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...to my loving parents.

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Zusammenfassung

Südostasien erfährt einen beispiellosen wirtschaftlichen Aufschwung, der durch einen florierenden Produktions- und Dienstleistungssektor, sowie einer rapiden Urbanisierung, umfangreicher Digitalisierung und einer wachsenden jungen Bevölkerung angetrieben wird. Dennoch können regionale Ungleichheiten in Bezug auf wirtschaftliche und soziale Indikatoren nicht ausgeblendet werden. Während beispielsweise viele städtische Regionen in den Vorteil der neuen Möglichkeiten kommen, hinken viele ländliche Regionen noch hinterher. Häufige Naturkatastrophen und der Abbau der natürlichen Ressourcen durch illegale Abholzung und Ausbeutung führen zu weiterem Druck auf die ländliche, arme Bevölkerung. Zusätzlich haben die Effekte des wirtschaftlichen Abschwungs durch COVID-19 auch die ländlichen Regionen erreicht. Erzwungene Arbeitlosigkeit der ländlichen Migranten in den Städten, eine wachsende finanzielle Instabilität und eine schwächere landwirtschaftliche Versorgungskette erhöhen die Anfälligkeit der ländlichen Bevölkerung in die Armut zurückzufallen. Die Region befindet sich an einem kritischen Scheideweg mit Aufgaben, die bewältigt werden müssen, aber auch mit Möglichkeiten, die eine bessere Zukunft für die Menschen und gleichzeitig für die Länder einleiten können.

Vor diesem Hintergrund hat die vorliegende Dissertation das übergeordnete Ziel, ein besseres Verständnis des Entscheidungsfindungsprozesses, insbesondere in der ländlichen Bevölkerung von Thailand und Vietnam, zu entwickeln. Beide Länder sind Vorreiter der wirtschaftlichen Entwicklung in der Region und haben eine umfassende strukturelle Wandlung im letzten Jahrzehnt durchlaufen. Eine gesteigerte Landflucht der Bevölkerung ist dabei zu einem besonderen Merkmal für Thailand und Vietnam geworden, mit großen Auswirkungen auf die Wirtschaft und Gesellschaft. Während der ländliche Arbeitsmarkt durch Überbeschäftigung und geringer Produktivität in der Landwirtschaft, sowie durch unregelmäßiges Einkommen gekennzeichnet ist, wendet sich die junge, ländliche Bevölkerung den urbanen Zentren in der Hoffnung auf bessere Arbeit und Bildungschancen zu. Diese interne Migration bietet für viele Haushalte eine geeignete Alternative einen Lebensunterhalt zu verdienen und mit Umwelteinflüssen zurecht zu kommen. Weiterhin profitieren die Haushalte auch von den Rücküberweisungen der migrierten Haushaltsmitglieder, welche für Konsumglättung, Investitionen in Humankapital und Risikostreuung verwendet werden. Daher ist es wichtig zu verstehen warum einige Menschen migrieren und andere nicht, und worauf die Unterschiede in den Rücküberweisungen der Migranten zurückgehen. Entscheidungen, die zu einer beruflichen Laufbahn führen, erfordern ebenfalls ein weitergehendes Verständnis. Ähnlich zu anderen Schwellenländern bleiben viele Menschen in den landwirtschaftlichen Berufen beschäftigt, trotz der wachsenden nicht-landwirtschaftlichen Sektoren. Während für diesen Zusammenhang meist kognitive Fähigkeiten und die Herkunft herangezogen wird, gibt es Anzeichen, dass auch nicht-kognitive Fähigkeiten eine entscheidende Rolle spielen. Diese Fähigkeiten, die mit der Persönlichkeit und der Präferenz verbunden werden, machen auch einen Unterschied in den Einkommen zwischen den unterschiedlichen Berufsgruppen aus.

Weitere Aspekte, die ebenfalls Aufmerksamkeit erfordern, sind das sich schnell ändernde

Konsumverhalten und dessen möglicher Einfluss auf die individuelle Gesundheit und die Umwelt. Diese Veränderungen können mit der steigenden Kaufkraft der Menschen und der einfacheren Verfügbarkeit von Ressourcen in Verbindung gebracht werden. So hat die Verfügbarkeit von preisgünstigen Internetverbindungen neue Wege für die Massen eröffnet, wobei sich gleichzeitig die Frage nach dessen Verwendung stellt. Während einige Anwender des Internets als produktiver beschrieben werden können, ist es wichtig zu verstehen, welche Faktoren die individuelle Entscheidung zur Verwendung des Internets beeinflussen. In Bezug auf die Ernährung der Menschen zeigt sich eine hohe Präferenz für eine westliche Ernährungsweise. Traditionelle Speisen werden durch Fleisch, Milch und Weizen ersetzt. Der gesteigerte Bedarf dieser Speisen führt zum einen zu einem Ausbau der Viehwirtschaft und der Lebensmittelindustrie, und zum anderen zu einem gesteigerten Druck auf die Umwelt. Daher ist es zwingend notwendig, den Antrieb dieser Veränderungen zu verstehen und ihre Auswirkungen auf die zukünftige Nachhaltigkeit zu bewerten. Anhand dieser Trends legt diese Dissertation den Fokus auf den Entscheidungsprozess in den drei Bereichen Migration, Arbeitsmarkt und Konsumverhalten. Diese Arbeit enthält 9 Kapitel – die Einführung und 8 weitere Kapitel mit individuellen Veröffentlichungen.

Diese Arbeit verwendet Primärdaten aus Thailand und Vietnam, die innerhalb des Thailand Vietnam Socio Economic Panel (TVSEP) gesammelt wurden. Umfragen auf Haushaltsebene wurden in drei verschieden Provinzen in Thailand – Buri Ram, Nakhon Phanom und Ratchathani und Vietnam – Ha Tinh, Dak Lak und Thua Thien Hue durchgeführt. In einem Zeitraum von 2007 bis 2019 wurden insgesamt 8 Befragungswellen durchgeführt, in denen Daten von zirka 4400 ländlichen Haushalten je Welle erhoben wurden. Migrantenbefragungen wurden im Jahr 2010 und 2018 für den Großraum Bangkoks in Thailand und Ho Chi Minh City in Vietnam durchgeführt. Beide Regionen zählen zu Hotspots der Landflucht. Im Rahmen dieser Dissertation werden die Daten aus allen Haushaltsbefragungen und Migrantenbefragungen verwendet. Darüber hinaus werden in Kapitel 3 die TVSEP Daten mit denen des Global Precipitation Climatology Centre und der GHCN Gridded V2 zusammengelegt, um die Auswirkungen von Trockenheit zu untersuchen. Kapitel 4 ergänzt die TVSEP Daten mit denen des Einkommens und des Bruttoinlandproduktes der Weltbank und der General Statistical Office (GSO). In Kapitel 6 werden zusätzliche Daten eines TVSEP Add-on Projektes – Behavioral insights into over-indebtedness within a vulnerable population“ verwendet. Das Kapitel 9 basiert auf Sekundärdaten des GSO, OECD, UN Comtrade, und der FAO-STAT.

In Kapitel 2 bis 5 wird die Entscheidung zur Migration untersucht. Kapitel 2 ist ein Konzeptpaper, das das Ziel hat, die Notwendigkeit für eine standardisierte Definition der internen Migration hervorzuheben. Daten aus einer Haushaltsbefragung aus Vietnam werden verwendet, um sechs Definitionen eines internen Migranten zu erzeugen, basierend auf Zeit, Raum und Motivation. Für jede Definition werden die Einflussfaktoren auf Migration und die Auswirkung der Migration auf den ländlichen Haushalt untersucht. Propensity Score Matching in Verbindung mit Difference in Difference estimator wird angewandt, um diese

Fragen zu analysieren. Das Ergebnis zeigt, dass eine Änderung der Definition nicht nur die Anzahl von Haushalten ändert, die als Migrations- oder Nicht-Migrationshaushalt identifiziert werden, sondern auch das Ergebnis der ökonometrischen Analyse. Definitionen, die nur die Zeit als definierendes Kriterium verwenden, führen zu einer Überschätzung der Ergebnisse, während strengere Definitionen, die die Zeit mit der Motivation der Migranten verknüpfen, zu geringeren Einschätzungen führen. Diese Unterschiede können den Identifikationsfehlern zugeordnet werden – Fehler aus Inklusion und Fehler aus Exklusion. Kapitel 3 untersucht die Auswirkung von extremen Umwelteinflüssen, insbesondere von Trockenheit, auf die Migrationsentscheidung. Die verwendeten Daten stammen aus einer Kombination aus TVSEP Panel Daten und hochauflösenden monatlichen Temperatur- und Niederschlagsdaten. Zuerst werden die direkten Folgen mittels Haushalts- und Umfragen-Fixed Effects berechnet. Im Anschluss werden die Kanäle hervorgehoben, durch die die Trockenheit die Migrationsentscheidung beeinflusst, unter Verwendung eines formalen Mediation Mechanism Models. Diese Methode ermittelt den Average Control Direct Effect. Dieser schätzt den Anteil des Average Treatment Effects aus zwei konsekutiven Trockenphasen auf die Migration, der durch den Potential Mechanism ermittelt wird. Das Ergebnis zeigt einen signifikanten negativen Einfluss von extremer Trockenheit, insbesondere in konsekutiven Jahren, auf die Entscheidung zur Migration des Haushalts. Die Analyse der vorliegenden Mechanismen zeigen, dass die Verschlechterung von Konsum und Vermögen pro Kopf für den negativen Effekt von Trockenheit auf Migration verantwortlich sind. Die wiederholte Aussetzung von extremer Trockenheit reduziert weiterhin die Bereitschaft ein Risiko einzugehen, obwohl das Ausmaß, welches die Risikohaltung in Bezug auf die Migrationsentscheidung hat, nicht definiert werden kann. Insgesamt legt das Ergebnis die Möglichkeit einer umweltbedingten Armutsfalle nahe, die eine extreme Auswirkung für eine wachsende Anzahl von gefährdeten Bevölkerungsgruppen in nachteilig beeinflusste Regionen hat. Kapitel 4 versucht die Aufenthaltsdauer in einer Stadt und die Intensität der Migration voraus zu sagen. Dabei bezieht sich die Intensität der Migration auf den Grad der Verbundenheit eines Migranten/einer Migrantin zum Herkunftsort. Als Datengrundlage werden drei zusammengelegte TVSEP Haushaltsumfragen, eine Migrantenbefragung und Einkommensdaten der Weltbank für Vietnam verwendet. Das Ergebnis des Random Effects Tobit Modells zeigt, dass die Migranten aus ländlichen Haushalten, die eine höhere Anzahl von idiosynkratische Schocks erfahren haben, ihren Aufenthalt in der Stadt verlängern. Ein gegenteiliges Verhaltensmuster wird beobachtet, wenn ein Migrantenhaushalt einen kovarianten Schock erfährt, wie eine Flut oder eine Trockenheit. Darüber hinaus wird ein Index der Migrationsintensität (IMI) zur Bewertung des Ordinary Least Square Modells erstellt. Die Ergebnisse zeigen, dass Migranten früher zurückkehren, wenn sie Schocks in der Stadt erfahren und die Lebensbedingungen sich in ihrer ursprünglichen Region verbessern. Kapitel 5 untersucht die Entscheidung zur Rücküberweisung von Geldmitteln anhand interner Migranten aus Thailand und Vietnam. Da diese Rücküberweisungen größere Auswirkungen auf die arme Bevölkerung haben, werden zusätzlich die Unterschiede in der Entscheidung zur Rücküberweisung zwischen Migranten mit unterschiedlichem wirtschaftlichen Hintergrund

untersucht. Damit sowohl sichtbare als auch nicht sichtbare Faktoren, die diese Entscheidung beeinflussen, berücksichtigt werden, werden neben Einflussgrößen auch die Motivationen zur Rücküberweisung analysiert. Die verwendete Datengrundlage besteht aus einer einzigartigen Kombination von Haushaltsbefragungen und Migrationsbefragungen. Das Ergebnis des Heckman Modells suggeriert, dass die Ausbildung der Migranten und die Dauer des Aufenthalts in einer Stadt die Schlüsselindikatoren zur Voraussage der Rücküberweisungen sind. Weiterhin sind die Rücküberweisungen von Frauen geringer und sinken für einen Haushalt mit dem Wachstum von Besitzgütern. Gründe für die Rücküberweisungen sind Zurückzahlungen von Krediten und gegenseitige Hilfestellung, der durch Altruismus unterstrichen wird. Weiterhin zeigt sich, dass während die Einflussgrößen der Rücküberweisungen abhängig von der wirtschaftlichen Situation des empfangenden Haushalts sind, die Motivation der Rücküberweisung eher unabhängig sind. Der Test zur Robustheit unter Verwendung der Hurdle, Tobit, Ordinary Least Square Modelle und mehrere Spezifikationen von Heckman stützen dieses Ergebnis.

Kapitel 6 und 7 fokussieren sich auf nicht-kognitive Fähigkeiten. Dabei untersucht Kapitel 6 die Gültigkeit des Big Five Modells bezogen auf Persönlichkeitsmerkmale in einem Entwicklungsland. Dazu werden Daten aus Thailand und Vietnam verwendet. Es werden eine Serie von psychometrischen Tests und verschiedenen Methoden wie die Principal Component Analyse, Cronbach's alpha und Test-Retest durchgeführt. Das Ergebnis zeigt, dass die vorliegende fünf Faktoren Struktur in der Probe ähnlich der Beobachtung aus entwickelten Ländern ist. Ein Vergleich zwischen den Wellen von 2017 und 2019 der Panel Daten ergibt, dass die Persönlichkeitsmerkmale eine stärkere Stabilität bei Befragten mit höherer Bildung zeigen. Es zeigt sich eine ungewollte Voreingenommenheit, weshalb weitere Tests durchgeführt wurden um die Robustheit der Kernhypothese zu bestätigen. Es gibt Hinweise für einen acquiescence bias, weshalb zusätzliche Test durchgeführt werden um die Robustheit der Kernaussagen zu validieren. Insgesamt zeigt das Big Five Model eine innere und äußere Gültigkeit für die ländlichen Gebiete aus der Datenprobe für Südostasien. Kapitel 7 untersucht die Rolle von nicht-kognitiven Fähigkeiten auf die berufliche Laufbahn und das Einkommen unter Verwendung von Daten aus Thailand und Vietnam. Dazu werden sechs Größen für die Persönlichkeit verwendet – die Big Five Persönlichkeitsmerkmale sowie Locus of Control, und drei weitere Messgrößen der Präferenz – Risiko, Vertrauen und Geduld. Das Ergebnis des Multinomial Probits suggeriert, dass die Gewissenhaftigkeit ein Schlüsselwert bei der Voraussage der beruflichen Laufbahn ist. Die Schätzung der Ordinary Least Square zeigt, dass sowohl Neurotizismus und Vertrauen das Einkommen negativ beeinflussen. Zusätzliche Tests zeigen, dass nicht kognitive Fähigkeiten einen heterogenen Effekt bei der Lohnverteilung haben. Es werden zahlreiche Robustheitstest durchgeführt wie das Heckman Modell, Multinomial Logit, Interaktionseffekt, und die Verwendung von Persönlichkeitsmerkmalen zur Korrektur der ungewollten Voreingenommenheit, um die Robustheit zu validieren.

Kapitel 8 und 9 handeln von der Konsumentscheidung. Kapitel 8 untersucht den Einfluss

der Internetnutzung anhand von demographischen Kennwerten, Persönlichkeitsmerkmalen und wirtschaftlichem Hintergrund. Die Internetnutzung wird in 4 Gruppen unterteilt – Soziale Interaktion, Informationsbeschaffung, Unterhaltung und wirtschaftliche Transaktionen. Verschiedene Logit Modelle werden für jede Gruppe ausgeführt. Das Ergebnis zeigt, dass eine höhere Bildung und Offenheit für neue Erfahrungen einen positiven Einfluss auf die Wahrscheinlichkeit der Internetnutzung hat. Weiterhin ist das Internet nicht ausgrenzend und die Nutzung unabhängig vom wirtschaftlichen Hintergrund oder Geschlecht. Kapitel 9 umfasst eine Literaturrecherche zum sich ändernden Konsumverhalten in Bezug auf Nahrungsmittel und die Auswirkungen auf die Umwelt. Des Weiteren werden Sekundärdaten verwendet, um die möglichen Auswirkungen dieser Veränderungen auf die CO2-Emissionen und die Flächennutzung zu schätzen. Der Fokus liegt dabei auf den wachsenden Konsum von Rindfleisch in Vietnam. Das Paper zeigt wie das wachsende Einkommen, die schnelle Verstädterung und die Globalisierung zu einer Zunahme des Rindfleischkonsums in Vietnam führt. Während ein Großteil der Nachfrage durch Produktion im Inland befriedigt werden kann, muss ein sichtbarer Anteil durch Importe bedient werden. Die wachsende Nachfrage hat im Inland dazu beigetragen, dass mehr CO2 ausgestoßen und weitere Flächen für die Viehhaltung verwendet wird. Um die globale Auswirkung dieser Entwicklung einordnen zu können, wird die Recherche auf Australien ausgeweitet, welches der Hauptexporteur von Rindfleisch nach Vietnam ist. Das Ergebnis zeigt, dass der gesteigerte Export sich zu einem großen Teil auf die CO2-Emissionen und die Flächennutzung in Australien auswirkt.

Stichworte: Entscheidungsfindung; Verhaltensökonomie; interne Migration; Migrationsintensität; Schocks; umweltbedingte Armutsfalle; Rücküberweisungen; Big Five Persönlichkeitsmerkmale; non- kognitive Fähigkeiten; Arbeitsmarkt; Einkommen; Internetverwendung; Konsum; Kohlenstoffbilanz; Südostasien; Thailand; Vietnam; TVSEP

Abstract

Southeast Asia has been experiencing unprecedented economic growth propelled by thriving production and service sectors, rapid urbanization, extensive digitalization, and a growing young population. However, issues such as regional disparities in economic and social indicators cannot be ignored. For instance, while urban areas enjoy new-found opportunities, their rural counterparts lag behind. Frequent natural disasters and natural resource degradation due to illegal logging and over exploitation have added further pressure on the rural poor. Additionally, the effects of the recent economic slowdown due to COVID-19 have also trickled to the rural areas. Forced unemployment of rural migrants in the cities, increased financial instability and weaker agricultural supply chains have aggravated their vulnerability to poverty. The region is at a crucial crossroad – facing challenges that need to be addressed, but also opportunities that herald a better future for individuals and the countries alike.

Against this background, the overall objective of this thesis is to provide a better understanding of decision-making, especially amongst rural populations in Thailand and Vietnam. Both countries have been the forerunners of economic progress in the region and have witnessed major structural transitions in the last decades. Increased rural-urban labour mobility has become a distinctive feature of both Thailand and Vietnam, and, has great repercussions for the economic and social landscape. As rural job markets struggle with overemployment and low productivity in agriculture, and, unreliable incomes, rural youth are turning to urban centres for better job and education opportunities. This form of internal migration provides a suitable alternative livelihood choice to many households and also serves as a coping strategy in response to environmental shocks. Rural households also benefit from migration through remittances, which can be used for consumption smoothing, human capital investments and risk diversification. Therefore, it becomes pertinent to understand why some individuals migrate and others do not, and, why are there differences in migrant remittance behaviour. Decisions pertaining occupational attainment also require further comprehension. Similar to other emerging economies, most individuals remain in agriculture despite the burgeoning non-farm sector. While this can be attributed to cognitive abilities and family backgrounds, there is reason to believe that non-cognitive skills also play an important role. These skills associated with personality and preferences additionally drive differences in earnings across occupations.

Other aspects that demand attention are the rapidly changing consumption patterns and their plausible impact on individual welfare and the environment. These shifts can be attributed to increased consumer spending power and easier access to resources. For instance, the availability of affordable Internet has opened new avenues for the masses, while raising questions about its usage. As some activities can be deemed more productive than others, it is worth understanding which factors influence the individual's decision on Internet usage. With respect to food consumption, people are demonstrating a higher preference for Western diets. Traditional food items are being substituted with meat, dairy and wheat. On the one hand, this increased demand has actuated expansion of the livestock and food-processing

industries. On the other hand, it has exerted sizeable pressure on the environment. In this regard, it is imperative to understand the drivers of these changes and estimate their impact on future sustainability. Given these trends, the thesis focuses on decision-making in three broad areas, namely migration, labour markets and consumption. It comprises nine chapters – the introduction and subsequently eight chapters that are individual papers.

The thesis uses primary data from Thailand and Vietnam collected under the Thailand Vietnam Socio Economic Panel (TVSEP). Household surveys were conducted in three provinces of Thailand – Buri Ram, Nakhon Phanom and Ubon Ratchathani and Vietnam – Ha Tinh, Dak Lak and Thua Thien Hue. Between 2007 and 2019, seven survey waves were conducted. These cover around 4,400 rural households each. Migrant tracking surveys were carried out in 2010 and 2018 in the major rural-urban migration hotspots of the Greater Bangkok Area in Thailand and Ho Chi Minh City and Da Nang in Vietnam. Data from all household survey waves and migrant tracking surveys are used in the thesis. In addition, Chapter 3 combines TVSEP data with weather data from the Global Precipitation Climatology Centre and the GHCN Gridded V2 data to obtain measures of drought exposure. Chapter 4 supplements the TVSEP data with income and GDP data from the World Bank and the General Statistical Office (GSO). Chapter 6 uses additional data from a TVSEP Add-On project – "Behavioral insights into over-indebtedness within a vulnerable population". Chapter 9 is solely based on secondary data from the General Statistical Office (GSO), OECD, UN Comtrade, and FAO-STAT.

