrants are expected to increase their remittances more than others. Applying this logic, we set the following hypotheses:

Null Hypothesis 1: When migrants' income increases because of a positive shock (i.e., receiving a special cash payment in Japan), migrants do not change the amount of their private transfers.

Null Hypothesis 2: When migrants' families in their home countries experience a negative shock to their income (e.g., unemployment or COVID-19 infection), migrants do not change the amount of their private transfers.

Null Hypothesis 3: When migrants' families in their home countries face positive shocks (i.e., the home government's financial support during the pandemic), migrants do not change the amount of their private transfers.

Null Hypothesis 4: The remittance amount does not differ between migrants with a high degree of altruism and a low degree of altruism.

Moreover, recent literature suggests that the permanency of stay in host countries affects the economic behavior of migrants (e.g., Merkle and Zimmermann 1992; Chabé-Ferret et al. 2018; Collier et al. 2018; Dustmann and Görlach 2016; Dustmann and Mestres 2010; Yang 2008), including remittance behaviors. Temporary migrants tend to remit more to their home countries than permanently placed migrants because they expect future utilities or earnings such as investment in their home countries. Fortunately, our data from the FCWs allow us to compare the economic behaviors of both temporary and permanent migrants, as discussed in the context section. Therefore, we propose the following hypothesis:

Null hypothesis 5: The amount of remittance does not differ between migrants who hold temporary visas (i.e., the Technical Intern Trainee or Specified Skilled Worker visa) and permanent visa holders (i.e., the EPA or Nursing Care visa).

4. 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 were not found in the secondary data. In this section, we explain the sampling method, format and contents of the questionnaire, and details concerning the data.

Sampling method

As we did not find personal information for each FCW in the country, we recruited the respondents via elderly care facilities where the FCWs were employed. As the MHLW publishes open data on the names and addresses of all elderly care facilities to the public, we selected facilities from this open data and sent letters to them asking for their cooperation in the research. We used the three methods for the selection of the targeted elderly-care facilities in the open data. First, we relied on MHLW information. The MHLW publishes the number of successful examinees who have passed the exam to become certified care workers among EPA visa holders every year. In these lists, the MHLW discloses the names of the facilities for each successful

applicant. We extracted 436 elderly care facilities from those lists, which were published from FY2012, when the first exam taken by foreign applicants was held, to FY2020. Second, we searched for news articles and websites of facilities that had introduced FCWs in the country. We found 168 additional facilities that employed FCWs, apart from those chosen by the first method. Third, we predicted that the number of facilities we could contact using the previous two methods would be insufficient. Therefore, we randomly selected elderly care facilities using open data from the MHLW. We obtained lists of facilities in the top ten prefectures for the number of Nursing Care visa-holders according to the recent statistics offered by the Immigration Services Agency of Japan.[7] We then assigned random numbers to all facilities on the obtained list and selected an additional 3,936 facilities from the lower random number. As a result, we mailed a request for participation in our survey to 4,540 facilities in Japan in August and September 2021.

We sent 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. In the flier, we described the objectives and provided an abstract of the survey, and included information on the honorarium and contacts of the help desk written in easy Japanese. The respondents could access the online survey using the URL or QR code displayed on the flier. We offered a mobile coupon equivalent to JPY500 (approximately US$5) to the respondents as a reward if they answered all questions in the survey. We set this price for the honorarium because the minimum hourly wage in Japan is approximately JPY1,000, and we expected respondents to finish each survey in approximately 30 minutes.

Survey procedure

We implemented this original survey using an online survey platform[8] to minimize measurement errors and logistics costs and to ensure the survey was easily accessible to FCWs during the pandemic. As the target samples were of a younger age (73.6% were in their 20s, according to the MUFJ reports), we assumed that they would be comfortable with the use of digital devices, such as smartphones and computers. Moreover, the MHLW(2019b) has provided guidance on employing FCWs in the facilities and asked them to secure a living environment in which the FCWs can communicate easily with their home families, such as installing Wi-Fi facilities in their

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[7] We employ this method because our field observation implies that elderly care facilities employing Nursing Care visa holders have a well-organized recruitment system for FCWs and are likely to hire other visa holders. We expected to advertise the survey to FCWs efficiently. The top ten 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 on Shikoku Island and Fukuoka is the economic center of the Kyushu Island.

[8] We utilize the Zoho survey in this research.

dormitories or supporting the subscription of mobile phone services. Thus, an online survey was deemed reasonable for this study. We conducted the survey using a beginner-level Japanese questionnaire [N4-N5 level (beginner's level) in the Japanese-Language Proficiency Test[9]] because all FCWs are required to master their Japanese level, at least to the N5 level. However, we found variation in Japanese skills among 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. Moreover, we translated difficult keywords into several languages in the questionnaire. These translations were supervised by native speakers. At the beginning of the questionnaire, we announced that the respondents could answer the questions with the help of other fluent Japanese speakers if they could not understand the questions well. More than 76% of respondents felt it was easy or relatively easy to answer the questionnaire in the survey.

One concern with online surveys is that the respondents may not be as diligent as the researchers expect when answering the questions, and these answers may decrease the validity of the survey. Many surveys in social sciences, such as psychology, have adopted 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 the instructions on the questionnaire using a style and format similar to other questions, for example, in the Likert scale questions. For instance, the message "Please click the button 'No' in this question" was employed after making the respondents read a relatively long question, regardless of the contents of the question, and the respondents were expected to answer "No" if they had read the question correctly. Three IMC questions were included in the middle of the questionnaire. Given the random error caused by mistyped answers, we regarded them as valid samples if they correctly answered more than two IMCs.

Questionnaire

The questionnaire is comprised of four parts. In the first part, we asked respondents about socio-economic characteristics, such as type of visas, entry dates into Japan, age, and gender. In addition, the respondents shared their experiences before coming to Japan, including education and work experience in their home countries and loan experiences for migration. Regarding income information, we inquired about their average monthly income in Japanese currency before and after COVID-19. The second part covered household information in their home countries, such as household composition, assets, infection, or unemployment experience during the pandemic,

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[9] The 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.

and the frequency of contact with the respondent. As with the respondents, we inquired about their average monthly income in their home currencies before and after COVID-19. Next, we investigated 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 of 2019 to the 2nd quarter of 2021. We did not ask about the weekly or monthly data on remittances because lengthy surveys have shown 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 obtaining quarterly data is the best option for researchers.

The final part of the questionnaire consisted of games and questions that assessed the degree of altruism. We provided two questions to test for altruism. The first is a self-reporting scale based on past engagements in altruistic behavior developed by Rushton et al. (1981), which is commonly used in 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 ranging from "never did" (0 points) to "do very often" (4 points). 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 from among those in the original scale and considered common behaviors across countries (Table 2). Some studies have found that these psychological traits may also change after a person experiences a significant shock (e.g., Hanaoka et al. 2018). As the COVID-19 pandemic has led to behavioral changes among people, such as refraining from physical contact with others, one concern was that using the altruism index measured after the pandemic may not capture altruism in ordinary times. Therefore, we used the measure of altruism, based on questions that capture altruistic experiences before they came to Japan or before the pandemic. For this altruism scale in the data, we summed the total scores for each behavior, and the total score was divided by the maximum points (40 points) to standardize the indices.

