Show Me the Money: Four Essays on Remittance Transfer Costs, Channel Modality, and Informal Finance Gaps

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Abstract

Remittances, defined as funds sent by migrants to recipients in their region of origin or other transnational diaspora members, constitute a substantial portion of global financial flows. Regrettably, there exist sparse estimates regarding the volume and characteristics of informal remittances. If informal channels, such as hand-carried cash across borders, undeclared goods, and other transfers were accounted for, literature suggests that total flows would be substantially larger than currently reported. Policymakers have endorsed various initiatives, namely transfer cost reduction policies, by committing to targets and spurring competition to formalise informal flows. Divided into two main parts, each consisting of two papers or chapters, this dissertation explores topics in remittance behaviour, channel modality (or channel choice), and formalisation policies. In the first part, the dissertation explores the Canadian case study of the micro effects of transfer costs on remittance choices and channel modality using household survey data. As such, the first two papers explore the micro-level factors underlying remittance decision making. The first paper studies the micro-determinants, namely transfer costs, on the propensity to remit and the simultaneous decisions of the amount and frequency with which to remit. The second paper's analysis expands upon Canadian remitters' case study and unpacks the dichotomisation of formal versus informal methods to delve deeper into channel modality at the migrant and household levels. The second part of the dissertation broadens the scope of analysis to a global scale. The third paper delves into policy analysis and international relations theory to analyse the causal pathways that explain how the 2001 9/11 attacks shaped modern formalisation policies. The fourth paper builds upon this policy shift to study the slowdown in global formal remittance growth. Via proxy estimations of the informal sector, results indicate that while formalisation has contributed to the growth in formal remittances, formalisation efforts yield diminishing marginal returns over time. The multi-levelled approach across micro and macro chapters provides a holistic understanding of the gaps in each level of analysis and sheds light on the still liminal literature on remittance modality and formalisation.

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Chapter 1: Introduction

1.1 Contextualising the informal remittance problematique

Remittances, defined as funds or goods sent by migrants to individuals or groups to their region of origin (Adams, 2009),¹ have proliferated since the 1980s. Global remittances, the nexus between international finance and migration, have recently received significant attention in light of Canada's increase in immigration flows since Justin Trudeau's electoral win in 2015. At approximately 8.4 billion USD in personal remittance outflows in 2019, or 6.1 billion USD migrant outflows,² remittances sent from Canada continue to outpace Canadian Official Development Assistance (ODA) as defined by the World Bank.³ Given such sizeable flows, the question becomes how best to harness these substantial flows to advance international development goals while addressing money laundering and other critical security concerns.

¹ Although this definition is common within the study of remittances and migration, subsequent chapters on Canadian remittances also account for transnational household flows across international borders beyond those flowing to the "home" country. For instance, remitters in Canada could send flows to family members or diaspora members in the United States despite being from a different "home" region. This practice is common as a form of transnational risk-sharing or co-insurance (Lucas and Stark, 1985; Stark and Lucas, 1988; Amuedo-Dorantes and Pozo, 2006; Carling, 2008; Amuedo-Dorantes and Pozo, 2011). Unfortunately, due to data limitations, the study of remittances is often limited to first-generation immigrants as opposed to second or more generation immigrants (those born of immigrant parents or, in the case of third generation immigrants of second-generation parents). These data limitations are restrictive in studying inter-generational remittance patterns, particularly within specific diaspora.

² And under two billion CAD received in 2019 (1.3 billion USD) according to World Bank estimates for personal remittances based on International Monetary Fund (IMF) balance of payments data.

³ To know where these flows were sent from Canada, one can rely on bilateral remittance matrix estimates (<https://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data>) made available by the Global Knowledge Partnership on Migration and Development (KNOMAD) based on a methodology developed by Ratha and Shaw (2007). Nevertheless, it is worth noting these estimates are modelled based on a country's migrant stocks and gross national income to determine the weighting of corridors applied to balance of payment statistics. Another option is to rely on the Statistics Canada conducted *Study on International Money Transfers*. Although it is a self-reported survey, the data are reliable and weights allow one to approximate national estimates (Dimbuene and Turcotte, 2019).

In 2019, personal remittances received reached 656 billion USD globally (639 billion USD in 2018), of which 503 billion USD (486 billion USD in 2018) flowed to low- and middle-income countries according to the World Bank (2021). Derived from the International Monetary Fund's (IMF) balance of payments, these estimates are most frequently limited to money transfers through formal remittance service providers (RSPs) such as banks, credit unions, and other established money transfer operators (MTOs).⁴ If latent informal flows, such as cash hand-carried across borders, undeclared goods, and other transfers were accounted for, the estimates would be substantially larger.⁵

Most informal flows, whether via digital methods or more rudimentary methods of transportation, are not captured. Existing estimates of the magnitude of informal remittances vary considerably across studies due to data limitations, lack of reliability, and erratic variation across geographies. As a result, some studies value informal remittances between two and ten times greater than officially reported global remittance flows (O'Neill, 2001). In contrast, others put them at 1.5 times the monetary value of formal remittances (Sander, 2004). Freund and Spatafora (2005, 2008) cite market observers estimating them anywhere between 0.5 and 2.5 times the volume of formal flows and estimate that the flows to developing countries constitute 35 to 75 per cent of official flows (citing high regional

⁴ An entity operating as a business that provides remittance services to users and charging a fee for said services. RSPs include a wide variety of financial institutions, whether formal or informal, but the main RSPs remain banks, credit unions, postal services, and larger MTOs such as Western Union and MoneyGram.

⁵ Other informal method types are generally culture-specific, such as *hawala* and *hundi* practiced among the Middle Eastern, South Asian and certain African diaspora, *fei chien* in China, *padala* in the Philippines, *Chuyen Tien Tay Ba* in Vietnam, or *viajeros* in Mexico (Basu and Bang, 2015; Hernández-Coss, 2005b; Yang, 2011). They are frequently specific to certain corridors and cultures. All these methods are categorised more broadly under the umbrella of informal methods. These methods incrementally became more sophisticated over time through their leverage of communal ties and diasporic networks as well as a mix of modern and traditional means of value transfer.

variation). Kupets' (2012) study of Ukrainian flows points to informal remittances being anywhere between 15 and 200 per cent of the value of reported remittances.

Unfortunately, neglected informal remittances and knowledge gaps vis-à-vis their role in terms of the broader migratory financial infrastructure are lacunae within the study of global finance and migration. This dearth in understanding informal flows has significant public policy, international development, security, and economic implications. Moreover, the lack of information on informal remittances is troubling considering the disparate impacts the ongoing COVID-19 pandemic has had on the informal sector and remittances on a global scale. Numerous debates about the usage of remittance channels remain, including how remittance modality can impact other remittance choices.

Furthermore, increasing financial technology developments, or FinTech, keep pushing the boundaries of current regulatory and data frameworks – often *de facto* categorising newer remittance channels as informal. The heterogeneity of digital methods is also of concern since mobile money transfers, online platforms with cash pickup options, and cryptocurrencies vary significantly in terms of their use as remittance methods. For newer channels such as digital currencies, issues surrounding convertibility to cash or other liquid assets (i.e., fungibility) – not to mention high fluctuations in value – remain problematic for remittance use. It remains unclear if digital methods help remove remittance barriers, or the lack of fungibility drive remitters to use informal methods when remitting to regions lacking the necessary financial infrastructure to receive certain digital transfers.

1.2 Formalisation: Caught between a security and development agenda

Policies surrounding the formalisation of remittances are a key area of study and policy, especially within security and national intelligence circles. Although concerns about money laundering and terrorist financing predate the 2001 9/11 attacks in the United States, the aftermath of the terrorist acts heightened security concerns. It shined a spotlight on informal monetary flows.

However, informal remittances flows should not be conflated with illicit activities and can be an economic development boon for the recipient country. Despite the breadth of research on informal remittances attributed to security scholars, remittances play a vital role as a source of peer-to-peer development finance. Moreover, their role in terrorist financing is minor (Passas, 2006).

Harmony between these two objectives remains a challenging and politically charged balance. Security and development policymakers have sought to formalise remittance flows. Whereas the former mainly aims for transparency and regulatory oversight, the latter primarily aims to leverage a goliath amongst financial inflows for low-income countries. That said, low transfer costs and the broader formalisation of flows have become common goals in both spheres.

Despite the neo-Marxist critiques of remittances in the 1970s and 1980s (De Haas, 2009, 2010, 2012), the increasing remittance flows of the 1990s and 2000s reignited scholars' optimism vis-à-vis their role as a catalyst for development. Remittances can be leveraged to promote investment in micro, small and medium enterprises, education, health, and other development initiatives. Furthermore, remittances are generally countercyclical (Brown, 2006; Ratha, 2007; Frankel, 2011; Mohapatra and Ratha, 2012;

Bettin, Presbitero and Spatafora, 2017), meaning they flow towards regions when most needed, such as during an economic downturn, conflict, social turmoil, and natural disasters or other types of catastrophes.⁶

Notwithstanding all these benefits, remittances are not without their shortcomings. Drawbacks include the initial reduction of qualified labour supply in the receiving country from remitters leaving (i.e., brain drain argument; Brown, 2006; Niimi, Özden, and Schiff, 2010) and encouraging a culture of dependency based on satisfying short-term consumption needs (i.e., dependency trap argument). Moreover, remittance dependency, where the remittance sector occupies a dominant portion of the economy, can induce inflation and real exchange rate appreciation (i.e., Dutch disease) that harm local economies (De Haas, 2009, 2010, 2012; Amuedo-Dorantes, 2014; Chatterjee and Turnovsky, 2018; Basnet, Donou-Adonsou and Upadhyaya, 2019). Given these critiques, development programs would do best to adopt multi-faceted approaches that promote remittance transfers and ensure they mitigate such adverse outcomes.⁷

One step to limiting potential adverse impacts of remittance promotion policies would be to ensure remittances flow through regulated channels and are adequately measured, thereby enabling macroprudential policies to consider these flows. Although informal remittances are not inherently undesirable, the lack of transparency inhibits

⁶ This finding is rather intuitive seeing that individuals may be more inclined to send funds to their families during times of extreme need, but it should be noted that remittances sent, or outward flows, are still procyclical in the sending region. However, it is worth noting that counter examples exist. For instance, Durdu and Sayan (2010) document opposite trends in Mexico and Turkey whereby remittances are countercyclical in the former and procyclical in the latter. However, it is also worth noting the possibility of endogeneity or dual causality. One needs to control for the possibility of Dutch disease arising from the inflow of remittances or the benefit of remittances for the economy, in addition to the inverse causation that low growth and crisis prone regions attract more remittances due to higher demand for financial assistance.

⁷ This is especially true for countries that are highly dependent on remittances. For example, countries with high remittance to GDP ratios such as Haiti, Nepal, or Tajikistan, just to name a few, are more susceptible to have remittances as a sector of high dependence.

policymakers from properly assessing their potential detrimental impacts within local economic settings. Moreover, it can lead to the exploitation of vulnerable migrants (Oxfam, 2012).

High transfer costs in the formal remittance sphere push, or at least incentivise, remitters towards informal channels. Unfortunately, higher regulation entails higher costs for remittance service providers that pass these costs onto consumers in the form of higher fees, thereby undermining the intended goal of regulating flows (Passas, 2006). For this reason, remittance transfer cost policies and initiatives have surfaced as some of the most prolific elements within international development.

Per its 2019 federal budget, Canada aims to reduce remittance transfer costs to five per cent by 2022 (of the amount remitted) and three per cent by 2030, with the latter coinciding with a plethora of international targets (compared to current global average prices that are just shy of seven per cent).⁸ Similar initiatives are occurring internationally. The sustainable development goal (SDGs) on poverty reduction (SDG 10c) and Objective 20 in the 2018 Global Compact for Safe, Orderly and Regular Migration are but the latest international commitments for transfer cost reduction that started with the UN's Addis Ababa Action Agenda that set a global three per cent transfer cost target by 2030. These objectives build upon previous initiatives like the "5x5" Objective to reduce transfer costs to five per cent by 2014 (from over 10 per cent globally in 2008).

Despite global efforts, transfer costs remain a significant barrier to remittance growth, particularly in the case of more expensive formal transfer methods (e.g., banks in particular if remitting smaller amounts) relative to informal methods (O'Neill, 2001;

⁸ Recent Canadian levels are around eight per cent according to the World Bank's *Remittance Prices Worldwide* (RPW) dataset.

Sander, 2004; Orozco, 2005; Pieke, Van Hear and Lindley, 2007; Orozco, 2010, Basu and Bang, 2015; Ahmed and Martínez-Zarzoso, 2016; Kakhkharov, Akimov and Rohde, 2017).⁹ Informal methods remain cheaper, and among the rare methods available to underbanked individuals and those with weaker financial literacy skills. Sander (2004) estimates that average global informal remittance costs hover around three to five per cent. Dimbuene and Turcotte (2019) find analogous evidence of Canada's relatively low informal transaction, or transfer, fees.

A large portion of informal transfers tends to be in the form of cash transfers that often carry a negligible explicit cost. For instance, if a migrant is already planning travels, has connections to other diaspora members travelling, or is receiving visitors intending to return to the recipient region, sunk costs such transportation may substantially reduce transfer costs. Although costs related to risks of loss or theft when hand-carrying cash remain, these may be considered only marginal risks. Another reason for these low transaction costs is the usage of diasporic connections, social capital, and other reputational mechanisms within migrant networks as the currency of exchange (Schaeffer, 2008). These reputational or social capital costs are particularly important when migrants leverage diaspora connections or informal networks to carry the funds on their behalf, thus partially offsetting the higher explicit monetary cost of remitting. However, given the frequent absence of explicit or direct costs, Siddiqui and Arbor (2003) document that specific informal methods, across certain corridors, feature higher exchange rates and implicit costs due to higher risks.

⁹ Underbanked refers to countries with low levels of financial development, financial penetration and access, and/or inadequate underwriting by financing institutions. Financial inclusion is a pillar of economic development and features in eight of the 2030 Sustainable Development Goals (namely SDGs 1, 2, 3, 5, 8, 9, 10, and 17).

The lack of reliable data should be a significant concern considering the magnitude of these undocumented flows. Despite this, there is growing literature on transfer channels and their importance within the broader global financial infrastructure. For instance, in 2015, the Canadian federal budget set aside considerable funds to study international remittances. This commitment led Global Affairs Canada (GAC) to commission the *Study on International Money Transfers* (SIMT), conducted by Statistics Canada. The survey extends beyond the regular collection of remittance data by including detailed questions on remitter satisfaction, frequency of transfers, costs incurred, and channels used. This innovation in data gathering is vital to shedding light on the phenomena of diaspora mobilisations lacking data and transparency within Canada and abroad.

As this dissertation's findings suggest, formalisation policies disproportionately impact those informal remitters with limited financial literacy or access to finance. Formal channels frequently provide vulnerable populations with few alternatives to address financial access concerns at a low cost. Inequalities that stem from current transfer fee structures and remittance policies should be addressed, or they risk undermining the development and security goals they strive to achieve.

The next section highlights the dissertation's main theoretical frameworks before delving into an empirical analysis of informal remittances within the Canadian and broader global contexts. Without such guiding theory, empirical results would largely be limited to correlational findings, thereby limiting the ability to draw causal inferences and, in turn, their potential contribution to informing policy.

1.3 Seminal theories of remittance decision-making

In her seminal work, Sharon Russell (1986) produced an elegantly parsimonious model that proceeded to frame and shape the evolution of the study of remittances of the last three decades. Albeit dated, the framework encapsulates the central debates within the study of remittances to this day, notably dividing remittance decision-making into three main nodes of interest (1) whether to remit, (2) how much to remit and through which channel, and (3) how to use the funds (for the recipient).¹⁰ Although this dissertation focuses on the former two decision nodes, the latter is vital since the needs and uses of the funds can affect the former two decision nodes. Furthermore, as an addition to this seminal model, there is a crucial decision on how frequently to remit that can impact the amount sent in any single transaction and the channel a remitter may select – a decision of vital importance to development scholars and policymakers (Yang, 2011).

The New Economics of Labour Migration (NELM) reshaped the study linking migratory and financial decisions and redefined the unit of analysis as transnational households rather than individuals (Lucas and Stark, 1985; Stark and Lucas, 1988). This reorientation towards transnational households paved the way for a novel interpretation of the motivations involved in migrant remittances. Expanding the unit of analysis beyond the traditional individual decision-maker introduces critical concepts of transnational risk-sharing and household consumption smoothing as common motivations for sending funds back to the home region. The concept has since evolved to study various patterns by

¹⁰ Although the fourth node studying how the funds are spent is of the utmost importance within remittance and migration scholarship, it is not the focus of this dissertation.

internationalising economic migration and “transnational living” (Erdal and Carling, 2020).

The NELM also introduces additional actors to capture intra-household dynamics. Hence, the recipient(s) and other transnational household members became relevant actors rather than solely focusing on the individual or remitter/sender. To adequately portray the various other actors, one can overlay the NELM with the first-last mile framework (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007). The first-last mile framework identifies three main actors that influence decision-making: the sender (first-mile), remittance providers and regulatory bodies such as states and institutions (intermediaries), and recipients (last-mile).

From these frameworks, three main motivations are outlined: (1) pure altruism, (2) tempered altruism such as repayment of investment in education or travel, coinsurance, or consumption smoothing (Amuedo-Dorantes and Pozo, 2006; Amuedo-Dorantes and Pozo, 2011)¹¹, and, lastly, (3) pure self-interest, such as investment in assets in anticipation of return or the expectation of inheritance (Carling, 2008).

When combined, these seminal frameworks lay the groundwork for the theory and models applied in this dissertation, aiming to synthesise and build upon these instrumental building blocks. In this dissertation, the first decision node captures the binary choice of remitting based on a utility maximising decision for the transnational household. The second node encapsulates three simultaneous choices of how much to send, how frequently, and through which means. Altogether, these three choices form the basic framework of analysis.

¹¹ Although Amuedo-Dorantes and Pozo (2011) demonstrate that remittances do smooth household income on average, it is not necessarily the primary motive for remitters.

In sum, the dissertation's theory-based objective is to combine sequential choices¹² and their interactions with one another. Moreover, the proposed model expands upon Sharon Russell's (1986) framework, which overlooks the simultaneity of decision-making and the absence of a clear typology of actors and determinants at each stage. Russell's framework also excludes the frequency of transfers – a vital remittance decision as studied in Chapter 2.

The resulting agglomeration of theories into a single succinct framework serves as a guide to each chapter. Linking the empirical findings to this framework allows one to derive causal relationships that are key to informing future remittance program development and targeting select population segments engaged in transnational transfers. The following section presents the overall layout of the dissertation and delineates the scope and contributions of each chapter.

1.4 Multi-level research design

This dissertation consists of four independent papers (henceforth referred to as Chapters 2, 3, 4 and 5). Although each chapter tackles separate analytical puzzles and research questions, the chapters interconnect in their treatment of different facets of remittance formalisation, the analysis of transfer costs, and remittance modality (channel choice).

The chapters each expand on portions of a multilevel framework employed to dissect remittance modality and formalisation efforts – of which transfer cost reduction policies are the main policy lever in addition to other factors such as financial literacy and access programs. Given remittance decision interdependencies, the analysis requires a

¹² Although some decisions are made simultaneously (as opposed to sequentially), which will also be explored in subsequent chapters.

broad framework rather than studying each decision in isolation. Moreover, the avoidance of disciplinary and methodological silos is crucial to better understand each decision and actor. The analyses at both micro and macro levels enable the triangulation of causal mechanisms underlying remittance behaviour, channel modality, and formalisation policy.

Through this multilevel approach, this dissertation bridges micro-macro gaps in the study of remittances. The dissertation balances plausible alternative explanations to triangulate key determinants of disaggregated remittance decisions, fundamental policy shifts at the aggregate level, and macro-scale trends worldwide. This blend of frameworks and levels of analysis is essential to adequately depict the underlying forces impacting remittances globally and the numerous formal and informal intermediaries that exist. By studying a range of analytical units, namely juxtaposing migrant households and macro institutions and state involvement, the dissertation provides a more holistic understanding of informal remittances and formalisation policies.

1.4.1 Dissertation layout

While the first two chapters in Part I focus on migrant remittance behaviour and channel modality at the micro or household level, the latter two chapters broaden the scope beyond the Canadian case study. More specifically, Part II focuses on global informal remittance trends and international formalisation policy. Figure 1.2 summarises the layout of this dissertation.

Figure 1.1 Revised remittance decision model

Note: The figure illustrates the dissertation’s overall layout into four main essays (i.e., chapters). While Chapter 2 focuses on the decision to remit, the amount remitted, and the frequency of transfers, Chapter 3 focuses on the simultaneous second stage decisions (grouped by the dotted black line) and their implications on transfer method choice (modality). Chapters 4 and 5 respectively seek greater external validity at the global level, analysing policy formalisation policy shifts and modality over time.

In light of this dissertation’s multilevel design, the outline below provides a synopsis of each chapter’s research questions.

Part I: Migrant- and household-level remittance behaviour in Canada

- **Chapter 2 research questions:** What determines how much and how frequently migrants transfer funds? How can economies of scale be better leveraged in remittance policymaking to ease the trade-off between the sum and frequency of funds sent?
- **Chapter 3 research questions:** Why do remitters in Canada opt for specific channels but not others? What micro determinants push remitters to continue to opt for informal methods and cash?

Part II: Global trends in informal flows and international remittance policy

- **Chapter 4 research questions:** How did the framing of transfer cost reduction policies shift from security concerns about terrorist financing towards promoting development and poverty alleviation? Are current policies mainly aimed at promoting remittances, formalising them, or both?
- **Chapter 5 research questions:** To what extent has remittance growth during the past decades been attributable to formalisation? Why has formal channel remittance flow growth subsided over the past decade, and is it attributable to diminishing returns to formalisation?

Part I of the dissertation addresses migrant- and household-level remittance decisions. The second chapter studies the micro-determinants of the propensity to remit, the amount remitted, and the simultaneous decision of how frequently to remit. Studying these remittance decisions and the impacts of transfer costs is a critical first step to understanding some of the main underpinnings of policies aimed at remittance promotion and formalisation. Moreover, these remittance decisions are further examined in Chapter 3 to unveil key interactions with remittance modality decisions.

The third chapter turns to a case study of Canadian remitters to determine the micro determinants that incentivise or push them to opt for specific channels, emphasising those choosing informal transfer methods and cash. Using the same survey data as in the previous chapter, Chapter 3 digs deeper into the mechanisms underlying remitter modality choices. The chapter contributes to bridging the literature gap on remittance channel determinants – an area of study that is scantily studied globally and rarely employs large sample analysis, especially in the Canadian context. The chapter complements the micro findings of Chapter

2. Chapter 3 also sets the tone for the subsequent chapters on international formalisation policy formulation (Chapter 4) and quantitative study of global substitution from informal to formal remittance channels of the past three decades (Chapter 5).

Part II expands the analytical scope beyond the Canadian case study to explore global formalisation policy shifts. The fourth chapter studies how transfer costs became the primary policy tool for remittance formalisation and how events in the early 2000s shaped the framing of remittance policies. The findings suggest that the 9/11 attacks in New York in 2001 acted as an essential impetus for formalisation efforts. By analysing the evolution of policy challenges in both the security and development spheres of remittances – one concerned about the illicit flows leaving countries and the other focused on remittances as a form of development finance. Chapter 4 demonstrates the causal mechanisms by which policy alignment occurred and contextualises the policies impacting micro-level decisions explored in Part I and the institutional factors supporting state-level trends studied in Chapter 5.

The fifth chapter addresses why formal channel remittance growth has waned over the last decade and whether formalisation efforts have mitigated this decline. From a macro perspective, the chapter undertakes a quantitative analysis of the balance of payments statistics to elucidate global trends. The chapter finds that formalisation efforts yield diminishing marginal returns despite substantially contributing to formal remittance growth over the last couple of decades. This finding suggests that the inflated growth in formal flows came at the expense of a commensurate decrease in informal remittances, and that this effect is diminishing over time. In policy terms, these diminishing returns could

reshape the political, economic, and social discourses surrounding remittances and have significant implications for framing remittance debates.

1.4.2 Methodology

The objective is to study remittance channel decision-making at the household level and tie these insights into broader macroeconomic remittance policy shifts. As such, the dissertation uncovers how these micro-level processes translate to global macro trends and, conversely, how global policy and transfer cost structures shape micro decision-making.

Although predominantly quantitative, as the research questions lend themselves to measurement and large sample analysis, the study also uses international relations process tracing (Chapter 4) to explore the underlying institutional and paradigm shifts that shaped modern remittance networks and policies. In doing so, this work sheds light on the frequent misuse of remittance data. Moreover, it contributes to a better understanding of current estimates, their strengths and limitations, and how policymakers and academics can identify common analytical and data oversights.

The use of mixed methods helps triangulate causal mechanisms for theory-revising (Beach and Pederson, 2016) and theory testing. While Chapters 2, 3 and 5 are inherently quantitative, Chapter 4 opts for institutional process tracing to explore the factors that led to the current remittance policy environment. To provide valuable insights to researchers and policymakers, the study synthesises current knowledge, integrates and revises existing theory, and accumulates knowledge through quantitative testing (Carment and Rowlands, 2007).

The edification of a rigorous theoretical framework is necessary to expand the analysis beyond mere correlates and provides a guiding structure supporting causal

inference. Albeit primarily inductive, the dissertation balances the largely atheoretical – and inchoate – study of informal remittances by supplanting it with the previously described cogent theoretical framework to guide the ensuing analysis.

While this dissertation's contributions converge on empirical findings and their policy implications, the study also makes two contributions to theory that fulfil the scientific need to be potentially falsifiable. First, it emphasises the importance of breaking up decision-making into sequential rational choices and the analysis of interdependent choices. Second, the dissertation underscores the heterogeneity of remittance channels, both between (formal versus informal) and within each category, and how they intrinsically rely on distinct receiver and sender clientele informs theory (first-last-mile model).

1.5 Motivation and significance of research

Research on endemically overlooked informal remittances and factors influencing remittance formalisation efforts – primarily through lowering costs – are of prime importance. Moreover, better understanding remittance intentions and the various actors involved, especially in the Canadian context where such efforts suffer from limited data availability, can improve current and future remittance-related policies. Four main motivations for undertaking this research stand out.

First, disentangling the various decisions that potential remitters face enables policymakers to evaluate and design better remittance programs. Consequently, the results apply to both programs to promote the growth of international volumes transferred and, conversely, those aimed at curbing capital flight, and those aimed at combatting illicit flows

such as money laundering and terrorist financing.¹³ Furthermore, this research is the first of its kind in the Canadian context to estimate the cost elasticity of remittances, enabling policymakers to quantify and assess current transfer cost reduction programs' effects.

Second, unpacking both informal and formal categories is necessary, given this dichotomy can lead to reductionist results and conclusions. The high degrees of heterogeneity in channels contained in each group remains understudied, especially in Canada. The informal or undocumented category, frequently treated as a residual or “fake” classification (Pieke, Van Hear and Lindley, 2007), comprises an assortment of different transfer methods. Moreover, numerous channels labelled as informal in one region may be labelled as formal in other geographies (for example, many Middle Eastern and North African states consider *hawala* a formal channel). In sum, inserting nuance to the binary treatment of remittances and studying each channel's characteristics constitutes an important step forward in understanding remittance behaviour.

Third, studying macroeconomic formalisation, the substitution in the usage of channels from informal to formal, provides much-needed evidence on the growth in formal remittances. However, diminishing marginal returns to formalisation efforts could justify the gradual diminishing remittance growth of the last decade. Hence, the latter chapters' findings are pivotal in supporting the thesis that a sizeable portion of remittance growth has been artificial of sorts and that current efforts to help remitters transition to formal methods of transfer will yield diminishing returns. This temporal dimension underscores the need to study informal flow trends using a dynamic framework – something that

¹³ Oklahoma taxes international remittances (wire-transfers) in the order of five dollars for first \$500 and one per cent of the volume sent thereafter. The taxation revenues are labelled as “Drug Money Laundering & Wire Transm. Rev. Fund” in the 2019 (fiscal year of July 1st to June 30th) Annual Report of the Oklahoma Tax Commission (https://www.ok.gov/tax/Forms_&_Publications/Publications/Annual_Reports/).

complements static or time-invariant analyses, including those in the earlier chapters of this dissertation.

Finally, the dissertation addresses the proverbial elephant in the room – teasing out an approximate size for latent informal flows. Estimates involve strict assumptions and rigorous empirical work to determine the proportion of remittances unaccounted for in Canadian and global statistics. Per its nature of being undocumented, there exist myriad challenges to obtaining data beyond anecdotal or small-N evidence that tends to be culturally and corridor specific. The resulting findings contribute to existing evidence of remittance substitution and ascertain the magnitude of latent informal flows.

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PART I: Migrant- and Household-Level Remittance Behaviour in Canada

Chapter 2: Transnational Money Transfer Choices and Redesigning Programs Around Remittance Fee Scale Economies

Abstract: Canadian support for development efforts could be enhanced by harnessing remittance outflows to official development assistance (ODA) eligible countries. There exists a plethora of international targets aimed at reducing transfer costs and promoting remittances, including the G20/G8 “5x5” objective, Goal 10c of the Sustainable Development Goals, and Objective 20 of the 2018 Global Compact for Safe, Orderly and Regular Migration. This chapter sheds light on the micro-determinants of remittance flow size and frequency using a 2018 survey of 22,908 migrants to Canada born in ODA-eligible countries. What determines whether migrants opt to remit, how much to remit, and how frequently to transfer those funds? What is the cost-elasticity of remittance demand, and how does the sensitivity to transfer fees differ across groups? The main theoretical finding suggests that interdependencies of simultaneous remittance decision are essential in rationalising sequential remittance choices that are influenced by cost structures. From a policy perspective, the empirical findings provide estimates of the cost-elasticity of remittance demand. These estimates are of particular use in adapting and assessing current remittance efforts to better target specific population segments and highlight substantial economies of scale within the remittance sector. Recommendations include developing programs that encourage the pooling of funds to better leverage economies of scale. The proposed diaspora cooperatives, or remittance pools, would allow for more frequent and less costly flows, thereby optimising remittance utility in addressing transnational household financial needs.

Keywords: remittances, transfer costs, migration, international development, Canada

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2.1 Introduction

Remittances have flourished since the late 1990s and early 2000s. Much of this expansion is attributable to global population growth and the increasing porosity of borders linked to the globalisation of human migration and international financial flows. Consequently, remittances have become a vital component of the migration literature across a broad range of disciplines.

According to the World Bank (2021), at approximately 8.4 billion USD in personal remittances, or 6.1 billion USD in migrant outflows, sent in 2019, formal remittances sent from Canada outpace outflows of Official Development Assistance (ODA). The policy relevance of remittances grew as academics and policymakers realised that these financial flows could assist international development efforts if adequately redistributed amongst the world's most impoverished regions (Adams and Page, 2005; Acosta et al., 2008).

As such, remittances have been a popular topic in the economic, development and migration literatures. Economic growth impacts are particularly effective in recipient countries with higher quality institutions (Catrinescu et al., 2009). The oft-cited comparisons of these transfers to ODA and foreign direct investment (Brown, 2006; Adams, 2009; Benmamoun and Lehnert, 2013; Driffield and Jones, 2013; Bird and Choi, 2020; Das and Sethi, 2020) have even led to labelling remittances as a “new development mantra” (Kapur, 2005).

Despite the pervasive pessimism regarding remittance dependence during the 1970s and 1980s (De Haas, 2009, 2010, 2012), growing remittance flows in the 1990s reignited scholars' optimism vis-à-vis their role as a catalytic development tool. Evidence suggests remittances predominantly have positive economic growth and development effects and

constitute a significant source of development finance (Adams and Page, 2005; Siddique, Selvanathan and Selvanathan, 2012). Remittances promote investment in micro, small and medium enterprises, education, health, and various other development initiatives. Furthermore, remittances are generally countercyclical (Brown, 2006; Ratha, 2007; Frankel, 2011; Mohapatra and Ratha, 2012; Bettin, Presbitero and Spatafora, 2017), meaning they flow towards regions in the presence of an economic downturn, social turmoil, cases of conflict and/or crisis, and natural disasters or other catastrophes. However, drawbacks remain with recent critiques vis-à-vis remittances' potential detrimental brain drain and Dutch disease impacts (Chami, Fullenkamp and Jahjah, 2005; Amuedo-Dorantes and Pozo, 2004; Amuedo-Dorantes, 2014).

Despite the surfeit of research, numerous theoretical and empirical gaps persist in our understanding of remittance behaviour. From a theoretical standpoint, dissecting and isolating the factors underlying separate remittance choices proffers a practical analytical framework. For instance, the decision to self-select into remitting (Amuedo-Dorantes and Pozo, 2005) can be separated from secondary choices of how much and how frequently to remit. Another example is a dearth in the literature on interdependencies between the frequency and magnitude of transfers (Yang, 2011). Cogent theory on remittance dynamics and remitter choices sets the foundation for the subsequent empirical analysis.

Transfer costs remain one of the most significant barriers to remittance transfers and constitute an important policy lever with regards to migrant remittance capacity. Recognising the barrier that transfer costs impose, numerous national¹⁴ and international

¹⁴ Per the 2019 federal budget, remittance transfer costs should be reduced to five per cent of the amount remitted by 2022 and three per cent by 2030. Current levels are over seven per cent according to the *Remittance Prices Worldwide* (RPW) dataset, which is the main tool employed to estimate SDG 10c progress.

programs aim to reduce transfer costs and promote remittance market competition. For instance, born from the 2009 G8 summit in L'Aquila, the "5x5" objective of reducing transfer costs to five per cent by 2014 (from over 10 per cent globally in 2008) did not reach its ultimate goal but unleashed a flurry of similarly minded policies worldwide. The succeeding Sustainable Development Goals (SDGs) on poverty reduction (SDG 10c) and Objective 20 of the 2018 Global Compact for Safe, Orderly and Regular Migration are the latest international commitments. Both stem from the UN's Addis Ababa Action Agenda setting a global three per cent transfer cost target by 2030.

High transfer costs inhibit remitters from sending greater volumes of funds abroad and limit their remittance frequency. In a field experiment, Aycinena, Martinez and Yang (2010) find that Salvadoran migrants increase their total remittances sent and transfer frequency, but decrease the average amount sent per transaction when prices fall. As elaborated in this chapter, remitters are most content with the highest frequency of transfers possible as well as the largest annual amount transferred. Regrettably, these two goals stand at odds with one another (in the absence of substantial price reductions) since significant economies of scale in the remittance market imply that smaller frequent transfers incur relatively high fees. Therefore, a trade-off between frequency and amount sent hinges on the remittance market's substantial economies of scale.

At first glance, it is analytically puzzling that remitters do not take advantage of economies of scale. Instead of sending frequent smaller sums that incur higher cumulative fees over the course of a year, remitters could send less frequent (but more substantial) lump-sum amounts. This puzzle underscores the need to holistically analyse remittance amounts sent in addition to simultaneous decisions such as the frequency of transfers.

The magnitude of scale economies suggests current policies aimed at overall transfer cost reductions could be improved. The cost of remitting smaller amounts remains far pricier, and the current measurement of average cost reductions largely ignores the reality of frequent, and often low-income, remitters.

This chapter addresses two main research questions with a particular focus on flows to low-income and ODA-eligible countries: (1) What are the main determinants of migrant money transfer choices, namely: the propensity to remit, and the amount and frequency of remittances? (2) How can economies of scale be better leveraged in remittance policymaking to ease the trade-off between the sum and frequency of funds sent?