Chapter 2 to 5 examine migrations decisions. Chapter 2 is a conceptual paper that aims to highlight the need for a standardized definition of an internal migrant. Household level data from Vietnam is used to create six definitions of an internal migrant based on time, space and motivation. For each definition, the determinants of migration and the impact of migration on the rural household are examined. Propensity Score Matching in combination with Difference in Difference estimator is used to analyse these questions. The results show that a change in the definition not only alters the number of households identified as migrant or non-migrant households, but also influence the results from the econometric analysis. Definitions that use only time as a defining criterion provide overestimated results, whereas stricter definitions that combine time with motivation of migration produce lower estimates. These differences can be attributed to identification errors – errors of inclusion and errors of exclusion.

Chapter 3 investigates the impact of environmental shocks, specifically droughts, on migration decisions. The data used is a combination of the TVSEP panel data and high-resolution monthly temperature and rainfall data. First, direct effects using household and survey Fixed Effects are calculated. Second, a formal Mediation Mechanism Model is employed to highlight the channels through which droughts influence migration decisions. This method produces the Average Controlled Direct Effect. It estimates how much of the Average Treatment Effect of two consecutive droughts on migration is mediated by the potential mechanism. The results suggest a significant negative impact of severe droughts, particu-

larly in consecutive years, on a household's migration decision. Analysis of the underlying mechanisms highlights that the deteriorations in consumption and assets per capita shape the negative effect of droughts on migration. Repeated exposure to severe droughts additionally decreases willingness to take risks, though the extent to which the risk attitudes mediate migration outcomes is not definitive. Overall, the results suggest the possibility of an environmentally-induced poverty trap, which may have severe implications for increasingly vulnerable populations in adversely affected regions.

Chapter 4 examines the predictors of duration of stay in the city and the migration intensity. Migration intensity refers to the degree of attachment of the migrant to his/her place of origin. Data from three pooled TVSEP household surveys, a migrant tracking survey and World Bank income data for Vietnam are used. The results of the Random Effects Tobit Model show that migrants from rural households that experienced a higher number of idiosyncratic shocks increase their stay in the city. An opposite pattern is observed when migrant households experience a covariate shock such as floods or droughts. Additionally, an Index of Migration Intensity (IMI) is created to estimate the Ordinary Least Squares. The results show that migrants return sooner when they face shocks in the city and the living conditions in the origin areas improve.

Chapter 5 investigates the remittance decisions of internal migrants in Thailand and Vietnam. Given that these decisions have greater ramifications for the poor, differences in remittance decisions across migrants from different economic backgrounds are examined. To account for observable and unobservable factors influencing the decision, both determinants and motivations of remittances are analysed. The data used is a unique combination of the household and migrant survey. The results from the Heckman Model suggest that education of the migrant and the duration of their stay in the city are the key predictors of remittances. Also, females remit lower amounts and remittances decrease as the household wealth increases. There is evidence for loan repayment and exchange motive, underscored by altruism. In addition, while the determinants of remittances are contingent on the economic standing of the receiving households, the motivations of remittances are rather independent. The robustness tests include the Hurdle Model, Tobit Model, Ordinary Least Square Model, and multiple specifications of the Heckman. These further substantiate the core results.

Chapter 6 and 7 focus on non-cognitive skills. Chapter 6 investigates the validity of the Big Five Model of personality traits in a developing country setting. It uses individual level data from Thailand and Vietnam. A series of psychometric tests such as the Principal Component Analysis, Cronbach's alpha and test-retest is conducted. The results highlight that the underlying five factor structure in the sample is similar to those observed in developed countries. A comparison across the 2017 and 2019 waves of the panel data reveals that the traits display stronger stability across higher educated respondents. There is evidence for acquiescence bias and, therefore, additional tests are executed to establish the robustness of the core findings. Overall, the Big Five Model is internally and externally valid in the rural Southeast Asian sample.

Chapter 7 examines the role of non-cognitive skills in occupational attainment and earnings using data from Thailand and Vietnam. Six measures of personality - the Big Five personality traits and locus of control, and three measures of preferences – risk, trust and patience are used. The results of the Multinomial Probit Model suggest that conscientiousness is the key predictor of an individual's occupational attainment. The Ordinary Least Square estimations for earnings show that both neuroticism and trust negatively influence earnings. Additional tests highlight that non-cognitive skills have a heterogenous effect across the wage distribution. Numerous robustness tests such as the Heckman Model, Multinomial Logit, interactions effects, and base regressions using personality traits corrected for acquiescence bias and omitted variable bias are performed to validate the robustness of the results.

Chapters 8 and 9 deal with consumption decisions. Chapter 8 examines how demographic characteristics, personality traits and economic backgrounds of migrants influence their Internet usage. Internet activities are categorized into four types – social interaction, information seeking, entertainment, and commercial transactions. Separate Logit Models for each usage type are executed. The results suggest that higher education and openness to new experiences positively influence the likelihood of Internet use for all activities. Also, Internet is inclusive and not connected to the user's economic status or gender.

Chapter 9 reviews literature on changing food consumption patterns and their impact on the environment. Furthermore, secondary data is employed to estimate the plausible impact of these changes on carbon and land use footprint. The paper uses increasing beef consumption in Vietnam as a case study. It highlights that growing income, rapid urbanization and globalization have encouraged increased consumption of beef in the country. While most of this demand is met domestically, there is visible reliance on imports. Domestically, this increased demand has contributed substantially to the carbon and land use footprint. To understand the global impact of this demand, Australia, which is one of Vietnam's top exporters of beef, is studied. The results show that this rise in exports also contributes largely to Australia's carbon and land use footprint.

Keywords: Decision-making; Behavioural economics; Internal migration; Shocks; Migration intensity; Environmental-poverty trap; Remittances; Big Five personality traits; Non-cognitive skills; Labour market; Earnings; Internet use; Consumption patterns; Internet usage; Carbon footprint; Southeast Asia; Thailand; Vietnam; TVSEP

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List of abbreviations

AASLE	Asian and Australasian Society of Labor Economics
AEL	German Development Economics Conference
APPAM	Association for Public Policy Analysis and Management
ATE	Average Treatment Effect
ATT	average treatment effect on the treated
CO2 equiv.	Carbon dioxide equivalent
COVID-19	Corona Virus Disease 2019
DENeB	Development Economics Network Berlin
EEA	European Economic Association
FAO	Food and Agriculture Organization of the United Nations
FIML	Full Information Maximum Likelihood model
FRIAS	Freiburg Institute for Advanced Studies
GDP	Gross Domestic Product
GSO	General Statistical Office
HC	Household characteristics
HH	Household
IMAGE	Internal Migration Around the GlobE
IMI	Index of Migration Intensity
IZA	Institute of Labor Economics
LULCC	Land Use Land Cover Change
MAUP	Modifiable areal unit problem
OECD	Organisation for Economic Cooperation and Development
PPP	Purchasing Power Parity
PSM	Propensity Score Matching
SD	Standard Deviation
SES	Socioeconomic Status
SPEI	Standardized Precipitation-Evapotranspiration Index

TVSEP Thailand Vietnam Socio Economic Panel

UN United Nations

UNESCO United Nations Educational, Scientific and Cultural Organization

VHLSS Vietnam Household Living Standards Survey

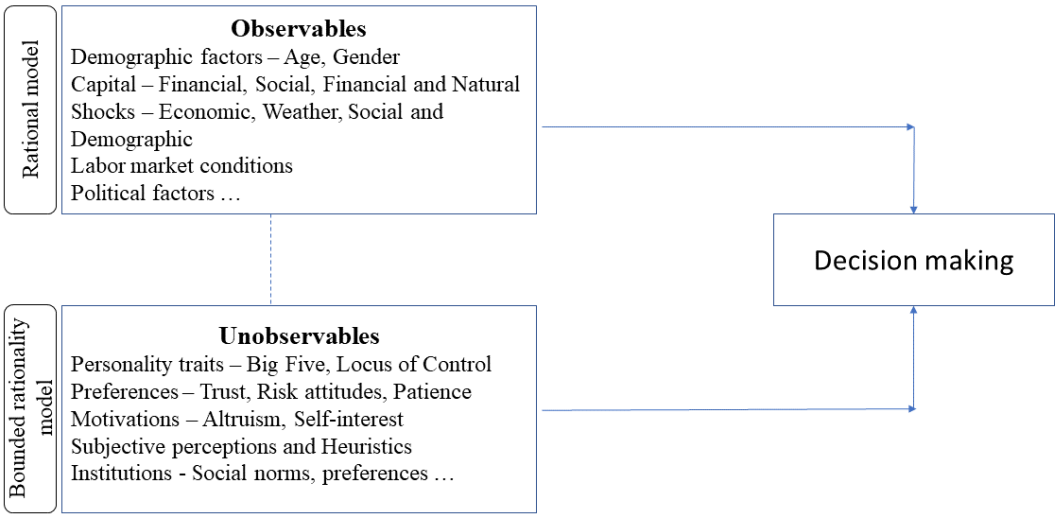
Chapter 1

Introduction

1.1 Motivation

Decision-making can be considered the core of microeconomics. The process of understanding why and how individual entities make certain decisions has always been fascinating for economists, though differences in approaches exist across different schools of thought. Classical and Neo-classical Economics assume that individuals are rational agents with stable and well-defined preferences who are only interested in utility maximization (Walras, 1854; Jevons, 1871; Menger, 1871). However, individuals might act bounded rational, especially when faced with uncertainty, and make choices that are not optimal from an economic perspective. This deviation from classic utility maximization is influenced by institutional contexts, individual personality, preferences, and heuristics. Accordingly, schools such as Institutional Economics, New Institutional Economics and Behavioural Economics propose that individuals are bounded rationals, who want to maximize satisfaction (Coase, 1937; Simon, 1955; Tversky and Kahneman, 1974; Kahneman and Tversky, 1979; Thaler, 1985; Ostrom, 2015). Therefore, to obtain a better understanding of decision-making, unobservable or latent factors such as personality, preferences and heuristics need to be acknowledged in addition to observable factors. This is depicted in Figure 1.1.

Figure 1.1: Decision-making framework – Rational Model and Bounded Rational Model



Source: Own depiction.

Against this background, the overall objective of this thesis is to provide better insights into the decision-making process, especially amongst the rural populations in emerging economies of Thailand and Vietnam. Southeast Asia is one the fastest growing regions in the world, with Thailand and Vietnam as vanguards of this economic progress. Liberalization of trade policies, globalization and inflow of foreign direct investments have led to thriving production and service sectors in both countries. This has greatly benefited the populations. In Thailand, sustained economic growth has led to a decrease in poverty rates from 67 per cent in 1986 to 9.85 per cent in 2018 (World Bank, 2020a). Vietnam, too, has made strong improvements in terms of poverty reduction, with poverty rates declining from 70 per cent to 6 per cent between 1986 and 2018 (World Bank, 2020b). These developments have created a plethora of job opportunities and encouraged migration, specifically of rural youth towards urban centres such as the Greater Bangkok Area in Thailand and Ho Chi Minh City, Hanoi and Danang in Vietnam. Increased labour mobility away from rural areas in conjunction with remittances that are sent back, have engendered a 'rural transformation' with changes in labour availability, land use, resource allocation, and environment (McKay, 2005; Rigg and Salamanca, 2011; Nguyen et al., 2019). This transition is also demonstrated by the changing consumption patterns of the populations. Sweeping digitalization has made access to Internet and technology easier and cheaper. This has translated into higher labour mobility and increased household incomes (Hartje and Hübler, 2017).

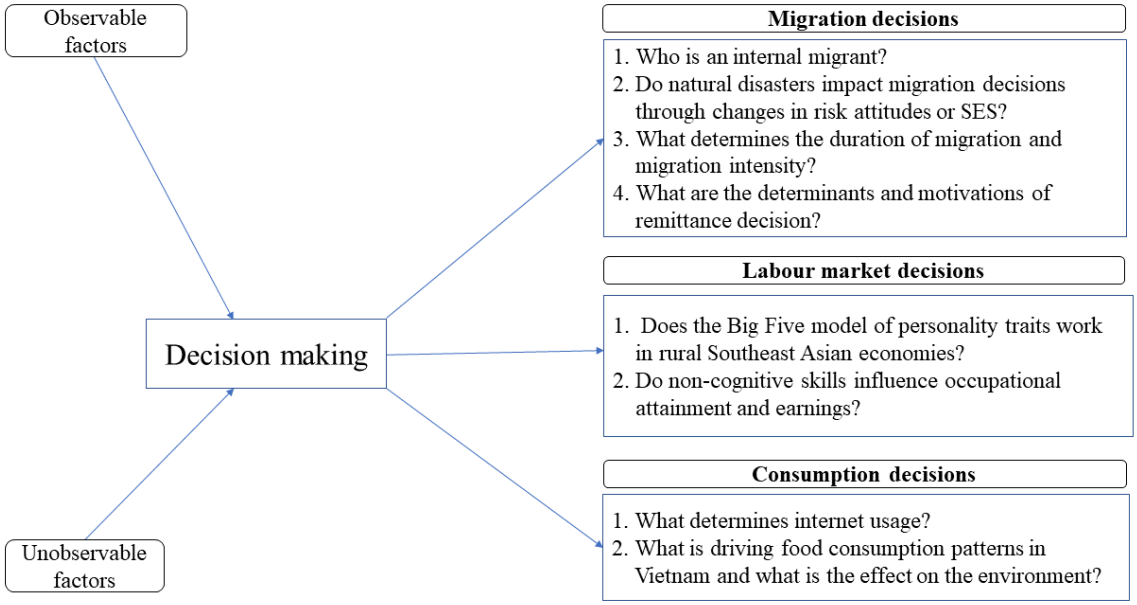
Despite these advances, the countries face many challenges. While poverty has declined in general, there are considerable differences across regions. 'Pockets of poverty' exist in rural areas that rely heavily on agriculture and natural resource extraction for their basic

survival (Amare and Hohfeld, 2016; Parvathi and Nguyen, 2018). Climate change, manifested in frequent and intense natural disasters, has exposed millions to extreme vulnerability. Specifically, rural households facing floods, droughts and salinity intrusion are experiencing a change not only in their immediate incomes, but also in their livelihoods (Malanson et al., 2014; Meïjer-Irons, 2015; FAO, 2016; Nguyen et al., 2017b). The ongoing COVID-19 crisis has also added further pressure. While Vietnam's Corona policy has been touted as a 'success story' (Chau et al., 2020), the disruption of the economy has led to work shortage and job losses, especially for low-skilled and informal workers (Tran et al., 2020). There is also evidence for a possible COVID-19 poverty trap (Tran et al., 2020). In Thailand, more stringent restrictions were followed and a complete lockdown of the economy was enforced. This has impacted people unequally across different income groups, with low income groups facing a larger risk of job loss (Lekfuangfu et al., 2020). In this regard, rural areas are generally seen as more resilient to shocks (Waibel et al., 2020). However, closed markets and borders have weakened the agriculture supply chains. This could directly affect the productivity and income of farmers. Additionally, many rural-urban migrants have been laid-off. This has entailed large scale return migration and consequently decline in remittances.

Therefore, these two countries exhibit a situation that is peculiar to all emerging countries – On the one hand, improving economic and social indicators have made multiple opportunities available to the people. On the other hand, there remain challenges and issues to a better future. In this regard, decision-making at all levels individual, household, community, or regional level, gains great importance because the choices made today will determine the outcomes of tomorrow. Policy makers too acknowledge that a better understanding of decision-making can lead to efficient policies and interventions, both at the micro and macro levels (World Bank, 2015b).

This thesis focuses on three broad areas - migration decisions, labour market decisions and consumption decisions. It examines eight diverse questions, two of which are conceptual in nature. Figure 1.2 provides an overview of how these relate to the decision-making framework.

Figure 1.2: Decision-making framework and inter-relation of thesis chapters



Source: Own depiction.

Chapters 2 to 5 deal with the migration decision and decisions made by the migrants. Chapter 2 is a conceptual paper that asks the question, 'who is an internal migrant?'. There is no universally accepted definition of an internal migrant, which leads to varied definitions and hence divergent measurements of internal migration across the world. The paper highlights the sensitivity of the econometric results to changes in defining criteria and argues for a standardised definition. The next chapter investigates migration decisions in response to environmental shocks. Literature posits that migration can serve as a coping strategy in response to natural disasters. However, migration is an expensive and risky pursuit. In this regard, the rural poor suffer a double-burden as they lack the means to migrate. This makes them particularly vulnerable to environmental changes in their original location (Black et al., 2011; Black and Collzer, 2014; Beine and Parsons, 2017; Beine and Jeusette, 2018; Riguard et al., 2018; Benonnier et al., 2019). Environmental shocks influence the migration decisions through changes in the household's socio-economic status (Hornbeck, 2012; Quiñones, 2019) and behavioural preferences such as risk aversion (Jaeger et al., 2010; Dustmann et al., 2017; Goldbach and Schlüter, 2018). Therefore, Chapter 3 further examines the mechanisms through which environmental shocks influence migration decisions. Chapter 4 focuses on the life of the migrants in the cities. In particular, decisions pertaining the length of migration and migration intensity are examined. Migration intensity is the extent to which the migrant shifts his/her attachment, association and engagement from the place of origin to the destination (Kaufann, 2007). These decisions have important implications for the socio-economic development strategies of both the origin and the destination areas. The last chapter on migration, Chapter 5, examines remittance decisions in detail. Remittances can be viewed as a 'vehicle for reducing the scale and severity of poverty in the developing

world' (Ratha, 2013). They aid in consumption smoothing, increase human capital investment and risk diversification (Yang, 2008; Amare and Hohfeld, 2016; Nguyen et al., 2017a; Hines and Simpson, 2019; Millán, 2019). The remittance decision is not only influenced by observables such as socio-economic and financial factors, but also by unobservables like the motivations of the migrant (Funkhouser, 1995). Therefore, a comprehensive analysis is provided by examining both the determinants and motivations of remittances.

Chapter 6 validates the Big Five Model of personality traits developed by Costa and McCrae (1992, 1997). The model categorizes individual personality under five factors – openness, conscientiousness, extraversion, agreeableness and neuroticism. As the typology and measurement of this model were carried out in the West using data from industrialised educated countries, concerns about its universal validity remain (Cheung, 2009; Gurven et al., 2013; Ludeke and Larsen, 2017; Laajaj et al., 2019). Therefore, internal and external validity of the model is investigated in a rural developing country setting. Chapter 7 builds on the validation of the Big Five Model to examine the role of non-cognitive skills in labour market decisions. Although non-farm job opportunities can provide higher and relatively stable income (Sohns and Revilla Diez, 2016; Sharma et al., 2016), a major proportion of the population in Thailand and Vietnam remain in the agriculture sector. Since the labour market opportunities and skills in these economies tend to be rather homogeneous, non-cognitive skills might explain why some individuals pursue a career other than farming and earn higher wages compared to their counterparts engaged in similar occupations. In addition to the Big Five, four additional measures of non-cognitive skills are used, namely, locus of control, risk, patience, and trust. The chapter estimates how these skills impact the occupational attainment and earnings of individuals.

Chapters 8 and 9 examine consumption decisions. Unprecedented economic growth coupled with globalization, urbanization, and digitalization in the two countries has led to substantial changes in the consumption patterns of the masses. As the Internet makes its way to the remotest areas, concerns regarding access and adoption of the Internet or the First Digital Divide have alleviated. Therefore, it is argued that future inequalities will arise due to differences in the use of the Internet. This is referred as the Second Digital Divide. Differential use of the Internet can lead to different gains because some activities are more 'capital enhancing' than others (Madden, 2003). Given this, Chapter 8 investigates the determinants of internet usage. In particular, a migrant sample is used because the impact of their internet usage decision is twofold: their actions have implications not only for themselves but also the rural household. Food consumption patterns in the region have also witnessed changes in the last decade. For instance, Vietnamese beef consumption is increasing by four per cent, annually (OECD-FAO, 2006). While these changes in diets can boost the economy and create new job opportunities, they have harmful impacts on the domestic and global environment. Chapter 9 specifically analyses drivers of increased beef consumption in Vietnam and its impact on carbon footprint and Land Use Land Cover Change (LULCC) in Vietnam and Australia. Australia is chosen as an additional case study because it is one of the top beef exporters

of Vietnam and thus an effect on its environment can be anticipated, when beef demand in Vietnam increases.

The thesis uses primary data from household and migrant tracking surveys conducted under the Thailand Vietnam Socio Economic Panel (TVSEP). The household panel contains data on around 4000 households from three provinces in Thailand Buri Ram, Nakhon Phanom and Ubon Ratchathani, and Vietnam Ha Tinh, Dak Lak and Thua Thien Hue. The three-stage sampling procedure accounts for differences in ethnic compositions and agro-ecological characteristics of the countries (Hardeweg et al., 2013). The questionnaires capture a broad range of socio-economic topics such as member information, employment, shocks, risks, agriculture, and financial transfers. An additional section on Big Five personality traits was added to the questionnaire in 2017. Until 2020, seven survey waves have taken place in the years 2007, 2008, 2010, 2013, 2016, 2017, and 2019. The migrant tracking surveys were conducted in 2010 and 2018 in the Greater Bangkok area in Thailand, and Ho Chi Minh City and the surrounding areas of Dong Nai and Binh Duong and Da Nang in Vietnam. These areas present ideal settings for a migrant survey because 80 per cent of internal migrants in Thailand migrate to Bangkok, whereas Ho Chi Minh receives 63 per cent of the internal migrants in Vietnam (NSO, 2008; Anderson et al., 2017). Information from preceding household surveys was used to track migrants in the cities. Migrant questionnaires collected information on migration and employment histories, remittances, working conditions, shocks, Information and Communications Technology (ICT), and future aspirations. The thesis employs data from all seven waves of the household survey and the two migrant tracking surveys. In addition to the TVSEP panel, chapter 3 uses monthly high-resolution (0.25°) rainfall measures from the Global Precipitation Climatology Centre and (0.5°) temperature information from the GHCN Gridded V2 data. In Chapter 4, World Bank and General Statistical Office (GSO) data on wages and GDP growth are used in combination with TVSEP data to supplement our analysis. Chapter 9 is an exception, where solely secondary data on meat consumption, imports and exports from General Statistical Office (GSO), OECD, UN Comtrade, and FAO-STAT is used.