The other index is derived from the dictator's game to detect individual altruism and is commonly used in experimental economics (Engel 2011). In this game, the enumerators offer a setting to give some money to the respondents and ask whether and how much the respondents will give to someone else. The values raised by the respondents were regarded as the degree of altruism. In a typical setting, two participants (e.g., college students) directly join this game, and the researchers evaluate the amount of money they give to the opponent. However, we could not create such an environment using an online survey. Moreover, some studies suggest that the results of a dictator's game may be influenced by the closeness to opponents, such as family members, an anonymous

person who has similar characteristics to the respondents, or the asymmetry of information about the receipt of money (Ambler 2015; Ben-Ner and Kramer 2011; Torero and Viceisza 2015). To address these concerns, we provide a dictator's game with two opponents in two situations (2×2 = 4 cases) in this survey. In the first case, we presented a fictitious woman as an 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 have produced a setting similar to that of an ordinary dictator's game in person. In addition, two situations are provided in this fictitious case: one where the woman knows that the respondent has received money, and the other where the woman does not know that the respondent has received money. These situations were provided to cope with information asymmetry. In the second case, we conducted the game in a setting where the opponents were the respondents' families in their home countries. Similar to the first case, we offered two situations regarding information asymmetry: the family knows or does not know. We asked how much the respondents would pay for the other person if we gave JPY10,000 to each respondent 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 game. In the discussion of individual altruism, it has been pointed out that there are several motivations for altruistic behaviors: pure altruism and warm glow (Andreoni 1990; Carpenter and Myers 2010; Kuroishi and Sawada 2019). In this research, we exploit each experiment in the dictator's game to disentangle altruistic motives in the remittance behaviors of FCWs.

We tested individual altruism using two methods because each has pros and cons. Some studies suggest that unobservable determinants, including mental traits, change after a significant shock (e.g., Hanaoka et al. 2018). To control for these fluctuations, we evaluated their altruism for self-reported psychological altruism, which was not influenced by the pandemic. At the same time, it might depend on their cultural context or the situation in which they were. On the other hand, altruism can be estimated experimentally using the dictator's game, but we cannot deny the influence of the pandemic on the results. Therefore, we comprehensively evaluated the degree of altruism using two scales.[10]

Data

After collecting the questionnaires, we cleaned the data 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 to those that passed more than two IMCs in the dataset. Although we collected data from 218 samples in the online survey, 200 respondents passed our criteria for IMC; thus, we used

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[10] We show the determinants of each altruism scale in Table A2. We find that there is no significant difference in the altruism degrees between temporary or permanent visa groups.

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 in or after the second quarter of 2019, to the second quarter of 2021. Therefore, we obtained 1,508 observations from 200 samples from the dataset.

Figures 1 to 3 show the distribution of the sample in these data on their visa type, origins, and prefectures in which the respondents are currently residing. Regarding visa type, although the largest sample belongs to Technical Intern Trainees (40%), it is almost equally distributed between permanent visa holders (EPA and nursing care) and temporary visa holders (Technical Intern Trainees and Specified Skilled Workers). Regarding their origins, 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 workers are 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 were also collected.[11]

Table 3 presents the summary statistics for this dataset. The data were mainly composed of relatively young female FCWs (84%). On average, they had already stayed for more than two and a half years, and about 80% were religious and single. On average, they have an education degree equivalent to the completion of high school in their home countries, and one-third have passed the national qualification exam for certified care workers in Japan. Of the respondents, 7% were accompanied by a family member to Japan. In regard to the special cash payments from the Japanese government, 72.5% had received the payment; however, some respondents had migrated to Japan after May 2020 and were outside the subsidy inclusion targets. The households left behind in their 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 governments in their home countries, and some family members (7%) had been infected by SARS-CoV-2. Regarding the psychological altruism scale and the dictator's game scale, we observed variations in their scores in the samples. When we dissolve the dictator's game scale into each game scale, we find that the respondents are likely to transfer more to their families than to the anonymous person in the game.

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[11] 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, as mentioned in Footnote 5.

As the income of respondents,[12] the income of households,[13] and the remittance amount of the respondents are reported in different currencies, we converted them into US dollars using the PPP-adjusted price.[14] Regarding income information, we only inquired about the average value before and after the pandemic, with consideration given to the volume of questions. We treated the 1st to 4th quarter in 2019 as the ex-ante period of COVID-19 and the 1st quarter in 2020 to the 2nd quarter in 2021 as the ex-post period. We substituted the average values before and after the pandemic into the value for each quarter in the panel dataset. We observed that the average PPP-converted respondents' income increased after the pandemic began, but the average PPP-converted household income decreased. Regarding remittances, more than 90% of the respondents made remittances to their home countries, and they remitted approximately US$1,000 in PPP value each quarter. Figure 4 represents the average trend of remittances among visa holders, 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 of 2019, temporary visa holders' share surpassed this after that. This tendency was also observed during the pandemic.

Furthermore, we find variation in the timing of receiving the special cash payment at the quarter level, as shown in Figure 5. As no municipality office has released information about the timing or ratio of special cash payments, this information is reported by each respondent. According to the MIC (2020), approximately 70% of residents had received special cash payments by June 2020, the 2nd quarter of 2020. However, more than half of eligible foreign workers received cash payments after the 3rd quarter of 2020. This is because FCWs are concentrated in urban areas, causing more delays in the distribution of benefits. In addition, a quarter of the sample did not reside in Japan at the reference date set by the government.

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[12] 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.

[13] Regarding the income of the households left behind, we observe some missing values because the espondents did not know the exact value. We substitute the average value of each country in each period into a missing value. We calculate the average price from other samples in the dataset for 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 was few, we substituted the average price with data produced by CEIC (https://www.ceicdata.com/en/indicator/annual-household-income-per-capita). Respondents from other countries have no missing values.

[14] 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.

5. Estimation strategy

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

$$log(Remit)_{i,q} = \beta_1 COVID19_q + \beta_2 Homesubsidy_{i,q} + \beta_3 Hostsubsidy_{i,q} + \beta_4 Negativeshock_{i,q}$$

$$+ \beta_5 log(Hostincome)_{i,q} + \beta_6 log(Homeincome)_{i,q} + \rho_i + \sigma_q + \mu \qquad (1)$$

where $log(Remit)_{i,q}$ is the log-converted total remittance amount (PPP-values) in the qth quarter for migrant i as the outcome of the model. $COVID19_q$ denotes 1 if the quarter q is on or after the 1st quarter in 2020. $Homesubsidy_{i,q}$ equals 1 if migrant i's households in the home country receive the government's subsidy in *the q*th quarter, and $Hostsubsidy_{i,q}$ is a dummy variable based on whether migrant i receives a special cash payment by the Japanese government in *the q*th quarter. As mentioned in the context section, the amount of cash payments in Japan is the same among all citizens, regardless of their characteristics. Therefore, we relied on the variation in the timing of cash payments received to estimate the effect of the subsidy by the host government.[15] $Negativeshock_{i,q}$ is denoted as 1 if i's households in the home countries face negative shocks (unemployment or infection) on and after the qth quarter. Furthermore, each $log(Hostincome)_{i,q}$ and $log(Homeincome)_{i,q}$ represents the log-converted average monthly income (PPP) in the qth quarter of the i or i's household in the home country. The model using both log-converted remittances and income allows us to estimate the income elasticity of the remittances.

