Impact of Remittances on Spending Behavior and Work Choices in Thai Households: A Quasi-Experimental Study

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Abstract

Remittances from migrants are essential for left-behind families in impoverished areas of developing countries. This paper uses data from the Thailand Household Socio-Economic Survey 2019 (HSES 2019) to quantitatively assess the impact of remittances on household spending behavior and their choice of labor force participation via a propensity score matching technique. An attempt is made to examine whether the outcome varies with the household head's gender. It is estimated that 2.1 million households, 10% of Thai households, have received remittances from migrants in 2019. Remittance-receiving households reduce spending share on food and allocate the funds toward spending related to durable goods, healthcare, and education. The impact of remittances on productive consumption is more pronounced among female-headed households than male-headed households. Moreover, remittances slightly reduce the labor force participation of female household heads but have no impact on the labor force participation of male household heads. Fiscal policy that encourages sending remittances to families left behind should be established, along with measures that promote international migration through formal channels.

Keywords

Migration; propensity score matching; quasi-experiment; remittances; Thailand

Introduction

Over the last few years, many workers have left their communities to pursue domestic and international opportunities. Remittances have become an essential lifeline for those who remain behind. Data from the World Bank Group (2023, 2024) show a high growth of international remittances flow to low- and middle-income countries, signaling that international remittances have increasingly become another source of income for households in low- and middle-income countries. The total inflow of remittances to low- and middle-income in 2022 was 614 billion USD, an increase of 9.3% over the previous record high of 562 billion USD in 2021 (World Bank Group, 2024). International remittances still grew in 2023 but at a slower pace of 3.8% (World Bank Group, 2023). Thailand is one of the primary beneficiaries of overseas remittances. In 2022, it received 8.92 billion USD of remittances from abroad, equal to 1.8% of its GDP. In addition to the international remittances flow, remittances originating within the countries are by no means insignificant. As moving within the country is more straightforward than moving to another country, internal remittances can easily surpass the volume of international remittances, especially in countries characterized by sizeable rural-urban gaps or have experienced rapid rural-urban migration within a brief period.

Thailand exemplifies many of the dynamics associated with significant internal remittances. The need for more opportunities in rural areas prompts many workers to seek economic prospects outside their communities. The country experiences permanent and seasonal rural-urban migration, resulting in a disproportionate concentration of the population in Bangkok and the adjacent provinces. According to a Thailand migration report in 2019, 9.4% of the Thai population, or 6.8 million people, have relocated within the country over five years (United Nations, 2019). In addition to working outside their communities, sending remittances is widely practiced among migrant workers since there exists a strong tie between migrant workers and their rural communities that helps foster a flow of remittances from urban to rural areas (Osaki, 2003; Vanwey, 2004).

Given that a considerable proportion of workers in Thailand are migrants who work in urban areas and send money back to their family members, the flow of remittances can be significant and consequential to the well-being of left-behind households. Unfortunately, the data limitation problem prevents priori researchers from using large-scale micro-data that cover general Thai households to examine the effect of remittances on the general livelihood of non-migrants. Nevertheless, recent rounds of the Thailand Household Socio-Economic Survey (HSES) (2013, 2019, and 2021) collected detailed information on migration and the remittances volume, allowing research to assess whether remittances influence household labor supply and consumption patterns.

Following the research questions, this study aims to assess the impact of remittances on household development by analyzing the consumption behavior and labor force participation of households that receive them. To achieve such goals, this paper compares the spending pattern and labor force participation of households receiving remittances with those that do not but possess similar demographic and socio-economic characteristics. Moreover, this paper also investigates whether the gender of the household head influences the outcomes since research suggests that female-headed households tend to allocate resources more efficiently towards essential needs such as education, healthcare, and nutrition. In contrast, male-headed

households might prioritize different areas, such as savings or investments (Basu & Maitra, 2020).

Literature review

Theory of remittances and household development

The theory linking remittances to household development explores the motivations behind remitting and examines whether remittances hinder or promote household development. Rapoport and Docquier (2006) identified four primary motivations for remitting: altruism, implicit or explicit family agreements, insurance against uncertainty, and investment in local businesses. These motivations highlight the intricate dynamics of remittance flows and their influence on the well-being of left-behind households.

After remittances are received, their effect on household development, i.e., the household's spending behavior and the decision to participate in the labor market, is not easily predictable and is, to some extent, influenced by factors such as the household discount rate and income effects. The discount rate determines whether households prioritize short-term consumption (e.g., food, transportation, and entertainment) or long-term consumption (e.g., consumer durables, health, and education). Households with high discount rates are more likely to focus on short-term consumption to meet immediate needs. In contrast, those with low discount rates prioritize long-term consumption, seeking sustained utility gains over time.

The decision to participate in the labor market after receiving remittance depends on whether households view leisure opportunities stemming from extra income, the remittance, as normal or inferior goods. Specifically, microeconomics predicts that households would still be in the labor market if households view leisure as inferior goods (demand less leisure if income rises). On the other hand, households would exit the labor market if they view leisure as normal goods (demand more leisure if income increases). Although one might expect that households treat leisure as inferior goods, such a postulate is not universally supported empirically, as discussed in the next section.

Evidence: Positive effect of remittance on household development

Building upon the groundwork laid by earlier scholars, numerous empirical studies have assessed the impact of remittances on household development, revealing a spectrum of beneficial and adverse effects. On the positive side, the studies found multiple benefits of remittances to the household. Studies in Sri Lanka, India, Cambodia, China, and Kyrgyzstan demonstrated a positive effect of receiving remittances: the receiving households in those countries spend more on productive consumption, such as health care, education, and capital investment (Chea & Wongboonsin, 2019; Mahapatro et al., 2017; Samaratunge et al., 2020; Thapa & Acharya, 2017; Wang et al., 2021). Remittances were also found to promote economic growth in Cambodia (Tangtipongkul & Khiev, 2019).

Moreover, studies in Nepal suggested that receiving households allocate more funds towards education while reducing spending on tobacco and alcohol without negatively impacting the labor supply of the receiving family members. The effects of remittances remain consistent across households headed by males and females (International Monetary Fund & Pacific,

2020; Mishra et al., 2022). However, a study in Ghana observed that the gender of the household head matters in determining household consumption behavior: female recipients spend more on child education than male recipients (Pickbourn, 2016).