A variety of data lacunae have historically constrained researchers' ability to delve deeper into understanding remitter behaviour. Unfortunately, large sample data on remittance behaviour at the individual and household level remain sparse. The lack of data is especially apparent in Canada, where the *Longitudinal Study of Immigrants to Canada* (LSIC) has remained among the only sources of large sample remittance related household data. Despite its advantages as a panel of immigrants to Canada, the data are quite dated,¹⁵ and the sample is constrained to recent immigrants. Moreover, data on transfer costs, the prime policy tool to promote remittances, are often unavailable and are scantily addressed within the broader literature.

Fortunately, the Canadian 2015 federal budget set aside funds for remittance research, with which Global Affairs Canada commissioned the *Study on International*

¹⁵ The LSIC covers three waves of immigrants, the first wave covers 2001 data, the second wave covers 2003 data, and the third wave covers 2005 data for migrants that arrived in Canada between October 1, 2000 and September 30, 2001. The *Extended Longitudinal Survey of Immigrants to Canada* (LSIC-IMDB) merges both the LSIC and the *Longitudinal Immigrant Database* (IMDB) to provide more recent data using tax files for those first wave respondents. However, the extended file does not contain remittance data beyond what is available through the LSIC.

Money Transfers (SIMT). Statistics Canada conducted the survey in 2018 (with 2017 as the reference year), which shed light on existing data and knowledge gaps. Using this novel cross-sectional dataset, this chapter explores migrant remittance behaviour by splitting the decision-making process into three main decisions. The includes the propensity to remit (binary choice to capture self-selection), the amount remitted, and the frequency with which remitters send funds abroad.

The chapter advances two main arguments: one theoretical and one empirical. First, the rationalisation of sequential decision-making simplifies the analytical process, yet overlooks simultaneous decision-making and interdependencies between remittance decisions. This chapter argues that, from a theoretical standpoint, it remains critical to separate remittance decisions, but also understand the trade-offs between the amount and frequency of flows as well as the initial self-selection into remitting (i.e., the binary choice to remit or not).

Second, as a main empirical argument, the chapter demonstrates that higher-income individuals can better take advantage of sizeable economies of scale through less frequent lump-sum payments. Moreover, current programs generally aim for market-wide reductions in fees and largely ignore the problems faced by remitters unable to leverage the existing economies of scale. Quantifying and assessing the effects of transfer fees is particularly important for policy decisions given the prevalence of efforts to reduce the costs borne by remitters to promote development and remittance formalisation. Current global remittance cost estimates, notably the *Remittance Prices Worldwide* (RPW) dataset, only minimally consider these substantial economies across corridors. For example, high-income individuals are more likely to use overall costlier banks and credit unions for

smaller remittance volumes. Although this is counterintuitive looking at the RPW data, it is attributable to these channels having the greatest economies of scale, making them the cheapest option for those remitters capable of sending larger lump-sum amounts. Consequently, high-income remitters capable of leveraging scale economies resort to these transfer methods to a higher degree than other remitters.

Recognising the magnitude of the transfer cost variation across the distribution of migrants is particularly vital for policy. The latter empirical argument on scale economies highlights the need for better targeting remittance programs to address the inaccessibility of lower fee transfers – specifically low-income and frequent remitter households’ inability to tap into substantial economies of scale. These findings provide empirical evidence favouring supporting and facilitating cooperatives and diaspora groups¹⁶ that could amass and send larger remittance volumes that better leverage economies of scale to lower the costs borne by migrants. As this chapter argues, remittance policies should prioritise and scrutinise the equity impacts across the distribution (and socioeconomic groups and corridors) rather than merely focusing on aggregate costs and remittance flows.

2.2 Synthesising a cogent analytical framework in a primarily atheoretical field

In her seminal work, Russell (1986) provided an excellent projection of the evolution in the study of remittances for the following three decades. As outlined in the previous chapter, Russell’s framework encapsulates the central debates within the study of remittances to this day. The model divides remittance decision-making into four primary nodes: whether to remit, how much to remit, through which channel, and how the funds

¹⁶ Provided the fees from such an organisation or institution do not outweigh the benefits. Alternatively, development funds could be used to fund these initiatives, thereby reducing costs for smaller remitters that tend to be low-income themselves and generally remit to low-income countries.

are utilised.¹⁷ Although this chapter converges on the first three of these decision nodes, the latter is vital since the needs and uses of the funds can affect the preceding decisions. Therefore, for the purpose of this chapter, the first decision node (renamed the first stage or self-selection stage) captures the binary choice of remitting based on a utility maximising decision for the transnational household, whereas subsequent nodes (regrouped as second stage decisions) encapsulate simultaneous choices of how much to remit, how frequently, and through which channel. Altogether, these three choices (or second-stage decisions) form the basic framework of analysis. While channel modality will not be the focal point of this chapter, it is the focus of subsequent chapters.

The methodological choice of splitting the decision between the propensity to remit and the determinants of the amount is common within the study of remittance determinants (Menjivar, DaVanzo, Greenwell and Valdez, 1998; Houle and Schellenberg, 2008; Sinning, 2011; Bouoiyour and Miftah, 2015). This initial choice allows one to correct for the self-selection of remitters to remit and avoids potential selection biases between both decisions. Controlling for selection bias also applies to the frequency of transfers given the large number of non-remitters in the sample. Therefore, the same two-staged decision-making process applies to frequency. Finally, conditional on the decision to remit, the

¹⁷ The latter node is addressed as an important factor (i.e., the intended purpose the sender remits to the recipient), but should not be considered a node per se within the context of this research. As far as the sender is concerned, they may only have limited direct control over this decision once the money is sent. It is also true that social structures and norms may in some cases dictate binding enforcement of the senders wishes. Therefore, given the dissertation's focus on transfer mechanisms for which the sender is the primary decision-maker, a better assessment of this node within this context is to analyse the sender's intended purpose of remitting (as opposed to trying to disentangle the determinants of sender and recipient remittance use – as well as distinguish who is the main decision-maker across cases). Therefore, sender intentions are used to explain the former decision nodes but, for the purposes of this chapter, intended remittance use is not labelled a decision node.

analytical framework's last subsection covers the interdependencies in second-stage choices.

2.2.1 The propensity to remit and self-selecting into cross-border transfers

Theory about the underlying motivations for sending remittances is crucial to determine the likelihood of remitting. The New Economics of Labour Migration (NELM) model links remittance decision-making to migration choices. It redefines the unit of analysis to include the entire transnational household rather than solely focusing on migrants themselves (Lucas and Stark, 1985). The NELM framework paved the way for three core remittance motivations: pure altruism, tempered altruism such as repayment of investment in education or travel, coinsurance, or consumption smoothing (Amuedo-Dorantes and Pozo, 2006; Amuedo-Dorantes and Pozo, 2011), and, lastly, pure self-interest, such as investment in assets in anticipation of return or the expectation of inheritance (Cox, 1987; Cox, Eser and Jimenez, 1998; Docquier and Rapoport, 2000; Carling, 2008). As Brown (1997) demonstrates empirically for Pacific Island migrants in Sydney, asset accumulation investment in the home country is a critical purpose in addition to more altruistic motives.

Empirics contend that both loan repayment and altruistic motives exist (Bouoiyour and Miftah, 2015) in addition to more self-interested motives such as funding the transnational displacement of family and relatives through sponsorship (Houle and Schellenberg, 2008). When studying remittances sent for family reunification purposes,¹⁸ remitters with family members in the recipient country had a higher likelihood of remitting (Sinning, 2011; Bouoiyour and Miftah, 2015). Conversely, those that initially migrated

¹⁸ Unfortunately, no options with regards to facilitating migration were asked as part of the intended use of funds in the *Study on International Money Transfers*. See Table 2.1.

with their children or from a larger household were less likely to remit (Houle and Schellenberg, 2008; Bouoiyour and Miftah, 2015). As for other socioeconomic characteristics, lower incomes, younger and older migrants, and unemployment as well as underemployment lowered are associated with lower propensities to remit for recent immigrants to Canada (Houle and Schellenberg, 2008).

Table 2.1 offers insights into the main reasons why migrants in Canada remitted in 2017, according to the SIMT. The estimates depict remittance outflows from Canada as mainly supporting living and health expenses, despite 34.7 per cent of remitters reporting at least a portion of their 2017 remittances were intended as a gift. Despite the various altruistic versus self-interested motives across remitters, a more valuable portrayal is to study these transnational household actions within the context of the NELM framework without the need to categorise the specific underlying probity of remitter intents.

When estimating the propensity to remit, one must distinguish between the capacity and the desire to send funds internationally (Carling and Hoelscher, 2013). Whereas the former is linked to the socioeconomic sphere and financial means at the migrant's disposal, the latter focuses on transnational ties and is more aptly determined by recipient needs – for instance, higher needs in times of crisis within the recipient region (Carling, Erdal and Horst, 2012). From these two concepts, one can further consider demographic factors such as older migrants remitting less due to reduced financial capacity and a potential decline in transnational ties or desire to remit (i.e., the remittance decay hypothesis). The propensity or likelihood of remitting captures both effects and is crucial in understanding what compels or prevents migrants from engaging in this form of global financial flow.

Table 2.1 Purpose of remittances sent in 2017, by percentage of respondents

Purpose	Per cent of respondents
Pay for recipient living expenses	59.3
Pay for recipient medical expenses	43.3
Give to recipient as a gift	34.7
Pay for recipient's education	21.7
Pay for a major expenses incurred by the recipient	11.5
Pay for recipient's non-health related emergencies	6.1
Other purpose	5.1
Pay for recipient's entertainment or leisure activities	5.0
Pay for recipient's insurance	2.1

Source: SIMT

Note: Totals do not add to 100 per cent since respondents frequently identified more than one purpose for remitting abroad.

2.2.2 Second decision node: Remittance amount

Once an individual elects to remit, there exist myriad micro- and macro-determinants of how much they send. Undesirably, prior work in this area is overwhelmingly empirically driven and regularly lacks guiding theory. Moreover, research in this area is mainly correlative and offers limited insights into decision-making beyond inferences based on household and socioeconomic characteristics. This subsection synthesises previous findings, primarily based on household and socioeconomic characteristics, in terms of micro- and macro-determinants of remittance amounts sent. Later, Section 2.2.4 develops and synthesises theory to achieve greater causal validity and explanatory power to address this oversight.

Among the main determinants of the amount sent are the needs and the number of recipients. Migrants tend to remit more based on an increasing number of people in the recipient country (Amuedo-Dorantes and Pozo, 2005; Sinning, 2011) or sponsoring family

members to join them in the host country (Houle and Schellenberg, 2008). By logical extension, the intentions back in the home country are one factor that influences the amount sent. Empirical evidence also suggests that those who send funds for investment purposes or cover routine expenses remitted more than those who remitted with other intentions (Unheim and Rowlands, 2012). All these elements align with notions of transnational household decision-making of the NELM framework.

Migration status, duration of stay, and the intentions of returning to the home country also play a major role. Unheim and Rowlands (2012) find that recent Canadian immigrants labelled as refugees remitted lower amounts than other classes of immigrants, but not after controlling for income and other socioeconomic factors. In Germany, Sinning (2011) finds that migrants who intended to return to their home country were more likely to remit larger amounts than those planning to stay in Germany. Remitters are also widely known to remit less during the short period following arrival in the host country due to the lack of an established network and setup costs. Once established, they remit more for a period. However, a steady decline in the amount remitted generally follows as linkages to the home country fade, otherwise known as the remittance decay hypothesis. Arun and Ulku (2011) find that, among South Asian communities in Manchester (United Kingdom), both Indian and Pakistani immigrants follow this trend, whereas Bangladeshi migrants do not exhibit signs of remittance decay. Houle and Schellenberg (2008) find that, in a panel of recent immigrants to Canada, those in their fourth year after landing remitted a smaller proportion of their income than during their second year after landing, but for most groups, this still amounted to a more substantial nominal remittance amount sent.

Other micro-determinants such as household and socioeconomic characteristics are crucial in understanding the main drivers of remittance flow size. As one expects, income and education are critical factors. Research demonstrates educated and higher-earning individuals tend to remit more annually (Houle and Schellenberg, 2008; Sinning, 2011; Unheim and Rowlands, 2012), most likely due to higher means of doing so.

Gender can impact remittance behaviour and the amount sent, but results are inconclusive about the type of impact. Whereas certain studies indicate that women remit less than men overall (Massey and Parrado, 1994), others find evidence of the opposite effect (Lucas and Stark, 1985). Canadian studies of remittance outflows using the LSIC yield conflicting results. While Houle and Schellenberg (2008) find that immigrant women in Canada are both less likely to remit and remit less on average than their male counterparts, other studies yield an insignificant effect across genders (Unheim and Rowlands, 2012).¹⁹

Further demographic and household characteristics that influence micro-level remittance decisions include remitter age, the number of children, and household size. Remitters, somewhat unsurprisingly, sent larger amounts when they were of working age than younger or older migrants and tended to remit less if they had children living with them in Canada (Houle and Schellenberg, 2008). Larger households (within Canada) also tend to send smaller remittance amounts (Houle and Schellenberg, 2008; Unheim and Rowlands, 2012). Household size in the host country was not statistically significant in a sample in Germany (Sinning, 2011), but this is most likely because the study controlled for

¹⁹ This includes a variety of controls for demographic and socioeconomic characteristics, especially income, which has long been established as one of the main factors for lower remittance amounts sent by female remitters.

the number of family members abroad, thereby eliminating the negative effect of already having reunited with one's family that larger households in the Canadian study were capturing. Marital status did not significantly impact the amount remitted in either the German or Canadian study (Sinning, 2011; Unheim and Rowlands, 2012).

Based on migrants' country of birth and corridor-specific characteristics that are primarily tied to business development and macroeconomic trends, many macro-determinants contribute to remittance decision-making (Lueth and Ruiz-Arranz, 2008). Such macro-determinants include economic factors such as interest rates, employment rates and inflation, and sociocultural variables, such as common language and colonial ties (El-Sakka and McNabb, 1999; McCracken, Ramlogan-Dobson and Stack, 2017). Higher interest rates in the recipient region, favourable exchange rates, high employment rates in the sending region, and cultural or linguistic commonalities favour larger flow volumes. There also exist essential determinants such as cultural influences and corridor specific impacts like the size of the diaspora in the remittance-sending country, which tend to increase the amount remitted (Carling, 2008). The diaspora effect is mostly attributable to networks that benefit job market integration and knowledge about remittance options.

Finally, and probably most importantly for policy, other corridor characteristics such as transfer costs play an essential role. For instance, the Canada-Africa corridors incur notoriously high transfer costs, thereby excluding many from remitting as much or as frequently as desired or needed (Loxley, Sackey and Khan, 2015). Low financial access and high costs discourage flows (Carling, 2008; Ahmed and Martínez-Zarzoso, 2016), but the former is partly explained by informal methods being mostly unaccounted for in the literature. Furthermore, informal remittances come at drastically different costs – often

much cheaper than formal alternatives. However, the cost differences are also heavily influenced by the amount sent due to substantial scale economies across specific channels.

Fortunately, the SIMT includes all forms of remittances, including cash and other forms of informal transfers, as well as the costs incurred when remitting. Moreover, the inclusion of transfer costs in the SIMT data is novel in that it provides data that were previously unavailable. The inclusion and study of remittance fees are vital given the substantial international commitments that hinge on cost reductions to promote remittance flows globally.

2.2.3 Another second stage decision: Frequency of transfers

Remitters face another decision: how often to send funds. The frequency of transfers can be a complicated decision given existing trade-offs between the amount sent and the frequency of transfers. As an example, Aycinena, Martinez and Yang (2010) find that, among Salvadoran migrants, when transfer costs decreased, they were more likely to increase the frequency of payments and the total annual amount sent, whereas the amount sent per transaction decreased. This trade-off between the average amount sent and the frequency of transfers is of particular importance to remittance scholars and policymakers since it affects the efficiency of global goals to promote remittances for development purposes and address transnational household financial needs.²⁰

²⁰ Furthermore, it highlights to what degree annual amounts may obfuscate details and/or flaws in measurement of SDGs and the Global Compact for Safe, Orderly and Regular Migration. Are 200 and 500 USD truly realistic if many are sending less than that at one time? Based on global trends in the early 2000s, are these amounts reflective of current flows and, although intended to be comparable across corridors, do they reflect corridor-specific preferences and trends in both remittance size and frequency? These amounts are the ones collected for the RPW dataset available through the World Bank. The amounts were selected to reflect typical amounts sent to developing countries and maintain a comparable volume sent across countries. The data section of this chapter delves deeper into these data.

Not only do Aycinena, Martinez and Yang (2010) emphasise potential problems in migrants' ability to remit as frequently as they desire, they find that lowering transfer fees would have a greater impact in increasing amounts sent net of fees on both an annual and per transfer basis.²¹ Understanding which segments of the remitter population are not (or are unable to) fully taking advantage of the economies of scale by reducing transfer frequency is crucial for future program and policy development. It also underscores how many remitters are regularly transferring funds while living paycheck-to-paycheck; evidence from Norway indicates these individuals are more likely to overwork and suffer from exhaustion, impacting their health and their number of employable years (Tharmalingam, 2011).

Although there is a dearth in remittance theory overall, the study of remittance frequency's lack of theory is particularly striking (Yang, 2011). Despite this theoretical lacuna, the study of transfer frequency is vital in understanding the consequences for remitters, their families, and numerous international commitments and understanding a high-growth industry built around financial transfers. The most likely explanation for why remitters do not take advantage of larger economies of scale by sending less-frequent lump-sum payments is that they already feel they reduce the frequency of transfers compared to their desired regularity of flows. Moreover, remitters are often under pressure to satisfy the immediate financial needs of recipients. In the case of Haitian and Jamaican remitters in Canada, Simmons, Plaza and Piché (2005) found frequencies to be high (where the majority remitted multiple time per month). In contrast, the amount sent only averaged

²¹ There is a dual impact of transfer fee reductions with (1) higher total remittance amounts sent net of fees (2) higher frequency of transfers that could contribute to better consumption smoothing and better address immediate migrant financial needs.

around two hundred Canadian, a low amount for the average remitter in Canada.²² However, despite these frequent transfers, remitters argue that high transfer costs discouraged them from sending funds even more frequently.

Yang (2011) highlights three additional explanations for remittance frequency decisions. First, smaller, more frequent transfers could reduce the costs borne by recipients when it comes to adverse events such as theft, forceful appropriation by a third party, or any other crisis or disaster that could jeopardise their ability to use the remitted funds. Second, the sender may be remitting smaller amounts with the purposeful intention of constraining or controlling recipient spending. Remitters may prefer to give smaller amounts even more frequently, but the transaction costs might make that prohibitive given the previously cited findings that remitters in Canada expressed the desire to remit more regularly but were constrained from doing so (Simmons, Plaza and Piché, 2005). Third, it could be that this is a transitional matter in that more recent immigrants may want to support family and friends but do not have the steady income or resources necessary to remit larger amounts. Furthermore, higher start-up costs while establishing a new life in the host country may impede their ability to remit more in the short term.

Empirical evidence from the US-Mexico corridor suggests household needs that require routine transfers (as opposed to larger, less frequent sums) to cover health expenses, food and maintenance, and construction or repair of a house back in Mexico are the primary drivers for remittance frequency (Amuedo-Dorantes, Bansak, and Pozo, 2005). In a study of Ethiopian remittances received, Adugna Zewdu (2019) found that female-headed

²² Note that this coincides with the 200 CAD captured within the RPW dataset of the World Bank. It is also worth noting these figures date back to 2005 and may have changed over time.

households were more likely to receive higher frequencies of transfers, most likely because of their household roles supporting a more traditional gendered reproductive role.

In a broader survey of 5,000 Hispanic people in the United States, Bendixen and Associates (2008) found that migrants sent an average amount of 325 USD per transaction, with over half of remittances sent regularly. In their study of Mexican migrants, Nziramasanga and Yoder (2013) find that remittance frequency is lower among those who have stayed in the United States for more extended periods and those who experienced unemployment exceeding a month the previous year. Overall, the above-cited studies find that although more regular or frequent senders transmit lesser amounts per transfer, they tend to remit more on an annual basis than infrequent remitters.

2.2.4 The model and overarching theoretical framework

As previously established, the study of remittances remains a relatively atheoretical field of inquiry despite the few theories underlying remittance motivations (Carling, 2008), the NELM (Lucas and Stark, 1985), and the distinction between desire and capacity to remit (Carling and Hoelscher, 2013). As the literature review for each remittance decision suggests, inductive empirical testing of hypotheses has predominantly been limited to the correlational study of households' characteristics rather than their underlying remittance motivations, or the costs and trade-offs they face.

This subsection borrows key elements from Russell's (1986) sequential rational choice model, ties with NELM, and the capacity and desire to remit arguments to construct a cogent model that reflects an accumulation and synthesis of previous theoretical endeavours. As Figure 2.1 suggests, the model focuses on the binary decision to remit in the first stage, followed by simultaneous second stage choices.

As the NELM framework indicates, transnational households make decisions to consumption smooth and share risk across borders, but there exists a trade-off between the amount sent and the frequency of transfers due to transfer costs per transaction. In times of urgent need or high risk, the amount transferred may increase, but this is subject to sender capacity constraints (i.e., income and transfer costs incurred). As another example, many migrants who want to remit frequently to smooth consumption may not do so given incentives of higher scale economies when resorting to larger payments, which may be a significant constraint to remitting as frequently is desired.

Figure 2.1 First and second stage remittance choices

Transfer costs constitute the main policy lever at policymakers' disposal to increase remitter capacity. For this reason, in addition to its prevalence in international agreements as a pivotal remittance growth tool, this study converges on transfer fees as one of the main determinants in remittance formalisation.

Thus, from the elementary decisions in Figure 2.1, three dependent variables are derived: the binary decision to remit, the amount sent, and the transfer frequency. Independent or explanatory variables can be divided into the desire to remit and the capacity to remit. The latter is more easily measured through costs incurred and income, whereas the former relies on incomplete data on remitter intentions and proxies such as the number of children. These are imperfect since surveys do not provide the intended uses for

funds for non-remitters (i.e., their hypothetical intended use had they remitted). Furthermore, although a higher number of children in the host country often indicates that the household immigrated with their children and thus has a lesser incentive to remit, this is not the case of households with no children that remit substantially to ailing parents or for investment purposes in the home region. Nonetheless, household and individual characteristics help shed light on remitters' profiles in Canada, which can subsequently serve to infer remittance desire based on the extant literature.

2.2.5 Hypotheses

This chapter's dual aim is to elucidate theoretical debates regarding simultaneous remittance choices and inform policies to reduce transfer costs. Even though there exist promising supplementary hypotheses external to this study concerning demographic, socioeconomic and corridor-specific characteristics, the following are the main overarching hypotheses:

H₁ If transfer costs increase, then the capacity to remit is weakened, and both the total amount per annum remitted and frequency of transfers decrease.

H_{1a} If transfer costs increase, then the amount remitted should decline since it could push many migrants out of the remittance market or simply reduce their demand for remittance services.

H_{1b} If transfer costs increase, then individuals remit less frequently by resorting to larger lump-sum payments to better leverage economies of scale.²³

²³ This runs counter to empirical evidence. However, going by “pure” rationality to see if there are deviations from rationality is the best way to understand why this is the case.

Although the first sub-hypothesis is hardly a novel theoretical contribution, the findings, in conjunction with the second sub-hypothesis, have important policy implications. Both H_{1a} and H_{1b} offer practical estimates in the first Canadian large-scale study of its kind; moreover, it estimates the cost elasticity of remittance demand for Canadian outflow services, and can be used to better assess and design future programs. Moreover, the first set of hypotheses serves as a conduit for the second hypothesis below.

Not only are there large economies of scale in the remittance market, but it is hypothesised that,

H₂ If remitters send more substantial amounts, then they tend to have a more inelastic demand for remittance services, whereas those sending smaller amounts are less sensitive to costs.

The second hypothesis that remitters do not optimally leverage economies of scale is at the foundation of the empirical argument. If validated, the premise bears implications on how future policies could incentivise ways to minimise costs through the aggregation, or pooling, of funds. From a policy perspective, this is also useful to demonstrate that if low volume remitters are price insensitive, prices likely do not constitute a sizeable barrier to remitting and do not contribute to pricing-out potential remitters. These hypotheses are tested across subgroups of recipient countries, the size of the diaspora in Canada (based on the 2016 Canadian Census), educational attainment, and household income using the SIMT data.

The next data section provides insights for the ensuing analysis, the particularities of the Canadian remittance market, and remaining data limitations.

2.3 Data and evidence from the Canadian money transfer market

In 2015, Global Affairs Canada commissioned the SIMT, which Statistics Canada conducted in 2018 (Dimbuene and Turcotte, 2019).²⁴ Using a sample of 22,908 migrants to Canada born in ODA-eligible countries, the SIMT is the first Canadian large sample dataset to contain considerable detail about remittances rather than just the annual amount. Unlike past studies of remittances in Canada, this research extends the analysis beyond recent immigrants²⁵ – although it still restricts participants to first-generation immigrants. Additionally, the sample size (22,908 individuals) is remarkable given the significantly smaller sample sizes of past studies previously discussed. It offers large-sample quantitative insights into remittance channel use for the first time in the Canadian context.

The data include questions about remittance motives, frequency of transfers, amount sent (distinguishing between formal and informal transfers), the cost of sending the last transfer, and other details unavailable until now. The analysis also focuses on remitters' country of origins and various demographic and socioeconomic details of interest.

Furthermore, the survey focuses on those migrants most likely to have a development impact abroad. The restriction to ODA-eligible country born individuals is particularly relevant in the context of this research, given the spotlight on tackling the

²⁴ Based on the 2015 Canadian Federal Budget funds allocated to promoting remittance outflows to lower-income countries as part of international commitments, such as the SDGs, to lower transfer costs. The survey, conducted between April 18th and July 16th, 2018, provides detailed data of outward-flowing remittances from Canadian migrants born in ODA-eligible countries during 2017 (reference year). This sample selection of ODA-eligible country born migrants lends itself perfectly to the study of the role of remittances as a growing source of development finance over the past three decades.

²⁵ As is the case in Statistics Canada's *Longitudinal Study of Immigrants to Canada* or LSIC that focuses solely on recent waves of immigrants. Other major migration datasets such as Statistics Canada's *Longitudinal Immigration Database* (IMDB) do not include remittance information at the time of writing. The database, based on Federal administrative tax files, is managed by Statistics Canada on behalf of a federal-provincial consortium led by Immigration, Refugees and Citizenship Canada (IRCC).

Canadian international development role of remittances as part of its global commitments, namely the SDGs and Canada's 2019 Federal Budget.

The sampling for the survey was based on individual respondents rather than households. It is important whether the person surveyed was chosen as the head of household, or as a random member of the family when interpreting results, since certain family members may be less familiar with household financial decisions than the primary decision-maker or household head. Yet, heads of households are also susceptible to gaps in knowledge about the intricacies of each household member's financial decision-making. Moreover, it should be noted that the amount sent oneself versus the amount sent by the household as a whole featured only negligible differences across the SIMT sample. This suggests that household head versus random household member selection concerns are unlikely to be of interest notwithstanding the implausible case of widespread, and near absolute, concentration of financial decision-making across all households within the sample.

The stratified random sample of respondents aged 18 and over as of April 1st, 2018 and born in ODA recipient countries includes 40,000 randomly sampled persons. The random sample stemmed from two sources: the 2016 Longform Census used to cover naturalized Canadians and landed immigrants, and administrative files from Immigration, Refugees and Citizenship Canada (IRCC) to cover immigrants that landed after the 2016 Census, refugee claimants, and temporary residents.

All the data analysis within this chapter is in accordance with the Statistics Canada Research Data Centre (RDC) guidelines for sensitive microdata releases. Statistics Canada provides probabilistic weights from both the 2016 Census portion of the sample frame and

the IRCC administrative immigration files portion of the frame. The principle behind estimation in a probability sample is that each unit in the sample represents the broader effects within the Canadian population.

2.3.1 Remitting: A series of decisions

The first decision migrants (temporary and permanent residents and first-generation Canadian citizens) face is whether to remit. The SIMT indicates that approximately 37 per cent of those born in ODA-eligible countries, or 1.8 million out of 4.9 million potential remitters, remitted in 2017 (refer to Table 2.2).

As outlined in the previous theory sections, remittance determinants are divided into capacity and desire to remit.

Regarding capacity, those respondents reporting higher household incomes and educational attainment were more likely to remit. However, as outlined later in the regression analysis, the educational effect is not statistically significant once one controls for household income. Contrary to other studies of Canadian remitters (Houle and Schellenberg, 2008; Unheim and Rowlands, 2012) where the residual effect of education can be puzzling since the expectation is that the educational effect would mainly be through income.

The desire to remit is far more complex to capture, given non-remitters do not provide a rationale for this decision. Therefore, it helps capture the desire to remit by piecing together a remitter profile for those who opted to transfer funds in 2017. The remitter profile includes an array of demographic and socioeconomic variables, including age, household size, gender, marital status, household income, and educational attainment. Although those of prime working age (30-59) constituted the majority of non-remitters (56

per cent), they constituted an even larger proportion (almost three quarters) of remitters. Women were less likely to remit than men, which correlates with their tendency to have a greater number of children in the household (in turn correlated with a lower propensity to remit). While household size did not stand out as a key factor impacting remittance likelihood, remitters were more likely to report being married or in a common-law relationship. A final determinant of the propensity to remit is migrants' residency status (citizens are less likely to remit) and time since their arrival to Canada.²⁶

Table 2.2 also highlights the breakdown of the second-stage decision of how much to remit. The majority of remitters (52 per cent) born in ODA-eligible countries remitted under \$1,000 in 2017. Although many of the migrant profile factors that impacted the propensity to remit also applied to the amount sent, key additional factors such as the cost, transfer frequency, and the number of recipients provide vital insights into the interdependencies between remittance decisions. As expected, those remitting to more people and incurring lower costs²⁷ remitted more on average annually, with those remitting under \$500 incurring an average transfer cost of 8.3 per cent compared to a charge of 2.6 per cent when remitting \$4,001 or more (i.e., economies of scale). Interestingly, although those remitting more frequently paid higher fees per transaction on average, those remitting more annually also remitted more frequently. However, this pattern could also be attributable to other recipient needs that require higher and more frequent transfers.

²⁶ Recall the remittance decay hypothesis, whereby immigrants are less likely to remit as their connection to the “home” country erodes over time or have already reunited with their family in Canada. As evidenced later in this chapter, remittance decay occurs for the propensity to remit, the amount remitted, and the frequency of transfer when studying those migrants that send remittances more than once per year.

²⁷ The SIMT transfer cost only applies to the last transfer made in 2017 since the survey understandably did not ask respondents to provide the average cost of total remittances sent for 2017. Transfers costs represent the fee as a proportion of the last remittance sent in percentage terms. Section 2.3.3 provides more details.

Table 2.2 Socioeconomic and demographic patterns in amounts sent

	Amount remitted in 2017					
	Did not remit	0 to \$500	\$501 to \$1000	\$1001 to \$2000	\$2001 to \$4000	\$4001 or more
Weighted frequency	3,111,436 63.2%	604,067 12.3%	341,305 6.9%	299,662 6.1%	257,454 5.2%	308,004 6.3%
Remitting patterns						
Remittance frequency		2.2	3.9	5.6	7.8	9.6
Remittance fee (last transfer, %)		8.3%	5.9%	4.7%	4.3%	2.6%
Number of people remitted to		1.6	1.9	2.2	2.5	2.5
Remitter/household profile						
No high school	11%	10%	8%	6%	9%	7%
High school	22%	22%	19%	18%	18%	13%
College, trade or some university	25%	31%	34%	30%	28%	27%
Bachelors	26%	25%	26%	31%	28%	31%
Graduate	16%	12%	13%	16%	17%	22%
Female	53%	58%	52%	49%	45%	44%
Age 18-29	18%	14%	12%	11%	10%	11%
Age 30-59	56%	66%	72%	76%	78%	75%
Age 60 +	26%	20%	16%	13%	12%	14%
Household size	3.5	3.7	3.7	3.7	3.6	3.5
Children	0.8	1.0	1.0	1.1	1.0	0.9
Household income under \$50,000	40%	40%	33%	29%	30%	26%
HH income \$50,000 to \$79,999	22%	26%	28%	27%	27%	23%
HH income \$80,000 to \$119,000	19%	20%	20%	24%	22%	23%
HH income \$120,000 or more	19%	14%	18%	20%	22%	29%
Single	22%	18%	17%	15%	14%	15%
Married or commonlaw	66%	70%	72%	75%	77%	74%
Widow or divorced	12%	12%	11%	10%	9%	10%
Immigration						
Years since arrival to Canada	18.9	17.5	16.0	15.0	13.7	13.5
Citizen	71%	71%	70%	65%	58%	53%
Permanent resident	25%	25%	25%	30%	35%	40%
Temporary resident	5%	4%	5%	5%	6%	7%

Source: SIMT

Note: Remittance amounts only account for remittances sent by the household, not for remittances sent on behalf of others. However, it should be noted that the latter trend of remitting on behalf of others is rather rare and that amounts tend to be significantly smaller on average.

Another critical decision node is the frequency remitters opt to send funds abroad.

Figure 2.2 outlines key trends in remittance transfer amounts and costs across the remittance frequency distribution. The most noteworthy result is that, although frequent remitters remit more annually on average, they send less per transaction, thereby incurring higher annual fees. Interestingly, remitters that remit 2 to 12 times per year incur higher percentage costs per transaction on average than those that only remit once a year or less

frequently than monthly. Appendix 2.1A outlines more in-depth remitter profile summary statistics.

Figure 2.2 Remitter amounts and fees by remittance frequency

Source: SIMT

Note: Refer to Appendix 2.1A for detailed summary statistics and socioeconomic breakdowns for each remittance frequency bin. Note that the transfer cost only applies to the last transfer and should be interpreted with caution. The subsequent analysis addresses this limitation by studying only those flows that were remitted through the last channel as the channel most frequently used in 2017.

2.3.2 Satisfaction amongst remitters: Balancing frequency, amount and cost

The trade-off between frequency, the amount remitted, and the remittance fees paid seen in the previous section (2.3.2) means remitters must face difficult choices and prioritise competing needs. Table 2.3 demonstrates that despite an overwhelming proportion of respondents claiming to be “satisfied” or “very satisfied”, remitters are more satisfied when sending funds more frequently whilst also incurring lower fees. There is, however, a clear trade-off between the cost and the frequency of transfers in terms of remitter satisfaction. Therefore, remitters must weigh two competing factors to balance both wants.

Table 2.3 The overwhelming majority of remitters are satisfied: But more frequent transfers and lower costs would not hurt

Satisfaction with overall experience when sending or bringing money abroad

	Distribution	Frequency of transfers in 2017	Cost of last transfer
Very satisfied	21%	4.6	4.9
Satisfied	73%	3.4	5.7
Dissatisfied	5%	3.1	6.9
Very dissatisfied	1%	2.7	10.7

Source: SIMT

The onus of this chapter's argument lies in this trade-off, or decision trilemma, between the amount sent, the frequency of transfers, and the fees incurred. As this chapter argues, one main policy avenue moving forward would be to pool funds and create diaspora cooperatives or remittance focused microfinance groups that leverage economies of scale without compromising the frequency of payments. The remainder of this chapter is dedicated to fleshing out these factors' nuances as remitters seek to maximise their transnational household utility.