First, we estimated this model using 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 the time-invariant variables. Instead of the

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[15] Thirty-eight respondents who had received the special cash payment did not remember when they received the subsidy, as shown in Figure 5. In these cases, we hypothesized that they received the payment by June 2020 (i.e., in the 2nd quarter in 2020) because they were likely to know the benefits during this quarter and 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 represented in Tables A3 and A4.

panel fixed effects ρ_i, we include control variables X: Visa types (=1 if temporary visa), altruistic experience scale, dictator's game scale, gender (=1 if female), age, origins (reference is Vietnam), religion status (= 1 if believes in any religion, = 0 if an irreligionist), marital status (=1 if married), farming by households, loan experience, dummy variable whether family members accompany in Japan, and schooling years at home in Eq. (1). We check the effects of temporariness in the host country and the degree of altruism in the random effects regression.

Furthermore, we conducted a heterogenous analysis using interaction terms with time-invariant variables, such as the degree of altruism and temporary stay visas, with the fixed-effects model, as follows:

$$log(Remit)_{i,q} = \beta_1 COVID19_q + \beta_2 Homesubsidy_{i,q} + \beta_3 Hostsubsidy_{i,q} + \beta_4 Negativeshock_{i,q}$$

$$+ \beta_5 log(Hostincome)_{i,q} + \beta_6 log(Homeincome)_{i,q} + \beta_7 TV_{i,q} * TI_i + \rho_i + \sigma_q + \mu \quad (2)$$

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

6. Results

Primary analysis

Based on Eq. (1), we first estimated the fixed-effects regression model as the primary analysis. Table 4 presents the results. As shown in Columns (1) and (2), we did not observe any noteworthy COVID-19 outbreak results for remittances. Therefore, the results reveal that FCWs are unlikely to increase or decrease the actual remittance amount because of the pandemic, although some international organizations projected a dramatic decrease in international remittances at the beginning of the pandemic. One of the reasons may be that the FCWs were able to maintain their jobs even during the pandemic, unlike the tourism or restaurant industries, although emergency declarations or stay-at-home measures may negatively affect remittances among FCWs. On the one hand, when migrants receive special cash payments from the Japanese government, the results suggest an increase in their remittances of about 79%. Moreover, the results show that remittances increase if respondents' incomes increase. The estimation shows that if migrants increase their income by 1%, their remittances increase by 0.26%. On the other hand, we did not find any

noteworthy results for the effects of subsidies 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 effects 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 contrary to the idea that remittances provide insurance for families in home country households (e.g., de la Brière et al. 2002; Yang and Choi 2007). Thus, of the null hypotheses presented in Section III, we rejected null hypothesis 1 but not null hypotheses 2 or 3 from the fixed effects estimation.

Columns (3) and (4) in Table 4 present the estimation results of the random-effects regression. Although we observed the same tendency as the fixed effect regression analysis on each variable, 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 suggests that home household income has crowding-out effects. One merit of the random effects regression estimation is that the impacts of time-invariant effects can be measured. The results suggest that the remittance amount is larger for temporary visa holders (Technical Intern Trainees or Specified Skilled Workers) than for permanent visa holders (EPA or nursing care). One reason 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 and Vinogradova 2015; Dustmann and 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 earnings or lifetime utility maximization after their return.[16] Regarding the altruism scale, we did not ordinally observe the effects of the behavior itself; thus, remittance behavior may not be influenced by altruism. Therefore, while we rejected null hypothesis 5 regarding temporariness, we did not reject null hypothesis 4 regarding altruism.

Heterogenous analysis

We conducted a heterogeneous analysis using the interaction variables for time-invariant variables (altruism degree and temporary visa status) and time-variant variables (COVID-19 shock and subsidies from the host and home countries) based on Eq.(2) in order to estimate the policy effects in detail. Table 5 presents the results of the heterogeneous analysis. We also show the F-test of the related variables captured in the fixed effects regression. Columns (1)–(3) show the interaction effects of the COVID-19 shock and time-invariant factors. We detected some positive effects for

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[16] The classification of the visa schemes based on the possible duration is also influenced by the skills the foreign workers possess. We note that the skill composition may also affect the remittance amount (Adams 2009).

temporary status at the 10% significance level. While the effect of temporary status originally had a positive effect on random effect estimations in Columns (3) and (4) of Table 4, temporary visa holders multiplied their remittances during the pandemic by approximately 97%. On the one hand, regarding the degree of altruism, 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 significantly 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 estimation of the random effects in Columns (3) and (4) in Table 4, the interactions suggest that the altruism degree functioned well after the pandemic outbreak. Although insignificant, we observed a positive tendency for interaction effects with the dictator's game degree (Column (3)).

Concerning the interaction effects with 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 more altruistic experience increased their remittance amounts at the time of receipt of subsidies by the host country. While we found significant effects of receiving the subsidy from the host country in the base estimation shown in Table 4, the effects are insignificant after including the interaction variables. When we decompose the policy effects of unconditional cash transfers in Japan, the positive results on remittances may be attributed to respondents with a specific type. In addition, similar to the interpretation of the heterogeneous analysis of COVID-19 shocks, altruistic people are likely to increase their remittances after receiving unexpected income. Interaction with the dictator's game is also positive but still insignificant. Therefore, based on the analysis, we partially rejected null hypotheses 4 and 5 in Section III.

Altruistic behaviors may be driven by either pure altruism or warm-glow motives (Andreoni 1990; Carpenter and Myers 2010; Kuroishi and Sawada 2019). To disentangle the motivation for individual altruism, we used various designs to measure the scale based on the dictator's game. One aspect is the type of opponent (whether an anonymous FCW or family members), while the other is whether the opponents are aware that the respondents received the subsidy. Thus, we provided four virtual different scenarios (2 × 2). For example, in a scenario where the opponent is a family member, and their family members know that the respondent receives money, it is highly likely that the altruism of the respondent is based on vanity rather than pure altruism. However, when the counterpart is a stranger (an anonymous female FCW), and she does not know

that the respondents received money, the base for altruism in remittances may be due to pure altruism.