Evidence: Negative effect of remittance on household development

Despite the optimistic finding, some studies suggested that the effects of remittances on productive consumption are negligible, and households that receive remittances participate less in the labor market. For example, studies in the Philippines and Tajikistan found no effect of remittances on households' investment in education and health care (Ang et al., 2009; Clément, 2011). Recent studies found that remittances reduce the labor force participation of non-migrants in developing countries such as Tajikistan and Ghana (Asiedu & Chimbar, 2020; Azizi, 2021; Murakami et al., 2021). A study in Nepal found that migration reshapes the time allocation of left-behind family members toward labor-intensive activities and traditional gender roles (Yokying et al., 2023). Meanwhile, a Tunisia study also showed that remittances significantly increase the unemployment rate since remittances reduce labor demand within the receiving areas (Habib, 2023).

In summary, international studies show that the effect of remittances on household consumption patterns and household participation in the labor market varies by country and region. Receiving households in Sri Lanka, India, Cambodia, China, Kyrgyzstan, and Nepal prioritize long-term gains by using remittances for productive investments while recognizing the necessity of remaining in the labor market despite having additional income from remittances. However, studies in the Philippines, Tajikistan, and Tunisia found no effect of remittances on long-term consumption. Remittances also reshape the work behavior of left-behind households, often leading them toward non-productive roles.

Such variation in impact might contribute to factors not often discussed in existing literature, such as institutional and cultural factors. For instance, in countries with universal healthcare, households might allocate remittances toward other essential needs, such as education or consumer-durable goods. Additionally, cultural norms that emphasize hard-working habits may lead households to view remittances as a supplement to labor income rather than a substitute. In such contexts, remittances might be used to finance tools, inputs, or transportation for productive activities, thereby supporting labor market participation without reducing labor supply.

Evidence in Thailand

Studies in Thailand found mixed findings on the effect of remittances on household development. Jones and Pardthaisong (1999) identified a common trend among receiving households in the North and Northeast regions, where productive investments rank lower than consumptive investments. The sampled households prioritize expenditures on consumer durables, house construction, and family savings over educational and business investments. Migrants often remit income for household expenses and consumer goods, reflecting a pattern of prioritizing immediate consumption over long-term productive investments.

Jones and Kittisuksathit (2003) observed similar behaviors in Udon Thani, Thailand, where households channel remittances toward the consumption of modern goods. However, another study found that receiving households emphasize the educational investment of their

children. For example, Rigg et al. (2014) found that first-generation migrants in rural Khon Kaen invest significantly in their children's education but do not pursue higher education. Rigg et al. suggested that while immediate consumptive uses of remittances dominate spending, there is a recognition of the long-term value of education for the next generation. Moreover, Leamcharaskul and Boonyamanond (2024) found that remittances reduce the risk of falling into poverty and alleviate the intensity of poverty among the receiving household. Yokying and Floro (2020) highlighted the impact of parents' labor market participation on children's burdens. The study found that when parents, particularly those engaged in informal work, participate in the labor market, it increases children's involvement in economic activities and household chores. This is especially true for girls, who often take on a larger share of housework, effectively replacing the role of the parent in these tasks and allowing the parent to be in the labor market. This finding suggests that remittance-receiving parents might choose not to participate in the labor market to reduce pressure on their children to engage in economic activities and household chores, allowing them to focus on educational advancement.

Given that previous research could not form a consensus on whether remittances promote or slow down household development, simultaneously evaluating the impact of remittances on consumption behavior and work choice of households using one of the latest techniques and large-scale micro-dataset from a country where migration is a common phenomenon could significantly contribute to existing literature and provide several critical insights. Nevertheless, to my best knowledge, no prior studies in Thailand and other countries have quantified the effect of remittances on household consumption patterns and labor supply disaggregated by the gender of the household head. This paper is one of the few that simultaneously examines the impact of remittances on household consumption and labor force participation and answers whether the role of gender determines the outcome.

Migration and remittances in Thailand

Table 1: Number of Households With Migration by Region, 2019

Region	Number of households (1)	Number of households with migrant (2)	The ratio of migrant households to total households by region
Bangkok	2,909,385	342,564	11.8
Central	6,699,256	876,452	13.1
North	3,865,637	1,017,330	26.3
Northeast	5,596,616	1,894,417	33.8
South	2,800,064	606,908	21.7
Thailand	21,870,958	4,737,671	21.7

Note: Author's calculation from the HSES 2019

Table 1 shows that a large proportion of Thai workers have migrated: 21.7% of Thai households had at least one migrant in 2019. The Northeast and North regions stand above the national average, with 33.8 and 26.3% of households having at least one migrant, respectively, followed by the South and Central regions. Households in Bangkok have the fewest outgoing migrants, which is not surprising since Bangkok is one of the main cities that receives incoming migrants. The result from Table 1 recounts the same story that has occurred since industrialization started in 1960: migrants from the Northeast and North regions left home for better job opportunities in Bangkok and the adjacent provinces.

Table 2: Number of Receiving Households by Region, 2019

Region	Number of households with migrant	Number of receiving households	Ratio of receiving households to migrant households by region
Bangkok	342,564	96,605	28.2
Central	876,452	330,013	37.7
North	1,017,330	387,536	38.1
Northeast	1,894,417	1,088,446	57.5
South	606,908	208,889	34.4
Thailand	4,737,671	2,111,489	44.6

Note: Author's calculation from HSES 2019

Among households with migrants, slightly less than half, precisely 44.6%, have received remittances from the migrants (as shown in Table 2). Notably, more than half of households with migrants in the Northeast region, 57.5%, were receiving households, and more than two-thirds, 70%, of remitters were migrants from the Northeast and North regions. Another one-third of remitters were migrants from the Central and South regions, accounting for 25.5% of total remitters. In comparison, those from Bangkok constitute only 4.5%, showing that migration originates from the Northeast and North regions, where job opportunities are relatively limited.