2.3.3 Fees and costs in the Canadian remittance market

Numerous major initiatives and a recurrent theme among remittance-related commitments, such as the SDGs, consist of lowering remittance transfer costs. The World Bank's RPW dataset offers useful insights to contextualise the SIMT data by tracking the costs of sending 200 and 500 CAD across 15 remittance corridors.²⁸ As an administrative data source, RPW provides comparable estimates across a variety of sending and receiving countries.

²⁸ The 15 corresponding countries are China, Ghana, Guyana, Haiti, India, Jamaica, Kenya, Lebanon, Nigeria, Pakistan, Philippines, Rwanda, Sri Lanka, Vietnam, and Zimbabwe.

The SIMT data have numerous advantages and limitations compared to RPW dataset estimates. Unlike the SIMT data, the RPW estimates do not cover informal methods.²⁹ Coverage of Canadian outflow corridors is also far more comprehensive in the SIMT data, covering over one hundred corridors; the RPW for Canada covers fewer than twenty corridors. Furthermore, SIMT data include greater insights into economies of scale by allowing for more variance in the amount sent among ODA-eligible country born migrants in Canada. It is worth noting that although banks carry high costs according to the RPW data, they are among the cheapest channels according to the SIMT results, and this is due to the considerable economies of scale for individuals remitting larger amounts.

Nevertheless, the SIMT data are not without drawbacks since, in contrast with administrative RPW data, the survey data are self-reported. Self-reported estimates may underestimate transfer costs, since many remitters are unlikely to account for exchange rate premiums and other hidden costs.³⁰ Problematically, the SIMT does not indicate the last transfer date, making the addition of spot exchange rates impossible and leaving the annual average exchange rate as the only viable alternative. However, in addition to the limited

²⁹ Although it is worth noting that cash does not carry any explicit cost. Implicit costs and risks associating with carrying currency are difficult to estimate. Unfortunately, attempts to proxy the transfer costs using geographic distance between provincial capitals and capitals of destination countries did not yield the desired results. Using great-circle distance or orthodromic distance, one finds that it is weakly negatively correlated with transfer costs since major corridors that carry lower costs (i.e., China, India and other large corridors) are often further away geographically in the Canadian case. Therefore, geographic distance does not act as an adequate proxy for transfer costs.

³⁰ Unfortunately, the SIMT does not include exchange rate fees or other hidden fees respondents may not have considered when responding to the survey. Since it is unknown whether respondents included or excluded these rates in their responses, it is impossible to ascertain which remitters are underestimating costs from those that accounted for indirect fees. Moreover, since the date of transactions were not part of the survey, it is also impossible to add the fees reported to spot exchange rates on the same day of transfer, leaving only yearly average exchange rates as a possible correction for omitted exchange fees (yet again, this would assume, most likely erroneously, that all respondents excluded exchange rate fees). Another caveat is that transfer cost data in the SIMT only apply to the last remittance amount sent by respondents or their household in 2017. In the analysis for remittance amounts and frequencies in 2017, the transfer cost percentage was used across all transactions if the remittance channel used most frequently in 2017 matched that used during the last transaction made that year.

use of an annual average, the ex-post addition of exchange rate fees risks introducing further bias given that some recipients may (or may not) have accounted for foreign currency conversion costs in their survey responses. Since it is impossible to know the proportion of respondents that included or excluded currency exchange costs, the study does not attempt to correct for potentially excluded exchange rate or other unreported fees.

Figure 2.3 depicts how the RPW and SIMT data compared within Canada in 2017. Significant economies of scale in the remittance market reflect the trade-off trilemma remitters face between higher amounts remitted, higher frequency of transfers, and lower transfer costs. Surprisingly, both datasets document similar transfer fees despite their contrasting methodologies and the amount sent. Moreover, the costs are relatively comparable, notwithstanding additional differences in the survey-based SIMT data relying on respondent declared costs compared to the RPW dataset, which uses administrative data sources by recording transfers through various institutions (including exchange rate costs). According to the last transfer sent by SIMT respondents, the average transfer cost was 7.9 per cent for amounts under \$500 and 1.3 per cent for amounts over \$4,000 (average of 5.6 per cent). In comparison, the RPW dataset yields an average cost of 7.4 per cent for sending \$200 and 4.6 per cent for sending \$500 (by simple average across all corridors and channels).

Besides the economies of scale related to the aforementioned trade-off dynamics, the SIMT also allows for an analysis of the significant pricing differences across channels, whether it be a bank, money transfer operator, cash, or other transfer methods. Numerous explanations exist for differences in remittance modality or channel choice (see Chapter 3). Although the next chapter addresses channel-based analysis, all regressions in this

dissertation, due to the significant differences in prices, ensure the channel category used in the respondents' last transfer matches the one most frequently used in 2017 to control for inter-channel variation.

Figure 2.3 Economies of scale: Fee by amount sent in the last transfer

Sources: SIMT and RPW dataset

Note: RPW estimates in the table above are simple unweighted averages across the four quarters of 2017 and by corridor. The prices cover the total transfer cost of sending \$200 and \$500, including exchange rate fees. Specific recipients may incur an additional cost when converting transfers to USD and subsequently to another local currency, which the World Bank does not capture. Although 200 USD and 500 USD amounts are sent in the RPW dataset for most countries, 200 CAD and 500 CAD were sent from Canada in 2017 despite the lower exchange rate.

2.3.4 Where are Canadian remittance outflows going?

According to modelled estimates based on migrant stocks and Gross National Income (Ratha and Shaw, 2007) available through the World Bank's bilateral remittance datasets, Canada's largest corridors in 2017 were to China, India, the Philippines, France, and Italy. The SIMT estimates,³¹ exclusively consisting of respondents born in ODA-eligible

³¹ All the SIMT and RPW dataset dollar-value estimates are in Canadian dollars unless stated otherwise.

countries, find that the top 5 destination countries of Canadian remittance outflows were the Philippines (\$1.2 billion), India (\$794 million), the United States (\$390 million), China (\$292 million), and Pakistan (\$236 million). Table 2.4 outlines remittance trends by region of birth.³² Key findings by region include the high amounts and frequency of transfers for Southeast Asia (and Oceania) and Sub-Saharan Africa born remitters, and the highest average costs are faced by those born in the Americas or Eastern Europe.

Table 2.4 Remittances by birth region and corridor specifics

	Remittances by region of birth (of which: born in ODA-eligible countries)							
	S-E. Asia/Oc.	Sub-S. Africa	South Asia	Americas	North Africa	W. Asia/Mid. E.	E.-S. Europe	East Asia
Weighted number of migrants	885,474	421,995	1,160,063	810,083	224,837	504,580	205,753	709,144
Total amount remitted	1,690	1,427	1,195	832	793	679	657	495
Amount remitted to birth country	1,558	1,036	937	672	612	300	445	378
Remittance frequency	3.6	3.5	1.2	2.6	0.9	0.6	1.2	0.2
Among those that do remit ...								
Remittance fee (last transfer, %)	4.3	7.2	3.7	8.5	6.2	5.9	7.8	2.3

Source: SIMT

Note: All estimates are weighted using Statistics Canada provided SIMT weights to represent the broader ODA-eligible country born immigrant population in Canada.

Another critical element addressed in the chapter focuses on development impacts of remittance funds to low and low-middle-income countries. Table 2.5 suggests an overwhelming proportion of Canadian remittance outflow amounts are sent to middle-income countries (84 per cent), of which 61 per cent went to low-middle-income countries, and 23 per cent went to higher-middle income countries.

³² Although the aggregation by region may dilute more granular and corridor-specific findings for specific countries, this level of aggregation is later necessary in the regression analysis. This is because RDC guidelines require that cross-tabulated variables have no fewer than 10 observations per crossed categories, meaning country-level results cannot be released based on the other variables used in the later regression analysis. However, having tested the results with country level dummies within the RDC, the results are quite similar, and it is fascinating to observe how the regroupings truly reflect regional specificities in remittance patterns and characteristics.

Table 2.5 Are Canadian remittances flowing to the poorest countries?

	Low-income countries	Lower-middle income countries	Upper-middle income countries	High-income countries
Proportion of remitters	8%	61%	23%	7%
Remitted amount	1,823	2,808	2,554	4,952
Remitted amount to birth region	1,531	2,569	2,206	428
Remittance frequency	6.4	5.3	4.4	3.0
Remittance fee (%)	9.6	4.6	6.6	6.1

Top 10 ODA-eligible destination countries	Percentage that remitted	Mean remitted amount (full sample)	Mean remitted amount (per remitter)	Fee (last transfer)
(note that this may differ from birth country)				
Philippines	69%	845	2,895	2%
India	33%	1,555	3,870	7%
China	11%	5,595	4,770	6%
Pakistan	44%	885	3,055	4%
Iran	11%	2,950	7,430	3%
Jamaica	56%	270	1,810	7%
Vietnam	29%	820	2,545	3%
Haiti	62%	275	1,455	11%
Nigeria	61%	440	2,900	6%
Sri Lanka	35%	715	2,065	6%

Source: SIMT

Note: Mean amounts sent by country are rounded to the nearest five by country.

Unfortunately, despite low-income countries recording the highest frequency of transfers (6.4 times per year), the remittances sent incurred the highest average fees (9.6 per cent of the amount remitted on average) and constituted only 8 per cent of total Canadian remittance outflows. These findings have important implications for development policy. These figures demonstrate the need to better understand remittance decision-making dynamics to maximise funds' leverage to low-income recipient regions and households. Results for Haiti stand out in Table 2.5 as Haitian remitters face extreme prices compared to other corridors, with a large portion of the high fees attributable to frequent lesser amounts sent per transaction.

2.4 Empirical methodology

A double hurdle Heckman model is used to empirically test the two decision nodes. As the first hurdle, a probit regression determines migrants' propensity to remit by studying their binary option to remit (remittances sent in 2017 are coded as 1, while cases of no remittances are coded 0). As the second step to the Heckman correction model, an Ordinary Least Squares (OLS) regression determines the main drivers of the annual amount remitters sent while correcting for the conditional expectation that the migrant remitted in 2017.

The theory section's endogeneity issues are also addressed – the Heckman correction for selection bias addresses potential endogeneity issues. Furthermore, regarding the central argument of remittance pooling, unconditional quantile regressions unearth the ideal framework for studying the variation across the distribution and narrow in on scale economies.

2.4.1 First hurdle: Choosing whether to remit

The Heckman (1979) selection model provides a cogent two-stepped framework to study the propensity to remit and how much to remit while correcting for selection bias in the event of a censored dependent variable such as amount remitted. Separating the analysis of the propensity to remit from that of the amount (Houle and Schellenberg, 2008) not only corrects for self-selection but is also in line with the previously outlined theoretical framework. As part of the first stage, a probit regression determines the probability of remitting amongst migrants and takes on the following form:

$$Prob(R = 1|Z) = \Phi(Z\gamma)$$

where R denotes remitting (1 if remitted in 2017, 0 otherwise), Z is a vector of a series of household characteristics and explanatory socioeconomic variables, γ is a vector

of unknown parameters, and Φ represents the cumulative normal distribution function. This stage is essential in studying how specific segments of the population self-select out of remitting and studying those population segments with varying propensities to remit.

2.4.2 A dual-faceted second hurdle: How frequently and how much

In the second stage of the Heckman model, one measures the amount remitted and corrects for self-selection by including the predicted probabilities from the previous stage as an added explanatory variable. The resulting second stage remittance equations are specified as follows:

$$r^* = X\beta + u$$

where r^* indicates both the natural log of the amount remitted or frequency of remittance sending in 2017 excluding those that did not remit in that year, X is a vector of explanatory variables, β is a vector of coefficients, and u is the error term. To obtain cost elasticities of remittance demand, transfer costs are also logged since the log-log transformation conveniently yields elasticity coefficients. Under the assumption that the error terms are jointly normal, one obtains the following equation that demonstrates Heckman's findings that one can model sample selection as an omitted-variable bias that is conditional on X and λ :

$$E[r|X, R = 1] = X\beta + \rho\sigma_u\lambda(Z\gamma)$$

where ρ is the correlation between determinants of the probability to remit and those of remitting u , and λ represents the inverse Mills ratio.³³ Note that models use probability weights and report statistical significance using robust standard errors for all

³³ Bouoiyour and Miftah (2015) offer an excellent example of a negative inverse Mills ratio in the context of the study of remittance determinants and how the two-step procedure allows to eliminate sample selection bias.

regressions due to sample heteroskedasticity and in line with Statistics Canada guidelines on data usage.³⁴ The OLS regression results help inform policy on promoting remittances in Canada and correct the self-selection bias caused by a heavily left-censored dataset where most migrants do not remit.

An alternative method would be the use of Tobit regressions that account for the left-censorship of the data.³⁵ Unfortunately, Tobit regressions do not separate the decision to remit from that of how much to remit. Furthermore, they would encompass the entire sample when studying the amount remitted rather than limiting it to the sub-sample of those sent in 2017 as in the second stage OLS regression in the Heckman model.

2.4.3 The cost-elasticity of remittance demand across quantiles

Another means of tackling the underlying endogeneity of transfer costs lies in analysis across the distribution – by distinguishing between low- and high-volume remitters. Econometric analysis has evolved from restricting the analysis “at the mean” to more sophisticated methods that better portray diverse population segments. For instance, quantile regressions have become increasingly popular in quantitative social analysis to better nuance the study of trends across the sample distribution. Nevertheless, conditional quantile regressions remain functionally limited since they do not hold the fundamental *ceteris paribus* condition of keeping all other factors constant – providing only

³⁴ For this reason, the Heckman regression using the inverse mills ratio was calculated without using the *-heckman-* function in Stata, which does not allow robust standard errors and weights in conjunction with the *-twostep-* option.

³⁵ Where the Tobit model can simply be stated as follows:

$$r = \begin{cases} r^* = X\beta + u & \text{if } r^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

where r^* indicates the natural log of the amount remitted or frequency of remittance sending in 2017 excluding those that did not remit in that year, X is a vector of explanatory variables, β is a vector of coefficients, and u the error term.

comparisons to observations within a specific quantile. This study uses unconditional quantile regression analysis to provide marginal variation relative to the dependent variable's unconditional mean to overcome this obstacle.

For example, one could study the transfer costs incurred by the sum remitted. Generally, one expects those remitting larger lump-sum amounts yearly to incur lower transfer costs than more frequent remitters. Seeing that transfer costs are higher when remitting smaller volumes, conditional quantile estimation may conclude that a specific remitter sending small amounts may incur lower transfer costs than other smaller volume remitters (conditional). Meanwhile, this may not be the case once compared to the total sample (unconditional). For this reason, policymakers and practitioners generally favour marginal variation relative to the unconditional mean of the dependent variable. To design social programs and policy, practitioners are usually more interested in the marginal effect on each individual compared to the population rather than a better understanding of the distribution. Moreover, this is even more relevant when a model is not univariate since the mean becomes conditional on numerous explanatory variables.

To account for this form of conditionality, Firpo, Fortin and Lemieux (2009) developed unconditional quantile regressions that consist of regressing the recentred influence function (RIF) of the unconditional quantile on the modelled independent variables.³⁶ The RIF is calculated by adding the distribution statistic back to the influence function to assure the expected value corresponds to that distributional statistic and can be

³⁶ At the τ^{th} quantile, the influence function $IF(Y; q_\tau, F_Y) = (\tau - d\{Y \leq q_\tau\})/f_Y(q_\tau)$ where $d\{Y \leq q_\tau\}$ is a dummy variable that undertakes a value of 1 if the outcome is below q_τ . Consequently, the recentred influence function, as defined by Firpo, Fortin and Lemieux (2009), $RIF(Y; q_\tau, F_Y)$ is the same as $q_\tau + IF(Y; q_\tau, F_Y)$. The resulting regression can easily be computed using the *-rifreg-* command in Stata developed by the same authors.

employed as the newly transformed dependent variable. The unconditional quantile partial effect (UQPE) is a weighted average of the conditional quantile partial effects (CQPE) at the conditional quantile corresponding to the τ^{th} unconditional quantile of the distribution. Firpo, Fortin and Lemieux (2009) conclude that the final form is summarised as follows:

$$\text{UQPE}(\tau) = E[\omega_{\tau}(X) \cdot \text{CQPE}(\zeta_{\tau}(X), X)]$$

where τ denotes the unconditional quantile q_{τ} of the distribution of dependent variable Y , ω_{τ} the weighted average over the distribution of X , and $\zeta_{\tau}(X)$ is the conditional quantile related to the τ^{th} unconditional quantile of the distribution of Y , q_{τ} .

The resulting average derivative of an unconditional quantile regression yields the marginal unconditional effect of a locational shift in the covariate distribution while holding all else constant. Furthermore, the obtained unconditional partial effects can be interpreted and analogous to those of OLS coefficients.

Using the same sample of remitters as in the second stage of the Heckman model previously described, this chapter identifies how transfer costs affect the cost-elasticity of remittance demand across the distribution. Using a log-log model form, and the same easily interpretable coefficients as in OLS regressions, unconditional quantile regressions provide accurate and easily interpretable remittance cost-elasticities. Unconditional quantile regressions also yield non-linear elasticity estimates across the distribution and can depict elasticity variation across sub-groups. Furthermore, it provides more helpful policy prescriptions by population segment and controls for whether remitted amounts are at the top, middle, or bottom of the distribution.

2.5 Results

The results section builds upon the theoretical and methodological points made thus far to analyse remitter decisions separately as well as their interdependencies while controlling for various factors. While the first subsections focus on separate remittance decisions, this last subsection uses unconditional quantile regressions to highlight a key literature and policy gap to better understand the trade-offs between amount sent, frequency and cost. The results demonstrate that failing to account for the frequency of transfers drastically underestimates the costs borne by remitters, particularly those not fully leveraging economies of scale. Policymakers should note that the under-researched area of remittance economies of scale has significant implications in unleashing remittances' development potential and transfer cost reduction programs aimed at formalising flows.

2.5.1 First hurdle: To remit, or not to remit

The first hurdle probit model measures the binary remittance decision by measuring the influence of various determinants on the decision to remit or not. As presented in the theory section, explanatory variables are split between the capacity and desire to remit. To study individual remitter characteristics, the analysis limits the sample of remitters to those that remitted themselves (i.e., not those that remitted through other household members; although this number is relatively small and inconsequential for the key results of this section). This is to ensure that respondent characteristics like age and sex are meaningful representations of the remitter themselves rather than solely capturing the head of household's characteristics. Although, as previously outlined, the sample selection is based on migrants as individuals rather than household heads, which mitigates limitations in interpreting such variables. However, limitations remain since households where the

respondent is not the main financial decision-maker, or household head may only provide a partial glimpse of their household finances.³⁷ One final purpose of the first hurdle will be to capture self-selection into remitting and its effects on second hurdle decision-making.

Table 2.6 presents the probit regressions results for five different models with coefficients representing the unconditional marginal effects for each explanatory variable. Model 1 represents the base model, while Models 2 and 3 test for robustness by adding immigration status and regional explanatory variables. Model 4 drops informal remittance methods from the sample and suggests that not accounting for informal channels leads to nearly identical results when studying the likelihood of remitting. Model 5, using a dependent variable for amount remitted “home”, suggests that the likelihood of remitting at least half of the remittances sent in 2017 to the “home country” followed the same trends across determinants for total remittances sent. Note that robust standard errors are used due to the presence of heteroskedasticity in the cross-sectional dataset.³⁸

Table 2.6 depicts an inverted-U relationship with income in terms of capacity to remit, whereby migrants with mid-ranging incomes levels (from \$50,000 to \$79,999) have

³⁷ Ideally, one would structure the analysis around total annual household remittances as a function of household characteristics, which was the approach taken in this study. However, respondent awareness and knowledge of household finances remains a limitation in quantitative studies of remittance patterns, including within the SIMT. As an example, a situation where a female with a male partner from a male-centered decision-making household might report sending a small remittance amount herself, but not report or not take into account the fact that the husband sent larger sums to his family in separate transactions. As such, an individual’s remittances requires consideration of the broader household context. Similarly, in another family, the respondent, regardless of their gender, may have reported total household remittances.

³⁸ Upon testing for homoskedasticity (null hypothesis of constant variance) using a Breusch-Pagan test, the test yields a chi-squared statistic of 4,499.67, thereby rejecting the null hypothesis in favour of the alternative hypothesis of heteroskedasticity (using Model 1 in Table 2.7 for the amount remitted). In order to correct for this, logging the dependent variable (amount remitted) eliminates heteroskedasticity in the model and the Breusch-Pagan test yields a chi-squared statistic of 0.75. Unfortunately, even with a logged dependent variable, the model remains heteroskedastic once weights are introduced (Breusch-Pagan chi-squared statistic value of 29.09, which implies rejecting the null hypothesis of constant variance). To conform with Statistics Canada guidelines in the use of RDC microdata that make the use of weights mandatory, and ensure a representative sample of the broader Canadian remitter population, robust standard errors are used throughout to correct for the presence of heteroskedasticity.

a 5.7 per cent higher likelihood of remitting compared to lower-income migrants. Immigrants with incomes of \$80,000 and over had a comparatively lower likelihood to remit unless one controls for regional differences, wherein they only remitted marginally less than those with household incomes between \$50,000 and \$79,999. Model 3 shows that this inverted-U relationship dissipates when controlling for the birth region, suggesting that the income differences are primarily attributable to inter-regional rather than intra-regional income dispersion. Finally, the reference group, respondents with a household income of under \$50,000, were the least likely to remit across all models.

Although higher education matters, its effect is negated when controlling for household income due to the high correlation between incomes and educational attainment, suggesting education has an income effect that disappears upon including household income. However, there does not appear to be a financial literacy proxy through education.³⁹

As for demographic and socioeconomic determinants of remittance propensity, several factors stand out. Female and single respondents were less likely to remit (by 2.3 to 2.9 per cent and 6.0 to 8.6 per cent, respectively), whereas there was surprisingly no difference between married and divorced/separated migrants. Prime working-age respondents had the highest propensity to remit, and Model 1 shows older migrants as the least likely (relative to the 18 to 29 years of age reference category). However, older migrants are 4.3 to 6.8 per cent more likely to remit than their younger than 30-year-old counterparts after controlling for years since arrival despite the lower likelihood without these controls (by 4.4 per cent). This finding supports the remittance decay hypothesis

³⁹ Refer to Chapter 3 on the possible proxy for financial literacy when analysing remittance channel decision-making.

being captured within the age variable without the proper time since immigration control.

A larger household size (in Canada)⁴⁰ made them more likely to remit (Models 1 and 2),

but this effect is not statistically significant once controlling for birth regions.

Table 2.6 Probit regressions assessing the propensity to remit

Marginal effects (dy/dx)	(1)	(2)	(3)	(4)	(5)
	Base	Immigration status	Regions	Only formal channels	Remit home
Profile for desire to remit					
Education: high school	0.015 (0.042)	0.021 (0.044)	0.004 (0.047)	0.013 (0.049)	0.004 (0.049)
Education: College, trade, or s. uni.	0.070 *** (0.04)	0.065 *** (0.042)	0.038 *** (0.045)	0.049 *** (0.047)	0.037 ** (0.046)
Education: Bachelors	0.045 *** (0.04)	0.019 (0.042)	0.014 (0.045)	0.016 (0.048)	0.013 (0.047)
Education: Graduate	0.006 (0.043)	-0.025 (0.045)	0.000 (0.048)	0.001 (0.051)	-0.007 (0.05)
Female	-0.023 *** (0.02)	-0.023 *** (0.02)	-0.027 *** (0.021)	-0.029 *** (0.022)	-0.023 *** (0.022)
Single	-0.060 *** (0.044)	-0.072 *** (0.045)	-0.086 *** (0.046)	-0.086 *** (0.048)	-0.086 *** (0.048)
Married/commonlaw	-0.006 (0.034)	-0.022 * (0.035)	-0.008 (0.036)	-0.005 (0.038)	-0.007 (0.038)
Age 30-59	0.111 *** (0.037)	0.152 *** (0.038)	0.109 *** (0.039)	0.111 *** (0.041)	0.098 *** (0.04)
Age 60 +	-0.044 *** (0.043)	0.068 *** (0.048)	0.043 *** (0.049)	0.041 ** (0.052)	0.028 * (0.051)
Household size	0.011 *** (0.007)	0.008 *** (0.007)	-0.001 (0.007)	-0.002 (0.007)	0.001 (0.007)
Do not speak Eng./Fr.	-0.031 *** (0.02)	-0.062 *** (0.022)	0.020 ** (0.024)	0.014 * (0.025)	0.027 *** (0.025)
Years since arrival to Canada		-0.005 *** (0.001)	-0.005 *** (0.001)	-0.006 *** (0.001)	-0.006 *** (0.001)
Permanent resident		0.005 (0.028)	0.009 (0.029)	0.015 (0.03)	0.008 (0.03)
Temporary resident		0.049 ** (0.055)	0.052 *** (0.059)	0.061 *** (0.062)	0.051 *** (0.061)
Capacity to remit					
HH income \$50,000 to \$79,999	0.057 *** (0.026)	0.077 *** (0.027)	0.056 *** (0.028)	0.049 *** (0.029)	0.049 *** (0.029)
HH income \$80,000 to \$119,999	0.033 *** (0.028)	0.063 *** (0.029)	0.048 *** (0.031)	0.039 *** (0.032)	0.047 *** (0.032)
HH income \$120,000 or more	0.021 ** (0.028)	0.059 *** (0.03)	0.054 *** (0.032)	0.042 *** (0.033)	0.039 *** (0.033)
Birth regions					
Americas			0.121 *** (0.033)	0.114 *** (0.034)	0.108 *** (0.033)
Europe, W. Asia and Middle E.			-0.109 *** (0.033)	-0.118 *** (0.035)	-0.153 *** (0.035)
Sub-Saharan Africa			0.160 *** (0.037)	0.144 *** (0.038)	0.107 *** (0.038)
North Africa			-0.069 *** (0.041)	-0.096 *** (0.043)	-0.078 *** (0.042)
East Asia			-0.309 *** (0.046)	-0.345 *** (0.052)	-0.290 *** (0.048)
S-E. Asia and Oceania			0.189 *** (0.035)	0.188 *** (0.036)	0.198 *** (0.035)
Observations	20,306	19,307	19,307	18,393	19,080
Pseudo R-squared	0.0276	0.0383	0.1245	0.1434	0.1369
p-value Wald test	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses and reported values are unconditional marginal effects. Model 4 excludes informal channels and cash. *** p<0.01, ** p<0.05, * p<0.1

⁴⁰ The survey question was framed as “how many people usually lived in your household in 2017?” referring to permanent household members in Canada rather than accounting for transnational household members.

Other factors linked to immigration status and corridor specificities also impacted remittance propensity. Those who do not speak English or French at home were less likely to remit (Models 1 and 2), yet were two per cent more likely to do so when controlling for the birth region (Model 3).⁴¹ Temporary residents have an approximately five per cent higher likelihood of remitting. In contrast, permanent residents and citizens are not statistically significantly different from one another in terms of their likelihood to remit.

Regional differences suggest those born in Southeast Asia and Oceania, the Americas and Sub-Saharan Africa were the most likely to remit (note that South Asia acts as the reference category for the birth region), while migrants from Europe, Western Asia, the Middle East, North Africa, and East Asia had lower propensities to remit. Indicators of the birth region led to significantly higher pseudo-R-squared measures for the models.

2.5.2 Second hurdle: How much to send

Table 2.7 outlines key OLS regression results using the amount remitters sent in 2017 as the dependent variable. Although a second-stage Heckman was initially used, the inverse Mills ratio (IMR) was statistically insignificant across all models, suggesting the absence of self-selective behaviour (for comparison, Tobit regression results are presented in

⁴¹ Not speaking English or French at home acts as the Heckman model exclusion restriction in the first stage given it is correlated with the propensity to remit, but not the amount remitted. The instrument positively impacts the propensity to remit (once including regional, educational and income controls) since not speaking either Canadian official language at home acts as a signal for low integration and high connections to the “home” country. That said, theoretically, the use of a foreign language domestically should not impact the amount they remit once controlling for other factors.

Appendix 2.2A).⁴² This result can also be squared with the overlap in results from the first stage probit regression (Table 2.6) and the second-stage decision of the amount to remit. Moreover, beyond the inconsequential nature of self-selection determined through empirical testing and robustness, remittance theory does suggest that the same household characteristics (e.g., income, education, age) are similar across both the propensity to remit and the decision on the amount remitted. If self-selection does exist, it is more likely based on other structural constraints or remitter preferences that cannot be captured in the first stage probit regression using the SIMT data (i.e., non-remitter preferences, potential costs, potential number of recipients, and other similar data are not available).

As such, the results support two separate decisions in that the former decision (opting into remitting) has no statistically significant effect in biasing the latter (the amount sent). However, the most important findings support H_{1a} , that transfer costs play an instrumental role, thereby confirming they play a critical development role beyond the formalisation role they undertake, as discussed in subsequent chapters (Chapters 3-5).

While Model 1 provides a base model for a logged dependent variable (total amount sent in 2017), Model 2 includes transfer costs⁴³ using a log-log form for the fee incurred.

⁴² In addition to the absence of differing results when running the second hurdle with and without the IMR, the Tobit results also resemble those of the double hurdle model. The three Tobit regressions in Appendix 2.2A reflect only migrant characteristics without any analysis of remitter behaviour because their inclusion would *de facto* remove the left-censor bias from the sample (since non-remitters naturally cannot report their remittance intentions, the cost of remitting, and other remittance characteristics). Moreover, the inclusion of remitter characteristics would not provide additional valuable information and would reduce the Tobit model to the OLS model. The main differences between the Tobit analysis and that from the double hurdle model are that the former captures larger impacts for those aged 30-59 that tend to remit larger amounts (\$2,220 more on average) compared to other age groups and the higher amount sent by temporary residents (more than twice the amount sent by the average permanent resident). These differences are attributable to the Tobit model combining both the greater propensity to remit with tendencies to remit more. Theoretically, this shows how the double hurdle model more aptly reflects the theoretical framework of differentiating remitter choices.

⁴³ The fee is based on transfer cost of last amount remitted provided the remitted used an analogous channel as their most frequently used channel in 2017. This step ensures that remitters that last used a remittance method that has a different price-point than their most frequently used method do not bias results for total remittances. See Chapter 3 for additional details on the underlying rationale and differences across channels.

The log-log form yields a cost-elasticity of remittance demand of -0.6 (i.e., a one per cent increase in cost would correspond to a 0.6 per cent decrease in the amount remitted).⁴⁴ In contrast, Model 3 uses the percentage cost. Model 3's log-linear form can be interpreted as a one percentage point increase in costs implying an approximately 7.4 per cent reduction in the annual amount remitted.⁴⁵ Note that both Models 2 and 3 exclude cash, which does not carry an explicit cost or transfer fee. Model 4 assigns a value of zero to the costs of cash transfers but yields the same results as Model 3. Model 5 suggests households with incomes above \$120,000 mainly used cash and remitted over 50 per cent more cash than those with household incomes under \$80,000 (when visiting back home or receiving visitors). Unexpectedly, temporary residents did not remit more via cash, but this is most likely because they will only do so once they have left Canada – therefore, their behaviour is not captured in the SIMT survey for 2017.

Model 6 includes frequency and frequency-squared terms as explanatory variables. Whereas the statistically significant positive coefficient of the former indicates those migrants that remit frequently send more annually on average (as in Figure 2.2), the latter negative coefficient of the quadratic term indicates an inverse-U parabolic relationship, whereby the amount remitted peaks at 42 transfers per year.⁴⁶ This means that only in the rarest cases, where remitters sent money abroad more than 42 times a year, was there a

⁴⁴ Meaning a one per cent increase in the transfer cost leads to a 0.6 per cent reduction in the total amount remitted annually for remitters in Canada born in ODA-eligible countries. The easy to interpret elasticity of demand stems from taking the first derivative with respect to x of the logged form on each side of the equation: $\frac{dY}{dX} \frac{1}{Y} = \beta_2 X \Leftrightarrow \beta_2 = \frac{dY}{dX} \frac{X}{Y}$

⁴⁵ For the interpretation of a log-lin coefficient, $\% \Delta y = 100 \cdot (e^{\beta_k} - 1) \forall k = \ln(j)$ meaning that for a coefficient of 0.07153, $\% \Delta y = 100 \cdot (e^{0.07153} - 1) \approx 7.415\%$

⁴⁶ The base model can be simplified and represented as $y_i = \alpha + \beta_1 x_i + \beta_2 x_i^2 + \dots + \varepsilon_i$. To estimate the local maximum of a quadratic term, one simply takes the first order derivative with respect to x :

$\frac{dy}{dx} = \beta_1 + 2\beta_2 x_i = 0 \therefore \max \text{ when } x = \frac{-\beta_1}{2\beta_2}$

decreasing relationship between the annual amount sent and transfer frequency. When controlling for frequency, remittance cost-elasticity grew more elastic, meaning remitters were more sensitive to costs when accounting for a higher frequency of transfers – in line with hypothesis H₁. It is also worth noting that when controlling for remittances, women went from remitting 17 per cent less than males in Model 2 to remitting 11 per cent less. This gendered remittance gap contributes to existing evidence that the difference in amounts remitted is partially attributable to a higher frequency of payments at higher costs. Concerning the capacity to remit, unlike the probit estimates for remitting likelihood, controlling for birth regions does not change the income effect, whereby migrants with higher incomes remit more. Higher household incomes translate to higher remittance amounts. Although the GDP per capita of the home country, and its square, capture an income/cost effect that influences the capacity to remit in the base model, this effect disappears when including transfer costs. Similarly, diaspora size has a significant positive effect. However, the diaspora effect is not statistically significant once transfer costs are factored in (with the sole exception of Model 4 that includes cash with a zero cost).

Typically, those who remitted more over the year did so in response to regular recipient needs to cover living expenses, costs of education, or recipient emergencies. In contrast, respondents that labelled their remittances (or at least a portion) as gifts remitted less on average.