Table 6 presents the results of the heterogeneous analysis of each dictator game. We observed that all the coefficients are insignificant, except for the interaction effects between the COVID-19 phases and the unknown situation for an anonymous FCW, which is positive at the 10% significance level (Column (4)). For this particular scenario, the FCWs would not ask for something in return or to show vanity to the opponents because the opponents do not know the respondents at all. Thus, the statistical significance of this interaction term seems to indicate that pure altruism is functional. This result is also in line with the results obtained for the interaction term of the psychological scale variable in Table 5, which basically evaluates altruism toward strangers (see. Table 2). Given this result, we may associate the behavior of FCWs in increasing the remittance amount with pure altruism, not with the warm glow or vanity during the pandemic. While there are some concerns regarding this estimation, such as a relatively weak p-value in the F-test and the risks of multiple hypothesis issues, the results provide suggestive evidence that pure altruism has been a driver of international remittances under global health risks. Taking the results as a whole, we find that the results in Tables 4 and 5 suggest that individual altruism itself (evaluated in both the dictator's game and the psychological scale) does not affect the remittance amounts. However, the interaction term of individual altruism, including pure altruism, with COVID-19 or the timing of the host subsidy positively affects remittance behavior. Although there is room for interpretation, individual altruism, especially pure altruism, may have functioned to promote international remittances only in extraordinary times.

7. Conclusion

This study 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 reveals that the FCW's income and cash payments implemented by the Japanese government prompted more remittances by FCWs. However, we did not detect any effects of positive or negative shocks for households in the home country on remittances, which means that there are no crowding-out effects after receiving public subsidies in the home country. Moreover, the heterogeneous analysis suggests that the individual altruism degree promoted remittances just after receiving financial support from the host government. Although we did not find any evidence of the effects of individual altruism itself on international remittances, we observed some evidence that altruism, especially pure altruism, seems to be motivating their behavior in extraordinary times. The analysis supports the assumption that the

role of altruism and the financial support of large economies to maintain international remittances contributes to resilience, as proposed by the World Bank (2021a).

This study did not detect any significant crowding-out effects of emergency subsidies in home countries, which are often observed after the enforcement of social security services. There are several reasons for this finding. First, as they enhanced their desire to help their families in the challenging situation caused by the pandemic, the migrants did not decrease their remittance amounts—even among households in their home countries receiving emergency support—while the magnitude of damage and the end of the pandemic remains ambiguous. Another hypothesis for the insignificance of home country subsidies is that the amount transferred by home governments is insufficient for migrants and their households to compensate for their uncertain risks or the recovery of social welfare.

However, we also observed a reduced amount of remittances due to the increase in income of households left behind in their home countries, as found in the random estimation models. While some international organizations have recently worked to develop and enhance social security systems in developing countries (World Bank 2012; JICA 2014), this evidence suggests that we cannot rule out the possibility that government subsidies crowd out private transfers. For example, if migrants know that the income level of the families left behind needs to be below a threshold to receive public financial support, migrants are likely to reduce private transfers so that their families become eligible for financial support, even though they can support their families by themselves. Crowding out may lead to inefficiency in amending market failure and social welfare loss (e.g., Nikolov and Bonci 2020). The results may entail another question on the efficiency and effectiveness of public support in developing countries from the perspectives of remittances and safety nets, which should be studied in the future.

Furthermore, the findings indicate that the Japanese government's economic stimulus prompted international remittances among migrants. The government aimed to facilitate the recovery of the national economy and stimulate consumption among citizens during the pandemic recession through subsidies. Some studies (Hattori et al. 2021; Kaneda et al. 2021; Kubota et al. 2021) have found positive impacts of such a "cash-infusion" policy on 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 for livelihood in developing countries. Studies have indicated indirect benefits of cash transfers to ineligible households in the same communities in developing countries (Angelucci and De Giorgi 2009; Bobonis and Finan 2009). Similar to this indirect benefit, our study confirms that transnational spillover effects of unconditional and blanket transfers occur in migrant households via international remittances.

On the other hand, financial support from the host countries may create new income inequality between local households that have informal networks with migrants and those without in the local communities in the home countries. As Shimizutani and Yamada (2021) suggested, remittance-dependent households were more stable than non-dependent households after the economic shocks of the pandemic due to remittances. Remittances as insurance will lead to a disparity in the recovery from financial loss in the communities. Furthermore, we find that almost all FCWs have formal access to send their money using a banking system in Japan, and more than 95% of their households have banking accounts in their home countries. However, according to the World Bank (2021a), some migrants or their families experience difficulties because they do not have access to any formal channels, such as banks, accounting for the lower remittances in some other regions. The existence of an organized financial system also affects remittance behavior after receiving public financial support from the host government. While there remains debate over the purpose, effectiveness, ethics, targets, and costs of the operation of social security (Hanna and Olken 2018; Gentlini et al. 2020), this research provides some insights into the potential effects of public and private transfers in developing and developed countries.

The heterogeneous analysis also provides critical information on research and policymaking. Using psychological and experimental scales, we estimated how individual altruism influences remittance behaviors and found that the altruism scale itself does not work for remittance behaviors. Nevertheless, policy implementation to transfer cash strongly affects remittances among highly altruistic migrants. This direct test of altruistic motives is beneficial for explicating the remittance mechanism because it is challenging to capture these decomposed effects. In terms of policy evaluation, the results suggest that the psychological traits of citizens should also be considered. Moreover, taking advantage of the fact that various visa-type holders coexist in one industry, we explored the effects of temporariness on remittance behavior. The results support the idea that tentative visa holders behave differently in their economic behavior in host countries, including remittance behavior (Dustmann and Görlach 2016). The duration of stay in the host countries should be considered in research and migration policy design.

In addition, we would like to note the difficulty of obtaining micro-level data that show the behavior of migrants and the need for the public sector to disclose this information to allow quantitative research, which enables us to understand the effects of public financial support. Most of the literature on migration research has employed secondary data, which has limited information to clarify the behavior of migrants. To design more effective policies in the future, it is necessary to validate whether the outcomes of the implemented policies are effective or efficient with cooperation from the public sector. To solve the existing problems in terms of data, we conducted an original survey in this research; however, this approach also has a limitation in terms

of sample size and administrative costs. As the World Bank (2021b) has emphasized, an initiative that enables the use and reuse of data to create economic and social value should be established for evidence-based policymaking. To prompt the facilitation of data effectively, we hope that sharing the data values is accelerated among the public and private sectors, as well as academia.

Although this investigation provides informative evidence for international remittances during the pandemic, there are some limitations to the research. First, the generalizability 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 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 industry might be less severely impacted by the recession than other industries, such as the tourism or restaurant industries in Japan (Miyakawa et al. 2021). Job security in the elderly care industry may affect remittance behavior among foreign workers. Furthermore, the Japanese government has not implemented strict lockdown measures, as has occurred in other countries. The difference in policy interventions influences migrants' economic behavior. In addition, we conducted a one-time survey for this research using an online format because of the unexpected pandemic. Although we carefully designed the details of the survey for respondents to answer easily and concisely, a retrospective survey may pose a risk of measurement error (Beegle et al. 2012; Gibson and Kim 2010; Sawada et al. 2019).

Nevertheless, the findings contribute to a better understanding of the motives for international remittances and shed light on the relationship between public and private transfers in unordinary times and the roles of individual altruism. The lack of reliable consumption data on the families left behind in their home countries did not allow us to evaluate whether remittances contributed to reducing the income volatility of families in the home countries or to investigate the presence of other instrumental motivations. However, based on existing literature, such as Amuedo-Dorantes and Pozo (2011) and Yang and Choi (2007), it is likely that their remittances would contribute to income smoothing in highly insecure times. These findings can be used to improve migration research and policy design for social security in developing and developed countries.