Table 3: Remittances Volume Received by Region, 2019

Region	Total remittances volume (in THB per annum)	Average amount of remittances (in THB per month)	Share of total remittances volume regional income
Bangkok	10,034,312,805	8,656	0.7
Central	19,331,233,955	4,898	0.9
North	23,484,134,269	5,056	2.6
Northeast	74,848,088,014	5,773	5.5
South	13,248,592,730	5,287	1.6
Thailand	140,946,361,774	5,588	2.1

Note: Author's calculation from HSES 2019; THB = Thai Baht

Table 3 shows the total amount of household remittances disaggregated by region. The total amount of household remittances was 140,946 million THB (or 3.9 billion USD), 2.09% of total household income in 2019. Notably, remittances accounted for 2.56 and 5.52% of total household income in the North and Northeast regions, indicating that remittances are crucial in influencing household well-being. Moreover, the average monthly remittances received by households (5,588 THB per month) are significant since they account for more than one-third of a government employee's starting salary of 15,000 THB for a bachelor's degree holder. The average monthly remittances sent by Northeast migrants also exceed the national average. This data implies that migrants, particularly those originating from the North and Northeast regions, have departed from their homes in pursuit of better employment with the intention of remitting funds to improve the living standards of non-migrant family members.

Table 4: Remittances Volume by Their Origin

Origin	Remittances volume (in THB per annum)
Remittance from domestic migration	111,130,894,972
Remittance from international migration	29,815,466,801
Total	140,946,361,774

Note: Author's calculation from HSES 2019

Table 4 shows the annual volume of remittances measured in Thai Baht (THB), categorized by the origin of the remittances. In the case of Thailand, remittances originated within the country and far exceeded remittances sent from another country. Notably, 20.8% of total remittances originated from a single city—Bangkok, confirming Thailand's extreme spatial concentration of economic activities. However, remittances originating from inter-provincial and intra-provincial networks are also meaningful. The volume of remittances sent from one province to another is the highest among the categories, totaling about 50 billion THB annually, followed by remittances sent within the same province, amounting to 29.80 billion THB annually. The volume of remittances sent from abroad is also significant, contributing about 20.8% of total remittances in 2019.

Table 5: Number of Households with Migrants by Their Type

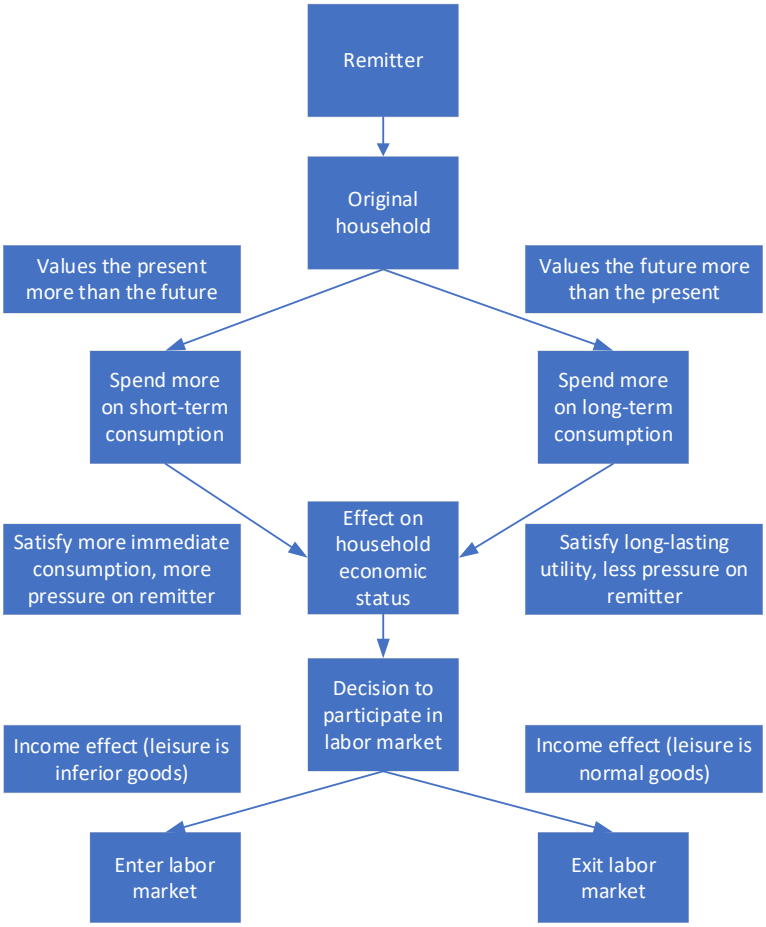
Household type	**Number of households**
Households that receive remittance from domestic migration	1,896,911 (40%)
Households that receive remittance from international migration	214,578 (4.5%)
Households that do not receive remittance	2,626,182 (55.4%)
Total (number of households with migrants)	4,737,671 (100%)

Note: Author's calculation from HSES 2019

Last but not least, Table 5 presents the number of households that received remittances versus those that did not. Most households with migrants did not receive remittances, followed by those from domestic and international migration.

Conceptual framework

Figure 1: Conceptual Framework



Note: Author's compilation

Figure 1 shows a conceptual framework employed in this study, which guides data selection, methodology, and interpretation of empirical results. At the top, migrants, driven by concern for the welfare of their families back home, decide to send remittances to the original households (a simple economic model describing the decision framework is shown in Appendix A).

The original households allocate their remitted income toward short-term or long-term consumption upon receiving remittances. Such a decision can be influenced by mutual agreement between the remitter and the original households, reflecting whether the remitter and the original households value short-term or long-term utility gains. The remittances increase the income of the receiving household, which, through the income effect, affects the household head's decision to participate in the labor market. The household heads will participate in the labor market if leisure is viewed as inferior goods. On the contrary, household heads will exit the labor market if leisure is considered a normal good.

Data

This paper utilizes the Household Socio-Economic Survey 2019 (HSES 2019) published by the National Statistical Office of Thailand (2001–2023) to examine the impact of remittances on household spending patterns and labor supply. The HSES 2019 was chosen to avoid the adverse effects of the COVID-19 pandemic on remittances in Thailand, as the World Bank Group (2020) reported that remittance-receiving households lost up to 75% of their remittance income in 2020. Additionally, recovery from the pandemic in Thailand has been slow (Durongkaveroj, 2024). Therefore, relying on more recent rounds of HSES, such as the 2021 data, would likely present a distorted picture of the impact of remittances on household spending patterns and labor market participation decisions.

The survey includes data from 45,586 Thai households. It provides four essential pieces of information on household characteristics: (1) general household characteristics (education, age, income, sex of household head, etc.), (2) the amount of remittances received from migrants over the past 12 months, (3) the origin of the remittances (domestic or abroad), (4) consumption items per month, and (5) the work status of each household member. The survey classified households into three groups: (1) households without migrants, (2) households with migrants who received remittances, and (3) households with migrants who did not receive remittances. I only focused on the last two groups and redefined them as receiving and non-receiving households.