Table 2.7 Amount remitted regressions analysis (second stage)

Ordinary Least Squares (no Heckman correction since no evidence of self-selection)	(1) Base	(2) Elasticity ln(fee)	(3) Fee (%)	(4) Fee (incl. zeros for cash)	(5) Cash only	(6) Frequency	(7) Remit home	(8) Base without intentions
Remittance characteristics								
Number of people remitted to	0.13389*** (0.00000)	0.15796*** (0.00000)	0.15792*** (0.00000)	0.15008*** (0.00000)	0.12643*** (0.00000)	0.05433*** (0.00001)	0.14913*** (0.00000)	0.17299*** (0.00000)
Intended for living expenses	0.54336*** (0.00000)	0.47914*** (0.00000)	0.51449*** (0.00000)	0.54927*** (0.00000)	0.49644*** (0.00000)	0.16139*** (0.00000)	0.46381*** (0.00000)	
Intended for education	0.43362*** (0.00000)	0.24814*** (0.00000)	0.32406*** (0.00000)	0.34796*** (0.00000)	0.27037** (0.04145)	0.10044*** (0.00387)	0.23663*** (0.00000)	
Intended for emergency	0.24049*** (0.00000)	0.15740*** (0.00002)	0.19894*** (0.00000)	0.22214*** (0.00000)	0.27941** (0.02055)	0.09884*** (0.00136)	0.14945*** (0.00015)	
Intended as gift	-0.27463*** (0.00000)	-0.17029*** (0.00000)	-0.20805*** (0.00000)	-0.21796*** (0.00000)	-0.39115*** (0.00006)	-0.13639*** (0.00000)	-0.16939*** (0.00000)	
Fee (last transfer, %)		-0.59788*** (0.00000)	-0.07153*** (0.00000)	-0.06412*** (0.00000)		-0.66678*** (0.00000)	-0.58539*** (0.00000)	
Frequency						0.14558*** (0.00000)		
Frequency squared						-0.00173*** (0.00000)		
Capacity to remit								
HH income \$50,000 to \$79,999	0.17850*** (0.00002)	0.20152*** (0.00000)	0.21473*** (0.00000)	0.21240*** (0.00000)	0.15439 (0.21710)	0.13273*** (0.00018)	0.13438*** (0.00246)	0.18605*** (0.00002)
HH income \$80,000 to \$119,999	0.35825*** (0.00000)	0.29436*** (0.00000)	0.32534*** (0.00000)	0.33661*** (0.00000)	0.25342* (0.05822)	0.20119*** (0.00000)	0.21674*** (0.00001)	0.35602*** (0.00000)
HH income \$120,000 or more	0.63534*** (0.00000)	0.54760*** (0.00000)	0.61264*** (0.00000)	0.59927*** (0.00000)	0.52575*** (0.00010)	0.37914*** (0.00000)	0.46494*** (0.00000)	0.64155*** (0.00000)
GDP per capita	0.00004*** (0.00000)	0.00001*** (0.00007)	0.00001*** (0.00000)	0.00001*** (0.00000)	0.00001** (0.04760)	0.00001*** (0.00000)	0.00002** (0.00432)	0.00002*** (0.00000)
GDP per capita squared ¹	-0.0003*** (0.00001)							-0.0004*** (0.00000)
Diaspora size	0.00034*** (0.00103)	-0.00004 (0.70061)	0.00015 (0.19190)	0.00026** (0.02353)	0.00044 (0.12296)	-0.00002 (0.79487)	-0.00000 (0.97378)	0.00064*** (0.00000)
Profile of desire to remit (amount)								
Education: high school	-0.05068 (0.48767)	-0.12204 (0.11411)	-0.09952 (0.24104)	-0.12547 (0.12977)	0.01862 (0.92100)	-0.12808** (0.04568)	-0.12245 (0.13590)	-0.10723 (0.14725)
Education: College, trade, or s. uni.	0.02732 (0.69510)	-0.03552 (0.62978)	-0.00998 (0.90201)	-0.02921 (0.71132)	-0.00393 (0.98218)	-0.06194 (0.30632)	-0.03027 (0.69995)	-0.02422 (0.73167)
Education: Bachelors	0.08708 (0.22827)	-0.00867 (0.90850)	0.04669 (0.57709)	-0.00150 (0.98536)	0.02547 (0.89159)	-0.01862 (0.76393)	-0.00516 (0.94906)	-0.00081 (0.99121)
Education: Graduate	0.24033*** (0.00168)	0.01264 (0.87404)	0.10335 (0.24448)	0.08305 (0.34069)	0.30284 (0.12357)	-0.00071 (0.99152)	0.01269 (0.88257)	0.14072* (0.07114)
Female	-0.18509*** (0.00000)	-0.16684*** (0.00000)	-0.16027*** (0.00001)	-0.17148*** (0.00000)	-0.25062*** (0.00297)	-0.10867*** (0.00004)	-0.14600*** (0.00002)	-0.21048*** (0.00000)
Single	-0.18282*** (0.00938)	-0.12389* (0.08667)	-0.09312 (0.24146)	-0.11377 (0.14314)	-0.41929** (0.02722)	-0.02631 (0.66825)	-0.09724 (0.20550)	-0.19020*** (0.00979)
Married/commonlaw	-0.11913** (0.03078)	-0.11905** (0.03375)	-0.10672* (0.08412)	-0.10993* (0.06667)	-0.15898 (0.28717)	-0.05489 (0.25098)	-0.11129* (0.06436)	-0.11330* (0.05063)
Age 30-59	0.26883*** (0.00001)	0.12645** (0.04203)	0.21912*** (0.00129)	0.25774*** (0.00012)	-0.00024 (0.99894)	0.11004** (0.04040)	0.12346* (0.06294)	0.37798*** (0.00000)
Age 60 +	0.26489*** (0.00123)	0.12198 (0.15063)	0.27563*** (0.00371)	0.32449*** (0.00042)	-0.04241 (0.85444)	0.16206** (0.02423)	0.10167 (0.25848)	0.31843*** (0.00019)
Household size	-0.06457*** (0.00000)	-0.06176*** (0.00000)	-0.06973*** (0.00000)	-0.06643*** (0.00000)	-0.03147 (0.30063)	-0.04173*** (0.00000)	-0.06183*** (0.00000)	-0.06785*** (0.00000)
Years since arrival to Canada	-0.00759*** (0.00009)	-0.00543*** (0.00550)	-0.00614*** (0.00497)	-0.00680*** (0.00155)	-0.01405*** (0.00875)	-0.00192 (0.25499)	-0.00741*** (0.00024)	-0.00939*** (0.00000)
Permanent resident	0.27340*** (0.00000)	0.23408*** (0.00000)	0.29077*** (0.00000)	0.29201*** (0.00000)	0.06485 (0.62498)	0.14506*** (0.00005)	0.22630*** (0.00000)	0.28682*** (0.00000)
Temporary resident	0.28628*** (0.00090)	0.17841** (0.03591)	0.29314*** (0.00176)	0.32027*** (0.00059)	0.17243 (0.61198)	0.04653 (0.51919)	0.08489 (0.37504)	0.31873*** (0.00047)
Constant	6.29511*** (0.00000)	7.20770*** (0.00000)	6.72353*** (0.00000)	6.59521*** (0.00000)	6.41296*** (0.00000)	7.05551*** (0.00000)	7.18267*** (0.00000)	6.60006*** (0.00000)
Observations	6,983	4,513	4,513	4,870	856	4,379	4,041	7,183
R-squared	0.23	0.45	0.33	0.31	0.25	0.63	0.44	0.14

Robust p-values in parentheses and with birth regions as control variables. *** p<0.01, ** p<0.05, * p<0.1. ¹ Scaled by dividing by 1,000,000.

Model 8 drops remitter intentions to address possible endogeneity issues whereby intentions could interact with other explanatory variables.

Several demographic factors affected the average amount remitted. Although there is mixed evidence in the literature, these regressions found that women remitted less than their male counterparts, even when controlling for income and isolating the propensity to remit. However, it is worth noting that women tended to dwell in households with more children, and those households with fewer children remitted more on average. Moreover, women tended to remit more as a percentage of their personal income.⁴⁷ Education had no impact once controlling for income, yet Model 1 indicates that having a graduate degree is associated with a small positive effect that disappears when factoring in transfer costs. Temporary and permanent residents remit more than citizens on average, but this effect does not apply to temporary residents for cash remittances, when remitting home, or controlling for frequency. The analysis of the amount remitted, as with the propensity to remit, suggests that the decrease in remittances sent related to higher years since the arrival to Canada. This trend confirms the merits of the remittance decay hypothesis as migrants lose touch with their “home” country or feel no need to remit as help to family members abroad once their family relocates to Canada.

Finally, concerning the goodness of fit, the model succeeds in achieving high explanatory power and efficiency in fitting results. In addition to a larger sample size compared to previous studies of the same topic, the inclusion of transfer costs and

⁴⁷ Despite women remitting less than men in nominal terms, evidence using the SIMT microdata shows that this is in large part due to their lower personal incomes seeing that they remit more as a percentage of their personal income on average. Upon further investigation, women remit a larger proportion of their personal income but a smaller proportion of household income – casting some much-needed light on intra household remittance dynamics. Interestingly, when men reported being the main household financial decision-maker, they remitted less as a proportion of their personal income, whereas the opposite was true for women. Furthermore, married men remitted less than married and non-married women as well as married men as a proportion of their income. However, one must underscore that personal and household incomes were not as accurately reported in comparison to the more reliable categorical income variables, wherein Statistics Canada corrected for erroneous reporting using imputed values gathered from the Census and other sources.

frequency contribute greatly to the model's better explanatory power. Unfortunately, it is difficult to compare relative to other studies since many do not report goodness of fit measures (Houle and Schellenberg, 2008; Sinning, 2011). However, the goodness of fit is higher than the one obtained by Unheim and Rowlands (2012), which is directly attributable to the dataset's larger sample size and the addition of variables that were not available at the time. Moreover, the dependent variable's logarithmic form contributes to better explanatory power, but the Tobit model in Appendix 2.2A also exhibited higher pseudo-R-squared values. However, unlike Unheim and Rowlands (2012), this study lacks explanatory power attributable to immigrant class, investment intentions, and ordinal rather than categorical income data.

2.5.3 Second hurdle: Frequency of transfers

Table 2.8 addresses another second stage decision of how frequently to remit. Unlike the amount sent, the Heckman model is necessary since the IMR for Model 1 has a negative coefficient, indicating that the inclusion of zeroes from the first stage probit model would bias estimates downward. This is logical given the option not to remit would equate to a frequency of zero. However, it is important to control for this self-selection effect since a failure to account for this impact would lead to an upward bias in the magnitude of coefficient estimates.

Table 2.8 contains three models. Whereas Models 1 and 2 include all remitters (Model 2 has fewer observations due to the inclusion of transfer costs), Model 3 drops those remitters that only remitted once. Model 3, as in Figure 2.2, shows that those remitting more frequently are on average more sensitive to cost. This result is crucial in understanding differences between regular remitters, and those that opted for a lump-sum

payment through a single transfer or those remitters that remitted only once as an irregular gift or family support.

Model 1, as with previous models, identifies GDP per capita of the home country as having a statistically significant cost effect. However, this effect is rendered statistically insignificant once controlling for transfer costs (i.e., capturing corridor pricing effects by economic development level of the recipient country). Regarding transfer costs, the positive coefficient in Model 2 may appear erroneous, which is most likely attributable to remitters transferring funds a single time in order to take advantage of larger economies of scale through a large (or lump-sum) incurring lower fees (as a percentage of the amount sent). Although the expectation was that they would be more price-sensitive at the onset of this research, this corroborates findings in Figure 2.2 that transfer fees are lower among those remitters that only remit once per year. Model 3 does, however, yield a negative cost effect for those remitting twice or more a year with a price elasticity of remittance-frequency of -0.56. A household income greater than \$120,000 significantly increased the frequency of transfers sent among respondents than all other income groups.

The intended purpose of the remittance funds played an essential role in determining remittance frequency. Those remitting to fulfil regular needs such as covering living expenses, costs of education, and even leisure, remitted more frequently than those intended for gifts, other short-term emergencies, and other reasons (with health emergencies acting as an outlier). Moreover, the number of remittance recipients also increased the frequency of money sent abroad.

Table 2.8 Frequency of remittance second-stage Heckman regression analysis

Ordinary Least Squares (Heckman correction - see inverse Mills ratio)	(1) Frequency (2nd stage)	(2) Remittance fee	(3) Frequency (> 2 times)
Remittance characteristics			
Number of people remitted to	1.43472*** (0.00000)	1.32457*** (0.00000)	1.17302*** (0.00000)
Intended for living expenses	2.40572*** (0.00000)	2.75866*** (0.00000)	2.73133*** (0.00000)
Intended for education	1.31545*** (0.00001)	1.19801*** (0.00003)	1.27186*** (0.00011)
Intended for health emergency	1.14103* (0.07358)	1.24776* (0.07487)	1.50312** (0.04250)
Intended for other emergency	0.48313** (0.02615)	0.47975* (0.05785)	0.31619 (0.30609)
Intended as a gift	-0.18092 (0.41141)	-0.37278* (0.08252)	-0.82743*** (0.00314)
Intended for leisure	0.82185** (0.03195)	1.44724*** (0.00334)	1.69389*** (0.00494)
ln(fee) (last transfer)		0.35300** (0.01468)	-0.55567** (0.02225)
Capacity to remit			
HH income \$50,000 to \$79,999	-0.09829 (0.66155)	0.39395 (0.15143)	0.38301 (0.28938)
HH income \$80,000 to \$119,999	-0.00661 (0.97574)	0.44094 (0.12363)	0.45518 (0.22449)
HH income \$120,000 or more	0.79042*** (0.00129)	1.63744*** (0.00000)	1.39326*** (0.00212)
GDP per capita	0.00005** (0.02067)	-0.00002 (0.56647)	
GDP per capita squared ¹	-0.0009** (0.01647)	0.00000 (0.66130)	
Regions			
Americas		1.58895*** (0.00000)	2.42464*** (0.00000)
Europe, W. Asia and Middle E.		-0.10402 (0.70153)	0.17098 (0.61768)
Sub-Saharan Africa		1.19730*** (0.00020)	1.87238*** (0.00000)
North Africa		-0.22547 (0.41394)	-0.17579 (0.63443)
East Asia		-0.75212** (0.04602)	-1.46373*** (0.00904)
S-E. Asia and Oceania		2.24871*** (0.00000)	3.26850*** (0.00000)
Profile of desire to remit (frequency)			
Education: high school	0.05061 (0.87841)	-0.26177 (0.56367)	-0.51674 (0.41078)
Education: College, trade, or s. uni.	0.47092 (0.15977)	0.22164 (0.62242)	0.00919 (0.98822)
Education: Bachelors	-0.04619 (0.88701)	-0.24662 (0.57177)	-0.95962 (0.11126)
Education: Graduate	-0.29308 (0.38566)	-0.36078 (0.43742)	-1.10182* (0.08193)
Female	-0.06465 (0.67473)	-0.30766 (0.13871)	-0.44141* (0.09946)
Single	-0.15107 (0.72517)	-0.57673 (0.27240)	-0.25872 (0.70609)
Married/commonlaw	-0.69834** (0.02132)	-0.44319 (0.21598)	-0.37480 (0.42017)
Age 30-59	-0.14653 (0.62938)	0.25572 (0.52189)	0.34081 (0.51417)
Age 60 +	-0.32542 (0.37524)	-0.44900 (0.36439)	-0.49081 (0.46706)
Household size	-0.19228*** (0.00017)	-0.24926*** (0.00012)	-0.29321*** (0.00027)
Years since arrival to Canada	-0.00128 (0.89118)	-0.03633*** (0.00193)	-0.03563** (0.03385)
Permanent resident	0.76445*** (0.00061)	0.88562*** (0.00127)	0.75153** (0.03034)
Temporary resident	0.76108* (0.05893)	1.04677** (0.03599)	0.99404 (0.10030)
Inverse Mills Ratio (IMR)	-3.18766*** (0.00000)		
Constant	4.05278*** (0.00000)	0.65284 (0.35957)	3.53848*** (0.00010)
Observations	6,745	4,379	3,109
R-squared	0.28	0.26	0.23

Robust p-values in parentheses. ¹ Scaled by dividing by 1,000,000.

*** p<0.01, ** p<0.05, * p<0.1

The coefficient estimates for other demographic variables suggest graduate degree holders remitted less frequently than all other educational attainment groups among those remitting twice or more per year (Model 3). Those respondents with larger household sizes remitted approximately 30 per cent less frequently, likely as their core family members lived with them in Canada. Non-citizens remitted more frequently, and temporary residents remitted more frequently than permanent residents. As is the case for the propensity to remit, Southeast Asia and Oceania, the Americas, and Sub-Saharan Africa were the most likely to remit frequently.

Unlike the analysis of the amount sent, the R-square values for the analysis of remittance frequency were lower, between 0.23 for Model 3 and 0.28 for Model 1. The lower explanatory power and fit are attributable to the smaller sample and reflect the lack of information and knowledge regarding transfer frequency within the literature. Beyond intended purposes for remitting, transfer costs and corridor specific trends, household characteristics provide little help explaining the incidence of flows.

2.5.4 The price sensitivity across remittance size

Although the previous analysis has addressed some elements of the trade-off between remittance decisions, it has largely studied each decision in isolation from the other. Figure 2.4 shows that for annual remittances, remittance demand's cost-elasticity becomes more elastic for those remitting higher amounts, with elasticity ranging from -0.35 ($q = 0.1$) to -0.73 ($q = 0.95$). However, this only speaks to total annual remittances sent and does not consider the higher fees paid by those frequently remitting smaller amounts or, conversely, those that leverage economies of scale through lump-sum payments.

Unfortunately, it is impossible to properly assess the fee impact without considering the frequency of transfers and the amount sent. Nevertheless, in studying individual transactions rather than annual totals, there exists a potentially endogenous relationship between the cost of remitting and the volume sent. As discussed earlier in this chapter, this endogeneity disables the ability to distinguish between cost sensitivity and the reverse effect of price structures (through economies of scale) on the amount and frequency of flows. To solve this issue, this section analyses cost effects across the distribution using unconditional quantile regressions. In studying the average amount sent per transaction and studying this across the distribution, the quantile-based analysis should better capture economies of scale rather than price sensitivity (since it controls for lump-sum payments by incorporating frequency as the denominator of the dependent variable).

Figure 2.4 Cost elasticity of total annual remittances sent across quantiles

Note: The brackets represent a 95 per cent confidence interval using robust standard errors across quantiles. For full regression results of select quantiles, refer to Appendix 2.3A.

Accounting for frequency is critical in understanding the real impact of costs on remittances. Going from Figures 2.4 to 2.5, the main takeaway is that frequency substantially affects the remittance amounts sent. Studying the impact of costs without considering frequency underestimates the impact of remittance costs. As shown in Figure 2.5, and argued throughout this chapter, the more elastic average remittance cost-elasticity for higher quantiles suggests that the economies of scale are even more pronounced when considering frequency (-1.77 at $q = 0.95$; compared to -0.51 to -0.17 for $q \leq 0.4$). However, recall that the amount and frequency run counter to one another (refer to Section 2.3.2), and therefore lump-sum payments provide less utility to transnational households than regular payments (or “remittance smoothing” all else held equal).

Figure 2.5 Cost elasticity of average amount sent per transaction by quantile

Note: The brackets represent a 95 per cent confidence interval using robust standard errors across quantiles. For full regression results of select quantiles, refer to Appendix 2.4A.

Due to the lack of available data, most studies have not considered the cost and frequency impact in detail – leaving the extensive effects of economies of scale omitted in

the literature. The omission of economies of scale also exists in policy where international goals, such as the SDGs, set absolute price targets without knowing if the significant economies of scale disproportionately affect certain remitters over others. Reducing average prices can be of great benefit to remitters as a whole but, for development purposes, this is best achieved by targeting lower-income remitters that generally incur higher fees. For this reason, one can demonstrate that initiatives promoting the pooling of funds could cut down on costs by leveraging untapped economies of scale without compromising on transfer frequency. Lower costs and higher amounts sent without resorting to more periodic payments can maximise remitter satisfaction and sent funds' development potential.

2.6 Conclusion

Although scholars and policymakers have long studied remittance decisions, the sequence of remittance decisions, new data on transfer costs, and the substantial economies of scale remitters face, merit renewed attention. As this chapter has demonstrated, there exist substantial inequalities in transfer costs across corridors and socioeconomic groups. The chapter also provides the first large-sample study of remittance cost-elasticity within the Canadian context. The chapter illustrates how migrants benefit from pooling diaspora funds to limit the frequency of smaller transactions. The findings contribute to nascent literature on the equality concerns across remittance corridors and offer insights into potential civil society or government-sponsored measures to reduce costs while also tackling remittance frequency concerns.

Migrants face a multi-staged decision-making process in choosing whether to remit, how much to remit, and how to remit. In the case of the propensity to remit and how much to remit, it will be essential to target specific population segments that are more likely to

attain global development goals. For example, although women remit more as a percentage of their incomes, they are less likely to send and remit less nominally than their male counterparts. Besides, while middle-income earners are more likely to remit than low- or high-income earners, high earners are most likely to send larger amounts and incur lower transfer costs. These findings contribute to understanding Canadian remittance trends and improving equity for initiatives to harness remittances to attain global development goals.

This chapter's findings contribute to expanding the empirical study of remittances within the Canadian context, highlighting the vital interdependencies of remittance decisions, and underscoring potential development policy avenues to better leverage current remittance market economies of scale. First, the chapter contributes to a better understanding of Canadian remittance dynamics and the potential for future studies of remittance transfer costs.

Second, another critical theoretical contribution includes analysing how remittance choices build on one another and how these interdependencies shape migrants' decisions. Studying remittance volumes in a vacuum and ignoring cost (especially economies of scale across remitters) and frequency will lead to research blind spots and flawed policy advice. Solving endogeneity issues and moving beyond transfer cost estimates that do not fully embrace the magnitude of economies of scale and their importance across demographic groups.

Third, in terms of public policy, evidence suggests a focus on diaspora cooperatives and leveraging economies of scale through microfinance-inspired programs could yield accrued benefits for transnational households. Increased diaspora mobilisation could benefit from government, non-governmental organisation, and other institutional

involvement to raise additional funds and expand Canada's development envelope. Non-governmental organisations and institutions can raise the necessary reserve funds at the recipient end to disburse netted-out transactions to recipients. Once these reserves are depleted, a single lump-sum transfer from the pooled remittances from the sending country would replenish these reserves and benefit from lower transfer costs. Such a scheme would reduce the costs borne by remitters without compromising on transfer frequency or the amount sent. The pool size could also effortlessly be scaled up or down depending on the needs of remitters and available funding opportunities. Although similar recipient government programs exist in numerous recipient countries, the proposed scheme offers a simple, scalable model for smaller diaspora or non-government organisation led initiatives.

Although remittance funds are not a panacea in raising international development funds,⁴⁸ programs mobilising diaspora and facilitating transfers could help advance numerous development objectives. The focus should not be solely on increasing overall remittance flows, but also their frequency. Furthermore, there should be a specific focus on lower-income households and corridors, for a broader-based equitable distribution of transnational remittances. Existing global objectives in lowering fees should reassess how economies of scale and frequency of flows are considered (if at all) within stated goals rather than limiting objectives to one-dimensional unweighted averages of prices.

Although this chapter covers ample ground in analysing remittance decision-making, there remain significant gaps, particularly concerning the choice of remittance channels and its relation to transfer costs and the amount and frequency of funds remitted.

⁴⁸ Even more important, privately raised funds should not be considered a substitute for international development assistance. Remittances, unlike development funds and foreign investments, cannot finance public projects with higher social benefits in recipient regions and primarily support consumption rather than long-term investment (Rosenzweig, 2005; Bouoiyour and Miftah, 2015; Lim and Basnet, 2017).

What determines channel choice, and why do Canadians resort to informal flows despite available cheap formal alternatives? Chapter 3 aims to address these issues as a continuation of Part I of this dissertation on the micro-level dynamics of remittance decisions within the Canadian case study.

2.7 Appendices

Appendix 2.1A Detailed remittance frequency descriptive statistics

	Frequency of transfers in 2017				
	Did not remit	Once	2 to 6	7 to 12	13 or more
Weighted frequency	64.1%	13.3%	13.7%	6.3%	2.5%
Remitting patterns					
Total amount remitted		2,006	2,295	4,089	7,186
Average amount remitted		2,006	690	403	353
Amount remitted to birth country		1,475	1,804	3,318	6,605
Remittance fee (last transfer, %)		4.8%	6.4%	5.8%	4.6%
Number of people remitted to		1.5	2.0	2.6	3.7
Remitter/household profile					
No high school	11.4%	10.2%	7.2%	5.7%	6.6%
High school	21.9%	19.8%	18.8%	17.5%	16.5%
College, trade or some university	25.2%	27.7%	30.0%	33.0%	34.8%
Bachelors	25.6%	27.2%	27.5%	29.8%	28.8%
Graduate	15.9%	15.1%	16.4%	14.1%	13.3%
Female	53.2%	52.2%	50.7%	50.0%	46.6%
Age 18-29	18.4%	12.3%	13.6%	9.3%	12.7%
Age 30-59	55.7%	66.8%	72.2%	80.2%	79.0%
Age 60 +	25.8%	21.0%	14.2%	10.5%	8.3%
Household size	3.5	3.7	3.7	3.6	3.6
Children	0.8	0.9	1.0	1.0	0.9
Household income under \$50,000	39.9%	33.5%	32.9%	31.0%	28.5%
HH income \$50,000 to \$79,999	22.5%	25.7%	26.8%	27.0%	27.1%
HH income \$80,000 to \$119,999	19.1%	22.3%	20.4%	21.5%	20.3%
HH income \$120,000 or more	18.5%	18.5%	19.8%	20.4%	24.1%
Single	22.2%	15.9%	16.9%	14.6%	19.5%
Married or commonlaw	65.7%	73.1%	72.9%	73.7%	69.2%
Widow or divorced	12.1%	11.0%	10.2%	11.7%	11.2%
Immigration					
Years since arrival to Canada	18.9	17.4	15.5	13.3	12.2
Citizen	70.7%	70.0%	66.5%	56.9%	50.1%
Permanent resident	24.7%	25.5%	28.9%	36.8%	41.9%
Temporary resident	4.5%	4.5%	4.5%	6.3%	8.0%

Appendix 2.2A Tobit regression analysis of amount sent

	(1) Base	(2) Residency status	(3) Birth region
Education: high school	-59.1 (0.842)	90.7 (0.766)	-406.5 (0.202)
Education: College, trade, or s. uni.	984.8*** (0.001)	1,029.9*** (0.001)	321.2 (0.310)
Education: Bachelors	752.3** (0.012)	480.2 (0.123)	18.4 (0.955)
Education: Graduate	706.5** (0.036)	319.7 (0.362)	328.9 (0.359)
Female	-712.3*** (0.000)	-715.8*** (0.000)	-833.1*** (0.000)
Single	-964.1*** (0.004)	-1,183.0*** (0.001)	-1,524.5*** (0.000)
Married/commonlaw	-293.5 (0.267)	-649.8** (0.019)	-426.9 (0.128)
Age 30-59	2,016.5*** (0.000)	2,728.4*** (0.000)	2,220.2*** (0.000)
Age 60 +	-452.1 (0.132)	1,352.5*** (0.000)	1,185.5*** (0.000)
Household size	27.0 (0.560)	-29.3 (0.536)	-153.0*** (0.001)
HH income \$50,000 to \$79,999	1,029.5*** (0.000)	1,382.8*** (0.000)	1,088.4*** (0.000)
HH income \$80,000 to \$119,999	933.7*** (0.000)	1,527.8*** (0.000)	1,292.1*** (0.000)
HH income \$120,000 or more	1,451.0*** (0.000)	2,238.5*** (0.000)	2,126.5*** (0.000)
Years since arrival to Canada		-69.7*** (0.000)	-84.3*** (0.000)
Permanent resident		608.3*** (0.002)	609.8*** (0.002)
Temporary resident		1,374.5*** (0.000)	1,350.8*** (0.000)
Americas			825.5*** (0.000)
Europe, W. Asia and Middle E.			-2,380.5*** (0.000)
Sub-Saharan Africa			1,888.7*** (0.000)
North Africa			-1,746.7*** (0.000)
East Asia			-5,831.6*** (0.000)
S-E. Asia and Oceania			2,479.2*** (0.000)
Constant	-5,613.2*** (0.000)	-5,294.0*** (0.000)	-3,489.4*** (0.000)
Observations	20,456	19,447	19,447

Robust p-value in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 2.3A Unconditional quantile regression of amount remitted

Uncondition Quantile Regression	(1)	(2)	(3)	(4)	(5)
	Quant 0.05	Quant 0.25	Quant 0.5	Quant 0.75	Quant 0.95
ln(remit fee)	-0.44858*** (0.00000)	-0.46535*** (0.00000)	-0.61177*** (0.00000)	-0.64638*** (0.00000)	-0.73339*** (0.00000)
Number of people remitting to	0.12045*** (0.00000)	0.15027*** (0.00000)	0.18535*** (0.00000)	0.16276*** (0.00000)	0.15981*** (0.00009)
Education: high school	-0.04858 (0.79784)	-0.07371 (0.49752)	-0.00356 (0.97420)	-0.14326 (0.20100)	-0.52522*** (0.00613)
Education: College, trade, or s. uni.	0.19625 (0.25807)	0.02884 (0.77578)	0.00762 (0.94125)	-0.01917 (0.85648)	-0.49710*** (0.00812)
Education: Bachelors	0.20325 (0.23104)	0.06948 (0.50069)	0.06047 (0.57276)	-0.05209 (0.64189)	-0.48737** (0.01475)
Education: Graduate	0.14293 (0.40686)	0.07078 (0.50773)	0.06301 (0.58434)	-0.00476 (0.96852)	-0.19192 (0.39252)
Female	-0.09132 (0.20182)	-0.16364*** (0.00044)	-0.19767*** (0.00009)	-0.20050*** (0.00013)	-0.08747 (0.27290)
Single	-0.14217 (0.41821)	-0.08527 (0.38495)	-0.23628** (0.02635)	-0.02827 (0.79830)	0.12026 (0.51947)
Married/commonlaw	0.11049 (0.41094)	-0.05852 (0.45319)	-0.18066** (0.03217)	-0.13811 (0.11064)	-0.03845 (0.78163)
Age 30-59	0.00334 (0.98045)	0.20296** (0.01796)	0.13007 (0.15377)	0.14590 (0.13152)	-0.11674 (0.47811)
Age 60 +	0.15087 (0.42012)	0.08245 (0.48640)	0.06921 (0.57426)	0.18942 (0.13468)	-0.05537 (0.79568)
Household size	-0.04012* (0.05456)	-0.02871** (0.04718)	-0.06830*** (0.00002)	-0.07365*** (0.00002)	-0.10561*** (0.00008)
HH income \$50,000 to \$79,999	0.29785*** (0.00132)	0.18559*** (0.00219)	0.25185*** (0.00010)	0.12286* (0.06930)	0.21322** (0.04584)
HH income \$80,000 to \$119,999	0.24127** (0.01948)	0.26330*** (0.00007)	0.38380*** (0.00000)	0.18161** (0.01413)	0.08188 (0.44959)
HH income \$120,000 or more	0.22781** (0.03043)	0.41204*** (0.00000)	0.59049*** (0.00000)	0.54692*** (0.00000)	0.61585*** (0.00001)
Years since arrival to Canada	-0.00834* (0.08468)	-0.00378 (0.18068)	-0.00757*** (0.00938)	-0.00655** (0.01954)	-0.00016 (0.97070)
Permanent resident	-0.02577 (0.77653)	0.10685* (0.06885)	0.29402*** (0.00001)	0.40959*** (0.00000)	0.32430*** (0.00311)
Temporary resident	0.18664 (0.22538)	0.15265 (0.17756)	0.11434 (0.38170)	0.34635** (0.01545)	0.25699 (0.30987)
GDP per capita	-0.00001 (0.43607)	0.00002 (0.13489)	0.00002** (0.02876)	0.00002** (0.04298)	0.00003 (0.18421)
GDPpc-squared	0.00000 (0.59123)	-0.00000 (0.16706)	-0.00000* (0.09365)	-0.00000 (0.24459)	-0.00000 (0.68466)
Americas	-0.06318 (0.64086)	-0.09827 (0.24041)	-0.09326 (0.28184)	-0.06408 (0.46000)	0.06091 (0.68278)
Europe, W. Asia and Middle E.	0.28426* (0.05289)	-0.01897 (0.83801)	0.13249 (0.17026)	0.21838** (0.02834)	0.41287** (0.02283)
Sub-Saharan Africa	0.11234 (0.34643)	0.14072* (0.06366)	0.27829*** (0.00121)	0.12831 (0.17341)	0.09529 (0.51010)
North Africa	0.28457* (0.06351)	-0.05811 (0.58683)	-0.13678 (0.20521)	-0.08319 (0.43349)	0.15366 (0.34816)
East Asia	0.14993 (0.47341)	0.16689 (0.22109)	0.24766 (0.15268)	0.21452 (0.30279)	0.43308 (0.33670)
S-E. Asia and Oceania	-0.06830 (0.52988)	-0.10775 (0.12340)	0.04421 (0.55987)	0.06821 (0.39091)	0.07266 (0.57284)
Intended for living expenses	0.37087*** (0.00000)	0.47140*** (0.00000)	0.70613*** (0.00000)	0.54249*** (0.00000)	0.06230 (0.46754)
Intended for education	0.09069 (0.16802)	0.24595*** (0.00000)	0.31435*** (0.00000)	0.30477*** (0.00002)	0.24098** (0.03352)
Intended for emergency	0.10916 (0.11863)	0.15836*** (0.00116)	0.15137*** (0.00737)	0.18427*** (0.00243)	0.07482 (0.45042)
Intended as gift	-0.08791 (0.25165)	-0.14029*** (0.00410)	-0.21990*** (0.00003)	-0.17088*** (0.00212)	-0.29529*** (0.00096)
Constant	5.05619*** (0.00000)	6.06953*** (0.00000)	6.89840*** (0.00000)	8.20279*** (0.00000)	10.29164*** (0.00000)
Observations	4,513	4,513	4,513	4,513	4,513
R-squared	0.08683	0.22812	0.30876	0.28539	0.14805

Robust p-values in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Note: To correct for methodological difficulties inherent in smaller samples sizes, bootstrapping was tested as a resampling tool but did not yield new evidence or significantly impact the findings without bootstrapping.