The structure of the thesis is as follows: Chapter 1 introduces and motivates the topic, provides a short overview of each chapter followed by policy implications of the thesis. Furthermore, I present an outline of the thesis and highlight contribution of the author to each chapter. The subsequent chapters are individual papers.

1.2 Brief summary of chapters

This section briefly presents a short summary of each chapter. It describes the specific research questions, methodology, findings, and contribution of these papers to existing literature. This is followed by a thesis conclusion and policy implications.

Chapter 2 is a conceptual paper that uses household level data from Vietnam. Six definition

of internal migrant based on time, space and motivation are used to examine the following research questions:

1. Does the change in definition of an internal migrant impact econometric/statistical results?
2. What drives these differences in results?

The findings show that a change in definition not only alters the number of households identified as migrant or non-migrant households, but also significantly impacts the results from the econometric analysis. In particular, if only time is used to identify migrants, this could lead to overestimation of results. Stricter definitions such as those that include an employment criterion tend to produce lower estimates. These differences in results can be attributed to identification errors – inclusion and exclusion errors.

Internal migration is widely discussed and researched on international platforms and academia. However, there is no universally accepted definition of an internal migrant. The paper, hence, addresses an important question. It highlights the need for a standardised definition by providing empirical evidence for the sensitivity of results.

Chapter 3 uses TVSEP panel data in combination with high resolution rainfall and temperature data to construct a Standardized Precipitation-Evapotranspiration Index (SPEI) that characterizes severe droughts associated with climate change. The research questions are:

1. What are the causal effects of contemporaneous and lagged severe droughts on household's migration decision?
2. What is the role of mediating factors such as risk attitudes and socio-economic status in shaping the migration decisions?

The findings of the Fixed Effects Model show that the migration decision is negatively influenced by a severe drought. To investigate the underlying mechanisms, a Mediation Mechanism Model proposed by Acharya et al. (2016) is used. The results suggest that reduction in a household's socio-economic status (SES) due to drought exposure leads to decrease in migration probability. Additionally, repeated exposure to droughts decreases the willingness to take risks. Overall, the results hint at the possibility of an environmentally-induced poverty trap.

The study contributes to the literature in two ways. While recent scholarship has acknowledged degradation of household's SES as an influential channel through which environmental disasters shape migration decision, research is limited on the underlying behavioural mechanisms. In addition, these studies do not investigate the mediation interrelations between environmental disasters, behavioural changes, SES, and the migration decision.

Chapter 4 focuses on the life of the migrant in the city. Aspects of length and intensity of migration have important impacts on the development of the origin and the destination areas and, hence, need to be understood in detail. TVSEP and World Bank data on Vietnam are employed to examine:

1. What determines the length of migration?
2. What determines migration intensity?

The results from the Random Effects Tobit Model show that an increase in number of idiosyncratic shocks faced by the rural household leads to an increase in duration of stay in the city, whereas an increase in covariate shocks has an opposite impact. The Ordinary Least Square regression for migration intensity suggests that migrants return sooner when the living conditions in the origin areas improve.

The paper adds to the scarce literature on extent and length of rural-urban migration by examining both micro and macro level indicators. Additionally, the use of Tobit with random effects provides robust results.

Chapter 5 aims to improve the understanding of remittance decisions amongst internal migrants in Thailand and Vietnam. Also, given that these decisions have greater implications for the poor, the analysis is extended to incorporate these households. Therefore, it investigates:

1. What are the determinants and motivations of internal migrant remittances?
2. Do determinants and motivations of remittances differ across migrants from different economic backgrounds?

The findings of the Heckman Model highlight that more educated migrants who have stayed longer in the city are more likely to remit. The main motivations are loan repayment and exchange motive, underscored by altruism. Additionally, we show that determinants of remittances differ for richer and poorer migrants, whereas motivations are homogenous. The additional robustness tests validate our findings.

There has been ample literature on remittance decisions but facing several issues. The paper contributes to the literature by addressing these concerns. Firstly, the used data set on 687 migrants and their rural households allows to acknowledge the two-sided nature of the remittance decision. It also leads to a robust analysis and eliminates omitted variable bias. Second, papers generally either focus on determinants or motivations of remittance decisions. The paper examines both, the observable determinants and the unobservable motivations, to provide a comprehensive explanation of differences in remittance behaviour. Lastly, an alternate measure of remittances is used to avoid endogeneity issues that are common in remittance decision literature.

Chapter 6 validates the use of Big Five Model of personality traits in a developing country setting. Individual level data from Thailand and Vietnam is used to test the following:

1. Are the Big Five scales internally and externally consistent in a rural emerging country setting?
2. Are the Big Five scales stable over time?
3. Is there acquiescence bias in the scales and what is its effect?

A series of psychometric tests such as the Cronbach's alpha and test-retest and Principal Component Analysis establish the internal and external validity of the Big Five measurement in the TVSEP. In line with expectations, a five-factor structure is observed. A comparison across the 2017 and 2019 waves is executed to find that the scales are relatively stable. There is evidence for acquiescence bias. Therefore, additional tests are performed to substantiate the main results.

The paper contributes to the literature in two ways. Firstly, it adds to the scarce literature on measurement and validation of personality traits models in developing countries. It especially expands the discussion on rural samples. Second, in regard to the novel section in the TVSEP data set, the paper illustrates the construction of the Big Five and validates the model. Hence, it provides a strong foundation for future research using this particular data.

Chapter 7 investigates the role of non-cognitive skills on an individual's occupational outcomes. It uses nine measures of non-cognitive skills to examine:

1. How do non-cognitive skills affect occupational attainment?
2. Are non-cognitive skills decisive for earnings across different occupation types?

The results from the Multinomial Probit Model suggest that conscientiousness and trust are the main predictors of occupational attainment. In regard to earnings, the Ordinary Least Square results show that neuroticism and trust determine the level of earnings within occupations types. In contrast to literature from developed countries, conscientiousness, locus of control and risk play no role. Additionally, there is evidence for an inverted U relationship between non-cognitive and earnings across the wage distribution. A series of tests that address omitted variable bias, selection on observables and unobservables, acquiescence bias and employ alternative model specifications such as the Mincer type regressions and Multinomial Logit Model are performed to validate the robustness of the core results.

The paper has the following contributions. First, it provides unique insights into the relationship between non-cognitive skills and occupational outcomes for individuals in rural Southeast Asia. It is the first paper to examine these aspects using a comprehensive range of measures for rural Thailand and Vietnam. Second, it complements existing studies from industrialized countries, by providing evidence for occupations that are specifically impor-

tant in rural labour markets, such as farming or small-scale businesses. Third, it advances the proposition put forth by Laajaj et al. (2019), that the role of non-cognitive skills is context-specific. Lastly, it adds to the growing literature on the importance of non-cognitive skills in developing countries.

Chapter 8 examines the internet usage patterns of migrants in cities using data from the Migrant Tracking survey from Thailand and Vietnam. In particular, it asks:

1. What are the determinants of internet usage amongst internal migrants in Southeast Asia?

Internet usage is categorised into four types - social interaction, information seeking, entertainment, and commercial transactions. The Logit Model results show that education and the Big Five personality trait of openness are the most important determinants of internet usage. There is no evidence for a 'gender gap' in internet usage.

The paper contributes to the scarce literature on internet use in developing countries. Additionally, it employs the Big Five factors of personality traits to account for influence of non-cognitive skills on Internet usage. This is a relatively novel approach and could expand the realm of literature on non-cognitive skills and migration.

Chapter 9 conducts an extensive literature review and uses secondary data on Vietnam to examine the change in consumption patterns and their impact on the environment. It focusses on the rising beef demand in Vietnam. The main research questions are:

1. What is the theoretic linkage between changing consumption patterns and their environmental impact?
2. What is the effect of rising beef demand in Vietnam on the domestic and global environment?

The paper highlights that food consumption patterns are changing in Vietnam and demand for beef has witnessed one of the strongest increases. Domestically and globally, this has contributed considerably to the carbon and land use footprints.

It contributes to the literature in the following ways. Firstly, reviews or analyses in this area generally focus on regional impacts, whereas the global effects are not considered. The framework in the paper proposes the inclusion of environmental impacts in the country of exports along with the country of demand, when ascertaining the overall environmental impact. Additionally, no similar study combining the two aspects of consumption patterns and environment is available for Vietnam.

In conclusion, the thesis provides many insights into the decision-making process, specifically in regard to migration, labour market and consumption decisions for rural populations in Southeast Asia. While each chapter presents substantial findings, it is possible to identify

some common results across the thesis which can provide important policy recommendations. First, amongst observable factors, education is a key predictor for decision-making in almost all chapters. Better educated individuals are more likely to make decisions that benefit them and their families. They have higher probabilities of migrating, remitting and also attaining complex high paying jobs. Both Thailand and Vietnam have nearly achieved universal primary education and are now working towards closing the gaps in secondary education. However, the quality of education is low and functional illiteracy is still predominant, especially in rural areas (World Bank, 2015a; Dang and Glewwe, 2017). Therefore, improvement of not only access but also quality of education should be prioritized. Additionally, vocational courses should be encouraged which can equip individuals with skills for non-farm related occupations. Second, chapters 3, 5, 7, 8, and, 9 highlight the importance of unobservable factors, especially non-cognitive skills for decision-making. Skills such as personality traits, preferences or motivations play a pivotal role in determining life outcomes and consumption. Therefore, investment in the soft skills generation through early childhood intervention programs can be recommended. Policy makers should also identify and resolve factors that can hinder the development of these skills.

Our findings also illustrate how unobservable characteristics differ across developed and developing countries. This needs to be acknowledged while framing policies in these regions. Thirdly, the significance of shocks faced by the rural households is non-trivial. Covariate shocks not only impact migration probabilities and remittances, but also decrease the migration duration of migrants who are already in the city. Keeping in mind the climate change narrative, the frequency and intensity of shocks such as typhoons and droughts can be expected to increase in the future. Heath and economic shocks faced by the people in the wake of COVID-19 also highlight this aspect. Policy makers need to devise safety nets such as cash transfers and insurance programs that are sensitive to the seasonal evolution of weather conditions and nimble in delivering support. Lastly, our results in chapters 3, 5 and 7 emphasize the need for encouraging off-farm opportunities in rural areas. Most rural households derive basic sustenance majorly from agricultural incomes. However, this reliance induces vulnerability because agriculture yields are highly dependent on weather conditions. A diversified livelihood portfolio including non-agricultural incomes would provide opportunities to cope with these vagaries in agricultural income. Migration can also be encouraged as an alternative livelihood strategy. Though this would need easier access to urban job markets, relaxation of housing registration systems such as the ho khau in Vietnam, and promoting social protection of migrants as illustrated in chapters 3, 4 and 5.

1.3 Thesis overview

Table 1.1: Thesis Overview

No.	Title	Authors	Published in/submitted to/presented at
2	Who is an Internal Migrant?	Rasadhika Sharma, Ulrike Grote	Earlier version published in: *TVSEP Working Paper Series* (January 2019) Earlier versions presented at: 1) Annual conference "Development Economics and Policy", (AEL), Berlin, June 2019. 2) FRIAS, Freiburg, February 2019. 3) The Migration Conference, Lisbon, June 2018.
3	Left Home High and Dry - Reduced Migration in Response to Repeated Droughts in Thailand and Vietnam	Esteban Quiñones, Sabine Liebenehm, Rasadhika Sharma	Published in: *Population and Environment* (April 2021) Earlier versions presented at: 1)Assciation for Public Policy analysis and Management International Conference (APPAM) (held virtually), July 2020. 2) Conference on Demographic Responses to Changes in the Natural Environment, Madison, October 2019.
4	Staying in the Cities or Returning Home? An Analysis of the Rural-Urban Migration Behaviour in Vietnam	Loc Duc Nguyen, Ulrike Grote, Rasadhika Sharma	Published in: *IZA Journal of Development and Migration* (May 2017)
5	What Predicts Remittance Decisions across Internal Migrants? Empirical Evidence from Southeast Asia	Rasadhika Sharma, Ulrike Grote	Submitted to: *IZA Journal of Development and Migration* (December 2020) Earlier versions presented at: 1) TVSEP users workshop, Hannover, January 2018. 2) DENeB annual workshop, Berlin, November 2017. 3) The Migration Conference, Athens, August 2017.

Continued on next page

Continued from last page

No.	Title	Authors	Published in/submitted to/presented at
6	Validation of the Big Five Model in Rural Developing Economies – Evidence from Thailand and Vietnam	Dorothee Bühler, Rasadhika Sharma, Wiebke Stein	Published in: *TVSEP Working Paper Series* (September 2020)
7	Occupational Attainment and Earnings in Southeast Asia: The Role of Non-Cognitive Skills	Dorothee Bühler, Rasadhika Sharma, Wiebke Stein	Published in: *Labour Economics* (September 2020) Earlier versions presented at: 1) Annual congress of the European Economic Association (EEA), held virtually, August 2020. 2) Asian and Australasian Society of Labour Economics (AASLE) conference, Singapore, December 2019. 3) 3rd IZA/HSE Workshop, St. Petersburg, September 2019.
8	Determinants of Internet Use among Migrants in South-East Asia: A Case Study of Internal Migrants in Thailand and Viet Nam	Rasadhika Sharma, Ulrike Grote	Published in: *IOM Migration Research Studies* (October 2019)
9	Changing Consumption Patterns — Drivers and the Environmental Impact	Rasadhika Sharma, Trung Thanh Nguyen, Ulrike Grote	Published in: *Sustainability* (November 2019) Presented at: Part of student lectures for course - Sustainability Economics

1.4 Author's contribution

The author's contribution to the chapters are as follows: Chapters 2 was conceptualized, developed, researched, and written by the author with contributions from Ulrike Grote. Chapter 3 is a joint work with Sabine Liebenehm and Esteban Quiñones. The author was part of the conceptualization, writing and peer-review process. In particular, the author helped in data compilation and descriptives, development of the theoretical framework, literature review, and the analysis on attrition bias. Chapter 4 is a joint work with Loc Duc Nguyen and Ulrike Grote. The author added to the literature review and wrote major parts of the introduction, methodology and the conclusion. The author also supported the peer-review process. Chapters 5 was conceptualized, developed, researched, and written by the author with contributions from Ulrike Grote. Chapters 6 and 7 were developed, researched and written with Dorothee Bühler and Wiebke Stein in equal authorship. Chapter 8 was conceptualized, developed, researched, written, and submitted/re-submitted by the author, with contributions from Ulrike Grote. Chapter 9 was conceptualised, developed, researched,

written, and submitted/re-submitted by the author, with contributions from Thanh Trung Nguyen and Ulrike Grote. In addition, the author was part of the data collection and data cleaning team in Vietnam in 2016. In 2017, the author supported data cleaning and managed a data checking team. In 2018, the author supported the formulation of the Migrant Tracking Survey questionnaire, participated in enumerator training in Vietnam and partially managed the data collection process in Thailand. The author was solely responsible for the 2018 migrant data cleaning and preparation.

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Chapter 2

Who is an Internal Migrant?

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Abstract

This paper asks the question "who is an internal migrant?". With no internationally accepted definition, administrative sources and academic papers use varied definitions of an internal migrant. This can lead to incompatible data sets and inconclusive results. Our paper (1) tests the sensitivity of results obtained by econometric analysis to the use of different defining criteria and (2) investigates what drives these differences in results. We examine household level data from Vietnam using six definitions of an internal migrant based on the dimensions of time, space and motivation.

We find that a change in definition not only alters the target sample but also significantly impacts the results from the econometric analysis. In particular, if only time is used to identify migrants, this could lead to overestimation of estimates. Stricter definitions such as those that include an employment criterion tend to produce lower estimates. We attribute these differences in results to identification errors. Our results highlight the need for a more standardized definition of an internal migrant, especially across international organizations and administrative sources. In regard to academic research, where definitions in accordance to the research questions might be warranted, we recommend providing robustness tests with alternative defining criteria.

Keywords: Internal migration; Internal migrant; Survey methods; Identification errors; Household income; Vietnam
JEL classification: J61, O15, R23, P25

2.1 Introduction

Internal migration is an important feature of our world. According to the World Bank (2016), there are globally about 756 million internal migrants, which is roughly equivalent to three times the number of international migrants. Internal migration is not only evident in developed countries where job hopping takes individuals across many cities during their lifetime, but also in developing countries where growing job opportunities and better education in certain parts of the country attract the population from other areas. Around 40% of the urbanization process in Asia, Latin America and Africa can be attributed to internal migration (Skeldon, 2006).

While there is ample literature available on the determinants, patterns, consequences, and other facets of the phenomenon, there is no universally accepted definition of internal migration. The World Bank (2016) states that *"internal migrants are those who have moved across administrative boundaries within national borders"*. The United Nations manual for measurement of internal migration defines internal migration as *"a move from one migration-defining area to another that was made during a given migration interval and that involved a change of residence"*. Therefore, a (internal) migrant *"is a person who has changed his usual place of residence from one migration-defining area to another at least once during the migration period"* (UN, 1970). However, these definitions are very broad and can be interpreted in various ways. This creates the following problems. Firstly, there is no way to harmonize various internal migration data sets across nations because each country defines and measures internal migration differently (UN, 2013). An international comparison of individual results could provide more substantial insights and aid to identify unique findings (Bell et al., 2015a). Secondly, non-standardization of definitions leads to what we could call the 'poverty line syndrome' – where a change in the poverty line by governments could change the proportion of poor in the country. In our context, changing the definition of an internal migrant would change the number of internal migrants or migrant households. This could induce identification errors such as errors of inclusion and exclusion in the analysis (Cornia and Stewart, 1993). Lastly, presence of many definitions can lead to inconclusive results. The socio-demographic and economic composition of samples depends on the choice of definition. Therefore, it is possible to obtain opposite results for the same questions when using an alternative defining criterion.

Our paper highlights these issues by examining two research objectives – (1) does the change in the definition of an internal migrant impact econometric/statistical results, and (2) what drives these differences in results? For the first objective, we examine two questions (i) what are the determinants of internal migration and (ii) what is the impact of internal migration on income of migrant's household of origin. We look for evidence on identification errors to examine the second research objective. The paper uses a comprehensive dataset from Vietnam. The country witnessed boom in production and service sectors since the doi moi reforms of the 1990s. This has furthered substantial internal migration, mostly directed towards the big cities of Ho Chi Minh, Hanoi and Da Nang. The current internal migration

rate stands at 14% (UNESCO, 2017). However, despite the economic progress, development has been uneven across regions with many existing 'pockets of poverty' (Amare and Hohfeld, 2016; Pham and Mukhopadhaya, 2018). Generally, individuals from poorer households view internal migration as a more viable livelihood strategy than international migration. Given this, Vietnam provides an excellent example for our case study.

Our results confirm that changing the definition of an internal migrant can not only alter the number of migrant origin households (target population), but also impact the econometric inferences. The choice of definition could lead to over- or underestimation of results. We attribute these to identification errors. The results provide justification for a more standardized definition of an internal migrant in international organizations and survey communities. The United Nations (UN) has recently finalized the Global Compact for Safe, Orderly and Regular Migration. The first objective of this compact is to "collect and utilize accurate and disaggregated data as a basis for evidence-based policies" (UN, 2018). This entirely rests on the assumption that the migrant is precisely defined which is not the case. Though this pact is pertaining to international migration, it is also relevant in the context of internal migration. From the perspective of an academic researcher, our results highlight the importance of being clear about the employed definitions and robustness tests.

The paper is structured as follows. The next section provides an overview of internal migrant definitions used in existing academic papers, survey and censuses. Section 3 illustrates the data and methodology used and section 4 presents the results. The last section concludes.

2.2 Current definitions

An investigation of academic literature, administrative surveys and reports from international organizations provides two broad dimensions that are used independently and in combination to define an internal migrant. These are time and space. However, each of these dimensions posits its fair share of complexities.

Under the temporal dimension, an individual is deemed to be a migrant if they spend more than a certain amount of time away from home. However, there is no consensus on this time interval. For example, the General Statistical Office (GSO) in Vietnam in its internal migrant survey term an individual as migrant if he or she has been away from the origin household for at least five years, while in the United States, there is a time interval of one to five years (GSO, 2016; Population Association of America, 1988). Additionally, in the internal migrant literature, permanent and temporary migrants who can be categorized based on this time interval, are generally not separated because of lack of a standard demarcation. Temporary migration is a peculiar feature of agrarian cultures, especially in Southeast Asia (Kelley et al., 2020). Therefore, use of a longer time period to identify a migrant could fail to capture these migrants.

The spatial dimension captures the type of geographical movement undertaken by the in-

dividual within the country borders. Boyle et al. (1998) state that internal migration is a movement across political or administrative units. However, it is not always clear which administrative units (provincial, district or municipal) should be considered. For instance, while there is a general notion that internal migration in developing countries is mainly rural-urban, this might not always be the case. Many laborers tend to migrate to neighboring villages for work, or the emergence of a new factory in rural areas could entail urban-rural migration. Also the COVID-19 pandemic has resulted in this reverse trend in internal migration from urban to rural areas (Waibel et al., 2020). Dang et al. (1997) stress on inter-provincial migrants in their paper because in Vietnam policy and socioeconomic development are more likely to entail movements across provinces rather than intra-provincial movements. Definitions such as these overlook migrants who migrate within the province but might perform similar activities and spend similar time away from their homes, as their inter-provincial migrating counterparts. The measurement is also hindered by the lack of controlled borders and associated documentation. Additionally, a cross-country comparison in this regard becomes difficult because spatial frameworks differ across countries. This is termed as the Modifiable areal unit problem (MAUP). Though there are sophisticated tools such as the Internal Migration Around the GlobE (IMAGE) studio,[1] that rectify this problem, the indicators that can be analyzed are limited and mostly lack individual level details.