Consumption categories are reduced from countless items into eight categories related to consumer-durable goods, transportation, education, entertainment, social contribution (taxed, donation, and the money given to another person), food, and addictive substances (alcohol and tobacco). Notably, the survey assigns sampling weights to each observation. These weights enable researchers to adjust the results to accurately represent the overall population and facilitate calculations of the total amount of the remittances migrants sent back to their families. Table 6 provides descriptive statistics on the variables applied in the paper.

Table 6: Descriptive Statistics of Households with Migrants

Observations	11,055
Categorical variable	
General household characteristics	
Area of household head	
Urban	52.3%
Rural	47.7%
Sex of household head	
Male	58.2%
Female	41.8 %
Marital status of household head	
Married	67.1%
Unmarried	32.9%
Job type of household head	
Unskilled	70.4%
Skilled	29.6%
Education level of household head	
Lower than upper secondary education	78.8%
At least upper secondary education	21.3%

The work status of household head		
Working population	70.1%	
Economically dependent population	21.0%	
Outside the labor force	8.9%	
Continuous variable	Mean	*SD*
Age of household head (year)	57.5	13.0
Household monthly non-remittance income (THB) (Non-remittance-receiving household)	25,777.5	32,047.0
Household monthly non-remittance income (THB) (Remittance-receiving household)	13,038.3	15,926.6
The amount of the remittances received from migrants per month (THB)	5,588.4	7,216.8
Household consumption items per month (THB)		
Consumer-durable	4,391.3	7,378.2
Health	627.3	3,178.8
Transportation	4,910.1	8,872.0
Education	1,869.9	3,627.4
Entertainment	770.2	2,088.2
Social contribution	3,800.9	5,946.3
Food	2,995.5	1,589.2
Addictive substances	94.6	296.8

Note: Author's calculation from HSES 2019

The urban and rural area refers to municipal and non-municipal areas, respectively. The marital status classification was redefined by regrouping household heads into two categories: those who were never married, widowed, divorced, or separated were categorized as unmarried, while those who were married were placed in the married category.

The skilled jobs referred to as non-elementary occupations include managers, professionals, technicians, clerical support staff, service and sales workers, skilled agricultural, forestry, and fishery workers, craft and related trades, plant and machine operators, assemblers, and members of the armed forces. Unskilled jobs typically require manual labor, such as cleaning services or other physical work. The work status of each household member was reclassified into three categories: (1) working population, (2) economically dependent population (children, older person, illness, and disabled person), and (3) outside the labor force (unemployed and homemakers).

Notably, approximately 70% of household heads with migrants are engaged in unskilled jobs, and 78.8% have an education level below upper secondary. The majority (67.1%) are married, and most household heads in this group are men. The average income (excluding remittances) for the remittance-receiving household is about 13,000 THB per month. On average, remittance-receiving households receive 5,588 THB per month in remittances, suggesting that remittances accounted for 43% of the non-remittance income of these households in 2019.

Methodology

Heterogeneity across households: A selection bias

Estimating the impact of remittances on household consumption behavior and labor supply requires dealing with a methodological issue: selection bias. Selection bias arises when

researchers compare two groups, and the members of each group inherently differ in many characteristics. For example, receiving households tend to have more non-working populations, such as children and older adults, as their members than non-receiving households. In this case, remittances and household size affect receiving households' decision to participate in the labor market. Moreover, the wealth of households also matters. A better-off household is less likely to spend remittances and convert them into savings, while worse-off households tend to live off remittances. Thus, failing to control household income will lead to a biased estimation of the effect of remittances on a household's spending patterns.

Propensity score matching

There are two techniques to address selection bias. One method uses the standard regression analysis to estimate the elasticity between remittances and spending, as seen in prior research (see Manich [2022], for example). Another technique, propensity score matching, relies on quasi-experimental approaches to directly compare the outcome between two groups. Propensity score matching is a nonparametric approach that requires fewer restrictive assumptions than parametric regression analysis (such as normality, linearity assumption [or oversimplify relationships]). It is well-suited for high-dimensional data with a large number of covariates found in socio-economic surveys and for capturing complex household behavior.

The propensity score matching technique estimates the impact of remittance on spending behavior by simply directly comparing the average spending pattern of the treatment (receiving households) and control groups (non-receiving households) who have similar characteristics. Thus, the reliability of propensity score matching depends on the quality of matches and whether unobserved confounders are taken into account by researchers. Moreover, factors that affect the believability of propensity score matching, like the quality of matches, could be easily assessed by a simple mean equality test. Furthermore, the detailed data on household characteristics in the dataset provide a unique advantage, allowing for a substantial reduction in the bias associated with unobserved confounders. As the following paragraph will detail, this method holds great promise in addressing the selection bias problem.

Model setup

Following Abate et al. (2016), the household access to remittances is defined as follows:

$$Y_{Di} = f_D(\mathcal{X}_i) + \varepsilon_{Di}\ D = 0{,}1 \text{ and} \quad (1)$$

$$D = g(\mathcal{W}_i) + \eta_i, \quad (2)$$

Where Y_{Di} is the expense on goods and services (as a percentage of expense) of households with migrants conditional on whether the household receives remittances. D is a dichotomous variable indicating whether household i is a receiving household ($D = 1$) or non-receiving household ($D = 0$). $\mathcal{X}_i$ and ε_{Di} represent vectors of observed and unobserved variables, respectively. $\mathcal{W}_i$ is a subset of $\mathcal{X}_i$ and contains observed household characteristics that affect access to remittances of household i and η_i refers to unobserved household characteristics that determine a household's access to remittances.

Probit model

The propensity score of each observation with and without access to remittances is the predicted values from the following standard probit model:

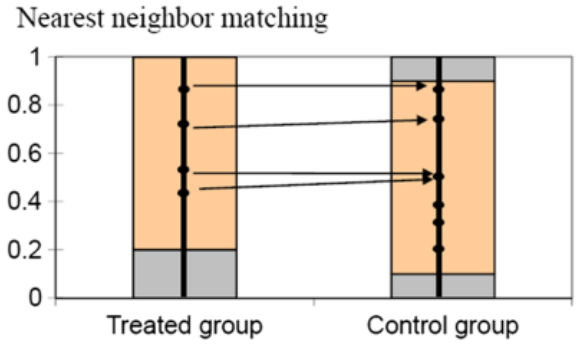
$$p(\mathcal{X}_i) = Prob(D_i = 1|\mathcal{X}_i), \quad (3)$$

Where $\mathcal{X}_i$ represents vectors of observed household characteristics affecting access to remittances of household i. The observed variables that are used in the probit model of this study include the area of the household (rural or urban), sex of household head, age of household head, marital status of household head, household size, job type of household head, education of household head, and income quantile of household. This paper transforms non-remittance household income into one hundred quantiles to facilitate the matching algorithm. This method clearly shows how households spend their remittances. Households with similar socio-economic characteristics would share similar propensity scores. The targeted outcomes are households' budget share of each consumption category.