Appendix 2.4A Unconditional quantile regression of the average amount remitted

Uncondition Quantile Regression	(1)	(2)	(3)	(4)	(5)
	Quant 0.05	Quant 0.25	Quant 0.5	Quant 0.75	Quant 0.95
ln(remittance fee)	-0.27265*** (0.00000)	-0.44626*** (0.00000)	-0.60865*** (0.00000)	-1.05148*** (0.00000)	-1.77209*** (0.00000)
Number of people remitting to	-0.03289* (0.09250)	-0.01699 (0.24131)	-0.00727 (0.61232)	-0.03285 (0.13101)	-0.07368* (0.08175)
Education: high school	-0.04130 (0.77059)	-0.19446** (0.02528)	-0.07605 (0.37877)	-0.32894** (0.01336)	-0.01410 (0.95776)
Education: College, trade, or s. uni.	-0.03286 (0.80240)	-0.15549* (0.05600)	-0.10228 (0.21410)	-0.26218** (0.03836)	0.18204 (0.47956)
Education: Bachelors	0.09507 (0.46041)	-0.05406 (0.51399)	-0.06528 (0.44224)	-0.30590** (0.02004)	-0.06781 (0.80131)
Education: Graduate	0.00175 (0.98905)	-0.17284** (0.04812)	-0.06695 (0.45841)	-0.14633 (0.29454)	0.32680 (0.29532)
Female	-0.09497* (0.07939)	-0.12756*** (0.00115)	-0.11175*** (0.00345)	-0.12194** (0.02708)	0.10424 (0.41296)
Single	-0.15971 (0.20765)	-0.09882 (0.25137)	-0.00588 (0.94216)	0.20687* (0.07442)	0.26979 (0.35983)
Married/commonlaw	-0.00536 (0.95444)	-0.00086 (0.99002)	0.01751 (0.78831)	0.01608 (0.85770)	-0.20578 (0.35896)
Age 30-59	0.37072*** (0.00171)	0.09390 (0.17887)	0.04385 (0.52808)	-0.09695 (0.36189)	0.03475 (0.88912)
Age 60 +	0.37763** (0.01316)	0.14157 (0.13638)	0.07705 (0.40979)	0.01689 (0.90731)	0.52717 (0.13121)
Household size	-0.02504 (0.11550)	-0.02403* (0.05403)	-0.03013** (0.01677)	-0.01762 (0.33471)	-0.07096* (0.05494)
HH income \$50,000 to \$79,999	0.15589** (0.02600)	0.17360*** (0.00074)	0.15335*** (0.00225)	0.06411 (0.36673)	0.06902 (0.67566)
HH income \$80,000 to \$119,999	0.15016** (0.04541)	0.22084*** (0.00006)	0.16413*** (0.00216)	0.16120** (0.04016)	0.12798 (0.46939)
HH income \$120,000 or more	0.12464 (0.12163)	0.22726*** (0.00014)	0.26621*** (0.00000)	0.40098*** (0.00000)	0.32513 (0.11094)
Years since arrival to Canada	-0.00332 (0.35906)	-0.00320 (0.16549)	0.00187 (0.40024)	0.00650** (0.04983)	0.00648 (0.39020)
Permanent resident	-0.01097 (0.87584)	0.05787 (0.25822)	0.10254** (0.04013)	0.11268 (0.11567)	0.21186 (0.21114)
Temporary resident	0.13709 (0.30430)	0.18123* (0.06055)	0.02638 (0.80349)	-0.29030* (0.05080)	-0.54591* (0.09442)
GDP per capita	0.00001 (0.58113)	0.00003*** (0.00033)	0.00003*** (0.00002)	0.00004*** (0.00176)	-0.00002 (0.45947)
GDPpc-squared	-0.00000 (0.51407)	-0.00000*** (0.00105)	-0.00000*** (0.00029)	-0.00000** (0.02133)	0.00000** (0.04223)
Americas	-0.41122*** (0.00003)	-0.57616*** (0.00000)	-0.47532*** (0.00000)	-0.41532*** (0.00002)	0.55367** (0.01636)
Europe, W. Asia and Middle E.	0.12096 (0.13022)	0.06099 (0.37064)	0.06866 (0.35808)	0.31484*** (0.00714)	0.89369*** (0.00124)
Sub-Saharan Africa	0.03558 (0.66195)	-0.09345 (0.14793)	-0.14034** (0.03834)	-0.14410 (0.13961)	0.35536* (0.09926)
North Africa	0.05004 (0.59238)	0.02780 (0.72555)	0.09199 (0.30127)	-0.01669 (0.90131)	0.29573 (0.23776)
East Asia	-0.20985 (0.11483)	-0.19171** (0.04339)	0.12393 (0.27644)	0.60099** (0.01372)	1.99840** (0.01440)
S-E. Asia and Oceania	-0.20567*** (0.00521)	-0.36946*** (0.00000)	-0.34112*** (0.00000)	-0.61136*** (0.00000)	-0.08265 (0.68945)
Intended for living expenses	0.01013 (0.85504)	-0.00764 (0.85094)	-0.03300 (0.40411)	-0.12872** (0.02786)	-0.23321* (0.09277)
Intended for education	-0.06340 (0.34790)	0.05080 (0.28143)	0.04304 (0.36871)	0.09073 (0.20363)	0.28852* (0.09624)
Intended for emergency	0.05613 (0.34273)	0.05432 (0.21219)	0.12112*** (0.00492)	0.10623* (0.09353)	0.12820 (0.40180)
Intended as gift	0.06084 (0.28645)	-0.06253 (0.13581)	-0.12510*** (0.00215)	-0.20216*** (0.00065)	-0.45664*** (0.00077)
Constant	4.60184*** (0.00000)	5.90107*** (0.00000)	6.60781*** (0.00000)	8.22309*** (0.00000)	10.47385*** (0.00000)
Observations	4,379	4,379	4,379	4,379	4,379
R-squared	0.07083	0.22557	0.32631	0.38858	0.24508

Robust p-values in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Note: To correct for methodological difficulties inherent in smaller samples sizes, bootstrapping was tested as a resampling tool but did not yield new evidence or significantly impact the findings without bootstrapping.

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Chapter 3: Migrant Channel Modality: Unpacking Choices in Canadian Remittance Transfer Mechanisms

Abstract: On a global scale, there exist a plethora of international targets aimed at both encouraging and formalising remittances, in part due to their potential to support international development efforts but also in controlling and monitoring illicit flows. In Canada, remittance outflows have received significant attention in light of Canada's increase in immigration flows. At approximately 6.1 billion USD in migrant outflows sent in 2019, Canada's remittances outpaced official development assistance for that year. However, despite efforts to promote formal remittance channels, informal remittances that are not captured through banks or other formal remittance service providers, continue to flourish among specific population segments. What determines which mechanisms migrants choose to remit funds abroad? Why is it that migrants continue to use informal methods, particularly cash transfers, despite the availability of numerous formal alternatives? This chapter analyses the micro-determinants of remittance channel modality, or channel choice, using a survey of 22,908 migrants to Canada. The findings posit that the frequent dichotomisation of formal versus informal remittances is reductionist in that it obscures crucial differences across remittance channels. All else held equal, remitters sending to countries with larger informal sectors were more likely to resort to money transfer operators (most of which offer cash pickup options to recipients) than informal methods. Moreover, due to Canada's unique geographical positionality, cash transfers operate quite distinctly from informal methods, contrary to the evidence from numerous other countries that share land or relatively proximate maritime borders.

Keywords: remittances, payment instruments, informality, Canada

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3.1 Introduction

According to the World Bank, the approximately 8.4 billion USD in personal remittances – of which 6.1 billion USD in migrant remittances – sent from Canada in 2019 outpaced its official development assistance (ODA) for that year. Derived from the balance of payments, these estimates are often limited to formal monetary transfers through banks, credit unions, and other established money transfer operators (MTOs) such as Western Union and MoneyGram. If informal flows such as cash hand-carried across borders, undisclosed postal goods, and other transfers⁴⁹ were accounted for, then the estimates would be even larger. In the presence of such sizeable formal flows and additional informal flows, many scholars have asked how to harness remittances and better leverage them to advance international development goals.

However, ascertaining the magnitude or documenting the extent of inherently unmeasurable informal flow use remains a significant obstacle to understanding their scope and policy significance. A far-reaching informal sector globally has spawned a profusion of innovative methods of estimating the size of the informal or shadow economy. Using everything from satellite images of night lights as a proxy for economic activity (Ghosh et al., 2010; Tanaka and Keola, 2017; Beyer et al., 2018) to an array of other sources (Henley, Arabsheibani and Carneiro, 2009; Medina and Schneider, 2018), numerous efforts exist to estimate this central latent variable – the informal sector.

⁴⁹ Informal channel types are generally corridor- or culture-specific, such as *hawala* and *hundi* practiced among the Middle Eastern, South Asian, and certain African diasporas, *fei chien* in China, *padala* in the Philippines, *Chuyen Tien Tay Ba* in Vietnam, or *viajeros* in Mexico (Basu and Bang, 2015; Hernández-Coss, 2005b; Yang, 2011). All these methods are informal methods that became more sophisticated over time and are specific to certain corridors. However, it is worth noting that a multitude of additional informal cash agreements exist and contribute to the size and importance of informal remittances.

Remittance data generally do not capture informal flows. This oversight is significant since some suggest that these transfers could constitute between two and ten times the amount of officially reported global remittance flows (O'Neill, 2001). By contrast, more conservative estimates still estimate them at 1.5 times the monetary value of formal remittances (Sander, 2004). Freund and Spatafora (2008) cite market observers estimating informal flow sizes across various corridors as constituting between 50 and 250 per cent of formal flows and estimate informal flows to developing countries as constituting 35 to 75 per cent of official flows (citing high regional variation).

Although there exist potential advantages of informal remittance channels in terms of cost, speed, accessibility, and anonymity (Kapur, 2005; Pieke, Van Hear, & Lindley, 2005; Siegel, Vanore, Lucas, & de Neubourg, 2010), informal channels suffer from reliability issues (impacting the sender and recipient) as well as a lack of transparency (impacting the ability to measure, monitor, and regulate flows). Within the development sphere, the reliability of channels and potential abuses of vulnerable migrant populations are of grave concern. Because of abuse concerns, programs exist around the world to support safe financial transfers. For instance, in Nepal, the Safer Remittances and Improved Livelihoods (SRIL) project in the districts of Surkhet and Kailali works to address unreliable informal sector transfer mechanisms (Oxfam, 2012). Through this initiative, which supports seasonal migrant access to financial services and the safe transfer of funds at minimal cost, vulnerable Nepali migrants are less likely to face barriers such as the need to bribe border guards, theft, or loss of remittance funds. These risks are inherent to Nepalese labour mobility and reliance on hand-carried cash and traditional *hundi* channels (Thieme and Wyss, 2005).

Transparency concerns and concerns from the security community acted as the impetus to monitor and measure unofficial flows.⁵⁰ For security experts, the New York terrorist attacks on September 11th, 2001, drew the security field's attention to these transfers, given the possibility that remittances could be used to fund terrorist activities. Although there existed an abundance of research on informal networks used for illicit activities such as tax evasion and money laundering (Shehu, 2003; McCusker, 2005), the 2004 9/11 Commission's report led to a dramatic increase in attention to this policy issue (National Commission on Terrorist Attacks upon the United States, 2004; Roth, Greenburg and Wille, 2004). The regulation that ensued was in stark contrast to the financial deregulation of the 1970s and 1980s (Seddon, 2007).

Within Canada, the federal financial regulator, the Office of the Superintendent of Financial Institutions (OSFI), and the Financial Transactions and Reports Analysis Centre (FINTRAC), Canada's financial intelligence unit administering the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act*, have been influential in extending oversight to MTOs in the early 2000s. Furthermore, as part of the Act, the Canadian Border Services Agency (CBSA) enforces declarations of 10,000 Canadian dollars or more being hand-carried, or money sent through postal offices.

Canada serves as an excellent case study of remittances; specifically, the study of channel choice or modality in the light of the persistence of informal methods. In Canada, in addition to abiding by provincial regulatory frameworks, money service businesses must register with FINTRAC and comply with the Canadian *Proceeds of Crime (Money*

⁵⁰ The topic of the security dimensions that shaped modern remittance formalisation efforts are explored in Chapter 4.

*Laundering) and Terrorist Financing Act.*⁵¹ Various 2002 to 2006 amendments added record-keeping, client identification, and other reporting requirements under the Act.

Moreover, informal flows are estimated to face lower transfer costs than their formal counterparts. Sander (2004) estimates that average global informal remittance costs around three to five per cent. Canadian remittance outflows through banks and MTOs place transaction cost estimates around 7.4 per cent for 200 CAD and 4.8 per cent when sending 500 CAD according to 2017 estimates of the World Bank's *Remittance Prices Worldwide* (RPW) database. In contrast, the SIMT estimates the average cost of informal networks at 4.4 per cent of the amount remitted during migrants' last transfer in 2017 (compared to an overall average of 5.6 per cent across all channels and amounts sent). Surprisingly, this is not far below market rates (around seven per cent globally according to RPW data) and may explain the high degree of formalisation in Canada's remittance market. Formalisation may also reflect high trust in institutions and the belief that formal transfers are more reliable or safer.

Albeit subdued, informal channel use endures in Canada despite high regulations, the availability of numerous formal alternatives, relatively limited cost benefits, and a significant level of isolation from ODA-eligible countries that precludes or inconveniences myriad informal and hand-carried transactions. Hence, one expects more informal and poorer economies to rely on informal methods. Despite this, recipient country informality (as explored in depth later in this chapter) is not a precise or sufficient determinant in explaining remittance informal channel modality in Canada – and significantly flawed based on the findings in this chapter.

⁵¹ Refer to FINTRAC's website for more details (<https://www.fintrac-canafe.gc.ca/msb-esm/msb-eng>).

Using SIMT data of 22,908 migrants born in ODA-eligible countries within Canada, this study addresses the following research question: Why do remitters in Canada opt for certain channels but not others? What micro determinants push remitters to continue to opt for informal methods and cash? These questions are especially policy relevant given the large-scale international efforts to formalise flows and steer migrants away from informal channels. Moreover, these questions seek to explain the underlying reasons why the use of informal channels is only weakly linked to recipient country informality, and informal channels continue to be used in Canada despite an assortment of alternatives.

In addition to answering the central analytical puzzles, this study contributes to a growing body of knowledge that unpacks the dichotomisation between informal and formal flows prevalent within the remittance literature. Pieke, Van Hear and Lindley (2007) correctly point out that the informal remittance categorisation merely serves as a residual category for all remittances that are unaccounted for, thus acting as a “fake” categorisation. Unpacking the dichotomisation of formal and informal in remittance channel decision-making is a research priority. This is especially important for the array of new innovative money transfer methods from mobile transfers such as M-PESA (Jack and Suri, 2011), digital methods (Dimbuene and Turcotte, 2020), and crypto-currencies that rarely fit neatly into this binary narrative.

The chapter is divided into five sections. Section 3.2 comprises an overview of similar studies using large sample individual and household data analysis and proposes a simple analytical framework to understand channel modality. Section 3.3 provides an overview of channel usage and remittance factor preferences within the Canadian remittance market through channel disaggregated summary statistics of the SIMT data.

Section 3.4 outlines the methodology and the techniques utilised to test the proposed model empirically. Section 3.5 provides an in-depth study of the regression results, ultimately leading into Section 3.6 that delivers a short synthesis of the chapter findings, including policy implications and future research avenues.

3.2 An analytical framework of remittance channel modality

As explained in previous chapters, Russell (1986) provided an excellent model of splitting the underlying remittance decision-making process that moulded the evolution of the study of remittances of the last three decades. The framework divides remittance decision-making at the individual or household level into central nodes: whether to remit, how much to remit, and through which channel.⁵² Altogether, these three choices form the basic framework of analysis for the micro determinants – of which the former two feature in Chapter 2. In contrast with the previous chapter, this chapter narrows in on the determinants that affect channel modality.

In converging on the study of channel modality, elucidating the sequence of remittance decisions provides the necessary theoretical context to better understand the positionality of the study's findings within the broader research agenda regarding micro remittance decision-making.⁵³ The purpose of this section is to outline a clear theoretical

⁵² Note that Sharon Russell (1986) provides a vital fourth node for development scholars vis-à-vis recipients' choices of how to use the remittance funds (broadly split between consumption and investments uses). However, this fourth node is not relevant within the context of this chapter and was therefore dropped as in previous chapters.

⁵³ In contrast with micro remittance research at the individual or household-level, macro-analyses of remittances study aggregate flows and rely on countries or regions as the base unit of analysis. Consequently, the distinction of remittance decisions and research agenda is quite different since aggregate remittance channel modality data are extremely limited. Therefore, macro studies rely on the narrower dichotomisation of formal and informal channels or the omission of unmeasured informal flows altogether.

framework of channel choice, review the existent empirical literature within this issue area, and layout the main hypotheses that are subsequently empirically tested.

3.2.1 Developing a channel decision-making model

This section overlays the first-last mile framework (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007) with six main determinants or factors from the literature on remittance channel decision-making. The parsimonious model identifies three main actors, with one per stage. The three stages of the model involve the sender (first-mile), intermediaries such as remittance providers (intermediary stage), and the recipient (last-mile).⁵⁴

Six main factors are selected to define the model further: sender convenience (including access to, and knowledge of, channels), recipient convenience, cost, timeliness of transfer, reliability of the channel, and recipient needs (more precisely, the urgency or importance of these needs). The model's value-added stems from detailing the various factors that affect each step within the process. The six factors above affect each stage of the model and thereby impact channel choice.

The first-mile, or sender, is directly impacted by sender convenience regarding access to different channels. For instance, lower levels of convenience may stem from a lack of access to certain types of channels or digital means, but may also be linked to migratory status. For instance, undocumented or temporary immigrants may favour informal methods (De Haas and Plug, 2006; Karafolas and Konteos, 2010).

⁵⁴ Intermediaries also include network linkage infrastructures that handle international payment systems connect both host and home country remittance transfer providers are connected (IMF, 2009). These intermediaries are not included within this chapter given its focus on remitter-level decision-making rather than delving deeper into the inner workings of the payment connection between remittance service providers.

The second stage involves the interaction of market actors and fund transfer services. This stage focuses on remittance service providers (RSPs) of all types – including the remitters themselves in cases where the funds are hand-carried. The main determinants in this stage are transfer cost, the method’s timeliness, and the channel’s reliability. Siegel and Lücke (2013) outline the importance of these three factors on channel choice and how they can influence remitters’ choice. All else held equal, remitters prefer cheaper, faster, and more reliable methods. However, higher reliability and speed generally carry a higher cost trade-off, such as MTOs. Informal methods may come at lower costs (Siddiqui and Arbor, 2003; Sander, 2004; Orozco, 2005; Ullah and Panday, 2007; Freund and Spatafora, 2008; Orozco, 2010; Basu and Bang, 2015; Orozco and Klaas, 2020), but they are generally slower,⁵⁵ and the reliability fluctuates immensely. Overall, the decisions imposed by these intermediaries are essential factors in the sender’s choice of channel modality.

The last-mile refers to the end distribution to recipients. This stage notes the importance of distribution channels, the links between sender and recipient communities, accessibility to banking services, and the needs and effects of remittances on recipient communities. The focus here is on the urgency or need for funds⁵⁶ and their access, or specifically convenient access, to distribution channels, whether they be banks, credit

⁵⁵ Although Ullah and Panday (2007) find contradictory evidence in the case of Bangladeshi remitters in Hong Kong and Malaysia, where migrants overwhelmingly preferred informal methods citing lower costs and faster transfer speed. However, respondents did acknowledge informal methods carried a significant amount of risk relative to formal alternatives. Siddiqui and Arbor (2003) also find that certain informal remittance methods outpace delivery times of their formal counterparts, despite evidence to the contrary in the SIMT dataset used in this chapter (and Chapter 2).

⁵⁶ Despite this chapter’s focus on the needs of recipients, this factor could be expanded to include the needs of the transnational household, including the senders themselves. For instance, a sender intending on remitting as an investment for when they return to the “home” country could be considered a need or desire to remit influencing the amount sent and channel modality. A broad literature on remittances ranging from pure altruism, to tempered altruism, to pure self-interest exists (Carling, 2008) and could serve as a potential expansion upon the current model if additional data on remittance motives is available.

unions, MTOs, microfinance institutions, department stores, currency exchange houses, post offices, or other channels. Financial access and financial literacy and cultural barriers and language (Sander, 2004; Pieke et al., 2005) all play a vital role in recipient convenience. For instance, banks often require access to formal financial networks, whereas MTOs generally offer cash pick-up options, albeit at an additional cost or premium. As another example, in a study of remitter willingness to pay in Niger's mobile remittance market, Aker, Prina and Welch (2020) report high regional variation that, since correlated with agent density, indicates infrastructure may constitute a critical barrier to the remittance markets. Furthermore, this result holds despite perceptions or beliefs of lower fees within the mobile transfer market among respondents.

It is also worth noting the possibility of interaction effects, especially where needs or urgency are vital. For instance, a natural disaster or crisis would increase urgency and need for funds, increase time sensitivity, and decrease cost sensitivity. Moreover, disasters may also be associated with temporary transfer impediments, including closures or disruptions to electrical power, disproportionately impacting digital channels and travel.

Despite the sender acting as the central decision-maker, they base their decisions on factors, or perceived factors as rational remitters, that are influenced by each stage and actor. The sender makes their channel choice based on the different factors (or determinants) that affect each actor through backwards induction logic.⁵⁷ As succinctly

⁵⁷ This model assumes agent (remitter) rationality but is expanded to take imperfect information into consideration. For instance, financial literacy and awareness of alternate mechanisms of transfer could affect decision-making – as evidenced by data in Figure 3.4. Albeit incomplete in assuming rationality, providing a baseline analysis of the average rational remitter is often a critical first step in studying modality and social behaviour. Only once this rational baseline has been established can research dig deeper into other factors such as outliers or deviations from rationality – since, by definition, one could not presume to identify factors unexplained by rationality without having first established said rational factors.

modelled in Figure 3.1, the sender weighs the factors influencing each stage of the remittance flow when selecting a transfer mechanism.

Figure 3.1 Sender channel decision model using backward induction

Note: The bottom blue arrow designates the process of backward induction. This logic is based on the sender being the sole decision-maker, but they base their remittance decision on various factors, including their perception of intermediary stage and last-mile influences, such as recipient preferences and transfer mechanism effects.

Although identifying the decision-making process as purely rational is analytically reductionist, it provides a critical baseline that can subsequently be used to study deviations from rational causal factors. Moreover, deviations from preferences do not necessarily imply deviations from rationality but are also attributable to personal circumstances and constraints – namely income, educational attainment, and various socioeconomic and

Despite the structural constraint approach of the model (Figure 3.1), cultural preferences and habits also play a role, which this rationality-based framework does not take into consideration. Maimbo (2003) describes the “adherence to unwritten but well-established codes of business practice” within *hawala* networks. For more information, refer to Section 5.2.2 of Chapter 5. However, in light of the objective of this chapter studying trends in average channel modality across all Canadian outflows, it is not feasible to document all corridor and cultural specificities that influence remitter decision-making. Such an exercise would be better suited for an analysis of specific corridors or diaspora than a broader study of Canadian outflows.

demographic factors. Therefore, the model is based on sender perceptions and considers imperfect information (frequently linked to a lack of financial literacy) and other asymmetries in information relative to other actors.

Since increased recipient needs also translate into larger volumes of funds sent, one must address the simultaneity (endogeneity) of the decision between the amount remitted and channel modality. As Amuedo-Dorantes and Pozo (2005) correctly point out, not only can the amount sent influence the choice of channel, but the choice of channel may also affect the amount sent. This simultaneity occurs because those using MTOs may choose to remit less frequently but in more substantial sums to take advantage of the lower transaction costs associated with economies of scale. Hence, it is essential to fully understand the dual or two-way causality that can potentially introduce endogeneity into the study if not adequately corrected.

Numerous demographic and socioeconomic characteristics correlate with channel selection. Subsequent sections link various household and individual characteristics to the factors listed above, namely convenience, cost, timeliness, reliability, and needs. Through the theoretical lens developed in this section, in combination with quantitative empirics, one can surpass an analysis restricted to correlations and uncover underlying causal mechanisms. Expounding different population segments' preferences in terms of factors is not only insightful in terms of social science theory, but it also provides policy relevant results regarding migrant preferences and, in doing so, can support policies to address specific causal factors better. It also serves to identify the main factors hindering migrant access to formal mechanisms and which groups of migrants are most, or least likely to be, affected by the myriad programs and policies aimed at remittance formalisation.

3.2.2 Review of large-N empirical work

Although there exists macro-level work on channel modality (Sander, 2004; Freund and Spatafora, 2008; Kupets, 2012), these studies are somewhat limited in detail in that they tend to dichotomise formal and informal flows. By contrast, this section provides a brief overview of studies on channel choice micro-determinants using large-sample analyses at the individual or household level. This review helps isolate common trends and study the methods employed, which inform this chapter's structure within the Canadian context. Four such studies stand out in the literature.

Amuedo-Dorantes and Pozo (2005) study a sample of approximately 6,000 Mexican migrants returning from the United States using data from five waves of the Encuesta Sobre Migración en la Frontera Norte de Mexico. These data, collected by the Colegio de la Frontera Norte, cover eight northern border cities and contain information on four main remittance channels: banks, MTOs, informal mechanisms (including cash) and others (acting as a catch-all variable for all other types of transfers). Using multinomial logistic regression analysis, the authors treat each channel as a separate dependent variable. Further, to correct the simultaneity in channel modality and the amount sent, the authors use the number of recipients as an instrument, since it is assumed this instrumental variable (number of recipients) affects the amount sent but is not causally linked to channel choice. To do this, Amuedo-Dorantes and Pozo (2005) use a Tobit model of the dollar amount remitted on family size and other factors and save the predicted values that subsequently serve as an instrument in the multinomial regression model of channel modality. The main findings attest that financial literacy (or knowledge of alternative channels) and access to formal finance are the main factors underlying channel decision-making. Those in non-

permanent forms of employment, new arrivals to the United States, and rural migrants are more likely to resort to informal methods.

Kosse and Vermeulen (2014) study the channel choice of 501 remitters in the Netherlands using the previous 12 months' remittance data collected in a survey conducted in 2009. The authors analyse five main transfer mechanisms: banks, MTOs, informal, ATMs, and cash (brought by oneself) transfers. Unlike Amuedo-Dorantes and Pozo (2005), Kosse and Vermeulen (2014) do not control for the endogeneity bias created by the simultaneity in channel choice and the amount sent. However, the authors posit that, while it is reasonable to assume migrants may remit less frequently to take advantage of economies of scale in transfer costs,⁵⁸ their data are less likely to incur such biases since it spans over 12 months. The findings of this study suggest that while education, costs, access, and financial development of the receiving country play an important role in channel choice, preferences, such as a preference for cash or online banking and general payment behaviour, carry limited explanatory power. The limited explanatory power of general payment habits (preference for cash and internet banking, for instance) is weakly significant when controlling for ATM density in the receiving country and the remitter's education. However, it becomes statistically insignificant once self-reported remittance channel choice reasons such as speed, sender convenience or ease, and lack of recipient bank access are included. Surprisingly, the number of visits back to the "home" country and household characteristics, other than education and urban dwelling, are largely statistically insignificant.

⁵⁸ Especially amongst MTO transfers, the transfer costs are generally set by bracket. Hence, remitting 100\$ once a month may be far more expensive than remitting 200\$ bi-monthly.

Siegel and Lücke (2013) use a 2006 sample of approximately 4,000 migrant households in Moldova, of which 1,139 have bilateral remittance relationships with recipients abroad. Like other studies, the authors use multinomial logistic regression for three separate dependent variables: formal services, informal operators, and personal transfers. The authors find that key reasons not to use formal methods include lower informal sector transfer costs, irregular or undocumented status in Moldova, and the shortness of stay (short migration spells and temporary or seasonal work). Furthermore, and surprisingly, migrants that are more likely to use informal methods include those from high-income countries (mainly within the European Union and possibly attributable to frequent travel). Less surprisingly, those that favour informal services care primarily about cost over convenience, speed, security and familiarity and, on average, do not hold a bank account.

Karafolas and Konteos (2010) study Albanian immigrants' experience in Greece, specifically in Central Macedonia. Using data collected between August and November of 2007, the sample includes 300 permanent and 183 seasonal migrants and include data on three separate channels: banks, MTOs, and cash carried by the migrants or their relatives. As in the previous studies, the authors use multinomial logistic regressions and find that hand-carried methods are preferred. Furthermore, they find that seasonal immigrants favour cash (equated to informal methods). However, within the formal remittance sector, seasonal immigrants prefer MTOs, while permanent immigrants favour banking networks.

3.2.3 Hypotheses

Two main hypotheses are derived from the theory outlined in the previous section. The first hypothesis, that each factor in the first- to last-mile framework impacts channel choice,

consists of five sub-hypotheses – one for each preference. Isolating these remitter preferences as key determinants is a crucial step in better understanding why they cannot be used to provide a one-to-one explanation of channel choice – largely due to household circumstances and socioeconomic constraints. The second hypothesis proposes that highly informal recipient country economies facilitate informal channel access and influence perceived transfer reliability. The hypotheses are as follows:

H₁ If remitters identify a certain factor from the first-to-last mile framework, then this factor will impact channel modality.

H_{1a} If migrants identify sender (recipient) convenience as the most important factor influencing their remittance behaviour, then their propensity to use formal channels increases (decreases) relative to other channels.

H_{1b} If migrants identify transfer cost as the most important factor influencing their remittance behaviour, then their propensity to use cash, informal methods, and cheaper formal methods (such as digital methods) increases relative to other channels.

H_{1c} If migrants identify timeliness as the most important factor influencing their remittance behaviour, then their propensity to use cash and informal methods decreases relative to other channels.⁵⁹

H_{1d} If migrants identify reliability as the most important factor influencing their remittance behaviour, then their propensity to use the channel they identify as reliable increases relative to other channels.

H_{1e} If recipient needs increase or needs are related to subsistence, health, or education needs, then migrants' propensity to use cash decreases relative to other channels.

Furthermore, in the event of increased needs, particularly emergencies, needs are expected to have interaction effects with other factors (e.g., in the event of a crisis affecting the recipient, senders could become more sensitive to transfer timeliness and less sensitive to transfer fees). See Table 3.1 for a detailed breakdown of expected signs by hypothesis.

⁵⁹ Mixed evidence on the timeliness of informal methods exists where some show evidence of slower transfer speed (Sander, 2004) and others document migrants claiming faster transfer speeds (Ullah and Panday, 2007).

H₂ If the relative size of the recipient country's informal economy is greater, then migrants have a higher likelihood of resorting to informal channels to remit.

Table 3.1 Expected signs for channel modality determinants

H1 Remitter motivation	Channel expected sign		
	Formal	Cash	Informal
a1 Sender convenience	+	+	-
a2 Recipient convenience	-	+	+
b Low transfer costs	-	+	+
c Timeliness of transfer	+	-	+
d Reliability of method	+	-	-
e Recipient needs (urgency of funds)	+	-	+

H2 Informality path dependence			
Informality of recipient country (access and convenience)	-	+	+

Note: Formal channels are treated as a homogeneous category, yet subsequent findings suggest numerous differences exist between selecting banks and credit unions, MTOs, and digital transfer mechanisms.

In addition to the hypotheses listed above, numerous interactions and household socioeconomics and demographic characteristics are considered. For instance, higher-income or more educated migrants are hypothesised to be less likely to resort to informal transfer methods. Moreover, demographic factors such as age correlate with greater use of digital channel use (most likely linked to convenience factors) and a higher number of children as an indicator for lower need to remit to family abroad (most likely an indirect estimation of recipient needs).⁶⁰ Other tests on variables such as gender, the region of birth, household size, marital status, residency status, diaspora size, and year of arrival in Canada identify links to channel choice and their underlying factors.

⁶⁰ Unfortunately, it is not possible to know whether a larger number of children captures a lack of desire to remit since the children are already with the parents in Canada, or increased expenditures raising the children leading to fewer remittances sent abroad.

3.3 Data on channel selection in Canada

As mentioned in Chapter 2, Global Affairs Canada commissioned the SIMT, which Statistics Canada conducted in 2018 with data released in 2019 (Dimbuene and Turcotte, 2019). The survey offers the first large data sample of ODA-eligible country born migrants' remittances out of Canada with a substantial amount of detail regarding their demographic and socioeconomic backgrounds. Moreover, the survey contains questions about their motives, remittance frequency, amount (accounting for both formal and informal transfers), the cost of sending their last transfer, and other details that were unavailable until now.⁶¹ The restriction to ODA-eligible country born individuals is particularly relevant in the context of this research, given the focus on tackling the Canadian international development role of remittances as part of its global commitments. Furthermore, the sample size of 22,908 individuals is remarkable given the substantially smaller samples of past studies. As such, it offers detailed insights into remittance channels for the first time in the Canadian context. The Canadian case is also interesting in that the destination countries are geographically distant, which heavily impacts informal channels relying on geographical proximity or frequent travel in the case of hand-carried flows.

3.3.1 Reclassifying remittance channels

This section highlights key trends impacting Canadian remittance channel modality by unpacking the dichotomisation of remittances between formal and informal categories. As hypothesised, different factors influence remittance modality. While cash is often grouped under informal, cash flows are substantially different in the Canadian context and should

⁶¹ Statistics Canada. (2018). Sending money home, <https://www.statcan.gc.ca/eng/blog/cs/sending-money>

not be treated as part of an already heterogeneous informal category. Formal methods also carry substantial differences, as is the case for transfers through banks and credit unions (in-person), MTOs (in-person), and digital methods (for all types of channels, including banks and MTOs).

Figure 3.2 indicates the aggregation of channels from the disaggregated categories outlined in the survey. Analogous channels are regrouped for three reasons. First, collapsing these categories together simplifies the analysis of commonalities across channel types and helps narrow down main trends in channel decision-making across groups of channels. Second, the regrouped categories facilitate comparisons to other studies, such as those outlined in the literature review, that use similar channel classifications. Third, the main motivation lies in compiling categories that respect the Independence of Irrelevant Alternatives (IIA) assumption for the subsequent multinomial logit analysis (Hausman and McFadden, 1984; Long and Freese, 2006: 275).⁶²

⁶² The basic Hausman test (i.e., without seemingly unrelated estimation) does not accommodate for significant differences in channel use across categories (namely the substantial usage of in-person MTOs), which violate the test's asymptotic assumptions. The *suest* version in Stata corrects for this. For more details on Hausman IIA testing using seemingly unrelated estimation to satisfy the test's asymptotic assumptions, refer to Appendix 3.1A.

Figure 3.2 Channel category aggregation

For the purposes of this chapter, the SIMT channels are best reclassified as banks and credit unions (in-person), MTOs (in person), digital transfer systems (banks, credit unions, MTOs, and others), cash transfers, and informal remittance systems (see Figure 3.2). This reclassification is based on common trends and explanatory factors.⁶³ With regards to formal differences, banks and credit unions are dissimilar to MTOs when studying their in-person usage by the remitters' last transactions (8.6 per cent versus 56.1 per cent of survey respondents) and average fee (4.2 versus 6.2 per cent of the amount sent). However, the distinct characteristics when remitting using digital remittance methods' respective websites or apps are muted. For instance, the costs of banking online were 3.9 per cent and were 4.5 per cent for money transfer stores online. As for informal channels, cash carried by oneself abroad or brought back by relatives visiting is entirely separate from giving cash to someone to carry funds on one's behalf (often at a fee whereas other forms of cash have no explicit cost) or other informal methods.⁶⁴ For additional details on similarities across disaggregated channels, refer to the SIMT report by Dimbuene and Turcotte (2019) or refer to Figure 3.4 for differences in use.

3.3.2 Channel modality factors and determinants

Canada's geographical seclusion from much of the developing world makes cash transfers and informal methods far less conventional than similar countries that are more proximate to ODA-eligible countries. Many forms of informal transfers, which rely on proximity to

⁶³ Moreover, several iterations using distinct categories yielded similar or redundant results that were not statistically significantly different. One noteworthy test in addition to several category iterations is the Hausman IIA test as outlined in the previous footnote and Appendix 3.1A.

⁶⁴ Note that "other" methods were also classified as informal since their characteristics within the sample best resembled those of the informal channel as well as in accordance to previously cited works that denote "informal" a catch-all term encompassing a broad range of, generally corridor and diaspora specific, heterogeneous channels.

ODA-eligible countries, such as those described in the literature review, do not apply to the Canadian context. The limited use of informal methods and cash due to their inconveniences in Canada (low speed of transfer, low sender convenience, and relatively low reliability) can be traced back to distance and limitations on physical transfers.⁶⁵ Cash transfers are mainly a matter of convenience when migrants return to their native countries or receive visitors who return with the funds. The decision to remit using cash is impacted by high travel costs in and out of Canada to the closest ODA-eligible countries and the timeliness and reliability of transferring physical cash. So, beyond the convenience of handing cash when visiting or being visited, why are cash transfers and remittance channels used at all in Canada?

Table 3.2 presents summary statistics by channel most frequently used in 2017 that indicated that, among the 36.9 per cent of ODA-eligible country born migrants in Canada, just shy of two-thirds of remitters favoured in-person MTOs. This overwhelming favouritism over other channels is puzzling at first glance, given all other channels were cheaper on average as a percentage of the amount transferred. Furthermore, the low cost of transfers through banks and credit unions are surprising given they are frequently listed as the most expensive channels according to the RPW dataset (see Appendix 3.2A).

⁶⁵ Note that these traits differ significantly from some made in the remittance literature, whereby informal remittance networks often provide faster and cheaper transfers (even when compared to MTOs and digital transfer methods). Refer to Section 3.2.1 for details.