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Tables & Figures

Table 1: Classification of the visa categories

	EPA	Nursing care	Technical Intern Trainee	Specified Skilled
Classification	Permanent migrants (High-skilled immigrant workers)		Temporary migrants (Low-skilled immigrant workers)	
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 an exam	Need	No need	No need
Duration to stay	Permanent after passing 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 the pass)	Yes	No	No

Note: Edited by the authors. The information is current as of April 1st, 2022. 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 (Technical Intern Trainee) for the numbers of each visa holder. The Japanese-Language Proficiency Test (JLPT) is a standardized test to evaluate Japanese proficiency for non-native speakers. It evaluates 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 a higher score than the threshold.

Table 2: Selected questions in the Rushton et al. (1981) 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 questions from the Rushton et al. (1981) scale about individual altruism. We asked the respondents to rate the frequency of each experience from 0 (Never) to 4 (Very often).

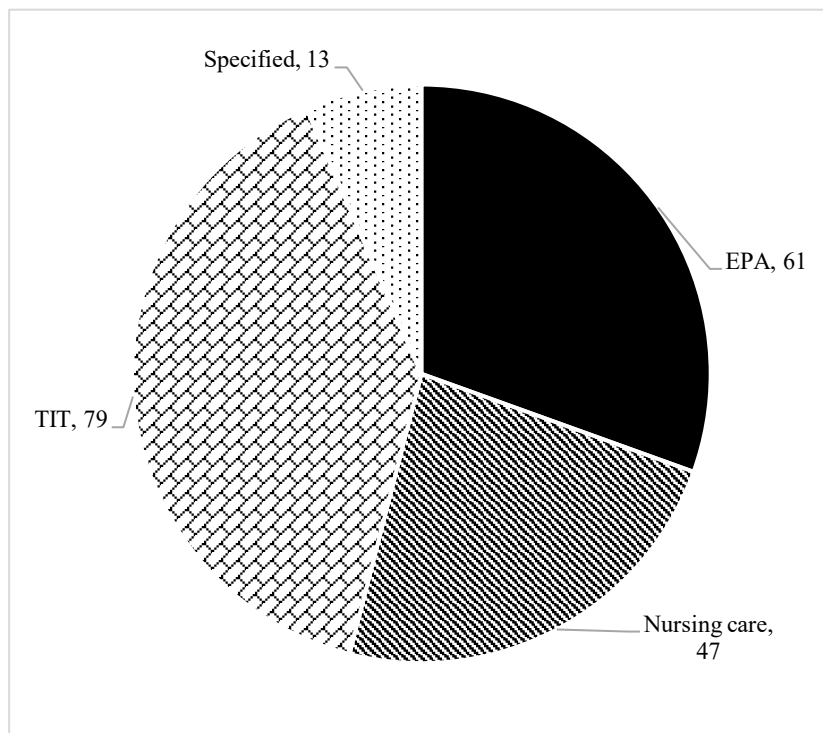
Figure 1: Distribution of visa types

Source: Authors' data
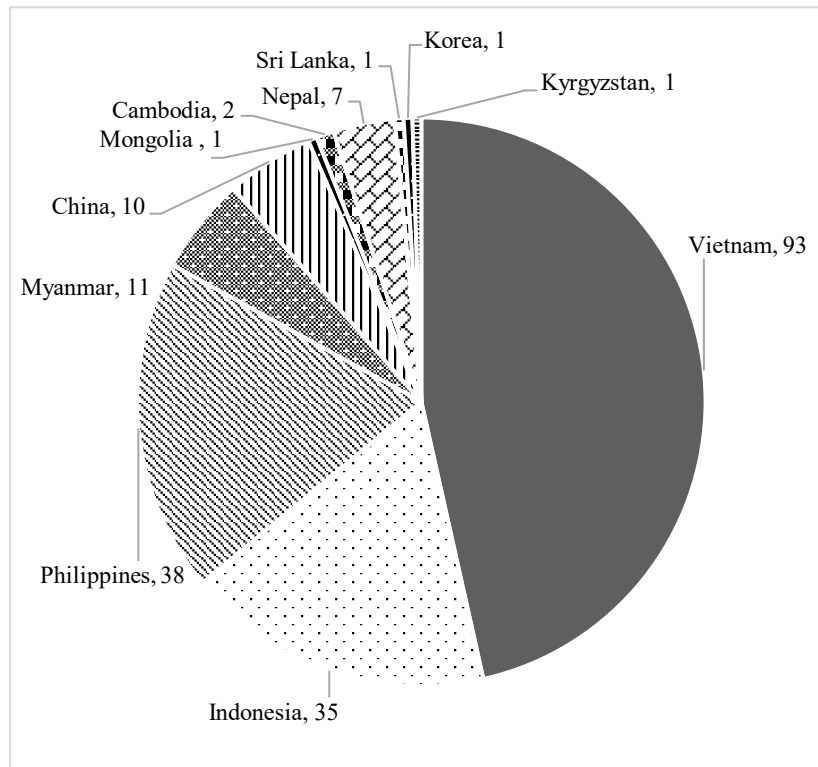
Figure 2: Distribution of countries of origin

Source: Authors' data
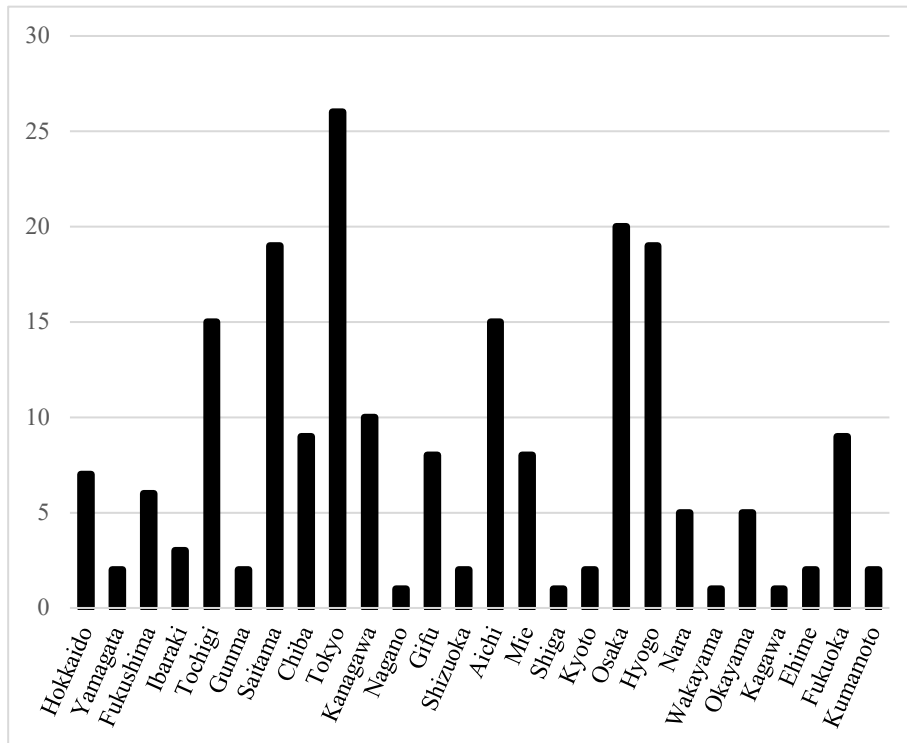
Figure 3: Distribution of current living prefectures (Unit: respondents)