In case of empirical research, most papers use data from censuses, population registries, migrant surveys, and household surveys directly and hence adhere to the definitions employed by their respective sources (Agesa and Kim, 2001; Phan and Coxhead, 2016; Mduduzi Biyase and Tregenna, 2016; Baez et al., 2017). However, it is also a common practice to formulate definitions depending on the research question. This is usually done by employing the aforementioned dimensions in combination with the 'third dimension' of internal migration – the motivation of migration. Examples include job search, education, environmental shocks, and marriage (Curran and Rivero-Fuentes, 2003; Boustan et al., 2012; Munshi and Rosenzweig, 2016; Gröger and Zylberberg, 2016). This dimension provides more specificity to the research theme and clearer policy implications. However, it is harder to measure and there is a possibility that various motivations could overlap.

2.3 Data and Methodology

The study uses data from 2016 and 2017 collected under the Thailand Vietnam Socio Economic Panel (TVSEP).[2] Around 2000 households were sampled in three provinces in Vietnam, namely, Thua Thien Hue, Ha Tinh and Dak Lak (Hardeweg et al., 2013). The questionnaires covered a broad range of topics such as shocks, finances, livelihoods, and agriculture.

[1] IMAGE studio is a software platform which uses an origin-destination matrix of migration flows to facilitate spatial analysis and modelling of internal migration in different countries. Please refer to Stillwell et al. (2014); Bell et al. (2015b).

[2] `https://www.tvsep.de/overview-tvsep.html`

Our first research objective aims to ascertain if a change in the definition of an internal migrant would entail differences in econometric and statistical results. For this, we examine two questions – what are the determinants of internal migration, and what is the impact of internal migration on the income of a migrant's household of origin? We examine these questions using six varied definitions of an internal migrant. We subsequently run six separate models and compare the final results.

Definitions used:

The following definitions are used (1) Individual is a migrant if he or she has been away from home for at least a month, regardless of the spatial movement and the motivation of migration; (2) Individual is a migrant if he or she has been away from home for at least half a year, regardless of the spatial movement and the motivation of migration; (3) Individual is a migrant if he or she moved for job opportunities, regardless of the time interval and the spatial movement; and (4) Individual is a migrant if he or she moved to another province, regardless of the time interval and the motivation of migration. These four definitions represent the temporal, spatial and motivation dimensions. In addition, we include two combination definitions that combine time and motivation (5) Individual is a migrant if he or she has been away from home for at least a month for job opportunities, regardless of the spatial movement; and (6) Individual is a migrant if he or she has been away from home for at least a half a year for job opportunities, regardless of the spatial movement. These definitions are procured from existing literature that uses data from Vietnam (Dang et al., 1997; Nguyen et al., 2015; Gröger and Zylberberg, 2016). While individuals migrate for many reasons, we choose employment because this motivation is more likely to affect the rural household's income. If the household has at least one member that could be identified as a migrant under a definition, the household is termed as a migrant household.[3] To facilitate easier readability, the definitions are renamed as (1) short-term migrant, (2) long-term migrant, (3) employment migrant, (4) inter-provincial migrant, (5) short-term employment migrant, and, (6) long-term employment migrant.

Sample description

Table 2.1 shows the number of households identified as migrant households under each definition. As expected, there is variation across the six definitions. Use of broader definitions such as short-term migrant categorizes more households as migrant households. Whereas more restrictive definitions such as long-term employment migrant, have the lowest number of migrant households. We are not able to track the migration of entire households due to the construct of the data set. There is however expected overlapping across the six definitions. Table 2.A1 in the appendix gives an overview. There are 406 households that can be considered migrant households under all definitions. This implies that these households have individuals who have been away from home in another province for at least half a year for employment.

[3] Migrant household refers to migrant's household of origin.

Table 2.1: Sample size under different definitions

	Migrant households	**Non-migrant households**
Short-term (1)	956	744
Long-term (2)	692	1008
Employment (3)	600	1100
Inter-provincial (4)	853	847
Short-term employment (5)	577	1123
Long-term employment (6)	459	1241

Source: Own calculations.

Model specification:

Equation (I) is used to identify the determinants of migration.

$$Prob(Mig_{ij,2017} = 1) = \alpha_o + \alpha_1\ HC_{ij,2016} + \alpha_2\ PC_p + \epsilon_{ijp} \tag{I}$$

The dependent variable takes the value 1 if the household i in village j and province p has any migrants in 2017 and 0, if otherwise. We regress this on Household characteristics (HC) from the year 2016 and provincial fixed effects. We use Probit modelling to analyze this question.

Equation (II) is used to examine the impact of migration on the annual income of the households.

$$ATT = [Y^1_{2017} - Y^1_{2016}|X_{2016}, D = 1] - [Y^0_{2017} - Y^0_{2016}|X_{2016}, D = 0] \tag{II}$$

The dependent variable is the average treatment effect on the treated (ATT) that captures the impact of migration on the change in annual per capita income of the migrant household between 2016 and 2017. As it is not possible to compare the outcome of the same household with and without a migrant, we use difference-in-difference in combination with Propensity Score Matching (PSM) to estimate our model. We use (I) to obtain the propensity score and nearest neighbor matching, kernel-based matching and radius matching to assess the impact of migration. Samples obtained under each definition are tested for basic assumptions of PSM such as common support and conditional independence, and for presence of hidden bias. Table 2.A3 shows the matching quality for all definitions.

Our second objective aims to ascertain the source of differences in results. This is contingent on finding any differences under the first objective. We perform a descriptive analysis and compare social, demographic and economic characteristics of migrant and non-migrant households across the definitions. This exercise can provide evidence of identification errors. Identification errors can be classified as errors of inclusion and errors of exclusion. These are commonly cited problems in policy programs (Hirway, 2003; Mahamalik and Sahu, 2011). They arise when entities that should ideally be part of the target sample are left out or vice versa. These can influence conclusions from surveys and hinder effective policy making.

2.4 Results

2.4.1 Determinants of internal migration

Table 2.2 shows the results for determinants of the migration decision. We notice substantial differences across the six definitions.

Table 2.2: Determinants of internal migration based on the six different definitions

Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Female HH head	0.006	-0.076	-0.056	-0.134	-0.077	-0.256***
	(0.094)	(0.096)	(0.098)	(0.094)	(0.102)	(0.096)
Age of HH head	0.004	0.003	0.003	0.003	0.004	0.017***
(years)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)
Dependency ratio	-0.262***	-0.354***	-0.236***	-0.058	-0.247***	-0.388***
	(0.069)	(0.076)	(0.076)	(0.069)	(0.079)	(0.092)
Shocks experienced by HH						
Demographic shock	-0.153**	-0.158**	-0.005	0.017	-0.031	0.052
	(0.074)	(0.075)	(0.076)	(0.073)	(0.075)	(0.073)
Social shock	0.332	0.419**	-0.055	-0.029	0.034	0.241
	-0.216	-0.211	-0.202	-0.196	-0.193	-0.191
Agricultural shock	0.053	0.038	0.035	0.01	0.032	0.147*
	(0.084)	(0.085)	(0.086)	(0.083)	(0.086)	(0.086)
Economic shock	-0.166	-0.013	-0.082	-0.067	-0.092	0.083
	(0.106)	(0.106)	(0.109)	(0.104)	(0.108)	(0.111)
Share of HH members						
Completed second.	0.291	0.379**	0.13	0.691***	0.126	0.310*
education	(0.184)	(0.187)	(0.192)	(0.184)	(0.189)	(0.176)
Completed higher	0.802***	0.868***	0.387**	0.888***	0.383*	0.607***
education	(0.194)	(0.191)	(0.194)	(0.187)	(0.2)	(0.19)
Log of land per	-0.002	-0.005	-0.002	0	-0.001	-0.032***
capita	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.01)
HH is indebted	0.200**	0.112	0.161*	0.203***	0.185**	0.232***
	(0.08)	(0.081)	(0.082)	(0.079)	(0.081)	(0.084)
Village controls	Yes	Yes	Yes	Yes	Yes	Yes
Provincial controls	Yes	Yes	Yes	Yes	Yes	Yes
Total observations	1498	1522	1521	1530	1518	1524
Chi2	425.93	526.96	505.1	477.79	448.85	238.46
R^2	0.21	0.252	0.25	0.226	0.261	0.159

Source: Own calculations.
Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant.$^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.1$. Standard errors are bootstrapped and clustered at village level. Observations are dropped to fulfil the common support assumption. This leads to a slight difference in total number of observations across the definitions. Complete results are presented in the appendix (Table 2.A2).

For instance, household head characteristics that are identified as important factors in the literature (Loschmann and Siegel, 2014; Coxhead et al., 2019) are only significant in the case of long-term employment. Migration probability can also increase or decrease in response to shocks faced by the household (Hunter et al., 2015; McLean, 2016; Entwisle et al., 2016; DeWaard et al., 2020).

However, this relationship can only be observed in the case of time definitions and the long-term employment definition. Additionally, though we observe homogeneity in terms of significance for some socio-demographic and economic variables such as education shares, dependency ratio and land per capita, the results are not same. Therefore, the conclusions from the analysis are highly dependent on the choice of definition.

2.4.2 Impact of internal migration on income of household of origin

Table 2.3 shows the results of the difference-in-difference with PSM used to analyze the impact of internal migration on the origin household's income. We find that for a short-term migrant (definition 1), the ATT is between 484 and 527 $PPP. This means that having a migrant who has been away from home for at least 1 month increases the annual per capita income of the household by 484-527 $PPP. In case of long-term migrant (definition 2), where the migrant migrated for at least half a year, the increase in household annual per capita income is larger, between 743 and 863 $PPP. This relatively higher amount of remittances is not surprising as a migrant who has been at the destination for a longer duration is expected to be settled and earn higher wages. Interestingly, when migration is for employment only (definition 3), the increase in annual per capita income of the household is much lower, between 192 and 244 $PPP. For inter-provincial migrant (definition 4), the household experiences an increase in annual per capita income in the range of 399 and 480 $PPP. In case of combination definitions, we note an increase in household per capita income in the range of 208 and 217 $PPP when the migrant has been away for at least a month for employment (definition 5) and under long-term employment definition the household per capita income increases between 238 and 277 $PPP (definition 6).

Table 2.3: Impact of internal migration on per capita income of the household

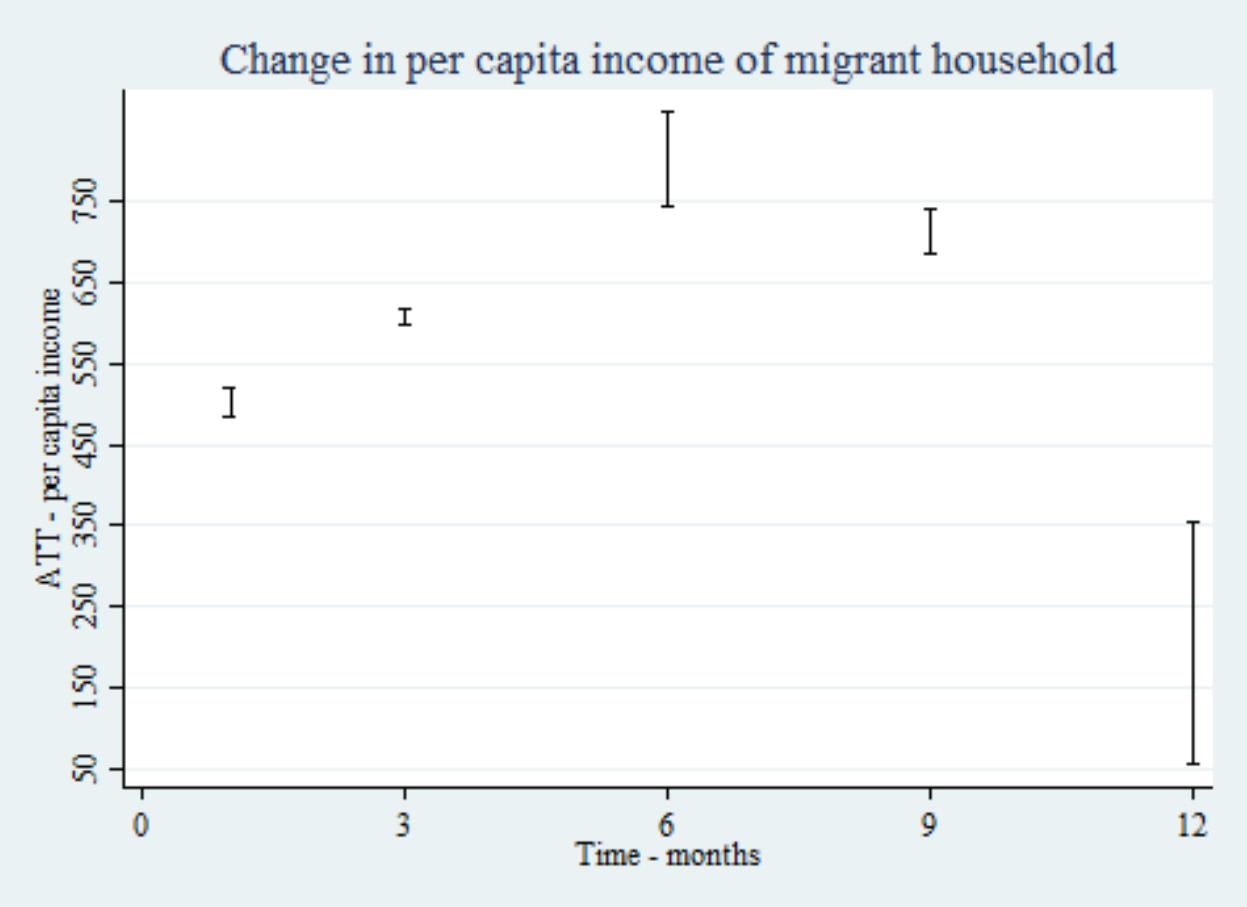
Matching algorithm (income change)	**Average Treatment Effect on the Treated (ATT)**					
Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Nearest neighbour (1)	484.23***	862.68***	243.93***	398.86***	113.49	277.25***
Nearest neighbour (5)	517.99***	756.59***	212.61***	477.79***	179.97	263.87***
Kernel based (6)	520.07***	755.75***	196.15***	464.86***	217.40***	249.68***
Kernel based (3)	526.85***	743.05***	193.80***	479.51***	208.50***	244.98***
Radius (6)	519.54***	751.73***	195.06***	463.71***	217.68***	238.06***
Radius (3)	522.77***	750.85***	192.17***	471.87***	216.83***	247.50***

Source: Own calculations.
Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.1$. All definitions satisfy the balancing property. All values are expressed in 2005 $PPP.

We see that the use of different definitions can lead to overestimating or underestimating of changes in per capita income. In general, the definitions that include an employment criterion tend to yield lower estimates in comparison to time only definitions. However, the variation is substantial across different time intervals. To provide further evidence in this regard, we plot the ATT results for different specifications of time.

We obtain an inverted U-shaped relationship between increase in per capita income of the households and the time that the migrant has been away from home is observed (refer to Figure 2.1). This implies that household income experiences a gradual increase as the duration of stay of migrant in the destination increases. However, after a certain period, which in our case is six months, the increase declines.

Figure 2.1: Impact of internal migration (ATT)



Source: Own calculations.
Note: The length of the bars shows the range of ATT estimations, when all matching techniques are considered together. All estimations have been carried out after satisfying all PSM assumptions.

Overall, the results show a dramatic difference in income effects. They also provide perspective on how different types of migration can have different impact on the household's income. If all these types are clubbed together under a broader definition to assess the impact of migration on households, it could lead to a distorted picture. There is no consensus in literature about the impact of migration on household income and welfare (Adams and Page, 2005; Adams, 2006; Mberu, 2006; Sabates-Wheeler et al., 2008; Adams and Cuecuecha, 2010; Andersson, 2014; Nguyen et al., 2015). This could be attributed to the lack of a standardized migration definition.

2.4.3 Testing for identification errors

For our second research objective, we ascertain if the differences in results arise due to identification errors. We perform descriptive tests, comparing demographic and economic characteristics across households that are included and excluded across the six definitions.

Table 2.4 and Table 2.5 show the partial results for migrant and non-migrant households, respectively. For full results refer to tables 2.A4 and 2.A5. In case of both migrant households and non-migrant households, we observe significant differences in characteristics of

households included as migrant households and excluded as migrant households, under the different definitions. The differences are especially stronger across consumption, dependency ratio and education variables. The results provide evidence of identification errors. Each definition includes and excludes different households which demonstrate varied socio-economic and demographic characteristics. Therefore, the results obtained through econometric or statistical analysis are not uniform.

Table 2.4: Migrant household descriptive statistics across different definitions

Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Per capita income of HH in 2016 ($PPP)	2067^{**}_{12}	$2250^{*}_{23,25}$	2056^{*}_{34}	$2216^{*}_{14,45}$	2063	2178
Per capita income of HH in 2017 ($PPP)	2623^{**}_{12}	2962^{***}_{23}	2561^{**}_{34}	2777	2580^{**}_{25}	2758
Dependency ratio	0.37^{**}_{12}	0.30^{**}_{24}	0.35	0.38^{*}_{46}	0.35	0.32
HH members w/completed higher education	$.27^{***}_{12}$	$.31^{*}_{23,25}$	0.29^{*}_{34}	0.29	0.28	0.31
Log of land per capita	0.69	0.69	0.5	0.68^{*}_{46}	0.55	0.53
Total observations	956	692	600	853	577	459

Source: Own calculations.
Note: Only migrant households. ttest for continuous variables and proportion test for binary variables. 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 2.5: Non-migrant household descriptive statistics across different definitions

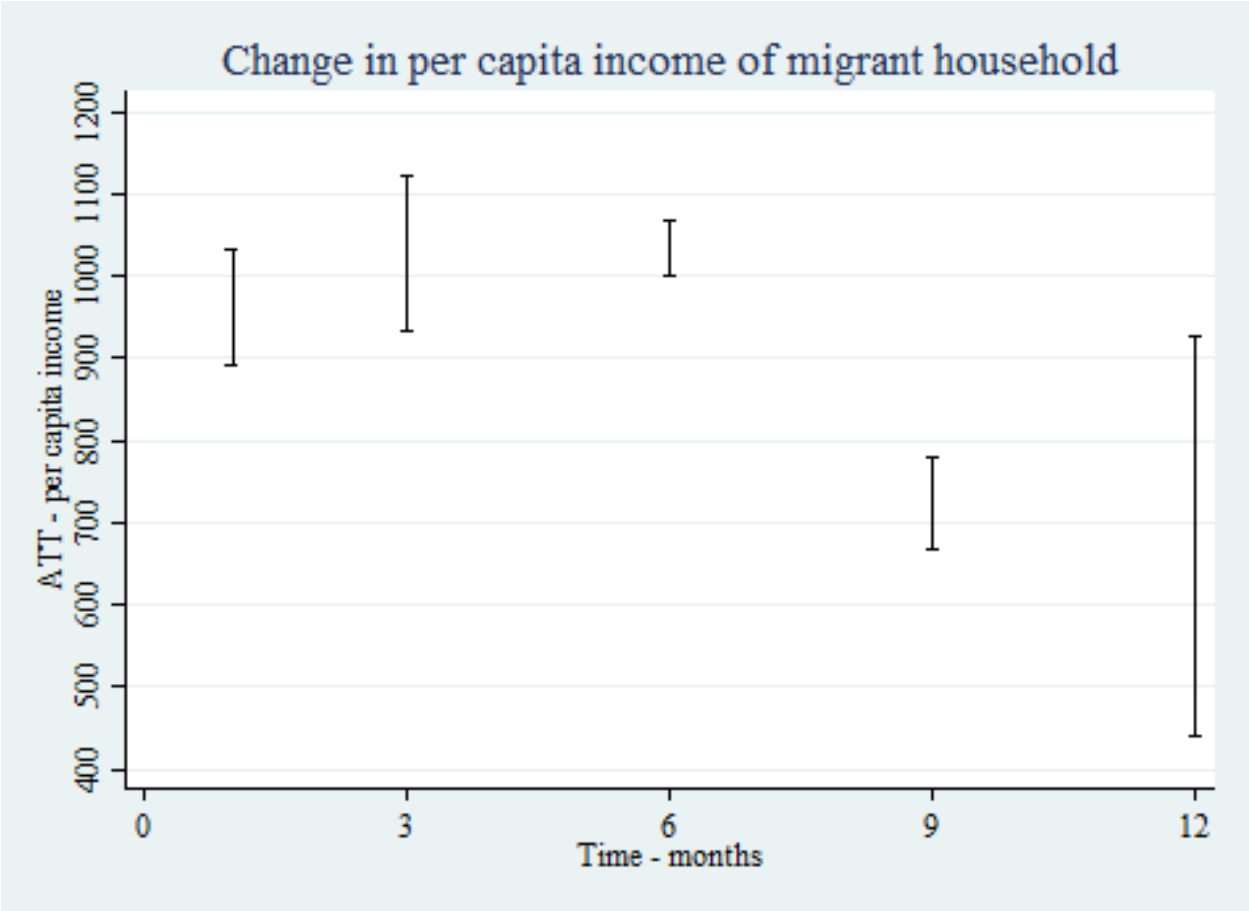
Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Per capita income of HH in 2016 ($PPP)	1670^{**}_{13}	$1666^{**}_{23,25,26}$	1829^{***}_{34}	$1594^{***}_{45,46}$	1831^{**}_{15}	1807^{*}_{16}
Per capita income of HH in 2017 ($PPP)	1828^{***}_{13}	$1829^{***}_{23,25,26}$	2148^{***}_{34}	1814	$2150^{***}_{15,45}$	$2124^{***}_{16,46}$
Dependency ratio	0.67^{**}_{13}	$0.64^{*}_{23,25,26}$	0.58^{*}_{34}	$0.61^{*}_{45,46}$	0.58^{**}_{15}	0.56^{***}_{16}
HH members w/completed higher education	0.13^{***}_{13}	0.14^{**}_{23}	0.17^{***}_{34}	0.14	$0.18^{***}_{15,25,45}$	$.18^{***}_{16,26,46}$
Log of land per capita	0.8	0.76	0.82	0.79	0.83	0.81
Total observations	744	1008	1100	847	1123	1241

Source: Own calculations.
Note: Only non-migrant households. ttest for continuous variables and proportion test for binary variables. 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

2.4.4 Robustness test

In an additional step, we estimate the same questions using TVSEP data from Thailand. We examine 1606 households from the three provinces of Ubon Ratchathani, Buri Ram and Nakhom Phanom. The number of households identified as migrant and non-migrant households differs across the six definitions (refer to table 2.A6 in the appendix). As expected, the results for the determinants of migration decision show significant differences across the definitions. In regard to ATT, employment definitions give lower income increase estimates. This is also observed in the case of the Vietnamese sample (Table 2.A7 and 2.A8 in the appendix). Figure 2.2 shows the ATT results for different specifications of time. Though we do not see a strong inverted-U like Vietnam, the overall conclusions remain similar.