Matching method

After calculating the propensity score for each household, observations are divided into treatment and control groups. The treatment group consists of receiving households, and the control group consists of non-receiving households with socio-economic characteristics similar to those of the treatment group, as determined by their propensity scores. A five-nearest-neighbors matching technique matches receiving and non-receiving households with similar propensity scores, creating a balanced and comparable set of treatment and control groups. The constructed control group could be referred to as an artificial counterfactual. Figure 2 visualizes the operation of the nearest neighbor method in the context of propensity score matching.

Figure 2: Visualization of Five-Nearest-Neighbors Matching Technique



Note: Nasri et al. (2020)

After identifying the treatment and control groups, the impact of remittances on spending patterns—the average treatment effect—is calculated by finding the difference between the average budget share of those who received remittances and the estimated average budget share if they had not received them. The following equation mathematically describes the calculation:

$$\tau_{ATE}^{PSM} = E_{p(x)D=1}\left[E\left(Y_{(1)i}|D_i = 1, p(\mathcal{X})\right) - E\left(Y_{(0)i}|D_i = 0, p(\mathcal{X})\right)\right], \quad (4)$$

where the term $E\left(Y_{(1)i}|D_i = 1, p(\mathcal{X})\right)$ represents the average budget share of households that receive remittances and $E\left(Y_{(0)i}|D_i = 0, p(\mathcal{X})\right)$ represents the average budget share of households that do not receive remittances but have similar observable characteristics.

Results

Receiving versus non-receiving households: A stylized facts

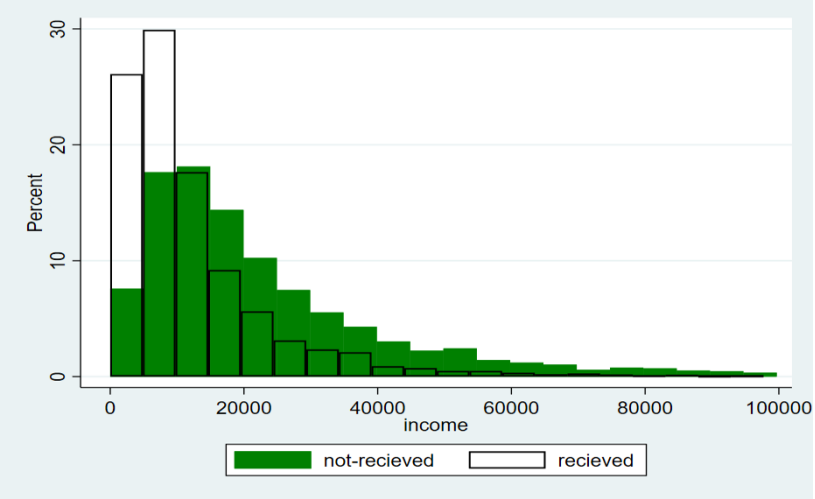
Table 7: Summary Statistic of Unmatched Samples by Access to Remittances

	Unmatched sample		
Variable	**Received**	**Not received**	**Diff- p value**
Area (Urban = 0, Rural = 1)	0.51	0.45	0.00***
Sex (Male = 0, Female = 1)	0.48	0.37	0.00***
Age	59.88	56.09	0.00***
Marital status (Unmarried = 0, Married = 1)	0.66	0.68	0.01***
Household size	2.80	2.66	0.00***
Job type (Unskilled = 0, Skilled = 1)	0.61	0.82	0.00***
Education level (Lower than upper secondary education = 0, At least upper secondary education = 1)	0.14	0.27	0.00***
Income quantile (Higher value represents higher income)	38.28	60.31	0.00***

*Note: *** significant at 1%, ** 5%, * 10%; Author's calculation from HSES 2019*

Before analyzing the impact of remittances on expenditure patterns, it is worth highlighting the difference between receiving and non-receiving households. The data in Table 7 and Figure 3 show that households receiving remittances are economically worse off, i.e., they tend to be in the lower income quantile (represented by the transparent bars in Figure 3). In contrast, households not receiving remittances tend to be in higher quantiles (represented by the dark green bars in Figure 3).

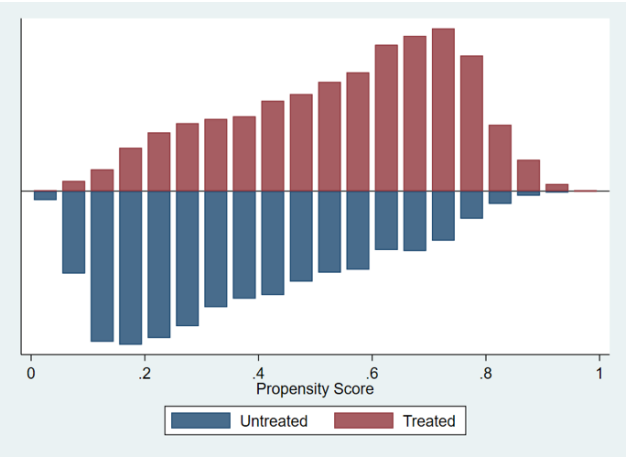
Figure 3: Monthly Income Distribution: Receiving vs. Non-Receiving Households



Note: Author's calculation from HSES 2019

In addition to wealth status, receiving households differ from non-receiving households in many characteristics. The heads of households that received remittances tend to be female, older, unmarried, and live in rural areas. The size of receiving households is larger than that of non-receiving households. Furthermore, the heads of households receiving remittances are likely to possess lower educational levels and to be engaged in unskilled jobs. This trend suggests a correlation between receiving remittances and specific socio-economic attributes, such as education and job type. In other words, receiving households are inherently different from non-receiving households. This fact reasserts the rationale behind using propensity score matching techniques to isolate the inherited differences between receiving and non-receiving households before examining the impact of remittances on household development.