Source: Authors' data

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 in home country	200	13.32	2.832
Visa status (=1 if Temporary type)	200	0.46	0.500
Has a certification (= 1 if Yes)	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
Accompanied by family in Japan (=1 if Yes)	200	0.075	0.264
Monthly Income in 2019 (PPP-adjusted US$)	146	1256.586	410.370
Monthly Income in 2020-2021 (PPP-adjusted US$)	200	1352.673	382.226
Infected by COVID-19 (= 1 if Yes)	200	0.05	0.218
Receive a subsidy by the Japanese gov't (= 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 US$)	200	1714.51	2908.533
Monthly Income in 2020-2021 (PPP-adjusted US$)	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.
Total remittance amount in a quarter (PPP-US$)	1,508	1033.628	1479.616
Log (Total remittance amount in a quarter (PPP-US$)	1,508	4.752	3.271

Source: Authors' data

Figure 4: Remittance trend by each visa type

Source: Authors' data

Figure 5: Distributed timing of the SCP in Japan

Source: Authors' data

Table 4: Results (Primary analysis)

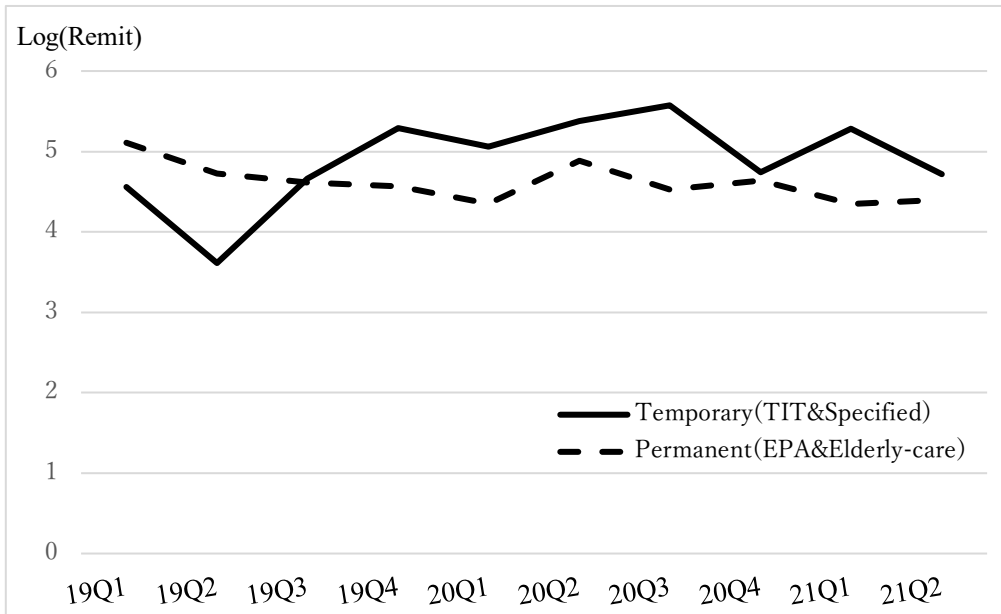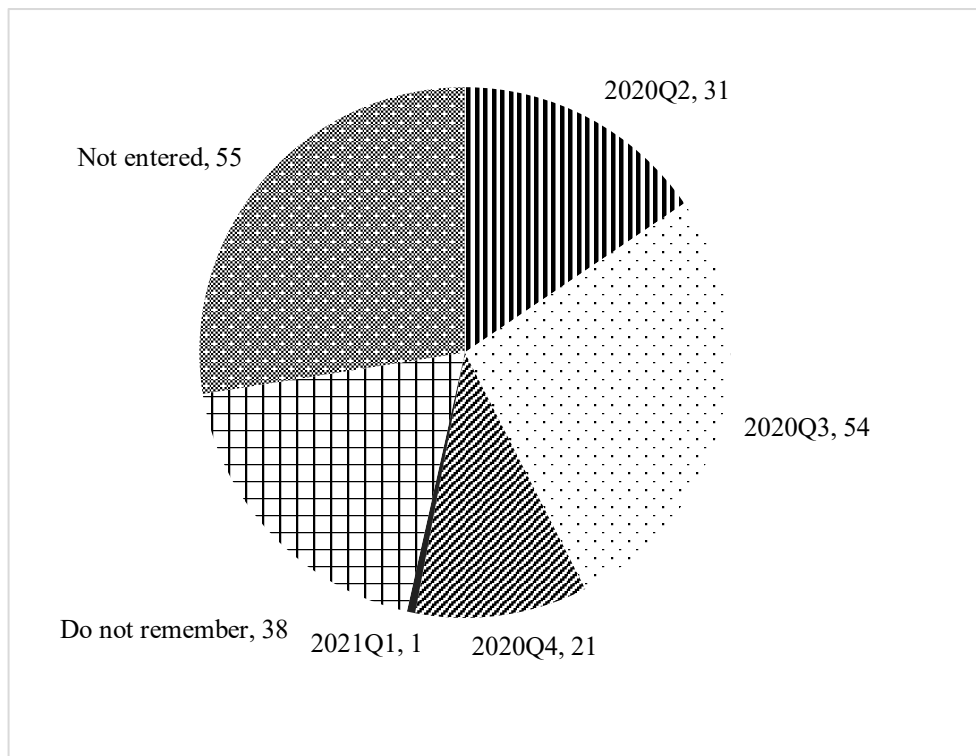|	Fixed effect		Random effect	
	(1)	(2)	(3)	(4)
COVID-19 term	-0.219	-0.277	-0.327	-0.373
	(0.313)	(0.322)	(0.314)	(0.321)
	[-0.836,0.399]	[-0.912,0.357]	[-0.942,0.288]	[-1.003,0.257]
Received any subsidy in home countries for this quarter		0.200		0.156
		(0.461)		(0.456)
		[-0.709,1.110]		[-0.739,1.050]
Received public subsidy in Japan for this quarter		0.554**		0.558**
		(0.200)		(0.202)
		[0.160,0.948]		[0.162,0.953]
Faced any negative shock at home		-0.035		-0.09
		(0.447)		(0.371)
		[-0.916,0.847]		[-0.817,0.637]
Log_Income of respondent		0.257**		0.366**
		(0.095)		(0.134)
		[0.071,0.444]		[0.103,0.628]
Log_Household income in the home		-0.042		-0.112*
		(0.070)		(0.056)
		[-0.180,0.096]		[-0.222,-0.001]
Temporary visa holder			1.343***	1.384***
			(0.380)	(0.375)
			[0.599,2.087]	[0.650,2.118]
Altruism based on the psychological scale			0.4	0.348
			(0.705)	(0.709)
			[-0.981,1.781]	[-1.042,1.737]
Altruism based on the dictator game			0.322	0.186
			(0.509)	(0.518)
			[-0.676,1.319]	[-0.829,1.201]
Gender (=1 if Female)			0.163	0.101
			(0.509)	(0.486)
			[-0.836,1.161]	[-0.852,1.054]
Age			0.084+	0.071
			(0.048)	(0.048)
			[-0.009,0.177]	[-0.023,0.165]
= 1 if has a religion			-0.62	-0.623
			(0.415)	(0.420)
			[-1.434,0.194]	[-1.447,0.200]
= 1 if get married			-0.03	-0.015
			(0.487)	(0.483)
			[-0.983,0.924]	[-0.963,0.932]
Engage in farming/fishing at home			0.173	0.17
			(0.359)	(0.353)
			[-0.530,0.876]	[-0.523,0.863]
Loan when coming to Japan			0.616+	0.562+
			(0.333)	(0.340)
			[-0.036,1.268]	[-0.103,1.228]
=1 if accompany family in Japan			-0.375	-0.27
			(0.590)	(0.600)
			[-1.532,0.782]	[-1.446,0.906]
School years in home country			0.037	0.04
			(0.061)	(0.059)
			[-0.082,0.156]	[-0.076,0.155]
Constant	4.848***	3.335***	0.498	-0.905
	(0.279)	(0.872)	(1.599)	(2.016)
	[4.297,5.399]	[1.615,5.055]	[-2.636,3.631]	[-4.856,3.047]
R-squared (between)	0.0000	0.0343	0.2692	0.2842
R-squared (Overall)	0.0028	0.0193	0.2016	0.213
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 brackets.
Columns (1) & (2) are estimated by fixed effects regression. Columns (3) & (4) are estimated by random effects regression. All estimations are controlled by time (Quarter-unit) effects. In Columns (3) & (4), the home country effects are also controlled.