Table 3.2 General characteristics by channel used most frequently in 2017

	Total sample	Remitters by channel in Canada				
		Banks and Credit Unions	Digital Transfer Systems	Money Transfer Operators	Cash Transfers	Informal Remit Systems
Remittance use in 2017	36.9%	9.5%	13.7%	65.6%	5.2%	6.0%
Remittance characteristics and preferences						
Amount sent in 2017*	1050	6844	4127	2171	1807	1861
Remittance frequency	1.8	3.3	6.8	5.5	1.7	3.4
Remittance fee (last transfer, %)	5.6	4.2	3.8	6.0	-	4.9
Most important remit factor: sender convenience	14%	17%	25%	15%	12%	11%
Most important remit factor: recipient convenience	24%	19%	16%	30%	25%	28%
Most important remit factor: cost	18%	15%	24%	14%	25%	25%
Most important remit factor: reliability	35%	42%	28%	30%	31%	30%
Most important remit factor: timeliness	9%	7%	7%	11%	7%	5%
Intended for living expenses	59%	49%	62%	62%	46%	55%
Intended for education	22%	15%	24%	24%	11%	14%
Intended for emergency	25%	19%	24%	27%	17%	20%
Intended as a gift	35%	32%	39%	33%	44%	39%
Remitter profile						
Female	52%	47%	48%	52%	55%	48%
Age 18-29	16%	9%	19%	11%	12%	13%
Age 30-59	62%	62%	74%	74%	66%	66%
Age 60 +	22%	30%	7%	15%	23%	21%
Single	20%	14%	19%	16%	15%	17%
Married or commonlaw	68%	75%	73%	72%	73%	72%
Widow or divorced	12%	12%	7%	11%	12%	11%
Household size	3.5	3.4	3.4	3.7	3.7	3.9
Children	0.9	0.7	0.9	1.0	0.9	1.1
Language: No English or French. spoken at home	61%	57%	54%	60%	65%	62%
Household income under \$50,000	37%	27%	25%	36%	27%	30%
HH income \$50,000 to \$79,999	24%	22%	24%	28%	23%	28%
HH income \$80,000 to \$119,999	20%	20%	24%	21%	21%	21%
HH income \$120,000 or more	19%	30%	28%	15%	29%	21%
Years since arrival to Canada	17.7	20.3	11.3	15.3	17.9	18.6
Permanent resident	27%	25%	38%	30%	21%	22%
Temporary resident	5%	3%	11%	5%	2%	4%
Citizen	69%	72%	51%	65%	76%	74%

*Average is lower in the case of the total sample since it includes zero values for non-remitters.

Source: SIMT

Note: This categorisation was chosen to respect the IIA assumption underlying the multinomial logistic model (see Section 3.4) and regroups channels categories with similar characteristics. Additionally, these categories are in accordance with Statistics Canada's conditions for preserving respondent confidentiality. The Research Data Centre (RDC) confidentiality rules restrict the release of data analysis to those categorical variables that contain no fewer than ten observations when the dependent variable (channel categories) is cross tabulated with each categorical explanatory variable in the model. All results are weighted based on recipient characteristics to be representative of the broader Canadian population.

MTOs and other in-person stores are heavily used in Canada to remit internationally. Interestingly, MTOs were most accessed by lower-income groups due to their prominence within the Canadian remittance market. Differences in the usage of MTOs versus other channels primarily lie in disparities in income and channel accessibility amongst remitters. Those who valued timely methods and convenience for recipients

(attributable to the commonly available option of cash pickups for underbanked or unbanked recipients) were also more likely to use MTOs. Finally, and probably the most crucial factor, MTOs provide among the cheapest remittance fees for smaller transfers (refer to economies of scale argument in Chapter 2), especially for less financially literate or less technologically savvy remitters avoiding digital methods. Moreover, unlike informal methods that tend to be corridor-specific, MTOs are commonly available without in-depth knowledge of transfer mechanisms or diaspora network connections.

As hypothesised, the identified remittance factors shed light on remittance modality dynamics. Whereas those who valued recipient convenience favoured MTOs and informal mechanisms,⁶⁶ respondents that identified sender convenience as their most important factor were most likely to remit most frequently through digital channels and least likely to resort to informal or cash transfers. Table 3.2 identifies informal (25.3 per cent), cash (25.2 per cent), and digital methods (23.9 per cent) as having the largest portions of respondents claiming that cost was the most important factor in making their remittance decisions. Despite reliability being the most commonly chosen factor by survey respondents, remitters that most frequently used in-person banks or credit unions to transfer funds abroad were the most likely to list reliability as the most important remittance factor. Finally, although timeliness held a less significant role than other factors overall, those respondents using MTOs frequently in 2017 were more likely to suggest timeliness was an important factor, while informal channel participants were least likely to list timeliness as their top consideration. Cash and informal channels carried the smallest and least frequent transfers.

⁶⁶ Which was also linked to high levels of cash pick-ups but variables on recipient pickups have a relatively poor response rate and were therefore not included in the key statistics for this chapter.

Differences in annual amounts sent and frequency of transfers also varied across channels. Although banks and credit unions were used to transfer the highest average annual amounts (\$6,844), digital methods (but among them primarily non-bank digital methods) were used to remit the most frequently, albeit with smaller amounts (mean of 6.8 times a year compared to 3.3 times per year with banks). Despite the smaller amounts, remitters using digital methods still remitted the second-highest amount annually (mean of \$4,127). Predictably, cash transfers were less frequent (mean of 1.7 times per year) since they relied on remitter or recipient travel plans, and less substantial sums were physically carried across borders relative to other channels (\$1,807 on average).

In terms of the intended remittance purpose, digital transfer mechanisms and MTOs had respondents that were more prone to have answered that the funds were sent to cover recipient living costs or education-related expenses. MTOs also attracted the highest proportion of respondents, indicating that the reason for the transfer was an emergency, which is most likely attributable to its trait as a swifter transfer method – and one enabling cash pickup in the event financial systems are affected by the crisis or disaster in question.

As discussed in the literature review and theory sections, informal channel use often reflects a lack of access (either for the recipient or the sender) and, to some degree, integration in the host country. As in Sander (2004) and Pieke et al. (2005), respondents that most frequently resorted to informal and cash transfers were somewhat less likely to speak French or English at home within Canada. Surprisingly, informal methods are most frequently used by citizens as opposed to permanent or temporary residents. Moreover, informal remittance system users reported having arrived in Canada an average of over 18 years ago, suggesting informal channel usage cannot be associated with a transitory phase

while adapting to a new environment. Instead, informal systems offer a remittance option that established immigrants and naturalised citizens also use.

3.3.3 Channel modality and the predominance of the cost factor

Based on the economies of scale argument of the previous chapter, it is worth delving deeper into the differences in cost structures across channels – especially given the simple averages in Table 3.2 may obfuscate key pricing trends within and between channels. Whether it be the SDGs or the Global Compact for Safe, Orderly and Regular Migration goals, the leading international initiatives and recurrent theme among remittance-related commitments include lowering transfer costs to promote (development-oriented goal) and formalise global remittance flows (security and free capital flow-oriented goals).⁶⁷ The World Bank’s RPW dataset offers useful insights by tracking the costs of sending 200 and 500 USD (CAD for Canada in 2017) across a wide array of remittance corridors. Appendix 3.2A illustrates the average Canadian RPW results across all four quarters in 2017.

Unlike the SIMT data, the RPW estimates do not cover informal methods.⁶⁸ Furthermore, SIMT data include more insights into economies of scale by allowing for higher variance in the amount sent among ODA-eligible country born migrants in Canada. It is worth noting that although banks carry high costs according to the RPW data, they are

⁶⁷ The next chapter, Chapter 4, delves deeper into the historical policy formulation as well as how development, security and economic remittance goals converged on transfer costs as the primary tool resulting from the alignment of policy objectives across key international institutions (particularly the Bank for International Settlements and Bretton Woods institutions) and governments in the aftermath of the 2001 9/11 attacks.

⁶⁸ Although it is worth noting that cash does not carry any explicit cost, there are implicit costs and risks associating with carrying currency that are difficult to estimate. Unfortunately, attempts to proxy the transfer costs using geographic distance between provincial capitals and capitals of destination countries did not yield the desired results. Using great-circle distance or orthodromic distance, one finds that it is weakly negatively correlated with transfer costs since major corridors that carry lower costs (i.e., China, India, and other large corridors) are often further away geographically in the Canadian case. Therefore, geographic distance does not act as a proper proxy for transfer costs.

among the cheapest channels according to the SIMT results. This is largely due to migrants self-selecting into sending larger amounts and taking full advantage of sizeable economies of scale. Still, the SIMT data are not without their drawbacks. In contrast with administrative RPW data, survey data are self-reported. As such, survey data may underestimate transfer costs since many remitters are unlikely to account for exchange rate premiums and other hidden costs.⁶⁹

Figure 3.3 illustrates how RPW and SIMT data compare for Canada in 2017 by channel. Banks and credit unions may be among the most expensive channels for smaller amounts sent, but experience vast economies of scale, even beyond those shown for amounts greater than \$2,000. Banks and credit unions are the cheapest channel on average for amounts in excess of \$2,000, which explains why Table 3.2 portrays these institutions as supplying some of the cheapest remittances (especially given most remitting through banks typically send larger lump-sum amounts per transaction).

⁶⁹ Unfortunately, the SIMT does not include exchange rate fees or other hidden fees respondents may not have considered when responding to the survey. Since it is unknown whether respondents included or excluded these rates in their responses, it is impossible to ascertain which remitters are underestimating costs from those that accounted for indirect fees. Moreover, since the date of transactions were not part of the survey, it is also impossible to add the fees reported to spot exchange rates on the same day of transfer, leaving only yearly average exchange rates as a possible correction for omitted exchange fees (which would assume, most likely erroneously, that all respondents excluded exchange rate fees). Another caveat is that transfer cost data in the SIMT only apply to the last remittance amount sent by respondents or their household in 2017. In the analysis for remittance amounts and frequencies in 2017, the transfer cost percentage was used across all transactions if the remittance channel used most frequently in 2017 matched that used during the last transaction made that year.

Figure 3.3 Receiving money, costs money (last transfer made in 2017)

Sources: SIMT and RPW dataset

Note: The RPW estimates for Banks and MTOs include digital transfers – no clear distinction can be made despite an available breakdown by payment instrument (i.e., cash, credit card, debit card, and other methods). The channels correspond to the channel chosen in the last transfer made, which corresponds to the same remittance as the fee. Cash transfers (apart from those that fall under informal transfers – see classification in Figure 3.2) are excluded since they carry an explicit cost of zero instead of relying on direct sender-to-recipient transfers.

3.3.4 Financial literacy and remittance knowledge

Even though channels have similar pricing for large remittance volumes as higher-end remitters become more sensitive to prices (see Chapter 2), digital and informal methods provide the cheapest options for remitters that opt for smaller transfers. However, these cost advantages have not been sufficient in sapping in-person MTOs' dominant market share. To encompass channel modality holistically, one must study other factors that dissuade migrants from selecting digital and informal channels.

One key barrier to digital methods is the slow transition to online platforms for less financially or technologically savvy remitters. Moreover, other considerations such as a lack of financial integration or financial access also impede both the sender and recipient

(both first and last miles, per the framework in Section 3.2) from using technology-dependent remittance mechanisms that require both parties to have an account.

Since cost structures only account for one factor in understanding channel modality, it is vital to emphasise the role of financial literacy and access to financial tools (sender and recipient convenience impacts). Descriptive statistics vis-à-vis awareness and knowledge of available transmission methods (Figure 3.4) show that financial literacy plays a major role in influencing channel modality. The lack thereof acts as a barrier to perfect information that inhibits optimal decision-making and options.

Figure 3.4 Knowledge and awareness of remittance alternatives

Source: SIMT

Figure 3.4 suggests more straightforward options that rely less on technology are more popular. Digital methods, including website and mobile apps, lag on this front. This may explain lower uptake among remitters despite competitive pricing schemes. Therefore, financial literacy is an important factor that could potentially be captured through the proxy of higher education in the subsequent regression analysis. Figure 3.4 establishes that only

22.6 per cent of respondents knew of or had used informal transfer methods – hinting at the possibility of corridor or diaspora-specific know-how.⁷⁰

3.3.5 Informality of the recipient country as a determinant of channel selection

Since informal regions have higher formal channel costs, lower financial literacy, and corridor specificities, it seems possible that these factors are all linked to path dependence, whereby more informal regions favour informal channels (i.e., Hypothesis 2). The SIMT data are merged with estimates of the shadow economy as estimated by Medina and Schneider (2018) using the Multiple Indicators Multiple Causes (MIMIC) method based on sequential equation modelling. Although the informality data used is for the 2015 calendar year, informality across countries is supposedly stable from 2015 to 2017.⁷¹

Figure 3.5 offers information on corridor-specific dimensions by providing a breakdown by destination country aggregate informality.⁷² More informal regions receiving remittances from Canada tend to experience higher mean prices (across informal and formal channels), which is largely attributable to smaller amounts sent per transaction at higher frequencies and limitations in methods to those that offer cash pick up options. Moreover, informal economies tend to receive smaller annual remittance values, which is likely caused by informality being intrinsically linked to low-income countries rather than informality per se, thereby capturing an income effect (i.e., low-income countries receive less in remittance flows due to lower emigrant and diaspora capacity to remit – see Chapter 2 for the GDP effect on the amount remitted).

⁷⁰ Appendix 3.3A demonstrates that migrants born in South Asia or Sub-Saharan Africa displayed higher knowledge of informal remittance channels as well as usage.

⁷¹ This is particularly given the rather static nature of the estimates within the period from 2010 onwards for the overwhelming majority of countries.

⁷² For more information on SIMT descriptive statistics and corridor information, refer to the Statistics Canada analytical report by Dimbuene and Turcotte (2019).

Figure 3.5 Remittance characteristics by destination country shadow economy size

Sources: SIMT and Medina and Schneider (2018)

Based on the descriptive statistics provided, Hypothesis 2, that remitters favour informal channels when remitting to informal recipient regions, is invalidated and not supported by the SIMT data. Although it may appear counterintuitive at first glance, MTOs are the most likely to be used, both in absolute numbers and relative to more formal economies. This pattern is illustrated in Figure 3.6 below, wherein informal channel usage is not exclusive to highly informal countries. In contrast, MTO market share correlates positively with the informal sector or shadow economy size. The most informal regions (with more than 40 per cent of GDP estimated as informal) gravitate towards MTOs first, followed by informal channels, digital transfer methods, banks, and credit unions.

Figure 3.6 Channel choice by destination country shadow economy size

Sources: SIMT and Medina and Schneider (2018)

Note: Informality as a proportion of GDP estimates (in percentages) on the horizontal axis are obtained using Medina and Schneider's (2018) estimates of the shadow economy based on countries' fiscal burden, institutional quality, economic openness, unemployment, and other control variables.

3.3.6 Data limitations and potential biases

A central issue in the chapter is the surprising use of formal channels in Canada to remit. However, dealings with informal channels are naturally subject to additional measurement challenges, seeing that they are, by their intrinsic nature, more obscure. Unfortunately, this sets limitations on the confidence we can have in this chapter's findings, including the possibility of overstating observations about the dominance of formal transfer methods. Although there are justifiable corrective measures to account for these limitations and the limitations do not undermine the validity of the core findings, acknowledging these shortcomings is critical for research transparency and replicability. Two main types of biases stand out in this chapter: desirability (response) and selection biases.

Desirability bias

In the context of this study, desirability bias refers to migrants' fear of government reprisal or immigration consequences based on migrant status or how they remit abroad. A type of response bias, desirability bias, corresponds to respondents' predisposition, who know they are being interviewed by government officials to appear as only remitting through formal means.

Although such a bias may exist, informal remittance channels are not necessarily illegal, and remittances, like most other income sources, are generally taxed at source, meaning there is rarely anything to hide from Canadian government officials. Regardless of the methods used, obtaining information on illicit flows or money laundering is neither the chapter's objective nor is it feasible to include within this large-sample study using a random sample of remitters. It is also worth noting that nobody in the sample was undocumented since this would be required for random sampling purposes and reduce respondent fears of reprisal.⁷³ However, undocumented individuals could constitute a selection bias in that they are by default excluded from the sample, which is subsequently discussed as a possible selection bias.

Alas, the only viable alternative to address the desirability bias more directly would require researchers to conduct their surveys independently or through non-government linked institutions. However, identifying these individuals within the context of large-scale surveys aimed at quantifying and measuring broader generalisable trends is either too

⁷³ Despite limited degrees of freedom and observations, those having arrived in Canada a number of years ago are marginally more likely to resort to informal channels. However, given the low number of observations, there is no conclusive evidence of lower informal remittance use for those remitters that arrived to Canada more recently, suggesting there is no clear bias within the data. See Table 3.4.

costly or infeasible. The lack of feasibility largely stems from the near impossibility of obtaining a proper random sample, as is the case for the SIMT sample.

Selection bias

Within the context of Chapter 3, selection bias limitations stem from the SIMT data's non-observation of undocumented migrants who are more likely to use informal means. Given undocumented migrants are out of the sample of studied individuals, this bias could lead to overstating findings regarding the low usage of informal methods.

Despite this limitation to the study's findings, two main arguments justify the validity of the chapter's findings. First, including undocumented migrants would impair the study's ability to have a weighted random sample that is broadly generalisable to the Canadian immigrant population born in ODA-eligible countries. Moreover, the inclusion of out of sample undocumented immigrants would be prohibitive in using quantitative methods that rely on normally distributed sampling of the broader population – something that is not possible without knowledge of the size of Canada's undocumented migrant population.

Second, although a relatively weaker argument than the former point, Canada's undocumented population is thought to be small, limiting the overall effect of this potential bias. The latest Canadian border control estimates cited in the 2003 Report of the Auditor General of Canada state that “the gap between removal orders issued and confirmed removals has grown by about 36,000 in the past six years” (Office of the Auditor General of Canada, 2003). This figure does not account for those that may have left without reporting their departure, meaning this number might be overstated, and the undocumented inflows during those years may be smaller still. In sum, evidence suggests any potential

selection bias would lead to minimal changes to overall remittance channel usage and is unlikely to invalidate this chapter's statistically robust findings.

There are no clear alternative methodologies to address this bias other than acknowledging the probable, albeit minor, understatement of informal channel use. Since one cannot randomise the selection of undocumented migrants, the only other methodological options would have to delve into qualitative methods aiming for greater internal validity whilst compromising on the large-sample external validity and quantification of effects derived in this chapter. Furthermore, alternative methods that do not rely on random samples would not yield the confidence intervals and error measurement achieved in this chapter.

3.4 Empirical methodology

Multinomial logistic regressions facilitate the analysis of channel modality. To not violate the IIA assumption, similar channels are regrouped into a typology of aggregate channels common within the literature. This section also addresses the endogeneity issues outlined in the theory section, and the results are presented in Appendix 3.4A. To correct the simultaneity bias in channel modality and amount sent, the chapter uses instrumental variables and uses the predicted residuals in the subsequent multinomial logistic regressions for channel selection.

3.4.1 Multinomial modelling of channel modality

The remittance channel decision-making analysis employs a similar approach to the empirical works previously cited (Amuedo-Dorantes and Pozo, 2005; Karafolas and Konteos, 2010; Siegel and Lücke, 2013; Kosse and Vermeulen, 2014). Therefore, this stage's goal lies in discerning the factors that influence the probability of selecting one

channel over other channels. Using multinomial logistic regressions, channel modality is based on their most frequently used channel throughout 2017. Individual remitters (i) have the choice between five aggregate channels (j): in-person banks or credit unions ($j = 1$), in-person MTOs and stores ($j = 2$), digital mechanisms including all apps, websites or cryptocurrencies ($j = 3$), cash carried by oneself or visiting relatives ($j = 4$), and cash carried by others, informal methods, and other methods ($j = 5$).⁷⁴ This method allows for multiple channels and does not reduce channel modality to the dichotomisation of formal versus informal transfer methods.

Individual i , having decided to remit, has the choice between five channels where $j \in [1,5]$ and opts for the one that yields the highest utility, denoted U_{ij} . The determinants of this utility decision are denoted D_{ij} and vary by individual i and channel j . The determinants can be personal characteristics, recipient characteristics, corridor-specific factors, or preferences such as sensitivity to cost, timeliness of transfer, and other such inclinations. The channel modality utility equation, as in Kosse and Vermeulen (2014) and Amuedo-Dorantes and Pozo (2005), can be modelled as follows:

$$U_{ij} = D_{ij}\alpha_j + \varepsilon_i$$

where the coefficients vector α_j varies across channels, and the error term ε_i is assumed to be independent. The probability of choosing a channel and maximising one's utility using a specific channel can be formally denoted as follows:

⁷⁴ As previously stated in Section 3.3, this categorisation was chosen to respect the IIA assumption underlying the multinomial logistic model as well as be in accordance with Statistics Canada's conditions in preserving respondent confidentiality. The confidentiality rules of the Research Data Centre (RDC) only allow release of data analysis that contain no fewer than 10 observations when the dependent variable (each channel, j , numbered 1 to 5) is cross-tabulated with each categorical explanatory variable in the model. In accordance with these confidentiality restrictions, per the Canadian *Statistics Act*, these categories enable the preservation of respondent confidentiality without obfuscating key results across non-aggregated channels. Refer to Figure 3.2 for a detail of channel reclassifications.

$$Prob(C_i = j) = \frac{\exp(\alpha_j, D_{ij})}{\sum_{k=1}^5 \exp(\alpha_k, D_{ik})}$$

where, as in Kosse and Vermeulen (2014), C_i refers to the channel chosen by individual i . As in previous studies, the magnitude with which a channel is preferred over another is best captured by ensuring the coefficients are easily interpretable relative risk (or odds) ratios ($Prob_{ij}/Prob_{i,MTO}$) with in-person MTOs as the reference category. As Amuedo-Dorantes and Pozo (2005) argue, this makes the results easy to interpret since a coefficient value of 1 would imply the relevant channel is equally as likely as the reference channel, whereas a relative risk ratio lower than one or higher than one would mean it is less or more likely respectively. Provided that these are relative odds ratios, a coefficient of 2 would mean the channel in question would be twice as likely to be selected. In contrast, a coefficient of 0.5 would mean that channel is half as likely to be chosen compared to the reference category, i.e. MTOs.

3.4.2 Addressing endogeneity: The simultaneity bias

Unfortunately, the simultaneity bias issue remains. This issue stems from the fact that not only can the amount sent affect channel modality, but the cost structure of individual channels may also influence the amount sent. For instance, one may want to remit more at a time, albeit less frequently, if considerable economies of scale are reached within a discrete step structure as described by Amuedo-Dorantes and Pozo (2005).

Furthermore, the discrete jumps they mention do not reflect most MTO customers' realities in Canada, given there are no discrete jumps in cost that would make an individual pay more in transfer costs (in terms of percentage of the amount remitted) if they were to remit more. At least not for larger providers such as Western Union or MoneyGram.

Moreover, most remitters in the SIMT sample use a single remittance method, suggesting this form of endogeneity is unlikely.

Kosse and Vermeulen (2014) suggest that the discrete step complication is less problematic when studying annual amounts remitted (such as this chapter using the most frequently used channel as the dependent variable) rather than analysing an individual transaction. Although remitters are likely to resort to lump-sum transfer in such instances and adjust the frequency they remit, as well as change their channel modality of choice, in the short-run (such as on a weekly or monthly basis), this is far less likely to occur annually. However, if one were to select the last remittance sent as the dependent variable, the possibility for this simultaneity bias would exist.

Although this form of endogeneity is improbable, a replication of Amuedo-Dorantes and Pozo's (2005) endogeneity correction estimation using the number of recipients as an instrumental variable (IV) for the amount remitted is tested. Given the number of recipients is positively correlated (albeit weakly at 0.5) with the amount sent but does not causally impact the choice of channel, it serves as an IV to correct for possible dual causation or simultaneity. Using a left-censored Tobit regression, one estimates and saves the predicted values for the amount remitted with the number of recipients as the main explanatory variable. These same predicted values are then used within the multinomial logistic regression to estimate the predicted Canadian dollar amount remitted (IV) during the migrant's last transfer in 2017 (refer to Appendix 3.4A for results). However, the results are not overly compelling since the weakly correlated IV (number of people remitted to in 2017) also provides low goodness of fit in predicting values.

Ultimately, like in Kosse and Vermeulen (2014), this chapter relies on the fact that, even if such a form of endogeneity exists, its effect is likely limited when analysing yearly flows.

3.5 Results

This section summarises the empirical results of the multinomial logistic regressions. The results are divided into two parts: (1) channel selection and (2) remitter priorities linking causal factors to key household characteristics and patterns across corridors.

3.5.1 The determinants of remittance modality

Table 3.3 outlines the multinomial logistic regression results in treating each respondent's most frequently used channel in 2017 as a dependent variable. As outlined in the methodology section, this maximum entropy model is ideal when comparing the relative likelihood of selecting any given channel over any other, holding all other explanatory variables constant. All multinomial logistic regression coefficients are calculated as relative risk ratios or relative odds ratios for ease of comparison. The subsequent analysis of the results is split among several categories of explanatory variables.

Most important factor identified by the remitter

In line with the first-to-last mile theoretical framework, six main factors are isolated to better understand the dynamics underlying remitter modality choices. First, those respondents having chosen sender convenience as the most important factor affecting their remittance decisions were more than twice as likely to opt for digital or informal methods than other channels. However, it should be noted that, although banks and credit unions were not statistically significantly different from MTOs at the 10 per cent threshold, they were at the 14 per cent threshold, thereby indicating that it also may be a more likely channel selection for those remitters favouring convenience. Therefore, cash transfers and

in-person MTOs were least likely to be chosen with no statistically significant difference between the two.

Second, selection of recipient convenience as one's preferred factor suggested informal methods were 2.37 times as likely to be selected relative to in-person MTOs (reference category), whereas all other methods were not statistically significantly different from the reference channel. This result is most likely due to recipients in remote or underfinanced areas being inconvenienced by other transfer modalities with limited or no access.

Third, reliability was the factor that made banks and credit unions, digital methods, and especially informal methods, more likely to be chosen over in-person MTOs or cash. As the most commonly picked factor, reliability can be linked to individual perceptions of trust. Although it could also be that respondents perceived this answer ("reliability of the method") as an indication of the importance of competitor choices within that channel category. Otherwise stated, the high coefficient for informal channels indicating they are 187 per cent more likely to choose informal methods over MTOs if they selected reliability as the most important remittance factor could be the wrong interpretation. Instead, it could be that those selecting informal methods were 187 per cent more likely to select a remittance service provider of that channel type since informal methods, as indicated in the literature review, are more likely to rely on remitter-provider trust.

Table 3.3 Remittance modality by most frequently used channel

Reference channel: MTOs (in-person)	(1)		(2)		(3)		(4)	
	Banks and credit unions (in-person)		Digital methods		Cash		Informal methods	
Remitter priorities (first-to-last-mile)								
Most imp. factor: Sender convenience	1.42150	(0.13924)	2.64878***	(0.00000)	1.12994	(0.68308)	2.03161**	(0.04396)
Most imp. factor: Recipient convenience	1.01672	(0.94260)	0.81703	(0.27231)	1.22318	(0.44201)	2.36734***	(0.00553)
Most imp. factor: Cost	1.48472*	(0.09251)	1.85707***	(0.00052)	2.04817***	(0.00547)	3.88769***	(0.00001)
Most imp. factor: Reliability	1.72869**	(0.01039)	1.35867*	(0.07588)	1.30959	(0.28814)	2.87270***	(0.00058)
Intended for living expenses	0.88418	(0.29544)	1.06801	(0.50341)	1.00719	(0.95660)	0.89537	(0.42486)
Intended for education	0.75777*	(0.06281)	0.79632**	(0.03366)	0.94091	(0.74925)	0.64056**	(0.01754)
Intended for emergency	0.87503	(0.29886)	0.85747	(0.13258)	0.69035**	(0.02529)	0.73564**	(0.04723)
Intended as gift	0.75135**	(0.01649)	1.17196*	(0.09260)	1.43387***	(0.00705)	1.49551***	(0.00308)
Other remittance choices								
Amount remitted	1.00009***	(0.00000)	1.00006***	(0.00000)	1.00003	(0.22922)	1.00001	(0.71826)
Frequency remitted	0.92897***	(0.00081)	1.00949	(0.13788)	0.70711***	(0.00000)	0.91549***	(0.00037)
Used other methods	1.80258***	(0.00000)	3.13409***	(0.00000)	2.95568***	(0.00000)	5.63470***	(0.00000)
Regional and corridor impacts								
Diaspora size	0.99977	(0.49736)	1.00097***	(0.00165)	0.99798***	(0.00000)	0.99858***	(0.00042)
Informality (shadow economy size)	0.97571***	(0.00019)	0.97602***	(0.00002)	0.96973***	(0.00043)	0.97940***	(0.00820)
GDP per capita (destination)	1.00005***	(0.00000)	1.00004***	(0.00000)	1.00002***	(0.00000)	1.00001	(0.26875)
Americas	0.61328**	(0.01995)	0.93978	(0.75143)	0.72248	(0.16732)	0.50202***	(0.00839)
Europe, W. Asia and Middle E.	1.37912	(0.13514)	1.12336	(0.59621)	1.07003	(0.78366)	1.31520	(0.27489)
Sub-Saharan Africa	1.00607	(0.97960)	2.15999***	(0.00016)	0.70735	(0.20602)	1.28833	(0.34157)
North Africa	1.25735	(0.34764)	1.85633***	(0.00678)	2.29890***	(0.00088)	1.58203*	(0.09326)
East Asia	3.73843***	(0.00000)	0.90391	(0.72364)	11.86210***	(0.00000)	3.11236***	(0.00245)
S-E. Asia and Oceania	0.70674**	(0.04201)	0.65934***	(0.00213)	0.67730	(0.10453)	0.65962*	(0.06928)
Remitter profile								
Female	1.06757	(0.53638)	1.06922	(0.45671)	1.21964	(0.13152)	1.00578	(0.96445)
Age 30-59	0.88376	(0.52181)	0.70080***	(0.00905)	0.68697*	(0.08565)	0.55201***	(0.00409)
Age 60 +	1.84537**	(0.01114)	0.61308**	(0.02864)	1.29470	(0.37413)	0.85806	(0.59375)
Household size	0.94387	(0.15947)	0.89873***	(0.00013)	0.98568	(0.73925)	1.04264	(0.24448)
Do not speak Eng./Fr. at home	0.79137*	(0.05020)	0.80880**	(0.03152)	0.96214	(0.79018)	0.88787	(0.40720)
Education: High school	1.30965	(0.29622)	1.20411	(0.52961)	0.86493	(0.63014)	0.71082	(0.20927)
Education: College, trade, or s. uni.	1.20189	(0.45878)	1.71786*	(0.05393)	1.11092	(0.70329)	0.73983	(0.23513)
Education: Bachelors	1.74735**	(0.02341)	2.68701***	(0.00042)	1.50366	(0.13926)	0.90179	(0.68573)
Education: Graduate	2.54923***	(0.00018)	3.12474***	(0.00006)	1.82199**	(0.03460)	1.13776	(0.62854)
HH income \$50,000 to \$79,999	1.11118	(0.49486)	1.30073**	(0.04417)	1.12609	(0.52180)	1.20694	(0.26635)
HH income \$80,000 to \$119,999	1.25434	(0.14622)	1.80755***	(0.00001)	1.34828	(0.11431)	1.07543	(0.68634)
HH income \$120,000 or more	1.80330***	(0.00018)	2.49049***	(0.00000)	2.24984***	(0.00002)	1.18434	(0.37095)
Years since arrival to Canada	1.01065*	(0.09169)	0.97392***	(0.00002)	0.99496	(0.47821)	1.01692**	(0.02033)
Permanent resident	1.53746***	(0.00482)	1.27962**	(0.03478)	0.89201	(0.52705)	1.11319	(0.54041)
Temporary resident	1.07287	(0.83080)	1.80663***	(0.00290)	0.52443	(0.14674)	0.88545	(0.78758)
Constant	0.07852***	(0.00000)	0.06034***	(0.00000)	0.21805**	(0.01106)	0.04803***	(0.00000)
Observations	6,237		6,237		6,237		6,237	

Robust p-values in parentheses. Cost variable based on last transfer (only applied if the channel used most frequently in 2017 matches the channel used last). Reference categories for categorical variables are: education (no high school degree), male, age 18 to 29, do speak French or English at home, household income under \$50,000, Canadian citizen, did not use other remittance methods, birth region as South Asia, and the most important factor affecting remittance choice as timeliness. *** p<0.01, ** p<0.05, * p<0.1

Fourth, as perceived by the sender through the logic of backwards induction, recipient needs are captured through respondents stated intended purpose of remitting. As seen in Table 3.3, respondents having said at least a portion of their remittances were intended to cover expenses related to emergencies selected were less likely to select cash and informal methods (31 and 26.4 per cent, respectively) than MTOs. The underlying reasons are likely due to the higher average transfer speeds (i.e., timeliness) of formal methods, which aligns with the theory that varying needs have interaction effects with other factors. Additionally, more regular remittance to cover ongoing expenses such as education expenses favoured in-person MTOs, whereas digital, cash and informal methods were more popular if the money was for gifts.

Fifth, although timeliness acted as the reference category, those that chose timeliness as the most important remittance decision factor tended to gravitate towards in-person MTOs (refer to Table 3.2).

Finally, the cost factor proved to be essential. Respondents claiming to be sensitive to costs were least likely to use in-person MTOs. Instead, those stating they were sensitive to costs were almost four times as likely to choose informal methods, twice as likely to choose cash transfers, and respectively 85.7 per cent and 48.4 per cent more likely to select digital methods or banks (and credit unions) compared to in-person MTOs.

Unfortunately, to further analyse the cost factor, the inclusion of transfer costs restricted the sample substantially.⁷⁵ It led to the violation of the IIA assumption (using both the Hausman seemingly unrelated estimation and the Small-Hsiao tests⁷⁶) for both

⁷⁵ Cash transfers are excluded since they carry no explicit fee. Moreover, transfer costs are only available for the last transfer within the SIMT – therefore, only costs for those respondents that used the same remittance channel in their last transfer as their most frequency used were studied.

⁷⁶ IIA test null-hypothesis H_0 : Odds(outcome j vs outcome k) are independent of other alternatives

banks (and credits unions) and digital transfer methods, relative to in-person MTOs. Although the narrower sample, which excludes cash transfers and only includes those who last used the same channel they used most frequently in 2017, does lend some credence to the uniform treatment of formal remittance methods. It also suggests that the cost factor holds primacy over other factors when pitting formal channels against one another. Ultimately, this result corroborates the findings in Table 3.3 despite violating the decision independence axiom.⁷⁷

The impact of other remittance choices

Building on the findings of Chapter 2, remittance decisions vis-à-vis the amount remitted and the frequency of transfers impact channel choice. As in the descriptive statistics presented in this chapter's data section, the larger volume remitters had a higher likelihood of opting for banks (and credit unions) and digital remittance channels. There was no statistically significant disparity between selecting the remaining three channels based on the amount sent.