Figure 4: Distribution of Estimated Propensity Score and Common Support, All Sexes



Note: Author's calculation from HSES 2019

Figure 4 visualizes the distribution of computed propensity scores from probit estimation. The propensity scores range from 0.02 to 0.95 and have a mean of 0.44. Interestingly, 100% of observations lie within that range, showing strong support for matching. The propensity scores of receiving households range from 0.03 to 0.95 and have a mean of 0.55, whereas the propensity scores of non-receiving households range from 0.02 to 0.94 and have a mean of 0.36.

Table 8: Balancing Tests for Matched Sample, All Sexes

Variable	Unmatched sample			Five-nearest neighbors matching		
	Received	Not received	Diff- *p* value	Received	Not received	Diff- *p* value
Area	0.51	0.45	0.000***	0.51	0.52	0.438
Sex	0.48	0.37	0.000***	0.48	0.48	0.631
Age	59.88	56.09	0.000***	59.88	60.31	0.103
Marital status	0.66	0.68	0.009***	0.66	0.67	0.265
Household size	2.80	2.66	0.000***	2.80	2.82	0.470
Job type	0.82	0.61	0.000***	0.82	0.82	0.983
Education level	0.14	0.27	0.000***	0.14	0.13	0.165
Income quantile	38.28	60.34	0.000***	38.28	38.68	0.454

*Note: *** significant at 1%, ** significant at 5%, * significant at 10%; Author's calculation from HSES 2019*

Table 8 presents the result of the balancing test for a matched sample of male and female-headed households using the five-nearest neighbors matching technique. The matching result is impressive. As suggested by the mean equality test of covariates between receiving and non-receiving households, these two groups are inherently different in all aspects before matching, indicating that they are incomparable from the start. However, after matching via the five-nearest neighbors matching technique, the mean values of covariates between receiving and non-receiving households are not significantly different in terms of area, sex, age, marital status, household size, job type, education level, and income, suggesting that these two groups are now comparable. The balancing tests for male and female-headed households are shown in Appendix C.

Uses of remittances

Table 9: Average Treatment Effect (ATE) on Household Budget Share

	Male		Female	
	ATE	T-stat	ATE	T-stat
Consumer-durable	1.30***	3.58	1.60***	3.41
Health	1.01***	4.59	0.53*	1.85
Transportation	0.50	1.00	-0.32	-0.54
Education	0.75***	3.75	1.30***	4.71
Entertainment	0.45**	2.33	0.32	1.01
Social contribution	-3.09***	-7.06	-2.08***	-3.84
Food	-0.80**	-2.12	-1.25**	-2.52
Addictive substances	-0.77	-0.08	-9.19	-0.98

*Note: *** significant at 1%, ** 5%, * 10%; Author's calculation from HSES 2019*

Table 9 presents the average treatment effect on the household budget share, differentiated by the sex of the household head. This reveals how remittances influenced spending patterns across various consumption items for male—and female-headed households. Generally, receiving households allocated more money to consumer-durable goods, health, and

education while spending less on food and social contributions. The remittances were found to have no impact on consumption related to transportation and addictive substances (tobacco and alcohol).

The results also demonstrate impact heterogeneity among receiving households; specifically, remittances sent to female-headed households contributed more to long-term consumption, such as consumer-durable goods and education, than male-headed households. In other words, female-headed households that receive remittances tend to reduce their food consumption and spend more on assets like durable goods and education. Notably, the results show that remittances increased spending on short-term consumption (such as entertainment) among male-headed households while having no significant effect on female-headed households. The impact of remittances on social contribution spending indicates that receiving households socially contribute less than non-receiving households, suggesting that receiving households are the beneficiaries rather than being benefactors.

Impact of remittances on labor supply

Table 10: Comparison of Household's Labor Supply (Percent of Total Labor Supply by Access to Remittances), Female Household Head

Type of work	Not received	Received (artificial counterfactual)
Working population	67.1	62.7
Economically dependent population (older adult, illness, and disabled person)	20.5	22.3
Outside the labor force (unemployed, housewife, and unwilling to work)	12.3	15.0

Note: Author's calculation from HSES 2019

As one of this paper's main contributions is to evaluate whether remittances affect the labor force participation of women-headed households, Table 10 then shows a comparison of labor market participation between women-headed households that did not receive remittances and their artificial counterfactual (households that received remittances and possess similar characteristics as determined by propensity score). The results suggest that, in the case of female-headed households, a larger proportion of receiving households were out of the labor force compared to non-receiving households (12.3% versus 15%). In terms of population, 30,213 women-headed households were out of the labor force due to receiving remittances.

On the contrary, remittances did not affect labor force participation in male-headed households (as shown in Table 11). Specifically, 3.8% of male-headed households that did not receive remittances were out of the labor force, while 3.6% of their artificial counterfactual were out of the labor force. In summary, the results suggest that remittances slightly decreased labor force participation of female-headed households but did not reduce work choice of male-headed households.

Table 11: Comparison of Household's Labor Supply (Percent of Total Labor Supply by Access to Remittances), Male Household Head

Type of work	Not received	Received (artificial counterfactual)
Working population	84.1	83.6
Economically dependent population (older adult, illness, and disabled person)	12.0	12.8
Outside the labor force (unemployed, housewife, and unwilling to work)	3.8	3.6

Note: Author's calculation from HSES 2019

Results and discussion

The results obtained from the propensity score matching technique yield several critical insights that support and disprove the findings of existing literature. Compared to male-headed households, female-headed households increase their spending on consumer-durable goods by 1.6 and 1.3 percentage points, respectively. However, their spending on food and social contributions decreases by 1.3 and 2.1 percentage points, respectively. The results also show that female-head households prioritize spending on consumer-durable goods equally with education, whereas male-head households emphasize spending more on consumer-durable goods. These findings show that the gender of the household affects the spending behavior of receiving households. It contradicts the findings of the study conducted in Nepal by the International Monetary Fund and Pacific (2020). However, it aligns with Pickbourn's (2016) study in Ghana, which found that women tend to spend more on child education than men.

The spending behavior of receiving households found in this study is broadly consistent with previous research conducted in Thailand by Jones and Kittisuksathit (2003) and Jones and Pardthaisong (1999), i.e., receiving households rank spending on education below spending on consumer-durable goods (such as house repairs or acquisition of modern goods). Nevertheless, such an attitude is more prevalent in male-headed households than female-headed households, i.e., female-headed households place as much importance on education as on consuming durable goods. This finding adds to the existing literature and reaffirms the conclusion from a recent study by Rigg et al. (2014), highlighting that receiving households allocate a portion of their spending to support their children's education.