Figure 2.2: Impact of internal migration (ATT) in Thailand



Source: Own calculations.
Note: The length of the bars shows the range of ATT estimations, when all matching techniques are considered together. All estimations have been carried out after satisfying all PSM assumptions.

2.5 Conclusion

The paper scrutinizes two research objectives – (1) does a change in definition of internal migrant impact econometric/statistical results and (2) what drives these differences in results. Using six definitions of internal migrants based on the dimensions of time, space and motivation, we examine household level data from Vietnam. We find that altering the definition

significantly changes the results. In particular, if only time is used to identify migrants, this could lead to overestimation of estimates. Stricter definitions such as those that include an employment criterion tend to produce lower estimates. We attribute these differences in results to identification errors. We find evidence that households that are included or excluded under the definitions are significantly different from each other in terms of demographic and economic characteristics.

Our paper highlights the need for a more standardized definition of internal migrants, especially across international organizations and administrative sources. We acknowledge that elimination of subjectivity is not possible. Rather as Simonsohn et al. (2015) state it is also not desirable. This is apposite in terms of academic research, where scholars need to adapt definitions to capture the theme of their research. In this case, we recommend the following. First, researchers should be explicit about the definition used and the justification behind this choice. Second, the analysis should be tested using alternative definitions to ensure the robustness of results. One possibility could be the use of different specifications of time to identify a migrant. Lastly, if possible, stricter definitions that incorporate more dimensions should be used as these tend to give more conservative results.

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2.6 Appendix

Table 2.A1: Distribution of migrant households under different definitions

Definitions	1	2	3	4	5	6
Short-term (1)		692	585	709	575	457
Long-term (2)			481	555	476	450
Employment (3)				517	577	459
Inter-provincial (4)					500	414
Short-term employment (5)						459
Long-term employment (6)						

Source: Own calculations.
Note: All 716 migrant households with migrants who have been away from home for at least half a year (definition 2) intuitively have migrants who have been away from home for at least a month (definition 1). 406 households can be characterized as migrants under all definitions, whereas 604 households cannot be considered as migrant households under any definition.

Table 2.A2: Determinants of internal migration (Vietnam)

Definitions	1	2	3	4	5	6
Household Characteristics (2016)						
Female HH head	0.006	-0.076	-0.056	-0.134	-0.077	-0.256***
	(0.094)	(0.096)	(0.098)	(0.094)	(0.102)	(0.096)
Age of HH head	0.004	0.003	0.003	0.003	0.004	0.017***
(years)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)
Dependency ratio	-0.262***	-0.354***	-0.236***	-0.058	-0.247***	-0.388***
	(0.069)	(0.076)	(0.076)	(0.069)	(0.079)	(0.092)
Migrant in 2016	1.089***	1.196***	1.406***	1.072***	1.433***	0.905***
	(0.078)	(0.079)	(0.083)	(0.076)	(0.092)	(0.182)
Member of socio-	0.124	0.098	-0.007	0.172*	-0.02	0.13
political organization	(0.102)	(0.107)	(0.108)	(0.104)	(0.093)	(0.116)
Engagement in off-	0.093	0.229	0.168	0.21	0.244	1.101***
farm activities	(0.17)	(0.171)	(0.179)	(0.168)	(0.204)	(0.186)
Per capita	0.000	0.000	0.000	0.001	-0.001	0.000
consumption	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log of land	-0.002	-0.005	-0.002	0	-0.001	-0.032***
per capita	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.01)
HH is in debt	0.200**	0.112	0.161*	0.203***	0.185**	0.232***
	(0.08)	(0.081)	(0.082)	(0.079)	(0.081)	(0.084)

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Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Shocks experienced by HH						
Demographic shock	-0.153**	-0.158**	-0.005	0.017	-0.031	0.052
	(0.074)	(0.075)	(0.076)	(0.073)	(0.075)	(0.073)
Social shock	0.332	0.419**	-0.055	-0.029	0.034	0.241
	(0.216)	(0.211)	(0.202)	(0.196)	(0.193)	(0.191)
Agricultural shock	0.053	0.038	0.035	0.01	0.032	0.147*
	(0.084)	(0.085)	(0.086)	(0.083)	(0.086)	(0.086)
Economic shock	-0.166	-0.013	-0.082	-0.067	-0.092	0.083
	(0.106)	(0.106)	(0.109)	(0.104)	(0.108)	(0.111)
Share of HH members with						
Completed second.	0.291	0.379**	0.13	0.691***	0.126	0.310*
education	(0.184)	(0.187)	(0.192)	(0.184)	(0.189)	(0.176)
Completed higher	0.802***	0.868***	0.387**	0.888***	0.383*	0.607***
education	(0.194)	(0.191)	(0.194)	(0.187)	(0.2)	(0.19)
Village Characteristics (2016)						
Village road	-0.092	-0.1	-0.191*	0.061	-0.162	-0.17
condition	(0.108)	(0.11)	(0.114)	(0.108)	(0.134)	(0.145)
Dist. to district	-0.001	0.002	-0.003	-0.006*	-0.003	-0.005
headquarters	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Provincial controls (2016)						
Ha Tinh	0.251**	0.155	0.503***	0.197*	0.062	0.144
	(0.104)	(0.104)	(0.105)	(0.101)	(0.101)	(0.114)
Dak Lak	0.293***	0.192*	0.487***	-0.011	-0.512***	-0.374***
	(0.098)	(0.1)	(0.103)	(0.097)	(0.103)	(0.113)
Constant	-0.835***	-1.078***	-1.177***	-1.375***	-0.771***	-1.816***
	(0.247)	(0.258)	(0.259)	(0.248)	(0.25)	(0.286)
Total observations	1498	1522	1521	1530	1518	1524
Chi2	425.93	526.96	505.1	477.79	448.85	238.46
R^2	0.21	0.252	0.25	0.226	0.261	0.159

Source: Own calculations.
Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors are bootstrapped and clustered at village level. Observations are dropped to fulfil the common support assumption. This leads to a slight difference in total number of observations across the definitions.

Table 2.A3: Matching quality indicators

Nearest Neighbour Matching - 1						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.012	0.011	0.015	0.02	0.01	0.013
Average standardised tests**	4.871	4.763	4.961	5.948	3.816	5.184
Nearest Neighbour Matching - 5						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.006	0.008	0.01	0.011	0.009	0.008
Average standardised tests**	3.734	3.936	4.026	4.61	3.722	4.106
Kernal Based Matching - 6						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.005	0.006	0.006	0.007	0.006	0.007
Average standardised tests**	3.183	3.207	2.762	3.843	2.91	4.283
Kernal Based Matching - 3						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.005	0.006	0.006	0.008	0.006	0.008
Average standardised tests**	3.074	3.081	2.796	3.894	2.979	4.792
Radius Matching - 6						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.005	0.005	0.006	0.007	0.006	0.006
Average standardised tests**	3.465	3.405	2.879	3.895	2.895	3.901
Radius Matching - 3						
psuedo R2*	0.21	0.252	0.25	0.226	0.261	0.159
Average standardised tests*	23.11	25.425	23.486	26.196	24.408	23.115
psuedo R2**	0.005	0.006	0.006	0.007	0.006	0.008
Average standardised tests**	3.156	3.08	2.838	3.847	2.989	4.769

Source: Own calculations.
Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. (*: before matching; **: after matching)

Table 2.A4: Migrant household descriptive statistics across different definitions

Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Per capita income of HH in 2016 ($PPP)	2067^{**}_{12}	$2250^{*}_{23,25}$	2056^{*}_{34}	$2216^{*}_{14,45}$	2063	2178
Per capita income of HH in 2017 ($PPP)	2623^{**}_{12}	2962^{***}_{23}	2561^{**}_{34}	2777	2580^{**}_{25}	2758
Age of HH head (years)	54.8	54.1^{*}_{h}	54.6	55	54.8	55.6
Dependency ratio	$.37^{**}_{12}$	$.30^{**}_{24}$	.35	$.38^{*}_{46}$	.35	.32
HH members w/completed higher education	$.27^{***}_{12}$	$.31^{*}_{23,25}$	$.29^{*}_{34}$	0.29	0.28	0.31
HH members w/completed secondary education	0.24	0.25	0.25	0.26	0.25	0.25
Log of land per capita	0.69	0.69	0.57	$.68^{*}_{46}$	0.55	0.53
Distance from village to district headquarters (km)	2.1	2.1	2.04	2.1	2.05	2.07
Binary variables (% of 'yes')						
Female headed HH	0.18	0.16	0.16	0.16	0.16	0.16
HH experienced:						
Demographic shock	0.47	0.43	0.46	0.46	0.46	0.47
Social shock	0.037	0.041	0.04	0.04	0.04	0.05
Agricultural shock	0.35	0.36	0.34	0.34	0.33	0.33
Economic shock	0.13	0.14	0.13	0.13	0.13	0.14
HH engaged in:						
Political/social organization	0.88	0.88	0.87	0.89	0.88	0.89
Off-farm activities	0.16	0.19	0.21	0.17	0.21	0.25
HH is indebted	0.64	0.66	0.66	0.64	0.65	0.66
Good road condition	0.87	0.87	0.88	0.88	0.88	0.89
Ha Tinh	0.34	0.34	0.37	0.39	0.38	0.4
Dak Lak	0.33	0.32	0.35	0.27	0.35	0.34
Total observations	956	692	600	853	577	459

Source: Own calculations.
Note: Only migrant households. ttest for continuous variables and proportion test for binary variables. 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant.$^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 2.A5: Non-migrant household descriptive statistics across different definitions

Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Per capita income of HH in 2016 ($PPP)	1670^{**}_{13}	$1666^{**}_{23,25,26}$	1829^{***}_{34}	$1594^{***}_{45,46}$	1831^{**}_{15}	1807^{*}_{16}
Per capita income of HH in 2017 ($PPP)	1828^{***}_{13}	$1829^{***}_{23,25,26}$	2148^{***}_{34}	1814	$2150^{***}_{15,45}$	$2124^{***}_{16,46}$
Age of HH head (years)	55.8	56	55.6	55.5	55.5	55.15
Dependency ratio	$.67^{**}_{13}$	$.64^{*}_{23,25,26}$	$.58^{*}_{34}$	$.61^{*}_{45,46}$	$.58^{**}_{15}$	$.56^{***}_{16}$
HH members w/completed higher education	$.13^{***}_{13}$	$.14^{**}_{23}$	$.17^{***}_{34}$	.14	$.18^{***}_{15,25,45}$	$.18^{***}_{16,26,46}$
HH members w/completed secondary education	0.19	0.2	0.21	0.19	0.21	0.21
Log of land per capita	0.8	0.76	0.82	0.79	0.83	0.81
Distance from village to district headquarters (km)	2.07	2.08	2.1	2.07	2.1	2.09
Binary variables (% of 'yes')						
Female headed HH	0.23	0.22	0.22	0.24	0.22	0.21
HH experienced:						
Demographic shock	0.48	0.5	0.47	0.48	0.47	0.47
Social shock	0.02	0.03	0.03	0.03	0.03	0.03
Agricultural shock	0.37	0.36	0.37	0.38	0.37	0.37
Economic shock	0.15	0.13	0.14	0.14	0.14	0.14
HH engaged in:						
Political/social organization	0.82	0.83	0.84	0.82	0.84	0.84
Off-farm activities	0.1	0.1	0.09	0.1	0.09	0.09
HH is indebted	0.54	0.56	0.57	0.56	0.57	0.58
Good road condition	0.85	0.86	0.85	0.84	0.85	0.85
Ha Tinh	0.27	0.3	0.28	0.24	0.28	0.28
Dak Lak	0.33	0.33	0.31	0.38	0.31	0.32
Total observations	744	1008	1100	847	1123	1241

Source: Own calculations.
Note: Only non-migrant households. ttest for continuous variables and proportion test for binary variables. 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant.$^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$.

Table 2.A6: Sample size under different definitions (Thailand)

	Migrant households	Non-migrant households
Short-term (1)	874	732
Long-term (2)	816	790
Employment (3)	768	838
Inter-provincial (4)	767	839
Short-term employment (5)	760	846
Long-term employment (6)	723	883

Source: Own calculations.

Table 2.A7: Determinants of internal migration (Thailand)

Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Household Characteristics (2016)						
Female HH	-0.037	-0.01	-0.114	-0.071	-0.102	-0.092
head	(0.075)	(0.074)	(0.083)	(0.081)	(0.081)	(0.072)
Age of HH	-0.005	-0.006*	-0.003	-0.001	-0.003	0.002
head (years)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Dependency ratio	-0.232***	-0.213***	-0.148**	-0.134*	-0.194**	-0.201***
	(0.073)	(0.075)	(0.072)	(0.072)	(0.076)	(0.072)
Migrant in 2016	1.362***	1.453***	1.639***	1.625***	1.560***	0.420***
	(0.08)	(0.084)	(0.084)	(0.089)	(0.085)	(0.123)
Membership in socio-	0.088	0.177	0.059	0.064	0.064	-0.014
political organization	(0.141)	(0.141)	(0.153)	(0.147)	(0.151)	(0.117)
Engagement in off-	0.300*	0.298*	0.068	0.213	0.211	1.286***
farm activities	(0.175)	(0.179)	(0.186)	(0.184)	(0.185)	(0.173)
Per capita	-0.001*	-0.001**	-0.001**	-0.000*	-0.001***	-0.000*
consumption	0.000	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log of land	-0.013**	-0.013***	-0.008	-0.008	-0.010*	-0.019***
per capita	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
HH is in debt	-0.003	0.028	0.037	-0.004	0.05	0.154**
	(0.078)	(0.077)	(0.081)	(0.083)	(0.082)	(0.078)

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Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Shocks experienced by HH						
Demographic shock	-0.027	-0.062	-0.022	0.068	-0.054	0.015
	(0.068)	(0.073)	(0.076)	(0.071)	(0.078)	(0.072)
Social shock	0.244	0.293	0.038	-0.027	0.066	-0.035
	(0.207)	(0.207)	(0.203)	(0.195)	(0.197)	(0.185)
Agricultural shock	-0.045	-0.035	-0.03	-0.107	-0.011	0.106
	(0.073)	(0.078)	(0.075)	(0.081)	(0.077)	(0.074)
Economic shock	0	-0.027	-0.01	-0.033	-0.002	0.073
	(0.078)	(0.075)	(0.077)	(0.076)	(0.078)	(0.071)
Share of HH members with						
Completed higher	-0.489	-0.694	-0.425	-0.276	-0.47	-0.223
education	(0.58)	(0.591)	(0.572)	(0.598)	(0.555)	(0.489)
Village Characteristics (2016)						
Village road	0.520**	0.447**	0.535***	0.411**	0.600***	0.302**
condition	(0.208)	(0.184)	(0.184)	(0.209)	(0.187)	(0.144)
Dist. to district	0.009**	0.006	0.007*	0.010**	0.009**	0.014***
headquarters	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Provincial controls (2016)						
Buri Ram	0.115	0.054	0.076	-0.071	0.136	-0.021
	(0.107)	(0.101)	(0.105)	(0.103)	(0.102)	(0.098)
Ubon	-0.041	-0.063	-0.072	-0.241**	0.033	-0.139
	(0.101)	(0.094)	(0.097)	(0.1)	(0.096)	(0.094)
Constant	-0.614**	-0.521*	-0.960***	-0.914***	-0.969***	-0.796***
	(0.306)	(0.294)	(0.298)	(0.299)	(0.301)	(0.268)
Total observations	1506	1512	1498	1481	1508	1518
Chi2	468.04	447.56	512.58	465.24	444.65	157.08
R2	0.236	0.255	0.289	0.286	0.279	0.092

Source: Own calculations.

Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors are bootstrapped and clustered at village level. Observations are dropped to fulfil the common support assumption. This leads to a slight difference in total number of observations across the definitions.

Table 2.A8: Impact of internal migration on per capita income of the household (Thailand)

Matching algorithm (income change)	**Average Treatment Effect on the Treated (ATT)**					
Definitions	**1**	**2**	**3**	**4**	**5**	**6**
Nearest neighbour (1)	890.00^{***}	1065.87^{***}	848.19^{***}	612.87^{***}	913.69^{***}	579.66^{***}
Nearest neighbour (5)	1031.83^{***}	1000.83^{***}	683.39^{***}	576.35^{***}	887.28^{***}	567.05^{***}
Kernel based (6)	935.55^{***}	1015.00^{***}	713.25^{***}	629.40^{***}	846.68^{***}	591.93^{***}
Kernel based (3)	920.83^{***}	1009.15^{***}	698.31^{***}	617.71^{***}	850.56^{***}	598.06^{***}
Radius (6)	947.62^{***}	1014.24^{***}	726.75^{***}	631.48^{***}	864.99^{***}	587.93^{***}
Radius (3)	920.45^{***}	1006.87^{***}	698.46^{***}	629.72^{***}	839.85^{***}	600.50^{***}

Source: Own calculations.
Note: 1 – short-term migrant; 2 – long-term migrant; 3 – employment migrant; 4 – inter-provincial migrant; 5 – short-term employment migrant; 6 – long-term employment migrant. $^{**}p < 0.05$, $^{*}p < 0.1$. All definitions satisfy the balancing property. All values are expressed in 2005 $PPP.

Chapter 3

Left Home High and Dry - Reduced Migration in Response to Repeated Droughts in Thailand and Vietnam

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Chapter 4

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Chapter 5

What Predicts Remittance Decisions across Internal Migrants? Empirical Evidence from Southeast Asia

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Abstract

This paper aims to improve the understanding of remittance decisions by providing a comprehensive analysis of both, determinants and motivations of remittances. Given that these decisions have greater ramifications for the poor, we further investigate if the determinants and motivations of remittance decisions vary across migrants from different economic backgrounds. We employ a unique data set that combines a household survey from three provinces in Vietnam and Thailand with a migrant tracing survey that was conducted in Ho Chi Minh City and the Greater Bangkok area.

Using the Heckman model, we find that higher education and employment in production or service sectors positively influence the migrant's decision to remit. In terms of the amount remitted, females remit less and remittances decrease as the household wealth increases. We find evidence for loan repayment and exchange motive, underscored by altruism. In addition, we observe that while the determinants of remittances are contingent on the economic standing of the receiving households, the motivations of remittances are rather independent. We also find regional differences in remittance behaviour that could foster regional inequalities. We recommend effective education policies and secure urban job markets for migrants to stimulate remittance flows.

Keywords: Remittances; Altruism; Self-interest; Internal migration
JEL classification: D64, F24, O15, R23

5.1 Introduction

Migrant remittances are recognized as a 'vehicle for reducing the scale and severity of poverty in the developing world' (Ratha, 2013). Empirical evidence posits that remittances can reduce poverty (Adams and Cuecuecha, 2010; Taylor and Lopez-Feldman, 2010; Amare and Hohfeld, 2016) and increase welfare of the receiving households (Gerber and Torosyan, 2013). These can be more effective than government transfers or aid because the receivers know their own needs and can utilize the money accordingly. The use is not only limited to consumption smoothing (Orozco et al., 2006). Recipient households also invest more in human capital such as education and health than households not receiving any remittances (Edwards and Ureta, 2003; Hildebrandt and McKenzie, 2005; Lopez-Cordova and Olmedo, 2006; Yang, 2008; Hines and Simpson, 2019). In addition, the countercyclical nature of remittances implies that they can act as strategies of risk diversification and insurance (Yang and Choi, 2007; Mohapatra and Ratha, 2009; Millán, 2019). Though most of these results are based on international remittances, they are also relevant in the case of internal migrant remittances. Rather, internal migrant remittances can play a more significant role when examining the poor in a rural developing country setting (Reardon, 1997; Cuong and Linh, 2019). In general, poorer households cannot afford to migrate internationally (Sugiyarto, 2018). Also, when faced with shocks, internal migration is the preferred coping strategy because households want immediate monetary help with little costs (Gray and Mueller, 2012; Gröger and Zylberberg, 2016).

Against this background, our paper aims to improve the understanding of remittance decisions. These decisions cannot be solely explained using observables, rather unobservable factors exist that also influence the selection of the migrant into remitting (Funkhouser, 1995). Therefore, our first research question investigates – (1) what are the determinants and motivations of internal migrant remittances? Further, given that these differences in remittances have greater ramifications for the poor, the second research question examines – (2) do determinants and motivations of remittances differ across migrants from different economic backgrounds?