Seemingly unrelated estimation based Hausman IIA test results:

Omitted	χ^2	df	$Pr(\chi^2)$	Evidence
Banks and credit unions	2.1e+04	78	0.000	Against H_0
Digital transfer methods	8.9e+04	78	0.000	Against H_0
Informal remittances	40.635	78	1.000	For H_0

Small-Hsiao IIA test results:

Omitted	lnL(full)	lnL(omit)	χ^2	df	$Pr(\chi^2)$	Evidence
Banks and credit unions	-907.628	-809.918	195.42	78	0.000	Against H_0
Digital transfer methods	-621.511	-536.033	170.957	78	0.000	Against H_0
Informal remittances	-1120.73	-1082.41	76.646	78	0.522	For H_0

⁷⁷ For more information on ranked decision-making models, one can look to seminal works in social choice theory, including Kenneth Arrow's impossibility theorem. An important critique of the IIA assumption is based on Condorcet's classic jury theorem, which states the IIA assumption's incompatibility with the majority rule. This critique is particularly relevant in this case of Canadian remittance decision modelling given the prominence of in-person MTO use over all other methods combined (see Table 3.2).

Regarding the frequency of transfers, in-person MTOs and digital channels were the most likely to be used by frequent remitters, followed by banks and credit unions and informal channels. Furthermore, the coefficient estimate for the frequency of transfers is statistically significant at the 14 per cent level (see Table 3.3) as a factor that positively affects the likelihood of using digital methods.

Another interesting remittance trend that partially explained channel decision-making was remitters' answers to the question of whether they used other remittance channels in 2017. All channels had a higher likelihood of remitters having used other methods compared to in-person MTOs, with MTOs and exchange stores capturing the dominant share of the Canadian remittance market. Users of informal channels were most likely to use other methods, more than five times as likely as in-person MTO users. This result is crucial in understanding channel choice dynamics. Seeing that MTOs played an even more dominant role than the most frequently used channel statistics suggest, they are the leading runner-up channel choice for most remitters.

Recipient region characteristics and informality

This portion of the results of remittance modality tackles recipient country and corridor impacts. However, before delving into corridor specifics, the most important result here is the recipient country's informality as proxied using estimates of the shadow economy size (see Medina and Schneider, 2018). In-person MTOs are surprisingly the most likely channel used by those remitting to more informal countries. Even more surprising is that, on top of informal methods being two per cent less likely to be used for every percentage point increase in the estimated portion of the recipient country's shadow economy, is that digital channels, as well as in-person banks and credit unions, were only

another 0.3 per cent less likely. This result indicates that, in the Canadian context, informal channels are not the preferred remittance channel to informal economies, thus rejecting the hypothesis based on the extant remittance literature.

The destination country's diaspora in Canada and the GDP per capita of the destination country also influence remittance modality. Though a larger diaspora in Canada was associated with higher digital remittance channel use (linked to corridor specific remittance transfer websites and apps), it correlated with a decrease in cash and informal channel usage despite a presumed increase in back-and-forth traffic. This result is primarily driven by Filipino, Chinese, and Indian remitters (among other more significant corridors), who have established major corridors of low-cost digital channels, thereby explaining how the major market force dominates larger diaspora effects. Regarding the GDP per capita of the destination country, more advanced economies tended to be associated with all other methods other than in-person MTOs and informal channels, which further confirmed that these two channels targeted a similar remitting clientele.

Results in table 3.3 also exhibit several corridor specific trends. Most notably, East Asia born migrants were almost twelve times as likely to remit using cash and more than three times as likely to remit using banks or informal methods than in-person MTOs or digital channels. Other groups with strong penchants for channels other than in-person MTOs included North African-born migrants (who prefer digital, cash or informal transfers) and Sub-Saharan African-born migrants (who prefer digital remittances).

Remitter demographic and socioeconomic profile

Linking remitter profiles to channel preferences is important in the tailoring of more targeted policies. For this reason, in the finding that highly educated and higher-income

households favour banks and credit unions, digital methods, and cash are critical. This pattern suggests that more educated remitters favour digital mechanisms based on sender convenience and cost advantages. Educated remitters also prefer banks and credit unions for their cost and reliability advantages when sending significant amounts (refer to Chapter 2 argument on economies of scale). More surprisingly, educated remitters also favoured the use of cash, which is most likely attributable to frequent trips to, or visits from, the “home” country (i.e., when opportune). If we assume that formal education is positively related to financial literacy, as seems reasonable, then the observed pattern suggests that governments might be able to influence remitter behaviour with financial skills training for immigrants.

Other demographic trends include women’s lower likelihood of carrying cash (only significant at the 13 per cent level), prime working-age (30 to 59 years) remitters’ preference for banks and in-person MTOs, and younger remitters’ higher likelihood of resorting to digital mechanisms. Interestingly, those having spent the most years in Canada were more likely to use banks, credit unions, and informal methods to remit, and temporary residents favoured digital channels over all other remittance methods. Finally, as a proxy for immigrant integration, those who reported speaking English or French at home were more likely to use banks, credit unions, or digital channels to remit than all other channels, thereby suggesting that immigrant integration favours remittance formalisation.

3.5.2 Factor preferences by demographic and socioeconomic status

As demonstrated in Table 3.3, factor preferences are critical in better understanding remittance modality, but the analysis thus far has not connected these factors back to remitter demographics to understand trends and origins for these preferences. This section

fulfils that role by taking remitter priorities as the dependent variable categories in a multinomial logit model (with reliability acting as the reference category) to see how they may be affected by socioeconomic and demographic explanatory variables. Table 3.4 has a higher number of observations since it expands the sample to all those that have ever remitted rather than limiting it to those that remitted in 2017.⁷⁸

Sender characteristics impacting the importance allocated to each priority

Some of the most revealing sender traits were their educational attainment and household incomes (see Table 3.4). In similar veins, both higher degree obtention and household incomes make migrants more sensitive to cost and reliability factors than convenience (of either sender or recipient) and timeliness. The education factor most likely acts as a proxy for financial literacy, whereas the household income variable can be inferred as being linked to cost sensitivity. This is because, as per Chapter 2 results, higher-income individuals remit more on average and are at least 22 per cent more likely to be sensitive to costs.

⁷⁸ However, it should be noted that the sample used in the previous subsection (Table 3.3) produced similar results – albeit less robust due to the less extensive sample size.

Table 3.4 Remitter priorities and preferences (reliability of channel as reference category)

Reference category: Reliability	Most important factor when remitting				Add control for remittances intended to alleviate burden of emergencies			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Sender convenience	Recipient convenience	Cost	Timeliness	Sender convenience	Recipient convenience	Cost	Timeliness
Education: High school	0.98223 (0.90670)	0.99008 (0.93824)	1.06082 (0.71202)	0.83913 (0.29424)	1.16197 (0.41682)	1.20934 (0.22022)	1.12424 (0.54911)	1.02855 (0.88915)
Education: College, trade, or s. uni.	0.78288* (0.09111)	0.84303 (0.16186)	1.19829 (0.22765)	0.72374** (0.04030)	1.00243 (0.98889)	1.07211 (0.63324)	1.37647* (0.08071)	0.99394 (0.97432)
Education: Bachelors	0.66617*** (0.00653)	0.67744*** (0.00178)	1.25724 (0.12971)	0.51401*** (0.00007)	0.82858 (0.29518)	0.90361 (0.49845)	1.48517** (0.03280)	0.71833* (0.09885)
Education: Graduate	0.58125*** (0.00065)	0.58135*** (0.00005)	1.14997 (0.37316)	0.41911*** (0.00000)	0.81570 (0.27927)	0.71577** (0.03656)	1.39428* (0.08304)	0.52764*** (0.00314)
Female	0.79488*** (0.00136)	0.92714 (0.20240)	0.80166*** (0.00048)	1.00475 (0.95440)	0.79415*** (0.00610)	0.88111* (0.07380)	0.80019*** (0.00466)	1.02747 (0.78360)
Single	0.93827 (0.67383)	1.11177 (0.40656)	0.87489 (0.32755)	1.22928 (0.22715)	0.87960 (0.46920)	0.94326 (0.70285)	0.81885 (0.23879)	1.08467 (0.69350)
Married/commonlaw	1.03723 (0.76061)	1.07429 (0.46787)	0.84317 (0.11018)	1.07131 (0.59993)	0.90390 (0.48452)	0.92821 (0.53448)	0.78490* (0.07778)	1.03488 (0.83333)
Age 30-59	0.88780 (0.38778)	1.16298 (0.20113)	0.74464** (0.01219)	0.96930 (0.84655)	0.89430 (0.46784)	1.17546 (0.23587)	0.70320** (0.01159)	1.01075 (0.95373)
Age 60 +	0.74088* (0.08506)	0.95285 (0.74550)	0.53365*** (0.00011)	0.81301 (0.30639)	0.72889 (0.11648)	1.00463 (0.97912)	0.51735*** (0.00111)	1.03764 (0.87540)
Household size	0.98305 (0.47259)	1.04807** (0.01284)	1.03111 (0.13479)	1.01849 (0.49668)	0.98259 (0.53018)	1.05412** (0.01672)	1.03450 (0.17978)	1.03690 (0.25611)
Do not speak Eng./Fr. at home	0.98320 (0.83132)	1.14231** (0.04231)	1.08165 (0.25327)	0.92604 (0.39201)	0.94229 (0.51741)	1.13902* (0.09166)	1.05185 (0.55325)	0.98881 (0.31745)
HH income \$50,000 to \$79,999	0.86589 (0.13399)	1.00613 (0.93822)	1.01334 (0.87711)	0.90352 (0.33944)	0.87494 (0.23267)	0.95646 (0.63329)	0.99751 (0.98132)	0.83838 (0.15985)
HH income \$80,000 to \$119,999	0.74590*** (0.00538)	0.88770 (0.16026)	1.10122 (0.28981)	0.81303* (0.07653)	0.77008** (0.03403)	0.83966* (0.08464)	1.06497 (0.57937)	0.75194** (0.04118)
HH income \$120,000 or more	0.77667** (0.01721)	0.77749*** (0.00509)	1.02777 (0.77247)	0.67248*** (0.00183)	0.82150 (0.11229)	0.76807** (0.01331)	1.07858 (0.52435)	0.63153*** (0.00205)
Years since arrival to Canada	0.99809 (0.63898)	0.99471 (0.10969)	0.97813*** (0.00000)	0.99263* (0.08516)	1.00512 (0.30415)	0.99900 (0.80697)	0.97991*** (0.00004)	0.99632 (0.48642)
Permanent resident	1.20387* (0.06002)	1.11236 (0.19539)	0.91332 (0.29244)	1.13474 (0.25509)	1.24354* (0.05378)	1.10663 (0.28788)	0.94280 (0.57212)	1.07179 (0.59560)
Temporary resident	1.83943*** (0.00239)	1.53312** (0.01961)	1.18676 (0.34200)	1.57909** (0.04832)	1.74768** (0.01049)	1.36943 (0.11562)	0.98204 (0.93164)	1.24140 (0.41060)
Diaspora size	1.00023 (0.28644)	0.99977 (0.18649)	0.99943*** (0.00461)	1.00018 (0.52937)	1.00011 (0.66805)	0.99962* (0.07066)	0.99924*** (0.00281)	1.00054 (0.12085)
Americas	1.13033 (0.41142)	0.94065 (0.60818)	1.01268 (0.92037)	1.55587** (0.01307)	0.97767 (0.89510)	0.88046 (0.35740)	0.96657 (0.82527)	1.73918** (0.01054)
Europe, W. Asia and Middle E.	0.93362 (0.66337)	0.86350 (0.24117)	0.91692 (0.50710)	1.32500 (0.13363)	0.89936 (0.56787)	0.86526 (0.33480)	0.83682 (0.28266)	1.47904* (0.09370)
Sub-Saharan Africa	0.99544 (0.97842)	0.91477 (0.50761)	1.06243 (0.66165)	1.50594** (0.03891)	0.84446 (0.38042)	0.79804 (0.14525)	0.99950 (0.99760)	1.64992** (0.03686)
North Africa	0.68725* (0.05683)	0.73348** (0.03743)	1.05658 (0.70809)	2.52736*** (0.00000)	0.70332 (0.12287)	0.69498** (0.04166)	1.04696 (0.80321)	3.02803*** (0.00000)
East Asia	0.67173** (0.01603)	0.49791*** (0.00000)	1.02634 (0.85850)	0.30239*** (0.00001)	1.00347 (0.98836)	1.00412 (0.98437)	1.54371* (0.05789)	0.54280* (0.09143)
S-E. Asia and Oceania	1.21499* (0.07577)	1.10782 (0.26403)	0.69024*** (0.00076)	0.62225*** (0.00170)	1.12574 (0.35050)	1.07391 (0.50776)	0.67766*** (0.00406)	0.55117*** (0.00066)
Intended for emergencies					0.77885** (0.01268)	1.13269 (0.11069)	1.10400 (0.25805)	1.07265 (0.51321)
Constant	0.69186 (0.21333)	0.76487 (0.26869)	1.19685 (0.49818)	0.39656*** (0.00520)	0.77916 (0.46979)	0.82907 (0.51031)	1.21933 (0.54902)	0.27364*** (0.00126)
Observations	10,116	10,116	10,116	10,116	7,028	7,028	7,028	7,028

Robust p-values in parentheses. Reference categories for categorical variables are: education (no high school degree), male, age 18 to 29, do speak French or English at home, household income under \$50,000, Canadian citizen, did not use other remittance methods, birth region as South Asia, and the most important factor affecting remittance choice as timeliness. *** p<0.01, ** p<0.05, * p<0.1

Other important remitter characteristics include gender, age, immigration status, and language skills as a proxy for social integration within Canada. Female respondents are 20 per cent less likely to select cost or sender convenience as the most important factor influencing their remittance decisions. Instead, the average female remitter favours recipient convenience, reliability and timeliness equally (i.e., no statistically significant difference among these three factors). As for age, younger remitters were more likely to list cost as the most important factor influencing their decision, and those aged over 60 were less likely to choose sender convenience as a determining factor. The longer migrants spent time in Canada, the lower their propensity to favour cost and timeliness factors. In contrast, temporary residents were most likely to select sender convenience, timeliness of transfer, and recipient convenience as their primary factor. Lastly, those who did not speak English or French at home tended to favour recipient convenience, which is, as with temporary residents, likely attributable to favouring cash pickups and considerations regarding the recipient being underbanked.

Corridor-specific factor preferences

Many factor preferences were significantly corridor-specific, with remitters born in Africa more likely to choose timeliness over any other factor, whereas those born in East and Southeast Asia and Oceania were least likely to make this choice. As another example, those born in the Americas were 50.6 per cent more likely to choose timeliness as their factor of choice over any other factor, with those born in South Asia acting as the reference group.

The impact of urgent needs on factor importance

Another element when studying remitters' priorities is interaction effects and the impact of urgent needs and emergencies on other remitter priorities, whether this means compromising cost to favour speed or other behaviour changes. In Table 3.4, Model 2 is nearly identical to Model 1, but adds a binary emergency variable as the intended purpose of remitting to capture priorities such as urgent recipient needs. In events where the remitter sent at least a portion of the funds to help during acute crises or emergencies, sender convenience is not a priority. This result highlights the focus remitters have on more critical factors in times of urgency, leading to a roughly 22 per cent reduced likelihood of selecting sender convenience over any of the four other factors – recipient convenience, reliability, cost and timeliness. Finally, although the effect of an emergency on the likelihood of prioritising recipient convenience is not significant at the 10 per cent level, statistical significance is barely rejected with a p-value of 0.11, which suggests that emergencies also share this effect of favouring recipient convenience for pick-up options.

3.6 Conclusion

At the onset of the chapter, it was established that informal channel use endures despite extensive regulatory policies to discourage their use, numerous formal alternatives, and a significant level of isolation from ODA-eligible countries that precludes or inconveniences myriad informal methods. Therefore, the chapter sought to explore the underlying rationale for remittance modality choices and better understand the micro determinants that explain the continued use of certain methods over others. It was posited that the frequent dichotomisation of formal versus informal remittances is reductionist in that it obscures

crucial differences across remittance channels – especially in light of the continued use of informal methods despite cheaper alternatives and the dominance of MTOs.

Linking this analysis back to the hypotheses outlined in this chapter, the data demonstrate that convenience, knowledge and financial literacy, transfer costs, channel reliability, transfer timeliness, and recipient needs are crucial factors. The first hypothesis linking these factors to the first-to-last mile model is fundamental in distinguishing channel use. Like Kosse and Vermeulen (2014), the chapter demonstrates the gravitation towards informal channels and MTOs to leverage lower transfer costs; however, this chapter shows the crucial impact of recipient characteristics and financial access when considering informal channels. Moreover, these factors help distinguish between the usage of competing formal channels. Although differences between banks and MTOs matter little when using their respective digital service variants, the various factors, remitter profiles, and the interaction with other channel decisions clarify and nuance channel choices beyond the formal versus informal binary. The rise of digital means and their evolving characteristics is something past research has scantily addressed (Dimbuene and Turcotte, 2020).

Regarding the second hypothesis, this chapter dispels the perception that informal channels are more likely to be used by remitters from countries with a larger informal economic sector. Albeit counterintuitive, all else held equal, destination countries with high degrees of informality were more likely to resort to MTOs than informal methods. This finding invalidates the second hypothesis of the chapter and contrasts findings in other regions – including the macro-level findings in Chapter 5. MTOs are the fiercest competitors to informal methods. The prevalence of MTO use is due to their cash pick-up

or delivery options, which make remitted funds readily available to recipients, including in countries with high degrees of informality. Canada's geographic isolation from low-income countries and various corridor specificities might mean that these observations could be specific to Canada rather than internationally applicable, a possibility that is explored further in the global analysis conducted in Chapter 5. This finding has significant policy ramifications given the high number of programs promoting remittances through banks and other formal financial institutions.

Another key finding of this study supports the notion that cash transfers operate quite distinctly from informal methods, and the two should not be lumped into the same category. Unlike other economies, in Canada, cash is primarily an opportunistic option. The study of SIMT data suggests highly educated individuals and high-income earners often resort to cash out of convenience when visiting abroad or receiving visitors, especially considering it carries a zero explicit cost (but an implicit risk cost remains). This finding aligns with Siegel and Lücke (2013) and Kosse and Vermeulen (2014), who find that cash has distinct properties, especially when cash is used out of convenience by those travelling back to their home country. However, this result contrasts Amuedo-Dorantes and Pozo (2005) and Karafolas and Konteos (2010), who equate cash and informal channels. Overall, preferences in terms of sender and receiver convenience, cost, speed of transfer, receiver needs, and reliability of the method play important roles in determining channel choice.

Given the already high formal remittance use levels, it may prove difficult (and unnecessary from a development standpoint) to formalise the Canadian remittance infrastructure beyond its current levels. From a policy perspective, cash hardly appears to

take on the same role as *viajeros* crossing the US-Mexico border or other types of informal methods reliant on proximate border crossings. Canada's isolation from the developing world means its hand-carried remittances are more differentiated from its informal methods.

However, from an international development standpoint, the most pivotal finding suggests that informal remittances are mainly used by lower-income remitters, thereby casting doubt on the wisdom of existing formalisation policies. Global efforts to promote remittances, particularly formal remittances, for poverty alleviation purposes may not only be misplaced, but could potentially exacerbate income and wealth inequalities if acting as a regressive tax of sorts.

Although remittances among middle and high-income migrants may benefit global international development efforts, a rethink of existing policies and the incentives they create merits further attention within academic and policy circles. A greater emphasis should be placed on the equitable impacts of remittance policies and mitigating the risks of exacerbating existing wealth and income inequalities. Chapter 4 further explores how existing remittance policies remain rooted in a security agenda, shaping current policy prescriptions.

Finally, data enhancements are necessary if scholars are to better understand these constantly evolving flows and the true magnitude of informal flows worldwide. Not only are channels more complex and heterogeneous than the formality binary, but they vary across corridors, retailers, digital platforms, currencies, and a plethora of other factors. Although there have been vast improvements in our understanding of remittances' development impacts, remittance harnessing to this end, and channel choice, much of the

work serves to nuance current findings in different geographic and cultural settings; this chapter sets the spotlight on the Canadian case. In Part II, Chapters 4 and 5 broaden the scope of the dissertation beyond the Canadian case study by examining macro remittance flows and policies at the global level for increased external validity as well as the dynamic analysis of trends over time.

3.7 Appendices

Appendix 3.1A Interdependence of irrelevant alternatives testing

Related to table 3.8

Seemingly unrelated regression-based Hausman tests of IIA assumption (N=6235)

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives.

Omitted	Chi-squared	df	p-value	Hypothesis
Money Transfer Operators (MTOs) (reference)				
Banks and Credit Unions	96.6	114	0.880	Accept Ho
Digital Transfer Systems	121.3	114	0.301	Accept Ho
Cash Transfers	108.1	114	0.637	Accept Ho
Informal Remittance Systems	96.1	114	0.886	Accept Ho

Related to table 3.9

Seemingly unrelated regression-based Hausman tests of IIA assumption (N=10116)

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives.

Omitted	Chi-squared	df	p-value	Hypothesis
Reliability	(reference)			
Sender Convenience	56.473	75	0.946	Accept Ho
Recipient Convenience	72.274	75	0.568	Accept Ho
Cost	67.918	75	0.706	Accept Ho
Timeliness	72.606	75	0.557	Accept Ho

Appendix 3.2A Annual average of quarterly costs for formal remittance channels

	China	Ghana	Guyana	Haiti	India	Jamaica	Kenya	Lebanon	Nigeria	Pakistan	Philippines	Rwanda	Sri Lanka	Vietnam	Zimbabwe
Bank	7.30 (8.14)	11.77 (9.15)		12.08 (9.35)	7.51 (5.88)	8.72 (5.8)	11.60 (9.15)	13.67 (11.56)			6.58 (4.89)	7.30 (5.5)		7.68 (5.53)	11.44 (9.15)
Bank of China	11.64 (10)														
CIBC				18.11 (15.63)										4.54 (0)	
ICICI Bank					6.20 (5)										
ICBC	4.91 (8.67)														
JN Money						3.86 (1.63)									
JNBS						7.19 (6)									
PNB Global Remit											4.76 (4)				
Royal Bank of Canada		9.17 (6.94)		9.63 (6.94)	9.78 (6.94)	11.84 (6.94)	11.36 (6.94)	9.25 (6.94)			11.96 (6.94)			9.29 (6.94)	9.29 (6.94)
ScotiaBank	6.53 (5.5)	8.90 (5.5)		8.50 (5.5)	7.08 (5.5)	8.37 (5.5)	6.25 (5.5)	14.26 (12.75)				7.30 (5.5)		6.85 (5.5)	7.56 (5.5)
State Bank of India					3.71 (2.5)										
Toronto Dominion Bank		17.24 (15)			17.65 (15)		17.18 (15)	17.49 (15)							17.46 (15)
Money Transfer Operator	6.88 (4.5)	8.04 (5.44)	11.08 (7.19)	8.60 (5.8)	4.56 (3.56)	10.04 (5.88)	8.22 (4.9)	9.31 (7.13)	6.76 (4.13)	4.80 (3.71)	3.73 (3.51)	10.18 (6.87)	6.40 (5)	5.53 (4.32)	9.56 (6.82)
AGR Money Transfer					5.26 (5)										
CAM				8.65 (5)											
Dollar Links										3.73 (2.5)					
Habib Express										2.66 (2.5)					
iRemit											3.81 (3.75)				
LeGoiTienLe														2.76 (2.69)	
Metro Remittance											4.53 (3.5)				
MoneyGram	8.08 (5)	10.26 (7.5)	11.98 (7.5)	9.57 (7.5)	5.31 (5)	11.87 (7.5)	11.50 (7.5)	9.34 (7.5)	8.01 (7.5)	5.59 (5)	5.37 (5)	10.51 (7.5)	6.84 (5)	8.18 (7.5)	9.84 (7.5)
MoneyTT	3.93 (3)														
Reliable Peso Remit											6.30 (4)				
Remit2India.com					5.29 (4.5)										
RemitBee					1.86 (1.5)									3.36 (1.5)	
RemitGuru					3.41 (0)										
Remitly Money Transfer											-1.08 (2.12)				
Ria	5.24 (4)	7.88 (6)	9.27 (4.5)		4.93 (4.75)	8.60 (4.44)	7.59 (4)			5.48 (5)	4.03 (3.5)		6.14 (5)		
Sigue Money Transfers	9.80 (5)	5.54 (4)				8.66 (4)	8.30 (4)	8.39 (6)	8.00 (6)	6.32 (5.33)	2.06 (4.33)		7.31 (6)	3.01 (2)	
Small World					6.64 (5)	10.48 (5)	7.95 (4.5)		4.85 (4)	3.64 (2.13)	4.39 (4)		6.98 (5)		
Thisal Financial													5.45 (5)		
Trans-Fast									6.00 (2.5)						
Transferwise									3.91 (3.12)						
Unitransfer				7.96 (5.25)											

Wave							3.14 (0)								
Western Union	8.07 (5.9)	9.89 (6.3)	11.81 (9.1)	7.70 (5.1)	7.51 (5.9)	11.08 (8.1)	9.62 (7.5)	10.44 (8.5)		6.71 (5.2)	6.77 (5.3)	10.93 (7.5)		7.72 (5.9)	10.30 (7.5)
WorldRemit		6.85 (3.25)		9.60 (6.5)	2.43 (1.37)	8.55 (5)	7.08 (4.37)	8.33 (5.5)	5.21 (4.25)	4.32 (3.25)	4.55 (3.25)	8.48 (5)	6.77 (4.25)	8.34 (6.08)	8.06 (4.62)
Xpress Money		6.76 (5)					7.74 (4)		11.05 (4.5)	4.64 (2.5)			5.54 (5)		
ZipZap	3.84 (2.48)				2.26 (2)						0.43 (0)				

Source: *Remittance Prices Worldwide*, World Bank

Notes: Figures in the table above are simple unweighted averages across the four quarters of 2017 and by corridor of the total transfer cost of sending 200 dollars including exchange rate fees and the amount below in brackets represents fees without exchange rate fees. However, certain RSPs send CAD and pay out in USD or require conversion to USD before being converted to the desired local home country currency. Therefore, recipients may incur an additional cost when converting USD to the local currency that is not estimated by the World Bank.

It should be noted that certain averages contain negative costs when factoring exchange rates since some RSPs benefit from advantageous exchange rates and choose to pass these beneficial rates onto customers. This does not imply that remittance service providers work at a loss. As an example, this is the case of the Industrial and Commercial Bank of China. It is also worth noting that all remittance recorded through Scotiabank that were made online (as opposed to a bank branch) were transferred using Western Union.

Appendix 3.3A Percentage who know or have used the method to send money abroad, by birth region

	Americas	E. Europe	S-S. Africa	N. Africa	W. Asia and M-E.	E. Asia	S-E. Asia and Oc.	S. Asia
Going to a bank or credit union	75.6	84.0	74.1	84.8	78.9	93.7	75.6	83.3
Going to a money transfer store	98.0	96.1	96.4	95.2	92.0	75.9	95.8	96.4
Going to a currency exchange store to send money	46.5	49.3	46.4	46.2	50.8	48.4	51.7	54.1
Going to another type of store or establishment	53.2	46.0	56.6	47.3	38.6	35.1	60.6	47.5
Bringing money to give to relatives or friends while visiting	89.5	92.5	86.9	91.7	82.7	90.7	89.9	81.4
Bringing money to someone who was travelling to give to relatives or friends for you	87.0	90.9	87.8	88.7	82.6	82.5	86.8	78.7
Giving money to someone who was visiting Canada	84.6	88.7	82.5	86.1	79.7	80.2	82.6	74.4
Using an informal transfer network system	16.8	16.3	26.6	21.0	23.3	19.1	17.8	32.9
Using a bank or credit union's website	55.2	59.2	57.0	59.0	51.9	59.4	60.5	65.8
Using a money transfer provider's website	60.6	65.1	64.8	55.9	51.0	44.0	68.9	67.1
Using another type of service provider's website	45.3	48.8	47.0	38.2	38.3	33.4	52.6	48.8
Using a bank or credit union's mobile app	50.9	50.6	52.3	50.2	45.6	42.4	55.6	56.3
Using a money transfer provider's mobile app	49.9	49.9	56.5	47.4	40.4	32.9	56.4	54.0
Using another type of service provider's mobile app	40.6	42.5	42.4	35.5	32.9	29.7	47.1	43.9
Using a cryptocurrency	29.1	36.1	31.1	29.4	26.7	22.2	22.8	28.9

Appendix 3.4A Multinomial logistic regression with an instrumental variable to replicate Amuedo-Dorantes and Pozo's (2005) endogeneity correction using the SIMT dataset

	(1)	(2)	(3)	(4)
Reference channel: MTOs (in-person)	Banks and credit unions (in-person)	Digital methods	Cash	Informal methods
Education: High school	1.22355 (0.43976)	1.22280 (0.50532)	0.88019 (0.68107)	0.66515 (0.15941)
Education: College, trade, or s. uni.	1.20610 (0.44995)	1.86880** (0.02822)	1.21418 (0.49853)	0.73388 (0.24053)
Education: Bachelors	2.02312*** (0.00390)	2.91530*** (0.00017)	1.63690* (0.08566)	0.95393 (0.85708)
Education: Graduate	2.76396*** (0.00004)	3.30691*** (0.00003)	1.94612** (0.02291)	1.31304 (0.33383)
Female	1.01685 (0.87236)	1.05478 (0.56148)	1.16535 (0.25691)	0.91843 (0.54593)
Age 30-59	0.87291 (0.50712)	0.70373** (0.01249)	0.64773* (0.05838)	0.57805** (0.01145)
Age 60 +	2.01103*** (0.00491)	0.67193* (0.07590)	1.29569 (0.38797)	0.94870 (0.85977)
Household size	0.91958** (0.04232)	0.88341*** (0.00002)	0.98587 (0.75059)	1.00416 (0.91471)
Do not speak Eng./Fr. at home	0.70127*** (0.00229)	0.76316*** (0.00731)	0.92560 (0.60714)	0.83546 (0.23677)
HH income \$50,000 to \$79,999	1.20147 (0.24784)	1.28583* (0.06296)	1.14925 (0.47556)	1.34446 (0.10194)
HH income \$80,000 to \$119,999	1.52438*** (0.00884)	1.97723*** (0.00000)	1.44506* (0.06290)	1.28417 (0.19388)
HH income \$120,000 or more	2.24748*** (0.00000)	2.71983*** (0.00000)	2.23929*** (0.00006)	1.58130** (0.03603)
Years since arrival to Canada	1.01637*** (0.00700)	0.97716*** (0.00024)	0.99830 (0.81950)	1.01795** (0.01499)
Permanent resident	1.66995*** (0.00085)	1.38296*** (0.00699)	0.98579 (0.93875)	1.38197* (0.08551)
Temporary resident	1.27935 (0.46567)	1.96636*** (0.00110)	0.51419 (0.18060)	1.14139 (0.78445)
Proxy amount (based on predicted values of number of people remitted to)	1.00001** (0.03531)	1.00000 (0.46027)	1.00001** (0.03882)	0.99986*** (0.00648)
Frequency remitted	0.95976* (0.06077)	1.01862*** (0.00355)	0.71592*** (0.00000)	0.91253*** (0.00075)
Used other methods	1.62908*** (0.00001)	3.02585*** (0.00000)	2.96676*** (0.00000)	5.66267*** (0.00000)
Diaspora size	0.99934* (0.05089)	1.00072** (0.02288)	0.99784*** (0.00000)	0.99834*** (0.00006)
Informality (shadow economy size)	0.96520*** (0.00000)	0.97455*** (0.00000)	0.96891*** (0.00046)	0.97618*** (0.00347)
Americas	0.56362*** (0.00506)	0.96534 (0.85887)	0.72638 (0.18050)	0.34002*** (0.00021)
Europe, W. Asia and Middle E.	1.62845** (0.01749)	1.21686 (0.38634)	1.20116 (0.46892)	1.21820 (0.44200)
Sub-Saharan Africa	0.76630 (0.25406)	1.81374*** (0.00435)	0.69880 (0.19851)	0.93890 (0.82684)
North Africa	1.15963 (0.54041)	1.72147** (0.02160)	2.42907*** (0.00055)	1.28519 (0.38531)
East Asia	5.33240*** (0.00000)	1.15865 (0.61105)	13.83476*** (0.00000)	3.38250*** (0.00257)
S-E. Asia and Oceania	0.60463*** (0.00279)	0.60125*** (0.00023)	0.62758* (0.06190)	0.56419** (0.01447)
Most imp. factor: Sender convenience	1.60260* (0.05776)	2.82821*** (0.00000)	1.25018 (0.47463)	2.26974** (0.02493)
Most imp. factor: Recipient convenience	1.09636 (0.70286)	0.81411 (0.28570)	1.40984 (0.20820)	2.65102*** (0.00227)
Most imp. factor: Cost	1.59382* (0.05557)	1.97956*** (0.00023)	2.21674*** (0.00296)	4.29783*** (0.00000)
Most imp. factor: Reliability	2.02280*** (0.00178)	1.49750** (0.02579)	1.45260 (0.16196)	3.32578*** (0.00013)
Intended for living expenses	0.78085** (0.03933)	1.05689 (0.58458)	0.98690 (0.92324)	1.03086 (0.84024)
Intended for education	0.80849 (0.15189)	0.79752** (0.03639)	0.93551 (0.72999)	0.78708 (0.23604)
Intended for emergency	0.74309** (0.02050)	0.82974* (0.07006)	0.64411*** (0.00848)	0.77163 (0.10541)
Intended as gift	0.74346** (0.01309)	1.18814* (0.07414)	1.47964*** (0.00469)	1.31666* (0.05669)
Constant	0.20731*** (0.00061)	0.09414*** (0.00000)	0.23452** (0.01694)	0.08386*** (0.00010)
Observations	5,626	5,626	5,626	5,626

Robust p-values in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

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PART II: Global Trends in Informal Flows and International Remittance Policy

Chapter 4: Why Pursue Remittance Transfer Cost Reductions? From the 9/11 Punctuation to Policy Alignment

Abstract: After the 2001 9/11 terrorist attacks in New York, informal migrant remittance flows were increasingly scrutinised as a tool for terrorism financing due to their lack of oversight. After increased regulation was deemed to have the adverse impact of reducing the appeal of formal alternatives, security scholars and practitioners resorted to formalisation policies through transfer fee reductions to make formal options more accessible. In economic development circles, similar policies gained traction. International commitments, such as the Sustainable Development Goals (SDG 10c) and Objective 20 of the 2018 Global Compact for Safe, Orderly and Regular Migration, aim to lower transfer fees to promote remittance growth and alleviate poverty. How did the framing of transfer cost reduction policies shift from security concerns about terrorist financing towards promoting development and poverty alleviation? The central thesis suggests the 9/11 terrorist attacks provided the punctuation that gave institutions the policy tractability to act upon pre-existing privatisation motives within Bretton-Woods institutions following the Washington Consensus. This chapter's findings contribute to a better understanding of policy creation and the cross-pollination of policies in the security-development space. This is necessary to identify 2001 as a critical inflexion point in remittance policy as further studied in Chapter 5.

Keywords: Remittances, formalisation, development, security, migration

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4.1 Introduction

In 2019, global personal remittances received reached 656 billion USD (639 billion USD in 2018), of which 503 billion USD (486 billion USD in 2018) flowed to low- and middle-income countries according to the World Bank (2021). Derived from the International Monetary Fund's (IMF) balance of payments, these estimates only account for money transfers through formal remittance service providers such as banks and established money transfer operators (MTOs). If informal flows, such as cash hand-carried across borders, goods, and other informal transfers, were accounted for, then the estimates would be even larger. Touted as an essential source of global development funds (Kapur, 2005), remittances also entail security concerns about money laundering and terrorism finance abound. Security concerns are exceptionally high in the case of informal flows, as these often lack or circumvent oversight despite evidence of large volumes of illicit monies flowing through formal channels (Passas, 2006).