Regarding health-related expenses, male-headed households significantly spend more on health. In contrast, while female-headed households also spend on health, this spending is only significant at the 10% level and is lower in magnitude compared to their expenditure on durable goods. This finding might reflect the effectiveness of the Universal Coverage scheme implemented in Thailand since 2002, which covers the general population and substantially reduces household burden on healthcare. In other words, Thai households might have a lower need for health-related expenditures than households in other developing countries, such as India, Mexico, Colombia, Ghana, and Guatemala, where UHC Service Coverage Index is ranked lower than in Thailand, as highlighted by the World Health Organization (Hildebrandt et al., 2005; Mahapatro et al., 2017; World Health Organization, 2023). The effects of remittances on household spending behavior in other non-productive consumption categories, such as transportation and addictive substances (alcohol and tobacco), are

insignificant but led to a 0.45 percentage point increase in spending on entertainment among male-headed households.

These findings reveal that receiving households prefer to spend remittances on goods and services that could improve their well-being and social status in the long run, i.e., the receiving households value the future more than the present and seek to reduce pressure on the remitter. This behavior indicates a preference for future benefits over immediate gratification and a desire to ease the financial burden on the remitter. It may also reflect implicit or explicit family agreements, where remittances function as conditional transfers. For example, remitters may send money on the condition that it is used for specific purposes, such as investing in their children's education or acquiring modern goods to improve the living standards of left-behind households. Notably, such phenomena are more common in households headed by females.

The effect of remittances on the labor force participation of household heads is worth highlighting a couple of points. Focusing on household heads who are outside the labor force (unemployed, homemakers, and unwilling to work), remittances are found to slightly decrease the labor force participation of female household heads by 2.7 percentage points (or equivalent to 30,213 people) but have no effect on the labor force participation of male household heads suggesting that male household heads do not necessarily view leisure as normal goods. These results are comparable to the findings from the quasi-experimental study in Ghana and Tunisia, where remittances are found to affect women's labor supply. However, female household heads might exit the labor market for a good reason. For example, the study by Yolying and Floro (2020) found that parents in households with girls choose to leave the labor market to focus on household chores, allowing their children, particularly daughters, to concentrate on their studies in school.

Lastly, economically dependent household heads (children or older adults, people with illnesses, and disabled people) were more commonly found in receiving households (receiving households have 46,923 more dependent household heads than non-receiving households), reflecting that remittances are not only a tool for consuming goods and investing in education but also vital financial support for the needy household.

Conclusion and policy implications

As the extreme spatial concentration of economic activities in Bangkok and vicinities causes workers to leave the rural areas to pursue better job opportunities within the country and abroad, remittances from these migrants become another source of income for the left-behind families. This paper uses data from the Household Socio-Economic Survey 2019 (HSES 2019) to evaluate the impact of remittances on spending behavior and labor force participation of the receiving households in Thailand. A propensity score matching, is used to directly compare the differences in spending behavior between receiving and non-receiving households with similar socio-economic characteristics. The main findings of this paper are summarized into five main points.

First, migration is a common phenomenon in Thailand. Roughly 22% of Thai households have at least one migrant. Northeast and North regions stand above the national average, with 34 and 26% of Northeast and North region households having at least one migrant, respectively.

Second, sending remittances to left-behind families is commonly practiced. The data indicate that 45% of migrants have sent remittances to their family members over the past 12 months. Notably, families in the Northeast region are the primary beneficiaries, with 58% receiving money from migrants during this period. Remittances account for 43% of the non-remittance income of households receiving them. Most remittances in Thailand originate domestically, where internal migration contributed to 78% of total remittances in 2019.

Third, receiving households tend to be poorer than non-receiving households. The heads of these households are typically older women with low education levels who work in unskilled jobs. In contrast, non-receiving households are usually headed by younger men with higher education levels who work in skilled occupations. These facts show that remittances function as financial support for the dependent population.

Fourth, remittances have an effect, albeit small, on household expenditure patterns. Receiving household households reduce their consumption of food and social contribution and tailor remittances toward the physical and human capital accumulation of the households, including the consumption of durable goods, health, and education. However, the impact is more pronounced in female-headed households, indicating that the gender of the household head influences spending behavior. In other words, remittances are not used for short-term consumption, such as addictive substances, entertainment, or food. Still, they are allocated to long-term consumption of goods and services, like investing in the education of their children and the purchase of durable goods. This fact shows that remittances are more or less equivalent to conditional transfers that remitters send to left-behind members with the condition that remittances must be used to invest in physical and human capital accumulation.

Fifth, remittances slightly reduce female household head participation in the labor market by 2.7 percentage points, affecting 30,213 women, but do not impact male involvement in the labor market, which aligns with findings from Ghana and Tunisia. Lastly, receiving households have 46,923 more dependent heads (older, ill, or disabled) than non-receiving households, highlighting that remittances are crucial for supporting vulnerable families.

These findings have some policy implications. The large volume of remittances reflects unbalanced development between places and regions. The first best solution is to reduce the gap by implementing a regional development plan. However, such policies might take time to design and are politically challenging to implement. Their effectiveness is also uncertain and may not yield immediate results.

Since remittances enhance household well-being by increasing physical and human capital accumulation while slightly reducing the labor force participation of the receiving household, sending remittances to the left-behind family members should be encouraged as the second-best solution that could instantly relieve household hardship.

One strategy to incentivize sending remittances is to increase the tax deductibility of remittance transactions for the senders. The current Thailand states that sending remittances to parents is tax deductible if parents are older than 60 and earn no more than 30,000 THB (820 USD) per year. These conditions could be eliminated or loosened to foster remittances encompassing a broader range of remitters. Moreover, alongside internal migration, the impact of international migration could be enhanced by safeguarding migrants from exploitation by foreign employers. Encouraging legal pathways for international migration is thus imperative.

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Appendices

Appendix A

Model Setup

Wongmonta (2017) found that altruism toward family members is the primary driver of sending remittances. Drawing on such findings, a simple economic model demonstrates that the altruistic motive is a key factor influencing a remitter's decision to send remittances. Specifically, migrants incorporate the consumption level of their families back home into their utility function, making the amount of the remittances and decision to remit directly impact their utility.