Existing literature has looked at these aspects, but facing severe limitations. Our paper contributes to the literature by addressing these issues: Firstly, most studies in this field face data paucity. They either make use of only migrant surveys coupled with limited or no household characteristics, or use household surveys with limited or no information on their migrant members. We use a unique data set consisting of a rural household survey and a survey of migrant members of the respective rural households who were tracked in the cities. This allows to consider the two-sided nature of the remittance decision, where both the migrant and the household are acknowledged. This is also postulated by the New Economics of Labour Migration (Stark and Bloom, 1985). Secondly, papers focus on analysing either determinants or motivations. However, it is possible that the migrant possesses the expected determinants but does not remit because he/she is not motivated or vice versa. Therefore, these two concepts need to be analysed in the same context to provide a comprehensive

explanation of the difference in remittance behaviour. Thirdly and closely related to the first point, it lies in the nature of determinants and motivations of remittances to strongly depend on the characteristics of migrants and households. Thus, better results are expected when using data of surveyed households and their tracked migrants. We do not rely on proxies – as other scholars have done to overcome this limitation – but rather use exact data to overcome omitted variable bias. Lastly, literature establishes migrant's income as the key predictor of the remittance decision. This overlooks the endogeneity of this variable with other determinants of the remittance decision (Bettin et al., 2012). We avoid this by eliminating migrant's income from our analysis and using an alternative variable for remittances.

Our paper uses a data set from Thailand and Vietnam which contains information on socio-economic variables for 687 migrants, and, their rural households. Both countries demonstrate high labour and capital mobility coupled with unprecedented growth in urban industrial centres (Kelley et al., 2020). Thailand shifted from an agricultural to an export-oriented and labour-intensive economy in the early 1980s. This, combined with huge foreign direct investments, created a plethora of jobs in the cities for low-skilled labour attracting domestic and international migrants. While the greater Bangkok area and the central region are the major destinations, most migrants come from the North and North east (Anant, 2017). In contrast, Vietnam has had a long history of internal migration dating back to the feudal kingdoms (Dang et al., 2003). However, a shift from organized to spontaneous migration occurred after the doi moi reforms in the 1990s, which triggered de-collectivization of the agriculture sector, introduced numerous liberalization policies and increased foreign direct investment (Niimi et al., 2009). This was followed by a boom in the private sector creating job opportunities for the country's young in major cities like Ho Chi Minh City, Hanoi and Da Nang. The internal migration rates in Thailand and Vietnam are around 17 and 14 per cent, respectively (Huget and Chamratrathirong, 2011; UNESCO, 2017). A big proportion of these migrants come from relatively poorer households that heavily rely on remittances to augment their incomes and welfare (Reda et al., 2012; Nguyen et al., 2015; Anant, 2017).

The paper is structured as follows. We first present a literature review in section 2, followed by a theoretical framework. Section 4 and 5 illustrate data collection and the econometric models used for estimation of our research questions, respectively. Section 6 presents the results and discussion. We conclude in the last section.

5.2 Literature review

5.2.1 Determinants of remittances

The selection of migrants into remitting is influenced by factors such as migrant and household characteristics. Migrant's income is the most important predictor of remittances and mostly exhibits a positive influence on the decision to remit and the amount of remittances (Hoddinott, 1994; Funkhouser, 1995; Durand et al., 1996). Among human capital, education

of the migrant is considered as a vital determinant of remittances. Generally, an educated migrant is less likely to send back higher remittances (Hoddinott, 1994; Funkhouser, 1995; Dustmann and Mestres, 2010). However, in certain cases, the education of the migrant could either have no significant effect on the remittance levels (Merkle and Zimmermann, 1992) or display a positive relationship (Mduduzi Biyase and Tregenna, 2016). Married migrants and migrants with a spouse or child in the origin areas remit higher amounts (Oberai and Singh, 1980; Konica and Filer, 2009; Niimi et al., 2009). Gender of the migrant presents an interesting case. Whereas a certain strand of literature establishes that women have a higher tendency to remit (Vete, 1995; Osaki, 2003), many papers conclude that men tend to remit more (Merkle and Zimmermann, 1992; Agarwal and Horowitz, 2002; Orozco et al., 2006; Havolli, 2011). Women also remit in response to shocks faced by the origin household (de la Brière et al., 2002). In addition, the older the migrant, the more likely he/she is to remit (Durand et al., 1996; Schreider and Knerr, 2000).

Duration of stay also influences remittances (Lucas and Stark, 1985; Funkhouser, 1995; Agarwal and Horowitz, 2002). Policies encouraging temporary migration lead to higher remittances (Vete, 1995; Dustmann and Mestres, 2010). However, a curvilinear relationship between the length of absence of the migrant and the remittances can also be observed (Czaika and Spray, 2013). Factors such as close family ties, employment conditions and residence status impact the amount of remittances being sent back home. A migrant with relatives at the destination remits more, whereas migrants with a permanent residence remit less (Vete, 1995; Dustmann and Mestres, 2010; Havolli, 2011). Shocks experienced by the migrant and the rural household can also influence the remittance decision, but findings regarding its directions are inconclusive (Agarwal and Horowitz, 2002; Schreider and Knerr, 2000; Pleitez-Chavez, 2004; Konica and Filer, 2009). Amongst household characteristics, wealth is the most significant determinant. In general, remittances decrease as the income or wealth of the household increases (Durand et al., 1996; Agarwal and Horowitz, 2002; Pleitez-Chavez, 2004). Also, remittances decrease when the educational attainments of the household head are higher (Dustmann and Mestres, 2010).

5.2.2 Motivations of remittances

In addition to determinants, 'behavioural differences' or motivations affect the remittance decision. Pure altruism was assumed to be the only motivation for remittances (Becker, 1974) until Lucas and Stark (1985) proposed additional alternatives. They hypothesize that a migrant's decision to remit could be driven by pure altruism, pure self-interest, tempered altruism, or enlightened self-interest. Under pure altruism, migrants care about the wellbeing of their family, sometimes over their own welfare. Conversely, pure self-interest is the main motivation when the migrant remits in expectation of future inheritance, intends to return home and/or invests in assets at home, and expects their maintenance. Though pure altruism and pure self–interest are two extreme ends of the spectrum, it can be difficult to disentangle the two. This gives rise to the concepts of tempered altruism or enlightened self-interest,

which are an intersection of the two views. However, these can also be viewed as separate sets of motivations or contractual agreements Lucas and Stark (1985). These are voluntary agreements made by the migrant and the family because they expect to be better off with the agreement than without it (Stark and Lucas, Robert, 1988). The bargaining power of each side depends on their utility function and the adherence is ensured through altruism and/or self-interest (Stark and Lucas, Robert, 1988; Hagen-Zanker and Siegel, 2007; Batista and Umblijs, 2016). Examples include coinsurance, loan repayment motive and exchange motive. Under the coinsurance motive, the rural household relies on the migrant for risk insurance and the migrant relies on their origin household in times of uncertainty. In the loan repayment motive, remittances are seen as repayment for the household's investment in the migrant such as education. Lastly, the exchange motive relates to the setup where the household receives remittances in return for a service like child care (Cox, 1987; Cox et al., 1998).

Literature uses the relationship between the level of remittances and various observables to ascertain motivations. Table 5.1 is a comprehensive representation of the expected effect of the variable on the level of remittances, when examined under a specific motivation strand. For example, if the effect of household wealth is negative on the level of remittances, this indicates pure altruism.

Table 5.1: Motivations of remittances

Effect of ... on level of remittances	Household Wealth	Number of migrants	Household shock	Migrant shock	Family Ties	Migrant Education	Duration of migration
Pure altruism	-		+		+		
Pure Self-interest	+	+					
Coinsurance	-		+	+			+
Loan Repayment	+/-					+	
Exchange motives	+/-				+	+	

Source: Hagen-Zanker and Siegel (2007) (modified by the authors).
Note: The empty spaces indicate that no such relationship has been established until now.

Lucas and Stark (1985) consider per capita income as the kernel of the pure altruism model: with an increase in the migrant's income, his/her remittances increase. In their seminal paper, they find that remittances are not only directed to poorer households but also increase as the household income increases. Hence, concluding a self-interest motive. The relationship between the number of migrants per household and remittances can also be used to make deductions. For instance, Agarwal and Horowitz (2002) highlight that under altruism, remittances fall with an increase in the number of migrants. Another variable used is land area, an inheritable asset, which can be used by parents as a 'reward' for migrants in return of remittances (Hoddinott, 1994). A positive relationship between land value and remittances corroborates the self-interest motive. In case of contractual agreements, an increase in remittances after a shock experienced by the household indicates the coinsurance motive (Hagen-Zanker and Siegel, 2007). However, this could also mean altruism. Interestingly,

under this concept, higher remittances could also be caused by higher risk level of the migrant (Hagen-Zanker and Siegel, 2007). Under loan repayment, remittances are expected to display a positive relation to the migrant's education level (Poirine, 1997; Niimi et al., 2009). In contrast, if the remittances are motivated by exchange, the levels are contingent on the migrant's valuation of the service. The transfers could also be made to demonstrate laudable behaviour. Cox and Stark (1996) analyse a three-generation setup to conclude that migrants with kids who live with their grandparents tend to send remittances to set an example of how they expect their kids to act when they grow up. In addition, a recent strand of literature uses experimental setups to examine motivations (Batista et al., 2015; Jena, 2016).

5.2.3 Evidence from Southeast Asia

In the case of Thailand, papers dealing with remittances, are mostly gender-oriented. As Thailand has a flexible bilateral family system, females, specifically daughters, could play a more important role than sons (Knodel and Nguyen, 2015). Females have a higher tendency to remit and remit bigger amounts (IOM, 2011). These remittances form a substantial proportion of the rural households' incomes (De Jong et al., 1996). Women and migrants who come from poorer households are more likely to remit with an altruistic motive, while males and migrants from non-poor households remit with a self-interest motive (VanWey, 2004). However, there is no general consensus on the motivations in the country context. While it is argued that remittances are an altruistic practice rooted in the Thai culture (Osaki, 2003), there is ample literature on 'skip-generation households' illustrating the exchange motive (Knodel and Pothisiri, 2015; UN, 2014). The term 'skip-generation households' refers to the common phenomenon witnessed in Thailand where grandparents take care of children in the rural areas while their parents work in the city.

With respect to Vietnam, the literature focuses on determinants of remittances and only slightly touches upon motivations. This can be attributed to the use of General Statistical Office data by most papers, which contains information only on the migrant. This has hindered a detailed examination of motivations of remittances which require household information (Niimi et al., 2009). An exception in this regard is the paper by Phan and Coxhead (2016) who establish a connection between the Vietnam Household Living Standards Survey (VHLSS) and a migrant tracing survey. However, they too focus only on determinants and deal with motivations only cursorily. Also, the use of VHLSS to examine migration raises concern. The data set only takes into account registered migrants who have been in the survey area for at least six months. Hence, a great share of migrants is overlooked (Pincus and Sender, 2008). In general, the duration of migration, bonus payments and increased earnings are positively associated with remittances (Niimi et al., 2009). Gender-specific differences in remittances can be attributed to endowment disparities (Niimi and Reilly, 2011). Remittances increase with an increase in the migrant's wage and when the attachment to the destination is weaker. This is associated with altruism (Phan and Coxhead, 2016).

5.3 Theoretical framework

To conceptualize the remittance decision mathematically, we follow Stark (1995), Funkhouser (1995) and Rapoport and Docquier (2006). There are only two decision units (i) – the migrant (m) and the household (h). U denotes utility, V is a function of consumption C, I is income, and R is remittances. While remittances can be bi-directional, we only examine the remittances sent by the migrant to the household. Hence, our main focus is the migrant's utility function which depends on consumption of the migrant and their family. This is an implication of the utility function proposed by Becker (1974).

$$U^m = f(C^m, C^h) \tag{1}$$

Where,

$$C^m = (I^m - R) \tag{2}$$
$$C^h = (I^h + R) \tag{3}$$
$$I^i = f(gender^i, education^i, abilities^i, ...) \tag{4}$$

for $i = m, h$[1]

Assume that $U^m = (\delta(U^m)/\delta(C^i)$ is strictly positive for $i = m, h$ and $\delta(U^m)/\delta(R) \geq 0$. As the utility derived from remitting varies across migrants, a migrant's utility is a weighted function of utility derived from own consumption and the consumption of the household.

$$U^m = (1 - \gamma^m)V^m(C^m) + \gamma^m(C^h) \tag{5}$$

γ captures the degree of altruism. The more altruistic the migrant, the higher the weight assigned to the household's consumption in their utility function and hence higher the value of γ.[2] Using equations 1, 2, 3, and 5 can be written as:

$$U^m = (1 - \gamma^m)V^m(I^m - R) + \gamma^m V(I^h + R) \tag{6}$$

Maximizing the above function with respect to R, we obtain:

$$-1(1 - \gamma^m)\delta(V)/(\delta(C)^m) + m(I^m - R) + \delta(V)/(\delta(C)^h) \leq 0$$

Considering that monetary variables I^m, I^h and R are log functions, we can conclude that an optimal amount of remittances would be:

$$R^* = max^m I^m - (1-^m)I^h, 0 \tag{7}$$

[1] Migrant and household characteristics enter the income functions of the migrant and household, respectively, in accordance with the Mincer's equation.

[2] Please refer to Rapoport and Docquier (2006) for a detailed derivation of other motivations such as investment, inheritance, insurance, and moral hazard.

This has the following implications:

I.1 Remittances are increasing in I^m, decreasing in I^h and increasing in γ^m. This is the basic premise to infer motivations of remittances for most empirical papers.
I.2 Optimal level of remittances or R^* can be equal to zero in three cases: (i) $U^R = 0$ implying that the migrant gains no utility from remitting, (ii) $I^m = 0$, implying that the migrant has no income, and (iii) $\gamma^m = 0$, implying that migrant has no motivations to remit.
I.3 $0 \leq \gamma^m \leq 1/2$. In case of pure altruism, the value of $\gamma^m = 1/2$.
I.4 $Remittances = f(\gamma^m, I^m, I^h)$ or using Equation 6,

Remittances = f(γ^m,gender^i, age^i, education^i, abilities^i,...) for i = m,h

Here, γ^m represents the motivations that affect remittances, while other factors such as the migrant and household characteristics represent the determinants. This further emphasizes that both determinants and motivations need to be examined together to better understand the remittance decisions.

5.4 Data

The paper uses cross-sectional data from 2010. It is a combination of a household survey and a migrant tracking survey, collected under the project, "Impact of shocks on vulnerability to poverty: Consequences for development of emerging Southeast Asian economies". The project has been extended under the name – Thailand Vietnam Socio Economic Panel (TVSEP).

For the household data, 2200 rural households were sampled in the provinces of Thua Thien Hue, Ha Tinh and Dak Lak in Vietnam. Similarly, 2200 households were sampled in Thailand in the three provinces of Ubon Ratchathani, Buriram and Nakhon Phanom. The stratified random sample was designed to represent the target population (Hardeweg et al., 2013), which is rural households in Southeast Asia. The questionnaires were identical across the two countries and covered a broad range of socio-economic topics such as household level information on agriculture, land, shocks, risks, and financial transfers, and household member information on employment and demographics.

Figure 5.1: Overview of Survey Region

Source: Hardeweg et al. (2013), based on ESRI World Map.
Note: The six TVSEP provinces are highlighted in red. The green dots represent internal migrants from the survey rural regions.

The migrant tracking survey was conducted in 2010 in Ho Chi Minh City and the surrounding areas of Dong Nai and Binh Duong in Vietnam, and, the Greater Bangkok area in Thailand. Using information collected during an earlier household survey (2008), it tracked 921 internal migrant members of the households. The respondents answered questions relating to their migration history, working conditions, shocks, and remittances. It should be mentioned that Ho Chi Minh City has the highest rate of in-migration in Vietnam (Anderson et al., 2017). Also, in Thailand over 80% of the internal migrants migrated to Bangkok and its surrounding areas looking for new opportunities (NSO, 2008). Therefore, these specific areas provide an ideal setting for internal migration studies in the respective countries.

After combining the two data sets and excluding migrants that receive remittances, our total sample comprises 687 migrants. There are 497 Thais and 190 Vietnamese. Table 5.2 shows a comparison between remitting and non-remitting migrants. It can be seen that remitters earn almost 1.6 times more than non-remitters. Additionally, remitters tend to be significantly older, married and more educated. Origin households of remitters have older heads. These households also have slightly higher per capita consumption and income per capita. With regard to the remittances, on average a migrant sends about 21% of his/her income back home. This amounts to approximately US$ 1,425 per migrant, annually.

Table 5.2: Data description – Comparing remitters and non-remitters

	Remitters	**Non-remitters**
Migrant characteristics		
Annual net income (USD)	7453.7***	4545.4***
Annual remittances (USD)	1425	– – – –
Years of schooling	8.4***	7.08***
Age	29***	26.06***
Gender (male)	48.6%	49.7%
Marital status (married)	47.4%	39.3%
Household characteristics		
Age of household head	58.7***	56
Years of schooling of household head	4.9*	5.8
Annual per capita consumption (USD)	1613.8	1627.6
Annual per capita income (USD)	1942.7	2067.8
Observations	504	183

Source: Own calculations.
Note: ttest on means. $^{***}p < 0.01,^{**}p < 0.05,^{*}p < 0.1$. Binary variables in %. Full descriptive table in Appendix (Table 5.A1).

5.5 Methodology

5.5.1 Determinants and motivations of internal migrant remittances

We follow the theoretical framework illustrated in section 3 to obtain our empirical strategy. In accordance with implication I.4, we examine both the determinants and the motivations of remittances to investigate the remittance decision.

Determinants of remittances

Remittance decision is a two-stage process, where the migrant first selects into remitting and then decides on the amount to be remitted. Therefore, we use the Full Information Maximum Likelihood (FIML) Heckman Model that executes the regression in two steps. Papers have modelled the decision using Tobit (Brown, 1997; Germenji et al., 2001). However, Tobit executes the model as a one-stage decision. It is not possible to isolate the factors impacting the decision to remit from those determining how much to remit. The one stage model also overlooks the results pertaining non-remitters. Additionally, as a migrant self-selects into the process of remitting, there is an inherent selection bias in the data. Therefore, OLS would give biased and inconsistent results. An analysis using OLS and Tobit is included in the Appendix (Table 5.A3).

(I) is called the selection equation and examines the decision to remit, while (II) is called

the outcome equation that examines the share of remittances.

$$Prob(Remit_{ij} = 1) = \alpha_0 + \phi \text{ Saving}_{ij} + \alpha_1 \ MC_{ij} + \alpha_2 \ HC_{ij} + \alpha_3 \ PC + \epsilon_{ij} \quad \text{(I)}$$

$$\text{Remittance share}_{ij} = \beta_0 + \beta_1 \ MC_{ij} + \beta_2 \ HC_{ij} + \beta_3 \ PC + \mu_{ij} \quad \text{(II)}$$

The dependent variable in (I), Remit is a binary variable indicating whether a migrant i from village j remits or not. In (II), Remittance share is the ratio of annual remittances sent by the migrant and the annual income of the migrant. It measures the proportion of income that is sent back home annually in the form of remittances. We use this measure due to the following reasons. Literature posits income of the migrant as the most important determinant of remittances (Stark and Lucas, Robert, 1988; Agarwal and Horowitz, 2002). However, migrant's income cannot be assumed to be exogenous to other determinants of the remittance decision (Bettin et al., 2012). Therefore, to avoid endogeneity, we do not include migrant's income as a control and use it to construct our dependent variable. In addition, our paper aims to understand the proportion of income that the migrant remits, irrespective of the level of their income. To ensure the validity of our dependent variable, we execute two robustness checks. Both tests examine Eqs. (I) and (II) using net remittances as the dependent variable. In the second test, however, we also include income of the migrant as an independent variable. Refer to Table 12 in the Appendix. Implication I.1 is used to decide on the controls for the model. The explanatory variables can be divided into two main categories – migrant characteristics (MC) and household characteristics (HC). Additionally, we apply provincial controls (PC) and log the monetary terms.

Migrant characteristics include demographic variables such as marital status and gender. As 70 per cent of our migrants have children, we include two variables in this regard. Child in city indicates whether the migrant has a child living with them in the city. Childcare takes the value of '1' when the migrant has a child below the age of 15 living with a grandparent (residing in the rural household) who is older than 55. We expect this variable to highlight the 'skip generation' phenomenon in our sample. Duration of stay is the number of years that the migrant has lived in the city. Close relationship implies that the migrant is either a child or spouse of the household head. There are also binary controls for the migrant's job profile. Production sector includes industries such as textile, basket making, construction and electronics. Service sector migrants are engaged as petty traders, waiters, electricians, and street vendors. Additionally, we expect employment quality of the migrant to influence the remittance decision. Therefore, we include Good living conditions which depicts if the migrant believes that their living standard improved after moving to the city. Additionally, migrant shocks are included. Private shocks include illness, accident, theft, and family ceremonies. Work shocks comprise job loss, collapse of business and debt problem. Weather shocks in this case are water shortage, flooding and drought. However, it should be mentioned that only 0.5% of the migrants reported a weather shock and, therefore, we do not include

it in the final regression.