Table 5: Results (Heterogenous analysis)

Time invar var	Y= Log(Total remittance amount in a quarter (PPP-US$))								
	X=COVID-19 term			X=Home subsidies			X=Host subsidies		
	Temporary visa	Altruism (Psychology)	Altruism (Dictator)	Temporary visa	Altruism (Psychology)	Altruism (Dictator)	Temporary visa	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 (Between)	0.0259	0.0028	0.0207	0.0348	0.0261	0.0189	0.0349	0.0284	0.0224
R-squared (Overall)	0.0184	0.0083	0.0177	0.0196	0l0168	0.0136	0.0208	0.0185	0.0152
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 brackets. 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 of whether the households faced any negative shock, Log-converted Income by respondents, Log-converted household income in the home left behind and time (Quarter-unit) effects. For brevity, we only show the related variables.

Table 6: Results (Heterogenous analysis of each dictator's game)

X	Y= Log(Total remittance amount in a quarter (PPP-US$))		
	COVID-19*X	Hostsubsidy*X	Homesubsidy*X
	(1)	(2)	(3)
Anonymous+Known	0.659	-0.043	0.204
	(0.558)	(0.506)	(0.972)
	[-0.442,1.760]	[-1.040,0.954]	[-1.713,2.121]
	(4)	(5)	(6)
Anonymous+Unknown	1.074+	0.018	-2.309
	(0.572)	(0.544)	(1.876)
	[-0.055,2.202]	[-1.055,1.091]	[-6.008,1.389]
	(7)	(8)	(9)
Family+Known	-0.149	0.24	0.288
	(0.407)	(0.444)	(0.583)
	[-0.950,0.653]	[-0.636,1.116]	[-0.863,1.438]
	(10)	(11)	(12)
Family+Unknown	0.266	0.285	-1.627
	(0.415)	(0.468)	(1.005)
	[-0.552,1.085]	[-0.637,1.207]	[-3.609,0.355]

Note: + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Robust-standard error in parenthesis. 95% CI in brackets. 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 of whether the households faced any negative shock, Log-converted Income by respondents, Log-converted household income in the home left behind and time (Quarter-unit) effects. For brevity, we only show the related variables. The observation of all estimations is 1,489 observations.

Appendix

Table A1: Individual characteristics and the distribution timing of SCP

	Timing of distribution (1)
Log_Income of respondent	0.108
	(0.088)
	[-0.065,0.281]
Temporary visa holder	-0.156
	(0.155)
	[-0.461,0.149]
Gender (=1 if Female)	0.262
	(0.198)
	[-0.129,0.653]
Age	0.021
	(0.017)
	[-0.013,0.055]
Kanto region	0.31
	(0.283)
	[-0.248,0.869]
Chubu region	0.33
	(0.312)
	[-0.285,0.945]
Kinki region	0.276
	(0.294)
	[-0.303,0.856]
Chugoku region	0.209
	(0.507)
	[-0.792,1.210]
Shikoku region	0.867
	(0.630)
	[-0.376,2.109]
Kyusyu region	0.303
	(0.392)
	[-0.470,1.075]
Constant	-0.594
	(0.766)
	[-2.105,0.918]
R-squared	0.0491
N	200

Note: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. Robust-standard error in parenthesis. 95% CI in brackets. All columns are estimated by OLS estimation with robust S.E. The outcome is the timing of distribution of special cash payment (i.e., 2020Q2=1, 2020Q3=2, 2020Q4=3, 2021Q1=4, Not received (Entry after April, 2020) =0). The classification of the region is based on the administrative division by the government, and we classify the respondent's prefectures according to the general classification as follows: Hokkaido & Tohoku region (Hokkaido, Yamagata, Fukushima); Kanto region (Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa); Chubu region (Nagano, Gifu, Shizuoka, Aichi, Mie); Kinki region (Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama); Chugoku region (Okayama); Shikoku region (Kagawa, Ehime) and Kyushu region (Fukuoka, Kumamoto). The reference region is the Hokkaido & Tohoku region.

Table A2: Determinants of altruism

	Altruism (Psychology) (1)	Altruism (Dictator) (2)
Temporary visa holder	-0.004	-0.006
	(0.040)	(0.052)
	[-0.083,0.074]	[-0.108,0.097]
Gender (=1 if Female)	-0.049	-0.091+
	(0.049)	(0.051)
	[-0.146,0.049]	[-0.191,0.009]
Age	0.010*	0.001
	(0.005)	(0.006)
	[0.000,0.020]	[-0.011,0.013]
Education years	-0.004	-0.003
	(0.005)	(0.008)
	[-0.014,0.007]	[-0.018,0.012]
= 1 if has a religion	0.071	-0.025
	(0.048)	(0.060)
	[-0.024,0.166]	[-0.144,0.093]
= 1 if get married	-0.018	0.078
	(0.044)	(0.061)
	[-0.105,0.069]	[-0.042,0.199]
Engage in farming/fishing	0.017	-0.012
	(0.037)	(0.043)
	[-0.057,0.090]	[-0.097,0.074]
Loan when coming to Japan	0.041	0.03
	(0.034)	(0.046)
	[-0.026,0.109]	[-0.061,0.121]
Constant	0.256	0.505*
	(0.162)	(0.208)
	[-0.063,0.576]	[0.095,0.915]
R-squared	0.056	0.032
N	200	198

Note: + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$
Robust-standard error in parenthesis. 95% CI in brackets. All columns are estimated by OLS estimation with robust S.E. Controlled by the home countries.