Utility Functions

Migrant's utility: The migrant derives utility from their consumption (C_m) and the well-being of their household (U_m), influenced by the household's consumption (C_h). The migrant's utility function is written mathematically as follows:

$$U = U_m(C_m) + \alpha U_h(C_h),$$

Where $U_m(C_m)$ represents the utility of the migrant from personal consumption. $U_h(C_h)$ represents the utility of the household from their consumption. The constant term, α, represents the altruistic weight of the migrant places on household welfare. A higher α suggests that migrant have higher concern for their families back home.

Household utility: Household utility depends on their consumption level (C_h), determined by their non-remittance income (Y_h^0) and remittances (R):

$$C_h = Y_h^0 + R$$

Budget Constraint

The migrant's income (Y_m) is the sum of personal consumption (C_m) and remittances (R):

$$Y_m = C_m + R$$

Key Assumptions

1. The diminishing marginal utility of consumption: Poorer households have a higher marginal utility of income, i.e., $\frac{\partial U_h}{\partial C_h}$ is higher when Y_h^0 is low. For the migrant, marginal utility from personal consumption decreases as their consumption rises.
2. The luxury effect occurs when rich households ($Y_h^0 > Y_h^{min}$) derive less marginal utility from additional income, reducing the incentive for migrants to remit.

Optimization problem

Assuming the migrant is a rational agent and chooses remittances (R) to maximize their utility, subject to their budget constraint.

$$\max_R U_m(Y_m - R) + \alpha U_h\left(Y_h^0 + R\right)$$

The first-order condition (FOC) for utility maximization is

$$-\frac{\partial U_m}{\partial C_m} + \alpha \frac{\partial U_h}{\partial C_h} = 0$$

Rearrange yields

$$\frac{\partial U_m}{\partial C_m} = \alpha \frac{\partial U_h}{\partial C_h}$$

The optimal condition suggests that the migrant chooses the amount of the remittances (R) that make marginal utility from their consumption equal to marginal utility from their household consumption adjusted by altruistic weight. Therefore, for the poor households (low Y_h^0), $\frac{\partial U_h}{\partial C_h}$ is high, leading to a larger optimal remittance R. For the rich households (high Y_h^0), $\frac{\partial U_h}{\partial C_h}$ is low, leading to little or no remittance.

Empirical predictions

Two empirical predictions arise from the simple model. First, there is an inverse relationship between household income and remittances. Poorer households receive more remittances because the marginal utility of additional income is higher. Migrants are more incentivized to send remittances to relatively poor households, whereas better-off households receive little to none due to their lower marginal utility of income. Second, there exists proportional contribution. For poorer households, remittances account for a significant proportion of their total income, reflecting their reliance on external support to meet basic consumption needs.

Appendix B

Table B1 presents the results from the probit estimation analysis of the determinants influencing households' propensity to receive remittances. While the findings align with expectations, the analysis reveals several noteworthy points. First, female-headed households are 10.4% more likely to receive remittances from migrants than male-headed households, suggesting that female-headed households may have lower incomes and are culturally more likely to be responsible for caring for children and other dependents.

Second, household heads with lower levels of education, those who are single, and those employed in unskilled occupations are more likely to receive remittances, which indicates that remittances function as financial support for needy households. Third, household income significantly influences the propensity to receive remittances. Households in higher income quantiles are less likely to receive remittances from migrants, whereas those in lower income quantiles are more likely to receive such financial support. Thus, including household income level—a variable usually neglected by other studies—is crucial for the matching procedure.

Table B1: Probit Estimation of Determinant of Household's Receiving Remittances

Variable	Coefficient	Standard error	Marginal effect
Area (Urban = 0, Rural = 1)	-0.015	0.026	-0.005
Sex (Male = 0, Female = 1)	0.314***	0.029	0.104
Age	0.010***	0.001	0.003
Marital status (Unmarried = 0, Married = 1)	0.256***	0.032	0.085
Household size	0.181***	0.010	0.060
Job type (Skilled = 0, Unskilled = 1)	0.137***	0.033	0.045
Education level (Lower than secondary education = 0, At least secondary education = 1)	0.126***	0.037	0.042
Income quantile (Higher value represents higher income)	-0.021***	0.001	-0.007
Constant	-0.602***	0.082	
Pseudo-R square	0.15		
LR chi-square	2,327.61		
Prob > hi-square	0.00		
Number of observations	11,055		
Sensitivity (%)	63.46		
Specificity (%) ()	74.55		
Total accuracy (%)	69.62		

*Note: *** significant at 1%, ** 5%, * 10%; Author's calculation from HSES 2019*

Appendix C

Table C1: Balancing Tests for Matched Sample, Male

Variable	Unmatched samples			Five-nearest neighbors matching		
	Received	Not received	Diff- *p* value	Received	Not received	Diff-*p* value
Area	0.51	0.45	0.000***	0.51	0.52	0.438
Sex	0.48	0.37	0.000***	0.48	0.48	0.631
Age	59.88	56.09	0.000***	59.88	60.31	0.103
Marital status	0.66	0.68	0.009***	0.66	0.67	0.265
Household size	2.80	2.66	0.000***	2.80	2.82	0.470
Job type	0.82	0.61	0.000***	0.82	0.82	0.983
Education level	0.14	0.27	0.000***	0.14	0.13	0.165
Income quantile	38.28	60.34	0.000***	38.28	38.68	0.454

*Note: *** significant at 1%, ** 5%, * 10%; Author's calculation from HSES 2019*

Table C2: Balancing Tests for Matched Sample, Female

Variable	Unmatched samples			Five-nearest neighbors matching		
	Received	Not received	Diff- *p* value	Received	Not received	Diff-*p* value
Area	0.51	0.45	0.000***	0.51	0.52	0.438
Sex	0.48	0.37	0.000***	0.48	0.48	0.631
Age	59.88	56.09	0.000***	59.88	60.31	0.103
Marital status	0.66	0.68	0.009***	0.66	0.67	0.265
Household size	2.80	2.66	0.000***	2.80	2.82	0.470
Job type	0.82	0.61	0.000***	0.82	0.82	0.983
Education level	0.14	0.27	0.000***	0.14	0.13	0.165
Income quantile	38.28	60.34	0.000***	38.28	38.68	0.454

*Note: *** significant at 1%, ** 5%, * 10%; Author's calculation from HSES 2019*