Household characteristics comprise years of schooling and age of the household head. Shock variables account for any shocks experienced by the household in the three preceding years. Again, the shocks are divided into three categories. Private shocks include shocks such as illness of any family member, death, accident, ceremonies, and theft. Job loss, collapse of business, being cheated at work, and changes in the prices of outputs and inputs are included in work shocks. Weather shocks are floods, droughts, pests and landslides. We include the coping strategy adopted by the household in order to recover from the shock. Cope grants captures receiving grants from relatives, the Government or NGOs. Furthermore, livestock value, total land area and per capita consumption are also incorporated as controls to capture the wealth status of the rural household. The selection and outcome equations contain the same variables, except Savings. Savings is a binary variable that takes the value '1' when the migrant has savings and '0' when the migrant has no savings. When using the Heckman model, it is important to have at least one variable more in the selection equation than in the outcome equation to ensure no collinearity. This extra variable is called the identifier and is supposed to have an effect on the selection decision but not on the outcome (Cameron and Trivedi, 2005). We choose Savings as the identifier due to the following reasons. Firstly, Savings creates nontrivial variation regarding the remittance decision but has no direct influence on the proportion of remittances. (Phan and Coxhead, 2016) use similar justification for their identifiers.[3] We also include a falsification test in the Appendix to support our choice of identifier (Di Falco et al., 2011). Additionally, we record savings as a binary variable and therefore it influences whether the migrant remits or not (binary), but not the amount or share being remitted.

Motivations of remittances

To examine motivations, we construct variable groups. Each group represents a proposed strand of motivation – altruism, self-interest, co-insurance, loan repayment, and the exchange motive. The variables in the groups are same as the controls described in the model specification for determinants of remittances. They are expected to display a specific relationship with remittances under different motivation strands. Table 5.3 shows these expected relationships, which are based on empirical literature or have been proposed by the authors. As motivations cannot be directly observed, we use the econometric results obtained for the determinants of remittances to make the inference. We categorize the results under the variable groups and compare the signs of the obtained coefficients with the expected relationships. Generally, papers employ only one or two of these variables to reach conclusions. However, analysing a group of variables instead can make the inference robust.

[3] Phan and Coxhead (2016) use ethnicity of the migrant and poverty status as identifiers.

Table 5.3: Variable groups representing motivations of remittances

Variable	Used by	Expected relationship
Altruism vs Self-interest		
Per capita consumption*	Lucas and Stark (1985) + Theoretical framework implication I.1	Negative – Altruism Positive – Self-interest
Land area	Hoddinott (1994)	
Number of migrants	Agarwal and Horowitz (2002)	
Age of household head	Own consideration	
Shock private (HH)	Lucas and Stark (1985)	Positive – Altruism Negative – Self-interest
Shock work (HH)		
Shock weather (HH)		
Coinsurance		
Per capita consumption*	Lucas and Stark (1985)	Negative
Good living conditions	Own consideration	Negative
Duration of stay (years)	Own consideration	Positive
Shock private (mig)	Agarwal and Horowitz (2002)	Positive
Shock work (mig)		
Shock private (HH)	Lucas and Stark (1985)	Positive
Shock work (HH)		
Shock weather (HH)		
Loan repayment		
Per capita consumption*	Lucas and Stark (1985)	Positive/Negative
Years of schooling (mig)	Poirine (1997)	Positive
Duration of stay (years)	Own consideration	Positive
Exchange motive		
Per capita consumption*	Lucas and Stark (1985)	Positive/Negative
Years of schooling (migr.)	Poirine (1997)	Positive
Child care	Own consideration	Positive

Source: Own calculations.

Note: *These papers use per capita income. We use per capita consumption to avoid endogeneity. Also, reports and papers based in developing countries use per capita consumption instead of income to capture wealth (Ministry of Planning, 2013; Ruggeri Laderchi et al., 2017). However, to check its robustness, we also execute regression analysis using per capita income. Please refer to Appendix (5.A4).

In our paper, altruism and self-interest are analysed using the variable group comprising per capita consumption of the rural household, land area owned by the household, value of livestock owned by the household, number of migrants, and, shocks experienced by the household. We include age of the household head in this group to capture the inheritance aspect of self-interest. If the household head is older, the probability of inheritance will be higher. Coinsurance is captured again by per capita consumption of the household, living conditions of the migrant and the shocks experienced by the household and the migrant. We include an additional variable on duration of stay. We expect that the longer the duration of stay of the migrant in the city, the more settled will be the migrant. This implies low risk and hence, a positive relation with remittances would indicate coinsurance. The loan repayment motive and the exchange motive are both analysed through the per capita consumption of the household and the education of the migrant. We include duration of stay in loan repayment and child care in exchange motive to ensure mutual exclusivity.

5.5.2 Comparing determinants and motivations of remittances across migrant households

The second question aims to understand if determinants and motivations of remittances differ across migrants from different economic backgrounds. A measure of relative poverty is used to categorize migrant households as poor or rich.[4] The choice of relative poverty over absolute poverty is guided by the following reasons. First, migrant households tend to be better-off than non-migrant households. Therefore, use of an absolute poverty line entails a very low sample size at the lower end.[5] Second, evidence on migration decisions (Stark and Taylor, 1989) highlights the higher role of relative deprivation. As drivers of remittance decision are closely related to those of migration, use of relative poverty can provide better insights. We use median based on per capita consumption of the rural households as a relative threshold of poverty. This facilitates differentiation between relatively poorer households and relatively richer households. In our sample, the median is USD 1143. Migrants from poorer households are less educated, more likely to be males and are mostly engaged in production sector. The per capita consumption of their rural households is half in relation to migrants who come from richer households (refer to Table 5.A2 in Appendix).

Determinants of remittances

A model similar to Section 5.1 is employed with slight modifications.

$$Prob(Remit_{ij} = \begin{vmatrix} Poor = 1 \\ Rich = 1 \end{vmatrix}) = \alpha_0 + \psi \text{ Saving}_{ij} + \alpha_1 \, MC_{ij} + \alpha_2 \, HC_{ij} + \alpha_3 \, PC + \epsilon_i j \quad \text{(III)}$$

[4] Relative poverty thresholds are determined from the distribution of income or other resources to measure poverty. Those falling below this threshold are termed as 'relatively poor' (Waglé, 2014).

[5] Under the World Bank poverty line of 2 USD per person, only 109 households can be categorised as poor.

$$\text{Remittance share}_{ij} = \beta_0 + \beta_1\ MC_{ij} + \beta_2\ HC_ij + \beta_3\ PC + \mu_{ij} \quad \text{(IV)}$$

The Full Information Maximum Likelihood (FIML) Heckman Model is used to estimate these regressions, which are run separately for migrants from poorer households and richer households. In (III), Poor = 1, if per capita consumption of the rural household is less than the median, and, 0 otherwise, and, Rich = 1, if the per capita consumption of the rural household is greater than the median, and, 0 otherwise. It should be mentioned that an imbalance in specific variables is induced when the sample is divided on the basis of median. Therefore, some explanatory variables such as child care and bonus are dropped. We also execute the same model using an income-based median to test for robustness of our results.

Motivations of remittances

The results from the determinants of remittances for both, migrants from poorer and richer households, are categorized under the variable groups illustrated in Table 3. We treat expected relationships as benchmarks, and compare them with the signs of the obtained coefficients to ascertain the motivations.

5.6 Results and discussion

5.6.1 Determinants and motivations of internal migrant remittances

Determinants of remittances

Table 5.4 shows the results for the determinants of remittances, which examine the influence of migrant and household characteristics on the migrant's remittance decision and the proportion of income remitted. In case of demographic variables, only gender of the migrant shows significance. Male migrants remit higher amounts compared to females. This is in line with the gender anomaly in remittance behaviour illustrated in the literature (Vete, 1995; Orozco et al., 2006). The duration of stay in the city positively influences the decision to remit. A migrant who has been living in the city for a longer period is more likely to be well settled and have a good paying job (Hagen-Zanker and Siegel, 2007). We also find evidence on the skip-generation households. If the migrant's young children are being looked after by the grandparent (Child care), it increases the likelihood of remitting. In contrast, if the migrant has a child in the city, the remittance decision is affected negatively. Interestingly, the relationship variable displays a negative association with the remittance share implying weaker family ties.

In terms of education, the higher the number of years of schooling for the migrant, the higher is the likelihood of remitting. Educated migrants tend to be employed in higher income yielding jobs and hence can send higher remittances (Mduduzi Biyase and Tregenna, 2016). Working in the production or service sector positively affects the decision of remitting.

Increase in bonus not only increases the likelihood of remitting but also positively influences the share of remittances. This implies that any extra money that the migrants receive augments the probability of remitting along with the amounts remitted. Our identifying variable, savings is highly significant and influences the migrant's decision to remit positively. Shocks experienced by the migrant have no role in determining remittance behaviour in our sample.

In relation to household characteristics, only age of the household head shows a negative association with the share of remittances. If the household experiences a private shock, the share of remittances is expected to be lower. We attribute this to the construction of our questionnaire. The household shocks are recorded for preceding three years, while the remittances are recorded for the last one year. Therefore, we might miss some effects. Also, the migrant is less likely to remit when the household experiences a work-related shock. Work shocks faced by rural households include shocks such as an increase in input prices or decrease in output prices have short-term effects. As the remittances included in the analysis are measured on an annual basis, it is expected that short term effects on remittances may not be visible.

Variables capturing wealth of the household such as per capita consumption of the household and value of livestock owned by the household are negatively associated with the share of remittances. Additionally, a higher livestock value negatively influences the remittance decision. The provincial controls show no significance implying no variation across Thailand and Vietnam.

Table 5.4: Determinants of remittances

	Selection Equation	**Outcome Equation**
Dependent variable	**Pr (Remit)**	**Remittance share**
Migrant Characteristics		
Marital status (married)	0.0859	0.0304
	(0.133)	(0.0251)
Gender (male)	0.085	0.0417*
	(0.118)	(0.0227)
Duration of stay (years)	0.0294***	0.00269
	(0.0104)	(0.00208)
Child care	0.850**	0.036
	(0.358)	(0.0389)
Child in city	-0.381*	-0.0398
	(0.209)	(0.0634)
Close relationship	0.102	-0.0633*
	(0.167)	(0.0327)
Years of schooling	0.0345***	-0.00263
	(0.0133)	(0.00291)
Service employment	1.050***	-0.0365
	(0.322)	(0.0622)
Production employment	1.219***	-0.0596
	(0.322)	(0.0623)
Annual bonus (log)	0.0710***	0.00393*
	(0.012)	(0.00233)
Savings	0.337***	− − −
	(0.128)	
Good living conditions	0.275	-0.00374
	(0.169)	(0.0339)
Shock private	-0.0222	-0.0268
	(0.126)	(0.0268)
Shock work	-0.111	-0.0332
	(0.158)	(0.0259)

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Dependent variable	**Pr (Remit)**	**Remittance share**
Household Characteristics		
Years of schooling°	-0.00782	0.00254
	(0.00995)	(0.00301)
Age°	0.00485	-0.00218**
	(0.00604)	(0.00107)
Number of migrants	0.00569	0.0121
	(0.0412)	(0.00937)
Shock private	0.0482	-0.0432*
	(0.125)	(0.0259)
Shock work	-0.331**	0.0616
	(0.157)	(0.0508)
Shock weather	0.0293	0.0276
	(0.123)	(0.0265)
Cope grants	-0.162	0.0277
	(0.22)	(0.0469)
Per capita consumption (log)	-0.115	-0.0463**
	(0.12)	(0.0209)
Livestock value (log)	-0.0327**	-0.00700**
	(0.0156)	(0.00333)
Total land area	-0.00726*	0.000764
	(0.0044)	(0.000721)
Buri Ram (TH)	0.136	0.0266
	(0.167)	(0.0318)
Ubon Ratchathani (TH)	0.247	0.0523
	(0.173)	(0.0375)
Ha Tinh (VN)	-0.199	0.0469
	(0.237)	(0.0538)
Thua Thien Hue (VN)	-0.0166	0.0533
	(0.213)	(0.0406)
Athrho		-0.210***
		(0.0653)
lnsigma		-1.406***
		(0.0905)
Observations	687	687

Source: Own calculations.

Note: ° - Variables specific to household head. Robust standard errors in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

We carry out additional tests to check the robustness of our results. Table 10 in the Appendix shows the results for the OLS, Tobit and Hurdle Model specifications. For OLS and Tobit, only one-stage regression results are obtained. In comparison to our core analysis, we note similarity in signs and significance of coefficients. As these methods do not account for selection bias, we find an expected downward bias in the results. The Hurdle model produces two-stage results which are in line with our main regression. However, we prefer our specification over this because we believe that the conditional independence assumption made by the Hurdle models cannot hold in our case. Tables 11 and 12 present Heckman model results with three different specifications – use of per capita income instead of per capita consumption and use of net remittances instead of remittance share, with and without a net income control. The results are almost identical to our main regression. In addition, they uphold the validity of our identifying variable, savings.

Motivations of remittances

Table 5.5 shows the various variable groups and the signs of coefficients obtained after estimation of determinants. It should be mentioned that most papers only use the relationship between the variable and the share of remittances to reach a conclusion. We believe, not only the share of remittances, but also the decision to remit should be motivated by the same reason. Therefore, the relationship between the variable and the migrant's decision to remit is also considered.

For the first motivation strand (altruism vs self-interest), we notice a negative association between the dependent variables and per capita consumption and land area. This clearly suggests an altruistic motive. Age of the household head also displays a negative sign to further support this view. However, the shocks variables are not in line with expectations. The coinsurance group holds partially in our sample. Though per capita consumption and duration of stay show expected relationships, none of the shock variables underpin the motivation. Both loan repayment and exchange motive show promising results. All variables in these groups display the expected signs.

Table 5.5: Motivations of remittances (based on results from Table 5.4)

Dependent variable	Pr(Remit)	Remittance share	Support for proxy group
Altruism vs Self-interest			
Per capita consumption		-**	Yes – Altruism
Land area	-*		Yes – Altruism
Number of migrants			
Age of household head		-**	Yes - Altruism
Shock private (HH)		-**	No - Altruism
Shock work (HH)	-**		No - Altruism
Shock weather (HH)			
Coinsurance			
Duration of stay (years)	+***		Yes – Coinsurance
Good living conditions			
Shock private (mig)			
Shock work (mig)			
Shock private (HH)		-**	No – Coinsurance
Shock work (HH)	-**		No – Coinsurance
Shock weather (HH)			
Loan repayment			
Per capita consumption		-**	Yes – Loan repayment
Years of schooling (mig)	+***		Yes – Loan repayment
Duration of stay (years)	+***		Yes – Loan repayment
Exchange motive			
Per capita consumption		-**	Yes – Exchange motive
Years of schooling (mig)	+***		Yes – Exchange motive
Child care	+***		Yes – Exchange motive

Source: Own construction.
Note: Empty boxes indicate insignificant values. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

When considering altruism, self-interest and all contractual agreements as separate strands of motivation, there is no definite conclusion. This is an issue highlighted in the literature (Kazianga, 2006; Brown and Jimenez, 2011). An alternative perspective is to consider that all motivations always require altruism and/or self-interest to make the agreements self-enforcing (Hagen-Zanker and Siegel, 2007; Batista and Umblijs, 2016). In this case, altruism demonstrates a stronger influence in our sample and hence can be identified as the major binding force. Thereafter, to ascertain a specific agreement, a comparison can be made between the contractual agreements – coinsurance, loan repayment and exchange motive. It can be concluded that loan repayment and exchange motive are the major motivations, while coinsurance exhibits a minor relevance in our sample. The adherence to these contracts is ensured by altruism.

The overall results show that it is imperative to analyse both determinants and motivations of remittances to obtain a comprehensive understanding of the remittance decisions. While it is common practice to only use one or two variables to deduce motivations, this could lead to incomplete conclusions. For instance, in our case, if we would rely solely on results for 'wealth variables', we would infer altruism as the main motivation. This overlooks the evidence for exchange and loan repayment motive. Therefore, a detailed analysis of both aspects is vital.

5.6.2 Comparing remittances across richer and poorer migrant households

Determinants of remittances

Table 5.6 shows the results for the determinants of remittances for migrants from rural households that form the poorest 50 per cent of our sample (Poorer households) with migrants from the richest 50 per cent (Richer households).

We observe that only migrants from richer households remit more when they are married. Also, males remit more compared to females. In case of migrants from poorer households, duration of stay assumes significance both for the decision to remit and the remittance amounts. Variables such as child care, the number of years of schooling of the migrant and employment in production and service sectors show similar results across all migrants. However, engagement in production and service sectors lowers the share of remittances only in the case of poorer households. This could hint that these migrants generally earn lower amounts and therefore remit less. Reda et al. (2012) also propose that poor households generate poorer migrants. If the migrants think that their life improved since the last job, they are more likely to remit if their household is richer. Migrant shock variables have no statistical significance for the poorer households. In contrast, if the migrant belongs to a richer household, he/she remits less when faced with a work-related shock. These households could manage without remittances and, therefore, when the migrant is in need of the money, he/she could decide to remit less.

Table 5.6: Comparing migrants from poorer and richer rural households - Determinants

	Poorer Households		**Richer Households**	
	Selection Equation	Outcome Equation	Selection Equation	Outcome Equation
Dependent variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Migrant Characteristics				
Marital status (married)	-0.0453	0.0151	0.0945	0.0646*
	(0.198)	(0.0376)	(0.186)	(0.0347)
Gender (male)	0.137	0.00628	-0.109	0.0719**
	(0.171)	(0.0293)	(0.17)	(0.0315)
Duration of stay (years)	0.0512***	0.00596*	0.0201	4.71E-05
	(0.0158)	(0.00322)	(0.0146)	(0.00249)
Child care	0.944**	0.0512	0.925*	0.00346
	(0.471)	(0.0541)	(0.521)	(0.0599)
Child in city	-0.355	-0.0906	-0.45	0.0129
	(0.287)	(0.0608)	(0.306)	(0.109)
Relation close	0.3	-0.0745*	0.0177	-0.031
	(0.24)	(0.0421)	(0.254)	(0.054)
Years of schooling	0.0552**	-0.00285	0.0283*	-0.00312
	(0.0218)	(0.00354)	(0.0168)	(0.00453)
Service employment	1.409***	-0.117*	1.072**	-0.0287
	(0.476)	(0.0625)	(0.483)	(0.101)
Production employment	1.377***	-0.122*	1.550***	-0.0589
	(0.478)	(0.0663)	(0.475)	(0.103)
Savings	0.297*	–	0.409**	–
	(0.18)		(0.186)	
Good living conditions	0.324	0.0135	0.425*	0.0244
	(0.255)	(0.0363)	(0.239)	(0.056)
Shock private	0.167	-0.00616	-0.0401	-0.0624*
	(0.178)	(0.0405)	(0.173)	(0.0349)
Shock work	-0.122	-0.0308	-0.293	-0.0299
	(0.23)	(0.0375)	(0.236)	(0.0405)

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	Poorer Households		Richer Households	
Dependent variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Household Characteristics				
Years of schooling°	-0.0191	-0.0022	-0.00226	0.00322
	(0.0222)	(0.00274)	(0.0109)	(0.00325)
Age°	0.0111	-0.0021	0.0039	-0.00192
	(0.0081)	(0.00149)	(0.00923)	(0.00164)
Number of migrants	0.0449	0.00374	-0.0375	0.0164
	(0.0568)	(0.0125)	(0.0606)	(0.0133)
Shock private	0.223	-0.0291	0.0244	-0.0577
	(0.188)	(0.0274)	(0.18)	(0.0434)
Shock work	-0.489*	-0.00123	-0.350*	0.101
	(0.264)	(0.0517)	(0.205)	(0.0718)
Shock weather	0.0628	0.0395	-0.114	0.0389
	(0.172)	(0.035)	(0.189)	(0.0433)
Cope grants	-0.784**	0.00604	0.154	-0.0148
	(0.337)	(0.0729)	(0.323)	(0.0574)
Per capita consumption	0.672**	-0.0372	-0.581***	-0.115**
	(0.279)	(0.0559)	(0.218)	(0.0516)
Livestock value (log)	0.00154	-0.00535	-0.0560***	-0.00727
	(0.0229)	(0.00414)	(0.021)	(0.00517)
Land area	-0.0122*	0.0013	-0.00487	-0.000313
	(0.00637)	(0.00105)	(0.00558)	(0.000949)
Buri Ram (TH)	0.0945	-0.0323	-0.0484	0.0849*
	(0.248)	(0.0401)	(0.243)	(0.0516)
Ubon Ratchathani (TH)	0.111	0.0258	0.0204	0.0702
	(0.25)	(0.0496)	(0.258)	(0.0582)
Ha Tinh (VN)	-0.346	0.00274	0.0686	0.106
	(0.322)	(0.0512)	(0.419)	(0.111)
Thua Thien Hue (VN)	-0.134	0.145**	0.0564	-0.131***
	(0.299)	(0.0594)	(0.346)	(0.046)
Athrho		-0.280***		-0.169*
		(0.107)		(0.098)
lnsigma		-1.531***		-1.356***
		(0.113)		(0.122)
Observations	344	344	343	343

Source: Own calculations.
Note: ° - Variables specific to household head. Per capita consumption is logged. Robust standard errors in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Our identifying variable, savings, is highly significant in both the cases. If migrants save, they are more likely to remit. This provides further robustness to the choice of our identifying variable.

In case of household characteristics, only work shocks experienced by the households display a negative influence on the migrant's decision to remit. This holds for migrants across all economic backgrounds. When households use grants to cope from shocks, migrants from poorer households are less likely to remit. Per capita income presents an interesting case. While in case of migrants from poorer households, an increase in the per capita consumption of the household increases the likelihood of remitting, the opposite is observed for the migrants from richer households. Unlike the pooled regression, we see some differences across the two countries. Migrants from richer rural households located in the Thai province of Buri Ram, remit higher amounts. Vietnamese migrants from the Thua Thien Hue remit more when they come from poorer households. The opposite is seen when these migrants belong to richer households.

Additionally, we execute a robustness test where we use income per capita to construct a median. The results show similar coefficients with some differences in significance of the variables. Please refer to Appendix (Table 5.A6).

Motivations of remittances

Table 5.7 shows the comparison of motivation between the migrants from poorer rural households and their counterparts from richer rural households.