Table A3: Results (Primary analysis: Excluded not-remembering sample)

	Y=Log(Total remittance amount in a quarter (PPP-US$))			
	Fixed effect		Random effect	
	(1)	(2)	(3)	(4)
COVID-19 term	-0.213	-0.335	-0.332	-0.419
	(0.349)	(0.362)	(0.351)	(0.360)
	[-0.903,0.476]	[-1.050,0.380]	[-1.020,0.355]	[-1.125,0.287]
Received any subsidy in home countries for this quarter		0.228		0.187
		(0.461)		(0.455)
		[-0.682,1.139]		[-0.705,1.080]
Received public subsidy in Japan for this quarter		0.471+		0.488*
		(0.241)		(0.245)
		[-0.004,0.946]		[0.007,0.968]
Face any negative shock at home		0.271		0.11
		(0.512)		(0.427)
		[-0.741,1.282]		[-0.726,0.946]
Log_Income of respondent		0.276**		0.375**
		(0.092)		(0.127)
		[0.095,0.457]		[0.126,0.624]
Log_Household income in the home		-0.038		-0.131*
		(0.076)		(0.062)
		[-0.189,0.112]		[-0.253,-0.009]
Temporary visa holder			1.469***	1.529***
			(0.414)	(0.407)
			[0.658,2.281]	[0.732,2.326]
Altruism based on the psychological scale			0.334	0.273
			(0.861)	(0.861)
			[-1.353,2.022]	[-1.414,1.961]
Altruism based on the dictator game			0.609	0.448
			(0.594)	(0.604)
			[-0.556,1.773]	[-0.736,1.632]
Gender (=1 if Female)			0.15	0.108
			(0.604)	(0.573)
			[-1.034,1.333]	[-1.014,1.231]
Age			0.082	0.063
			(0.051)	(0.053)
			[-0.019,0.183]	[-0.040,0.166]
= 1 if has a religion			-0.860+	-0.804+
			(0.440)	(0.446)
			[-1.723,0.002]	[-1.678,0.070]
= 1 if get married			0.095	0.108
			(0.509)	(0.504)
			[-0.903,1.094]	[-0.880,1.095]
Engage in farming/fishing at home			0.075	0.079
			(0.418)	(0.409)
			[-0.744,0.894]	[-0.723,0.881]
Loan when coming to Japan			0.583	0.512
			(0.380)	(0.390)
			[-0.162,1.327]	[-0.252,1.277]
=1 if accompany family in Japan			-0.02	0.121
			(0.610)	(0.627)
			[-1.216,1.177]	[-1.107,1.349]
School years in home country			-0.053	-0.04
			(0.065)	(0.063)
			[-0.180,0.074]	[-0.164,0.084]
Constant	4.952***	3.284***	1.862	0.501
	(0.298)	(0.870)	(1.713)	(2.095)
	[4.363,5.540]	[1.566,5.001]	[-1.495,5.220]	[-3.604,4.607]
R-squared (between)	0.0007	0.0284	0.2594	0.2754
R-squared (Overall)	0.0029	0.0238	0.2043	0.2176
N	1177	1177	1158	1158

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

Table A4: Results (Heterogenous analysis: Excluded not-remembering sample)

	Y= Log(Total remittance amount in a quarter (PPP-US$))								
	X=COVID-19 term			X=Home subsidies			X=Host subsidies		
Time invar var	Temporary visa	Altruism (Psychology)	Altruism (Dictator)	Temporary visa	Altruism (Psychology)	Altruism (Dictator)	Temporary visa	Altruism (Psychology)	Altruism (Dictator)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
X	-0.437	-1.156+	-0.585	-0.001	-1.404	0.945+	0.133	-0.67	0.421
	(0.388)	(0.634)	(0.461)	(0.530)	(1.103)	(0.513)	(0.300)	(0.523)	(0.397)
	[-1.203,0.330]	[-2.408,0.096]	[-1.495,0.325]	[-1.048,1.046]	[-3.582,0.773]	[-0.069,1.958]	[-0.458,0.725]	[-1.702,0.363]	[-0.364,1.205]
X* Time	0.53	1.758+	0.516	0.79	3.573+	-1.49	0.985*	2.448*	0.094
Invariant Var	(0.392)	(1.057)	(0.768)	(0.981)	(2.138)	(1.004)	(0.449)	(1.001)	(0.709)
	[-0.244,1.304]	[-0.330,3.845]	[-1.001,2.032]	[-1.147,2.726]	[-0.649,7.796]	[-3.471,0.492]	[0.099,1.871]	[0.472,4.424]	[-1.306,1.495]
R-squared (Between)	0.0430	0.0020	0.0198	0.0289	0.0210	0.0159	0.0347	0.0261	0.0182
R-squared (Overall)	0.0289	0.0105	0.0205	0.0242	0.0206	0.0164	0.0269	0.0235	0.0178
Joint-sig (2 related vars)	0.3287	0.1847	0.4453	0.6427	0.2008	0.1639	0.0086	0.0076	0.1643
p-value of the model	0.0885	0.0497	0.0735	0.0525	0.0517	0.0291	0.0156	0.0129	0.047
N	1177	1177	1158	1177	1177	1158	1177	1177	1158

Note: + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Robust-standard error in parenthesis. 95% CI in brackets. 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 any negative shock, Log-converted Income by respondents, Log-converted household income in the home left behind and time (Quarter-unit) effects. For brevity, we only show the related variables.

Abstract (in Japanese)

要　　約

世界的に国際送金の重要性は認識されているが、公的扶助や個人の利他性が送金行動にもたらす影響への理解は十分ではない。COVID-19 による世界的なパンデミックの初期段階では、国際送金が激減すると予測されていたが、実際の送金額の減少幅は予想よりもはるかに小さいものであった。その理由として、移民労働者の利他的動機や先進国の景気刺激策などが挙げられるが、ミクロな視点からの詳細な調査は不足しており、さらなる研究が必要である。本研究では、日本において介護業界で働く外国人労働者を対象にオンライン調査を実施し、パンデミック下での外国人労働者の送金行動を検証した。パネルデータによる推計の結果、受入国での緊急現金給付は移住者の送金額に正の影響を与える一方、母国政府からの補助金によるクラウディングアウト効果は観察されなかった。また、異質性分析により、利他性の高い送金者は、受入国で現金給付を受けた後に母国により多く送金する可能性が高いことが明らかになった。本論文による分析結果は、パンデミック時の国際送金のレジリエンスは人々の利他性と受入国における財政支援によって支えられたという国際機関の主張を支持するものである。

キーワード：国際送金、利他性、日本、COVID-19、現金給付

JEL コード： D91, I18, J61, 012, 019