Table 5.7: Comparing migrants from poorer and richer rural households - Motivations (based on results from Table 5.6)

	Poorer households		Richer households		
Dependent variable	**Pr (Remit)**	**Remit. share**	**Pr (Remit)**	**Remit. share**	**Support for proxy group**
Proxy group: Altruism vs Self-interest					
Per capita consumption	$+^{**}$		$-^{***}$	$-^{**}$	Y – Self-interest (poorer) Y – Altruism (richer)
Land area	$-^{**}$				Y – Altruism (poorer)
Number of migrants					
Age of HH head					
Shock private (HH)					
Shock work (HH)	$-^{*}$		$-^{*}$		Y – Self-interest (both)
Shock weather (HH)					
Proxy group: Coinsurance					
Per capita consumption	$+^{**}$		$-^{***}$	$-^{**}$	Y – Coinsurance (richer) N – Coinsurance (poorer)
Duration of stay (years)	$+^{***}$	$+^{*}$			Y– Coinsurance (poorer)
Good living conditions			$+^{*}$		N - Coinsurance (richer)
Shock private (mig)				$-^{*}$	N – Coinsurance (richer)
Shock work (mig)					
Shock private (HH)					
Shock work (HH)	$-^{*}$		$-^{*}$		N – Coinsurance (both)
Shock weather (HH)					
Proxy group: Loan repayment					
Per capita consumption	$+^{**}$		$-^{***}$	$-^{**}$	Y – Loan repayment (both)
Years of schooling (mig)	$+^{**}$		$+^{*}$		Y – Loan repayment (both)
Duration of stay (years)	$+^{***}$	$+^{*}$			Y – Loan repayment (poorer)
Proxy group: Exchange motive					
Per capita consumption	$+^{**}$		$-^{***}$	$-^{**}$	Y – Exchange motive (both)
Years of schooling (mig)	$+^{**}$		$+^{*}$		Y – Exchange motive (both)
Child care	$+^{**}$		$+^{*}$		Y– Exchange motive (both)

Source: Own construction.
Note: Empty boxes indicate insignificant values. Remit. - remittance. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

With the given results, it is hard to disentangle altruism and self-interest. Migrants from poorer as well as richer households show altruism and self-interest. For coinsurance, migrants from richer and poorer households display the expected relationship under only one variable. However, duration of stay is an important indicator. Coinsurance deals with the migrant and household supporting each other in times of need. Though none of the shock variables shows significance, we can infer the migrant's risk level from the time they have stayed in the city. Despite the low risk level, if the migrant sends remittances, this indicates partial coinsurance.

In case of loan repayment, we observe relative homogeneity. However, the deciding variable that ensures mutual exclusivity for these motivation groups is only significant for migrants from poorer households. Exchange motive seems to motivate across all groups.

Overall, we note that the determinants of remittances and their influence vary across poorer and richer migrants. However, the motivations show similarities. This implies that while all migrants are motivated to remit, the differences in their remittances arise due to differences in determinants such as education, employment types and living conditions.

5.7 Conclusion

This paper uses pooled data on 687 migrants and their rural households from Thailand and Vietnam to answer – (1) what are the determinants and motivations of internal migrant remittances? and (2) do determinants and motivations of remittances differ across migrants from different economic backgrounds?

Under the first research question, we find that remittance behaviour depends to a large extent on the duration of the stay of the migrant in the city along with the job profile of the migrant. Gender also plays an important role with males remitting higher proportions of their incomes than females. Education of the migrant also positively influences the decision to remit. Amongst household characteristics, age of the household head displays a negative association with the share of remittances. Wealth variables of per capita consumption of the rural household, livestock value and land area also exhibit negative influence on the remittance decision. Only work shocks experienced by the household show significance in our analysis. In terms of motivations, we find that both loan repayment and exchange motive are the main motivation in our sample, while coinsurance plays a partial role. These contractual agreements are enforced with altruism. Our results also highlight the importance of analysing both determinants and motivations to obtain a complete understanding of the remittance behaviour.

The second question compares the determinants and motivations of migrants from relatively poorer and relatively richer households. For determinants, we observe considerable differences across the migrants. Demographic variables of gender and marital status are only significant in case of migrants from richer households, while duration of stay is relevant for migrants from poorer households. Per capita consumption of the household negatively influences the remittance decisions for richer household migrants. Interestingly, the opposite is seen for migrants from poorer households. In contrast to determinants, motivations present a more homogeneous picture. Migrants from both, poorer and richer households, are motivated by loan repayment, exchange motive and partially by coinsurance. The underlying enforcement is derived from both altruism and self-interest. Hence, we conclude that while determinants of remittances are contingent on the economic standing of the receiving households, the motivations of remittances are rather independent.

At the micro level, remittance decisions made by the migrant can determine the survival of poor rural households. At the macro level, these decisions can define remittance flows and their dynamics within the country and provide opportunities to formulate more efficient migrant policies. The paper highlights the importance of investment in human capital such as education. Better educated migrants are employed in more rewarding jobs. This increase in income can translate into higher remittances. It is also encouraging to know that differences in remittances across richer and poorer migrants stem from determinants rather than motivations. These observables are easier to address through efficient policies. For instance, we observe that migrants, especially those from poorer households, are more likely to remit when they feel secure. This could be facilitated by ensuring stability of urban labour markets and written job contracts. In addition, legal frameworks such as the housing registration system that directly influence spontaneous migrants require reformation. Migrants from poorer households are also more likely to be trapped in certain low paying sectors. Therefore, smoothing of sectoral income discrepancies could be encouraged. Lastly, we find evidence for regional differences in remittance behaviour. This could further regional inequalities and therefore needs to be addressed through detailed regional research and appropriate policies.

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5.8 Appendix

Table 5.A1: Descriptive statistics – Remitters vs Non-remitters (Binary variables - % of 'yes')

Variable	Remitters	Non-remitters
Migrant characteristics		
Annual net income (USD)	7453.7***	4545.4***
Annual remittances (USD)	1425	—-
Annual bonus (USD)	329***	116.4***
Years of schooling	8.4***	7.08***
Age	29***	26.06***
Duration of stay in city (years)	9.7***	7***
Household characteristics		
Age of household head	58.7***	56
Years of schooling of household head	4.9*	5.8
Total migrants in household	2.2*	2
Annual per capita consumption (USD)	1613.8	1627.6
Annual per capita income (USD)	1942.7	2067.8
Livestock value (USD)	867.1*	1118.7*
Total land area (ha.)	15.4	16
Binary Variables (yes in %)		
Marital status (married)	47.4	39.3
Gender (male)	48.6	49.7
Shock private (experienced the shock)	29	34.4
Shock work (experienced the shock)	15.2	15.8
Production employment (employed in production)	48.6	44.3
Service employment (employed in service)	50	49
Savings (have savings)	73.6	55.7
Child in city (has child in the city)	8.3	12.6
Good living conditions (better off than in the village)	89.5	82
Close relationship (son, daughter or spouse of the hh head)	82.3	83.6
Observations	504	183

Source: Own calculations.
Note: T- test on means, $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Binary variables in %.

Table 5.A2: Descriptive statistics – Migrants from poorer rural households vs migrants from richer rural households (Binary variables - % of 'yes')

Variable	Poorer households	Richer households
Migrant characteristics		
Annual net income (USD)	6333	7025.6
Annual remittances (USD)	957**	1154
Annual bonus (USD)	186.7***	358.4
Years of schooling	7.5***	8.7
Age	27.5**	29
Duration of stay in city (years)	8.6	9
Household characteristic		
Age of household head	57.5	58.5
Years of schooling of household head	4.3***	6.1
Total migrants in household	12***	2.4
Annual per capita consumption (USD)	944.6***	2292
Annual per capita income (USD)	1326***	2628
Livestock value (USD)	958.6	909.5
Total land area (ha.)	18.7***	12.7
Binary variables - % of 'yes'		
Savings (have savings)	64.5	73
Marital status (married)	43.6	47
Gender (male)	45.4	52.5
Shock private (experienced the shock)	29.4	32
Shock work (experienced the shock)	15.7	15
Production employment (employed in production)	55	40
Service employment (employed in service)	42	57.4
Child in city (has child in the city)	9.6	9.3
Good living conditions (better off than in the village)	88	87
Close relationship (son, daughter or spouse of the hh head)	81.7	83.7
Observations	345	342

Source: Own calculations.
Note: T- test on means, $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Binary variables in %.

Table 5.A3: OLS, Tobit and Hurdle Model results

	OLS	**Tobit**	**Hurdle Model**	
			Selection Equation	Outcome Equation
Dependent Variable	**Remit. share**	**Remit. share**	**Pr (Remit)**	**Remit. share**
Migrant Characteristics				
Marital status (married)	0.0304	0.0405	0.101	0.301
	(0.021)	(0.0264)	(0.136)	(0.233)
Gender (male)	0.0383**	0.0436*	0.0463	0.265
	(0.0188)	(0.0237)	(0.116)	(0.202)
Duration of stay (years)	0.00413**	0.00600***	0.0317***	0.0196
	(0.00179)	(0.00213)	(0.0104)	(0.0153)
Child care	0.0758*	0.0935**	0.836**	0.245
	(0.0389)	(0.0426)	(0.383)	(0.308)
Child in city	-0.0644	-0.0924*	-0.396*	-0.549
	(0.0451)	(0.0552)	(0.205)	(0.438)
Close relationship	-0.0362	-0.0319	0.118	-0.417
	(0.028)	(0.0348)	(0.167)	(0.273)
Years of schooling	0.000589	0.00331	0.0342***	-0.0102
	(0.00218)	(0.00277)	(0.0129)	(0.0219)
Service sector employment	0.0822*	0.201**	1.099***	-0.126
	(0.0433)	(0.0876)	(0.345)	(0.738)
Production sector employment	0.0769*	0.199**	1.230***	-0.271
	(0.0432)	(0.0872)	(0.35)	(0.747)
Annual bonus (log)	0.00843***	0.0124***	0.0678***	0.0429*
	(0.00205)	(0.00264)	(0.0121)	(0.023)
Savings	0.0294	0.0531*	0.356***	− − −
	(0.0221)	(0.0289)	(0.13)	
Good living conditions	0.0298	0.048	0.101	0.301
	(0.0257)	(0.0359)	(0.136)	(0.233)
Shock private	-0.0208	-0.0242	0.0463	0.265
	(0.0225)	(0.0277)	(0.116)	(0.202)
Shock work	-0.037	-0.0475	0.0317***	0.0196
	(0.0228)	(0.0302)	(0.0104)	(0.0153)

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Dependent Variable	**Remit. share**	**Remit. share**	**Pr (Remit)**	**Remit. share**
Household Characteristics				
Years of schooling	0.00115	0.000693	-0.00907	0.0142
	(0.00247)	(0.00289)	(0.00983)	(0.0164)
Age°	-0.00118	-0.000747	0.00455	-0.0197*
	(0.000917)	(0.00117)	(0.00596)	(0.0115)
Number of migrants	0.00987	0.00945	0.0208	0.0813
	(0.00746)	(0.00901)	(0.0426)	(0.067)
Shock private	-0.0283	-0.0252	0.0667	-0.358
	(0.0204)	(0.0259)	(0.126)	(0.245)
Shock work	0.0192	-0.00913	-0.373**	0.366
	(0.0384)	(0.0458)	(0.168)	(0.288)
Shock weather	0.0236	0.0303	-0.00954	0.199
	(0.0222)	(0.0275)	(0.121)	(0.205)
Cope grants	0.0139	0.00372	-0.185	0.333
	(0.035)	(0.0465)	(0.233)	(0.411)
Per capita consumption (log)	-0.0415**	-0.0514**	-0.0624	-0.449*
	(0.0176)	(0.0228)	(0.12)	(0.238)
Livestock value (log)	-0.00718**	-0.00943***	-0.0360**	-0.0541**
	(0.00303)	(0.00355)	(0.0145)	(0.0261)
Total land area	-0.00024	-0.000667	-0.00750*	0.0044
	(0.000595)	(0.000807)	(0.00427)	(0.00733)

Source: Own calculation.
Note: Observations = 687. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. R^2 (OLS) = 0.133. Sigma (Tobit) = 0.285***. Sigma (Hurdle) = -0.381*. Remit. - remittance

Table 5.A4: Heckman Model using income per capita

	Heckman model using income per capita	
	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**
Migrant Characteristics		
Marital status (married)	0.0728	0.0293
	(0.133)	(0.0252)
Gender (male)	0.0815	0.0407*
	(0.117)	(0.0226)
Duration of stay (years)	0.0293***	0.00271
	(0.0103)	(0.00211)
Child care	0.856**	0.0383
	(0.361)	(0.0384)
Child in city	-0.375*	-0.0398
	(0.208)	(0.0631)
Close relationship	0.0973	-0.0633*
	(0.167)	(0.0329)
Years of schooling	0.0354***	-0.00273
	(0.0132)	(0.00292)
Service employment	1.028***	-0.0461
	(0.322)	(0.0608)
Production employment	1.199***	-0.0694
	(0.323)	(0.061)
Annual bonus (log)	0.0704***	0.00359
	(0.012)	(0.00229)
Savings	0.342***	—
	(0.129)	
Good living conditions	0.275	-0.00374
	(0.17)	(0.0333)
Shock private	-0.0318	-0.0298
	(0.127)	(0.0272)
Shock work	-0.109	-0.0344
	(0.157)	(0.0258)

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	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**
Household Characteristics		
Years of schooling°	-0.00762	0.00248
	(0.00996)	(0.00298)
Age°	0.00532	-0.00205*
	(0.00603)	(0.00107)
Number of migrants	-0.000382	0.00976
	(0.0405)	(0.00927)
Shock private	0.0507	-0.0440*
	(0.124)	(0.0258)
Shock work	-0.333**	0.0579
	(0.156)	(0.0508)
Shock weather	0.0143	0.0259
	(0.124)	(0.0271)
Cope grants	-0.153	0.0261
	(0.22)	(0.0481)
Per capita consumption (log)	—	—
Per capita income (log)	-0.0876	-0.0246*
	(0.0815)	(0.0131)
Livestock value (log)	-0.0314**	-0.00618*
	(0.0155)	(0.0032)
Total land area	-0.00713	0.000676
	(0.00442)	(0.000724)

Source: Own calculations.
Note: Observations = 687. Athrho (Model 2) = -0.201*** and lnsigma (Model 2) = -1.405***. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5.A5: Heckman Model using net remittances as dependent variable

	Heckman Model (1)		**Heckman Model (2)**	
	Selection Equation	Outcome Equation	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Migrant Characteristics				
Marital status (married)	0.0294	0.172	0.0246	0.162
	(0.127)	(0.114)	(0.127)	(0.112)
Gender (male)	0.0813	0.13	0.0801	0.133
	(0.112)	(0.1)	(0.112)	(0.099)
Duration of stay (years)	0.0275***	0.0224***	0.0170*	0.0215***
	(0.0104)	(0.00846)	(0.0102)	(0.00825)
Child care	0.640*	-0.0125	0.447	0.0102
	(0.385)	(0.142)	(0.276)	(0.145)
Child in city	-0.2	-0.365	-0.258	-0.385
	(0.236)	(0.241)	(0.253)	(0.241)
Close relationship	0.169	-0.277**	0.171	-0.278**
	(0.16)	(0.134)	(0.161)	(0.131)
Years of schooling	0.0236*	-0.00105	0.0169	-0.000713
	(0.0125)	(0.012)	(0.0129)	(0.0118)
Service employment	1.016***	-0.666*	0.742***	-0.505
	(0.308)	(0.352)	(0.278)	(0.311)
Production employment	1.164***	-0.977***	0.945***	-0.799**
	(0.314)	(0.356)	(0.281)	(0.315)
Annual bonus (log)	0.0545***	0.013	0.0518***	0.0134
	(0.0127)	(0.0105)	(0.0134)	(0.0106)
Savings	0.271***	——-	0.308***	——
	(0.0996)		(0.0995)	
Good living conditions	0.205	0.2	0.113	0.169
	(0.167)	(0.172)	(0.172)	(0.169)
Shock private	0.0669	-0.085	0.0473	-0.105
	(0.119)	(0.114)	(0.119)	(0.112)
Shock work	-0.0427	-0.0233	-0.053	-0.0322
	(0.153)	(0.142)	(0.148)	(0.137)

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	Heckman Model (1)		**Heckman Model (2)**	
	Selection Equation	Outcome Equation	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Net income (annual)			0.445***	0.116
			(0.0925)	(0.104)
Household Characteristics				
Years of schooling°	-0.00787	0.0072	-0.00706	0.00786
	(0.00901)	(0.00896)	(0.00977)	(0.00907)
Age°	0.00394	-0.0076	0.00335	-0.00791
	(0.00558)	(0.00529)	(0.00577)	(0.00513)
Number of migrants	-0.0078	0.0127	-0.0021	0.0154
	(0.0397)	(0.0369)	(0.0417)	(0.0376)
Shock private	-0.0102	-0.174	-0.0144	-0.190*
	(0.118)	(0.109)	(0.121)	(0.108)
Shock work	-0.243	0.0728	-0.242	0.0825
	(0.157)	(0.169)	(0.152)	(0.164)
Shock weather	0.118	0.056	0.109	0.0356
	(0.118)	(0.106)	(0.118)	(0.104)
Cope grants	-0.165	0.164	-0.202	0.133
	(0.217)	(0.205)	(0.198)	(0.197)
Per capita consumption	-0.116	0.0127	-0.185	0.0011
(log)	(0.111)	(0.0964)	(0.115)	(0.097)
Livestock value (log)	-0.0349**	-0.00193	-0.0368**	-0.00245
	(0.0149)	(0.0121)	(0.0152)	(0.0119)
Total land area	-0.00722*	0.00880**	-0.0105**	0.00804**
	(0.00404)	(0.0038)	(0.00417)	(0.00368)

Source: Own calculations.

Note: Observations = 687. Model 1 does not include Net income of the migrant as a control. Model 2 includes Net income of the migrant as a control. Athrho (Model 1) = -1.450*** and lnsigma (Model 1) = 0.138**. Athrho (Model 2) = -1.533*** and lnsigma (Model 2) = 0.122*. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 5.A6: Comparing migrants from poorer rural households and richer rural households (median based on per capita income of the rural households)

	Poorer Households		**Richer Households**	
	Selection Equation	Outcome Equation	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Migrant Characteristics				
Marital status (married)	0.208	-0.0149	0.0594	0.0648*
	(0.185)	(0.0376)	(0.195)	(0.0341)
Gender (male)	0.248	0.0452	-0.206	0.0131
	(0.168)	(0.0319)	(0.17)	(0.0302)
Duration of stay (years)	0.0463***	0.00221	0.0201	0.00262
	(0.0151)	(0.00305)	(0.0138)	(0.00305)
Child in city	-0.477	0.0496	-0.684**	-0.208***
	(0.308)	(0.0982)	(0.297)	(0.0369)
Relation close	0.421*	-0.116**	-0.139	-0.0181
	(0.221)	(0.0535)	(0.26)	(0.0349)
Years of schooling	0.0566***	-0.00359	0.0338**	-0.000909
	(0.021)	(0.00466)	(0.0164)	(0.00316)
Service employment	1.801***	-0.189***	0.764*	-0.0386
	(0.642)	(0.0671)	(0.439)	(0.0557)
Production employment	2.064***	-0.214***	0.523	-0.046
	(0.649)	(0.0732)	(0.437)	(0.0544)
Savings	0.291*	− − −	0.471**	− − −
	(0.173)		(0.192)	
Good living conditions	0.650***	-0.0519	0.187	0.0543
	(0.237)	(0.0579)	(0.249)	(0.0384)
Shock private	0.428**	-0.0809**	-0.353*	0.0182
	(0.172)	(0.0361)	(0.183)	(0.0495)
Shock work	0.0059	-0.056	-0.342	0.00883
	(0.229)	(0.0386)	(0.235)	(0.0378)

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	Poorer Households		**Richer Households**	
	Selection Equation	Outcome Equation	Selection Equation	Outcome Equation
Dependent Variable	**Pr (Remit)**	**Remittance share**	**Pr (Remit)**	**Remittance share**
Household Characteristics				
Years of schooling◦	-0.00431	0.00875	-0.00946	-0.00154
	(0.0157)	(0.00538)	(0.0118)	(0.00273)
Age◦	0.0156*	-0.00340*	-0.00265	-0.000221
	(0.00874)	(0.00174)	(0.00877)	(0.00121)
Number of migrants	0.00995	0.0212*	-0.0453	0.00532
	(0.0571)	(0.0119)	(0.0674)	(0.0103)
Shock private	0.192	-0.0710*	-0.0285	-0.015
	(0.18)	(0.0426)	(0.193)	(0.0272)
Shock work	-0.3	0.138*	-0.444*	-0.0165
	(0.226)	(0.0772)	(0.235)	(0.0453)
Shock weather	-0.0527	0.0252	0.0659	0.0327
	(0.173)	(0.0365)	(0.193)	(0.0356)
Cope grants	-0.131	-0.0264	-0.313	0.0336
	(0.356)	(0.0614)	(0.32)	(0.0751)
Per capita consumption	0.391**	-0.449**	-0.0556**	-0.0163
(log)	(0.184)	(0.183)	(0.0242)	(0.0278)
Livestock value (log)	0.000461	-0.0135**	-0.0556**	-0.000744
	(0.021)	(0.00596)	(0.0242)	(0.00291)
Land area	-0.0161**	0.00117	-0.00121	-8.27E-05
	(0.00653)	(0.00129)	(0.00657)	(0.000756)

Source: Own calculations.
Note: Observations = 687. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Athrho (Model 1) = -1.450*** and lnsigma (Model 1) = 0.138**. Athrho (Model 2) = -1.533*** and lnsigma (Model 2) = 0.122*.

Chapter 6

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