A little over a decade ago, at the 2009 G8 summit in L'Aquila, members of the G20 opted to set a target to reduce the cost of international remittances. Dubbed the "5x5" Objective, the target aimed to reduce remittance transfer costs by five percentage points (from approximately 10 per cent, in 2008, down to five per cent of the total amount remitted) within five years. Although the latest World Bank figures still placed average global remittance costs around seven per cent in 2017, this target ushered a plethora of initiatives to reduce costs associated with formal flows.

In recent years, international development efforts to reduce costs have flourished, intended primarily as poverty alleviation measures. These include the Sustainable Development Goals (SDG 10c in particular) on poverty reduction born from the Addis

Ababa Action Agenda (a new target of three per cent by 2030) and, most recently, Objective 20 of the 2018 Global Compact for Safe, Orderly and Regular Migration. Since these policy directives, coupled with the 2011 G20 summit's adoption of the "5x5" Objective in Cannes, there has been an increase in the monitoring of remittance transfer costs, including the *Remittance Prices Worldwide* (RPW) database, which scrutinises hundreds of remittance corridors, published by the World Bank. While the five per cent target remains out of reach, data demonstrate significant drops in remitting costs.

Insofar as the development literature is concerned, the reduction of remittance costs principally targets poverty alleviation. Increasing funds directed at developing countries can help attain development goals (Adams and Page, 2005), support financial stability and business development (Straubhaar and Vâdean, 2005), and reallocate funds in cases where income smoothing is required (Amuedo-Dorantes and Pozo, 2011). The income smoothing and risk-sharing elements of these funds are especially vital during times of natural disasters and civil conflict (Mohapatra and Ratha, 2012) when the need on the receiver side is greatest. The objective of proliferating remittance flows is to provide an alternative or additional form of development finance that, contrary to traditional sources such as charitable flows and official development assistance (ODA), is not reliant on donor funds.

However, following the 9/11 attacks in 2001, the security sphere grew increasingly concerned about informal remittance transactions. The 2004 publication of the 9/11 Commission's report pointed to *hawala*,⁷⁹ a form of informal transfer, as a source of

⁷⁹ *Hawala*, Arabic for transfer, is a system, or informal network, for transferring money traditionally used in predominantly Muslim countries, whereby the remittance funds (along with the associated fees) are transferred to an agent who proceeds to instruct a remote associate in the destined region to pay the final recipient (Wilson, 2002; El Qorchi, Maimbo and Wilson, 2003; Passas, 2003). Technically, only domestic transfers need take place.

terrorist funding used by al-Qaida, albeit not used in funding the 9/11 attacks themselves (De Goede, 2003; National Commission on Terrorist Attacks upon the United States, 2004; Roth, Greenburg and Wille, 2004). Cracking down on *hawala*, erroneously lumping them in with illegal activities such as tax evasion and money laundering or fuelling conflicts abroad (Horst, 2008), suddenly became a priority. The need to address the incentive in gravitating to low-cost informal networks became central to tackling these informal remittances (Sander, 2004; Freund and Spatafora, 2008).

The lack of interdisciplinarity in treating this issue, studying development and security in separate analytical silos has led to disciplinary blindness. With the former pointing to the drying up of development funds and the latter focusing on terrorism financing and money laundering, it is somewhat puzzling that both not only gravitated towards remittance transfer costs as their primary policy tool but also did so in a coordinated manner across states and international institutions. The myopic stance limits the study of remittance policy to phenomena within each field, despite the evident crossovers and existence of a symbiotic relationship. This chapter studies how the convergence of international development and security spheres played a role in forging modern remittance policies across various international organisations and states.

There exists an abundance of policy evaluations (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007; IMF, 2008; Kupets, 2012) and a myriad of varying datasets to monitor remittance patterns and the effect of the policies surrounding remittance costs. Nevertheless, an analytical gap remains since scant scholarly work has studied the interdisciplinary causal mechanisms of why such policies were adopted. How did the framing of transfer cost reduction policies shift from security

concerns about terrorist financing towards promoting development and poverty alleviation? Or were both impacted simultaneously? Are current policies aimed at promoting remittances, formalising them, or both? Understanding the origins of these policies sheds light on the evolution of intended objectives and the underlying motives that inspired the formulation of crucial policies that are now enshrined in numerous international commitments and agreements.

This chapter argues that despite formalisation policies being inherently rooted in security, anti-money laundering, and terrorist financing efforts, such initiatives have been re-branded and now undertake a poverty alleviation role. As per punctuated equilibrium theory, the 9/11 terrorist attacks in New York raised concerns about international funds flowing towards illegal and terrorist activities through informal networks. Moreover, “since at least 2004, the G-8 Heads of State – as well as the G-7 Finance Ministers and others – have been emphasising the importance of improving the availability of statistical data on remittances (as well as reducing the costs associated with sending and receiving remittances through formal channels such as banks)” (IMF, 2008). However, stuck within the security disciplinary silo, there was a lack of direction to formalise remittance flows until the report on “General principles for international remittance services” (Cirasino and Hollanders, 2006), which primarily centred around illegal activities, terrorism and money laundering.

In tandem with the exogenous shock or punctuation within the security sphere, this chapter illustrates a pivotal paradigm shift within international organisations and states that fostered remittance formalisation efforts. This ideological shift led to remittance policy mainly framed in development terms rather than in regulatory and security terms. Based

on constructivist literature in international relations, it is argued that remittances became viewed as a means of increasing development funding and privatising development finance. Remnants of the Washington Consensus (Williamson, 1990, 2009; Marangos, 2009) led to institutional pathologies (Barett and Finnemore, 1999) and norms within international institutions favouring privatisation, transparency of exchange, and freedom of capital flows. Loosely based on Sabatier and Jenkins-Smith's (1993) policy advocacy coalition framework, specific policies and interests aligned across Bretton Woods institutions in the aftermath of the 9/11 punctuation, which provided policymakers with the necessary tractability to implement these policies initially framed in terms of national security. The punctuated equilibrium model provides the spark whereby neoliberal ideals of free markets and privatisation took foothold within institutions and still heavily influence global remittance policy to this day.

The chapter explores how the development and security spheres converged, and how their shared interests shaped international policy formulation. In answering the main research questions about how the two spheres converged, one also uncovers the historical pathways through which international organisations designed such policies, how they evolved, and why these issues arose at that specific juncture. Furthermore, it sheds light on why transfer cost reduction targets were favoured over countless other programs and policies to promote international development.

Chapter 4 is divided into four main parts. First, the chapter defines what constitutes a remittance as well as the characteristics and analytical motives in dichotomising formal and informal channels. Second, the chapter provides a brief overview of the development impact of remittances. Third, the chapter sets forth a policy analysis framework, drawing

from both the policy analysis and international relations literature. The study blends various theories to form a more cogent portrait of causal links between international security and development policy formulation. Finally, the chapter concludes with highlights of key future avenues of research and data – and these yield the necessary transition to Chapter 5.

4.2 Defining, framing and scoping the study

Before proceeding with the policy analysis, one must define the terms and scope of the chapter. This subsection defines what constitutes a remittance and a remitter – a definition that differs from that of the previous two chapters centred on ODA-eligible country born immigrants to Canada. The following subsection details the literature’s penchant for monetary remittance analysis, and therefore overlooks in-kind remittances and how the narrow monetary definition contributes to the inflation of informal flows that remain uncaptured. Finally, the last subsection elaborates on the characteristics of formal and informal channels and how this rather simplistic dichotomisation may obfuscate noteworthy distinctions and granularity across channels as well as corridor specificities.

4.2.1 Defining what constitutes a remitter

The typical remittance definition refers to migrants sending money back ‘home,’ generally to their household or family. The International Organisation for Migration defines remittances as “private international monetary transfers that migrants make, individually or collectively”.⁸⁰ Although seemingly broad, this definition is far less inclusive than in many scholarly studies as it excludes transfers back from naturalised citizens, those remittances sent to transnational household members outside the country of origin, and

⁸⁰ International Organisation for Migration Website. <https://www.iom.int/key-migration-terms> [accessed on June 14, 2021]

excludes many forms of transfers that may not be as liquid as cash – all of which are common across global migrants and diaspora members. Moreover, it can exclude coordinated diasporic efforts to remit to organisations rather than individuals and even investments funds such as state-issued diaspora bonds (Ketkar and Ratha, 2010). It also excludes the sending of goods.

The residency-based definition is particularly problematic, seeing that the definition excludes non-resident individuals (or differing definitions of residency), especially considering that the security and development concerns previously cited originate from financial flows of both nationals and non-nationals. The World Bank's *World Development Indicators* (WDI) database has a definition that hinges on the residency rather than the nationality of migrants and comes from the IMF's balance of payments data:

Personal transfers, a new item in the Balance of Payments Manual 6th Edition (BPM6), represents a broader definition of worker remittances. Personal transfers include all current transfers in cash or in-kind between resident and nonresident individuals, independent of the source of income of the sender (and regardless of whether the sender receives income from labor, entrepreneurial or property income, social benefits, and any other types of transfers; or disposes assets) and the relationship between the households (regardless of whether they are related or unrelated individuals).⁸¹

Unlike previous chapters and the subsequent chapter, both diasporic remittances and remittances to organised groups are accounted for, given the focus of security concerns have often been with diaspora members (Hoffman et al., 2007). The following section justifies the emphasis on monetary rather than in-kind, or non-monetary, remittance

⁸¹ World Bank. *World Development Indicators* (WDI) database. <https://datahelpdesk.worldbank.org/knowledgebase/articles/114950-how-do-you-define-remittances>

transfers within the literature and how this, albeit narrow, definition suits this chapter's purposes (and those of the subsequent chapter).

4.2.2 The focus on monetary rather than non-monetary remittance flows

Statistics and studies tend to concentrate narrowly on monetary remittances rather than on the broader spectrum of remittances. This definition of remittances can be useful in the policy context for ease of data capture as well as fitting the narrative of reduced fees through MTOs, banks and credit unions as measured in the RPW database. Therefore, the narrower definition is suitable for this chapter's purposes studying remittance transfer cost policies that specifically target monetary flows.

Unfortunately, even the limited remittance literature focus on monetary flows is often restricted to formal flows through banks and MTOs. In some instances, additional estimates for flows transferred through postal offices or informal flow estimates can be included ad-hoc but remain significantly underestimated. The RPW database is the tool used to keep track of SDG 10c progress and includes no channels other than formal institutions at the time of writing.

In contrast, non-monetary remittances include a vast number of alternative flows such as cultural norms, goods and services, technology transfers, and a wide array of other intangibles (Orozco, 2002; Kapur, 2005; Clemens, Özden and Rapoport, 2014). Many non-residents opt for informal remittance channels due to the lack of financial development on the recipient side, lower fees, illegal transactions, and multiple other factors. As such, the next sub-section defines and frames the distinctions of formal versus informal channel remittances.

4.2.3 Unpacking the dichotomisation of formal and informal channels

As with the development framing of remittances, the distinction of formal and informal flows is itself biased towards regulation in that unregulated or informal flows are often treated as synonymous with unlawful activities rather than the grey economy (Pieke Van Hear and Lindley, 2007). Unfortunately, this means the informal category is often better defined as a residual classification rather than a homogeneous category of its own. The oversimplification of informal channels as a homogeneous category is especially apparent given the corridor-specificity of informal method types, whether they be *hawala* and *hundi* practised in the Middle East, South Asia and certain parts of Africa, or *fei chien* used in China, *padala* in the Philippines, *Chuyen Tien Tay Ba* in Vietnam, *viajeros* in Mexico, or numerous others. This subsection outlines the distinguishing features of formal versus informal remittance channels and how this rather simplistic dichotomisation may obfuscate noteworthy distinctions and granularity across channels as well as corridor specificities.

A vast proportion of the remittance literature limits analysis to formal flows through banks and MTOs, citing data limitations. Most statistics only consider formal remittances because informal remittances, whether through oft-cited undocumented *hawaladars* or cash transported across borders, are difficult, if not impossible, to measure accurately without statistical estimations, proxies, or costly custom surveys.

Informal remittance systems encompass far more than illicit money transfers since they include a large portion of the informal economy, which can be quite extensive in developing economies (Choucri, 1986; Medina and Schneider, 2018). Nikos Passas (1999) has criticised regulators and international organisations for certain ethnocentric approaches that fail to consider traditional informal finance.

Informal flows are pervasive and constitute an enormous portion of global remittances. There is reason to believe that these transfers could be between two and ten times greater than officially reported global remittance flows (O'Neill, 2001). Sander (2004) estimates unofficial global remittances at 1.5 times the monetary value of formal remittances. Similarly, Ghosh et al. (2010) estimate that the Indian informal economy and inflow of remittances are approximately 150 per cent larger than official estimates. Other estimates vary enormously. For instance, informal remittances to Ukraine account for anywhere between 15 and 200 per cent of the value of officially reported remittances (Kupets, 2012). In contrast, estimates of Italian informal remittances approximate they account for six to 38 per cent of total outflows (Ferriani and Oddo, 2019).

Numerous types of informal remittances exist. Migrants carrying undeclared cash home is a common source of unofficial flows (O'Neill, 2001). Recent evidence from Canada corroborates these findings and suggests cash is the primary form of informal remittance transfer, whether it be when visiting relatives, informal agreements amongst diaspora members, or handing funds to visitors to carry back with them (Dimbuene and Turcotte, 2019). Other examples of informal transfers include the hiring of taxi and bus drivers in South Africa to carry sums across the border to Zimbabwe (Chisasa, 2014) or *viajeros* (couriers) in Mexico (Orozco, 2002).

The three core arguments for resorting to informal channels are lower transfer costs, lack of financial development in the recipient region, and anonymity, regardless of whether this is related to the sender's illegal activities or undocumented status.

First, informal flows are estimated to be much lower in cost than formal flows (Sander, 2004). These estimates are considerably lower than those of formal flows through

banks and MTOs, which edged slightly below seven per cent for the first time in the first quarter of 2017, according to preliminary estimates of the World Bank's RPW database. Further, there is evidence that formal transfer costs are mostly regressive, meaning there exist large economies of scale (Kalan and Aykut, 2005; Dimbuene and Turcotte, 2019) that are not possible for a significant number of remitters to utilise, pushing them to resort to informal channels.

Second, a common reason for choosing informal channels is the lack of banks or financial institutions in proximity to the remittance recipient. For example, the lack of sender or recipient access to the financial tools necessary to transfer the funds often compels migrants to resort to informal systems (Puri and Ritzema, 1999; Maimbo, 2003; Freund and Spatafora, 2008). Furthermore, the accessibility to financial tools is not uniquely linked to the lack of physical and online access, but also a lack of financial education. For example, Kosse and Vermeulen (2014) find that, in their quantitative investigation of 501 migrants in the Netherlands, those with higher education and displaying signs of financial inclusion were more likely to remit through official networks. For this reason, there exist additional policies to fulfil the World Bank Group's vision of Universal Financial Access by 2020, which will aid in the formalisation of remittance networks globally.

Third, the study of informal methods, such as *hawala*, frequently limits itself to analysis uniquely within a security context, often to finance illicit or terrorist activities and to rely on the anonymity and lack of government oversight of informality (Wilson, 2002; El Qorchi, Maimbo and Wilson, 2003; Maimbo, 2003; Passas, 2006; IMF, 2009). These

flows rely on their participants' trust to maintain a certain anonymity level or liminal record-keeping and regulatory oversight.

This blind spot that appeared in the literature post-9/11 demonstrates the shift in focusing on terrorist financing and cracking down on potentially illegitimate flows. However, as previously established, informal remittance systems encompass substantially more than the transfer of illicit monies, and substantial informal networks are pervasive in developing economies (Beyer et al., 2018; Medina and Schneider, 2018). Within this context, anonymity can also represent a necessary attribute for undocumented or other forms of immigration susceptible to government persecution.

Increasingly digitalised payment alternatives pose another challenge as regulation and oversight struggle to keep up with incessant innovations in payment processes. Remittance channel modality and formalisation are a research priority given the array of new innovative methods of money transfer from mobile transfers such as M-PESA, digital methods, blockchain technologies, and crypto-currencies rarely fit neatly into this binary narrative for formal versus informal categorisations (Jack and Suri, 2011; Rodima-Taylor and Grimes, 2018; Dimbuene and Turcotte, 2020; Orozco, Klaas and Ledesma, 2020).

4.3 The development effect of remittances

Lying at the nexus between development and migration, remittances have a lot to offer in terms of international development objectives and commitments (refer to Chapter 2). Remittances have long served as a critical provision of funds and therefore constitute a vital guardrail for the integration and financial access in developing countries. Remittances were among the most consistent form of capital inflows despite cost and trans-border payment risks (Rodima-Taylor and Grimes, 2019). Whether it be the case of isolated island

states requiring an injection of foreign funds (Bertram, 1999) or supports in conflict areas such as Ukraine post-2014 (Carment, Nikolko and MacIsaac, 2021), remittances play an important role in alleviating household and state needs. As another example, despite slowing remittance growth in Latin America, remittances mitigated the impacts of larger economic shocks; however, signs of dependency on remittances are of concern in certain regions (Orozco, 2020).

Nevertheless, as De Haas (2009) points out, the study of remittances is far from new. Although there is considerable optimism about remittances' role in the development sphere, the rise of structuralists and dependency theorists in the 1970s and 1980s led to lots of pessimism surrounding remittances (De Haas, 2009). The pessimism largely stemmed from worries about the dependence effect on lower-income countries losing qualified workers (brain drain) in exchange for dependence on foreign funds. Countries with high remittances to GDP, such as Nepal and Haiti, are but some examples of regions highly dependent on remittances. Therefore, additional research into remittances' usage became necessary in response to growing concerns about promoting a subsistence model. Debates regarding the short-term consumption versus long-term investment goals of remittances are crucial to determining whether remittances support subsistence or foster increases in savings and investments for durable economic development. To this day, there remains mixed evidence on the inequality impacts of remittance flows, with evidence across corridors demonstrating both inequality exacerbating effects as well as potential inequality gap narrowing effects (Stark, Taylor and Yitzhaki, 1988; Acosta et al., 2008; Vacaflor, 2018; Arapi-Gjini, Möllers and Herzfeld, 2020; Azizi, 2021).

In the later 1980s and 1990s, there was renewed optimism as remittances became an increasingly large part of international financial flow. Furthermore, the advent of the New Economy of Labour Migration (NELM) model (Lucas and Stark, 1985; Stark and Lucas, 1988) found evidence that remittances played an important role in transnational households' ability to mitigate risks, consumption smooth, improve living conditions (Amuedo-Dorantes, 2014), engage in implicit loan arrangements (Poirine, 1997), and funding various activities – notably education and health-related (Amuedo-Dorantes, 2014). This rising form of finance held the potential to become a major source of development finance and meant increasing empirical evidence of its benefits for international development. Although the fears of dependency from the previous decades persist, the overall effects are positive, and there is an increasing number of programs aimed at leveraging remittances for longer-run development rather than falling into the trap of subsistence support, such as savings and diaspora bonds (Ketkar and Ratha, 2010). Nonetheless, all new program implementation should bear the dependency critiques of the 1970s and 1980s in mind when formulating development-oriented projects.

Finally, before switching the focus to policy development and the security remittance space, one must not fall into the trap of reducing the remitter category to poverty-stricken migrants on one side or vilified as fuelling capital flight, funding terrorism, or engaging in illegal money laundering activities on the other. A more accurate depiction would be that remitters come from a range of backgrounds and that those remitting the most tend to come from relatively privileged socioeconomic backgrounds. As one expects, and per the seminal Harris-Todaro model (Harris and Todaro, 1970), income and education are not only the main underlying reason for migrating, but remittances

correlate positively with incomes (Sinning, 2011; Unheim and Rowlands, 2012). The next section draws from the policy and international relations literature to explore how formalisation policies born in the security sphere became synonymous with the development policies of the 2010s.

4.4 From policy analysis to international relations theory

The subsequent four subsections elucidate the underlying incentives and motivations within Bretton Woods institutions that led to such policies. First, this chapter argues that it was the 9/11 punctuation that provided “the resurgent preoccupation with regulation of informal money transfers [...] rather than from the promotion of development or poverty reduction” (Pieke Van Hear and Lindley, 2007). Second, this research explores the neoliberal institutionalist underpinnings and why these policies were highly desirable and made politically tractable post-9/11. Thirdly, the study explores constructivist theory and how historical institutional stickiness led many institutions to promote the Washington Consensus’s privatisation focus. Finally, the fourth subsection blends the above theories to construct a cogent and encompassing framework explaining why remittance cost reduction policies aim to formalise global flows through an alignment of policy implementation across security and development institutions.

4.4.1 Punctuated equilibrium theory: The 9/11 impetus for change

Concerns about money laundering and illegal activities through remittances were a concern pre-2001 (FATF, 2001), yet these concerns only led to incremental policy changes. In the aftermath of the 11 September 2001 terrorist attacks on the New York twin towers and the Pentagon, heightened security concerns regarding terrorism, including terrorism financing, dominated an emerging study of non-regulated flows. These events led to the launch of a

“war on terrorist finances” to cripple the “lifeblood” of terrorist groups, thereby potentially acting as an existential threat to these movements (Heng and McDonagh, 2008; Vlcek, 2014).

Post-2001, security circles escalated concerns about informal remittance transactions after the publication of the 9/11 Commission report, which pointed to *hawala* networks as a source of terrorism funding; albeit not used to fund the 9/11 attacks themselves, cash and wire transfers use funded other terrorist activities (De Goede, 2003; National Commission on Terrorist Attacks upon the United States, 2004; Roth, Greenburg and Wille, 2004). Eliminating or regulating unregulated flows, particularly *hawala* networks accused of abetting terrorism, and lumping them with various forms of other illegal activities such as tax evasion and money laundering, emerged as a policy priority. Promptly thereafter, a change in accounting to include multiple forms of MTOs as part of formal remittances in the balance of payments insofar as remittances pre-2002 only accounted for transfers through commercial banks (Clemens and McKenzie, 2018).

The regulation that ensued was in stark contrast to the financial deregulation of the 1970s and 1980s (Seddon, 2007). Regulatory initiatives, such as the Financial Action Task Force’s (FATF) Special Recommendation VI, recommended that all funds transfer systems (formal and informal) be licensed or registered with governing authorities, thereby cracking down on informal networks other than smaller-scale hand-carried remittances (FATF, 2001).

Employing Google Scholar as an indicator of academic publication trends, one can examine the evolution of publications that mention informal remittances as a proxy for the policy shift post-2001 (refer to Figure 4.1). One can observe the shift in policy and

academic momentum from 2001–2005, whereby the number of sources including “informal remittance” (also including the term “migrant”) moves from one stable equilibrium pre-2001 to another post-2005. Relative to the broader category of sources on “remittance” (also including the term “migrant”), this shows that although the remittance literature as a whole took shape as awareness of these flows increased in the 2000s, it also portrays a sharper spike in attention to informal remittances around 2001. In contrast, the growth in the overall remittance literature is more gradual and sustained.

Figure 4.1 Punctuation in policy: Hits on articles mentioning “informal remittance”

Source: Google Scholar

Note: Annualised search of the set of terms “informal remittance” and “migrant” compared to “remittance” and “migrant” appearing in the title, abstract or body of documents using Google Scholar (28 March 2021). Estimates calculated by the author. The Figure does not imply that 9/11 terrorist events are a causal factor, but rather that these events correlate with the popularisation of the study of informal remittances.

The report on “General principles for international remittance services” (Cirasino and Hollanders, 2007), a joint effort by the Bank for International Settlements’ Committee on Payment and Settlement Systems and the World Bank, focused on principles for illegal activities, terrorism and money laundering, and left principles surrounding poverty reduction and attaining Millennium Development Goals for last. The International Monetary Fund also stepped-up accountability measures within the disseminated balance

of payments estimates to make up for a wide array of “accounting leakages” (Puri and Ritzema, 1999). Buencamino and Gorbunov (2003), Page (2004), and Passas (2006) were among those that questioned regulation as the solution. Stating that illicit funds also travelled via formal remittance networks, increased regulation would only discourage remitters from resorting to formal methods, thereby rendering these policies ineffective, even counterproductive.

However, informal remittance systems encompass far more than illicit monies since they also include the entirety of the hidden economy, which can be extensive in many developing countries (Choucri, 1986). Nikos Passas (1999) warned that regulators should avoid ethnocentric approaches (that do not consider traditional informal finance) that could hinder economic development and crime control efforts. Passas suggested that it was reductionist, if not erroneous, to conflate informal flows with illicit flows.

Punctuated equilibrium theory offers a reliable framework to make sense of the policy response to the abrupt vicissitude, or shock, instead of incremental policy change. Within this framework, unexpected changes in dissatisfaction with the pre-punctuation status quo lead to a rapid change in institutional inertia and increase the political will to implement corrective policies (Baumgartner, Jones and Mortensen; 2017). This “disproportionate” reaction directly answers the initial under-response caused by friction or the previous lack of political will or impetus for change. Considering this theoretical import from the public policy scholarship, one can label 2001 and 2008 as critical punctuations that affected remittance policy. Whereas the latter was economic in nature (namely the Great Financial Crisis of 2007-2009), the former consists of reactionary measures following acute security concerns and political shifts.

Alas, punctuated equilibrium theory only explains the timing of the shift, not its causal underpinnings. Merely pointing to an inflexion point is insufficient to explain why remittance formalisation policies shifted from the security sphere to the development realm. It is also insufficient in understanding the institutional mechanisms by which formalisation measures were re-branded over time. This shift in policy framing is fundamental considering later evidence from the 9/11 Commission (National Commission on Terrorist Attacks upon the United States, 2004; Roth, Greenburg and Wille, 2004; Passas, 2006) surmised that the vast majority, if not all, of the funding of the 9/11 attacks used formal remittance channels that are both regulated and monitored by security agencies. From this perspective, the 9/11 attacks may have been a key punctuation that drove the motivation or incentive for change (political traction). However, additional theories are necessary to delve further into the causal determinants of remittance formalisation and promotion policies through transfer fee reductions.

Although the 9/11 punctuation and the United States' "other war on terror" (Heng and McDonagh, 2008) marks a significant shift in remittance policy, formalisation efforts are not solely an American issue. In Canada, despite contributing to the December 2001 amendment of the *Proceeds of Crime (Money Laundering) Act* to become the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act*, other local phenomena guided formalisation efforts. Distinct Canadian policy issues, such as the coercion of the Tamil diaspora to remit in support of the LTTE (Human Rights Watch, 2006), also drew attention to remittances suggest that it is overly simplistic to characterise the formalisation push as solely attributable to the American "war on terror". Another example includes the head of the Eritrean Consulate in Toronto, who extorted the country's diaspora in Canada for

remittances, or a so-called “diaspora tax”, to support Eritrean government expenses and culminated in the expulsion of the Eritrean diplomat from Canada (Canadian Broadcasting Corporation, 2013). Although remittances remain a significant source of funds supporting humanitarian responses during crises of all sorts, those crises can include support for competing adversaries in global conflicts or even have transnational security implications that directly impact the host country.

Given security concerns represented the original rationale for increased remittance industry transparency and formalisation, it remains curious that policies evolved to primarily be framed in development terms, mainly aimed at reducing poverty and increasing investment in developing countries. The following section complements the previous findings vis-à-vis the 9/11 exogenous shock that instigated formalisation concerns by studying how the diffusion of norms surrounding the Washington Consensus permeated institutions and influenced policy formulation. Subsequent sections further examine causal factors underlying this paradigm shift and how it affected remittance policymaking using policy diffusion and constructivist international relations theory.

4.4.2 Neoliberal institutionalism, liberalism, and the formalisation agenda

In contrast to the realist school of thought based on hard power, neoliberal institutionalism shies away from zero-sum games by favouring interdependence and cooperation through institutions (Keohane and Nye, 1977). The influence of economics and its blend with the international relations literature is critical here. Within this framework, institutions provide information (to avoid market failures), reduce transaction costs, increase transparency, and boost economies of scale. This section examines the neoliberal ideals that pervaded Bretton

Woods institutions and how they shaped policymaking decisions regarding the formalisation of remittance flows.

For example, the World Bank Group has pushed for the reduction in transfer costs, higher economies of scale in global remittance transfers, and the avoidance of market failures. The World Bank's RPW database has increased the transparency of formal transfer services' cost structure and helped to "name and shame" MTOs and banks into compliance.⁸² Other efforts include the World Bank's Greenback 2.0 initiative, which mainly consists of awareness campaigns of formal remittance channels amongst immigrants. Greenback 2.0 pilot projects for remitter financial literacy started in Turin and Montreuil (International Fund for Agricultural Development and the World Bank, 2015). The goals of the Greenback 2.0 initiative target efficiency and transparency to promote formal remittance use. In the United Kingdom, the Greenback 2.0 project survey in London found increasing digital technologies usage, particularly mobile phone transfers that frequently transcend cost and financial inclusion barriers (World Bank, 2015). Another survey of remittance products in the United Kingdom found that MTOs, despite their higher rates, are often used due to the urgency of sending funds or the need to prioritise speed over cost (DFID, 2005).

The lack of access to formal financial services and mainly the lack of competition could lead to market failures (Maimbo and Ratha, 2005). For instance, the increase in competition could lead to decreases in transfer costs and enhanced services provision. This attention to large-scale transfer cost reduction, the avoidance of market failures and the

⁸² Payment Systems Development Group, The World Bank (IBRD and IDA). Resources available online at <http://documents1.worldbank.org/curated/en/728251468192564101/pdf/705740ESW0P1100Cape0Town0April02009.pdf>

increase in economies of scale perfectly fits neoliberal institutionalist agenda setting. The increased formalisation of remittance flows allows formal remittance transfer services to take advantage of economies of scale to reduce transaction costs further (see Chapter 2).

The neoliberal institutionalist influence is also apparent within the BIS and IMF, particularly regarding the efficiency and transparency of financial flows. The lack of transparency in the balance of payments macroeconomic statistics, where remittances received do not match remittances sent, constitutes a significant concern for the IMF (Shelburne and Palacín, 2007). For its part, the BIS shares the World Bank's concerns and is mainly concerned with the lack of transparency in the market, the lack of understanding (and financial literacy) of users, weaknesses in infrastructure, the possibility of adverse effects from poor regulation, lack of competition and overall risk of informal mechanisms (Cirasino and Hollanders, 2006).

Although neoliberal institutionalism explains targeting transfer costs and transparency of channels, there remains a gap in understanding the reasoning behind the policy's framing. Thus far, this chapter argues that the 9/11 punctuation and a neoliberal agenda supported reducing transaction costs, increasing transparency, reaching economies of scale and limiting risk as well as market failures. However, it is not yet clear how these concepts influenced the formulation of specific policies, notably those surrounding remittances.

The marketisation and privatisation of development funds was an integral part of the neoliberal agenda (Pellerin and Mullings, 2013; Khanal and Todorova, 2019). In conjunction with growing migrant stocks worldwide and increasingly integrated globalised markets, rising remittance volumes caught the eye of development practitioners and

scholars as potential funding sources. The following subsection turns to a constructivist argument on expanding how the neoliberal ideologically driven notions of development privatisation and transparency impacted norms and values within international institutions, namely the Bretton Woods institutions and states.

4.4.3 Constructivism: Formalisation and privatising development finance

The World Bank has long advocated the increase in private forms of development finance towards developing countries. Through a constructivist lens, this section argues that privatisation and other free-market ideological values permeated the ranks of Bretton Woods institutions, thereby replacing more traditional means of development funds and aid.

In 2005-2007, there were substantial decreases in ODA, and the increases from 2008 onwards were due to considerable efforts to maintain development efforts throughout the unfolding and ensuing contagion of the global financial crisis. Rough estimates place ODA volumes in 2012 as approximately the same as in 2005 without adjusting for inflation. Economic stagnation during recessionary years barely kept up with global inflation rates, especially amongst an array of developing countries where inflationary pressures are high. International institutions, mainly the World Bank, saw accentuated promise in the privatisation of development efforts to support poverty alleviation and economic growth in the Global South.

According to World Bank estimates, despite a significant proportion of remittances flowing towards developing countries (around three-quarters of official remittances), the literature often depicts remittances as being uniquely funnelled towards poverty struck regions. Remittance recipients do not tend to be overly poor either. The treatment of

remittances as an engine for growth and funds for poverty alleviation may hold at the aggregate level (Adams and Page, 2005), but they lack the high public good and high social returns of targeted development-driven investments (Rosenzweig, 2005).

This sub-section argues the framing of remittances as a tool to finance international development was the institutionalisation of the shift towards privatising development finance. The last couple of decades experienced a surge of private funding towards developing countries under the auspices of Bretton Woods institutions. Whether it be foreign direct investment, private debt and portfolio equity, or remittances, they greatly outweighed the growth of ODA. The privatisation of development funds carried on with little to no criticism since governments would not be tied to high donor contributions or development fundraising as austerity measures loomed globally (Dade, 2006; De Haas, 2007). The privatisation of international development is a symptom of what constructivists would label “institutional stickiness” (Bell, 2011). This institutional sticking, or continuation of privatisation efforts in the aftermath of the influence of *laissez-faire* economics and the lessons of the Washington Consensus (Williamson, 1990, 2009; Marangos, 2009), were key institutional remnants that influenced the institutional fabric of influential institutions that took on a leadership role in promoting remittances.

Kapur (2005) claims that remittances constitute a “new development mantra” or a new development paradigm. This paradigm shift is intrinsically linked to the historical institutionalised “stickiness” of privatisation and free-market ideologies within institutions and its application to privatising international development efforts. There also exist empirically proven reasons to believe remittances are countercyclical (Orozco, 2002; Mohapatra and Ratha, 2007; Debnath, 2017), meaning remittances increase when the needs

are highest (i.e., natural disasters, economic crises). As a consequence of this countercyclicality, remittances offer stability while also reducing the burden on large aid donors, notably states that tend to be procyclical. Hence, remittances have gained popularity due to their stability and ability to reduce large donors' burden.

Remittances are frequently likened to development funds despite being person-to-person, generally within the same transnational household, money transfers with no high social returns (Rosenzweig, 2005). Dilip Ratha (2014) talks about “dollars wrapped with love,” which serves as a caricature of how private remittances from person to person are oft glorified as being synonymous with altruistic donations aimed at poverty alleviation. Such attributions can obfuscate the complexities and heterogeneity in remittance transfers globally.

4.4.4 A policy transfer narrative: Combining policy analysis and international relations theories

Whereas the 9/11 punctuation provided the policy tractability to formalise flows (Pieke, Van Hear and Lindley, 2007), neoliberal institutionalist and privatisation agendas provided the incentives to undertake transfer cost reductions policies. Having explored both policy analysis and international relations theories, this subsection blends the previous three subsections under a policy advocacy coalition framework (Sabatier and Jenkins-Smith, 1993). Using the aforementioned policy advocacy framework, one can regroup the previously examined theories to demonstrate how the alignment of policy goals, coupled with the 9/11 punctuation, led to the policy transfer of transfer cost reduction policies from the security to the development field.

Initial regulations, mainly aimed at preventing money laundering and terrorism financing after 9/11, contributed to higher costs, and evidence showed this was counterproductive as it led to the increased usage of informal methods (Page, 2004). Since regulation has become known to increase the likelihood of resorting to informal channels (due to substitution between formal and informal remittance channels), privatisation and counterterrorism finally acquired common ground for a policy approach to formalising remittance flows. This convergence influenced other institutions and states to follow in the World Bank's footsteps, including states and the OECD (Straubhaar and Vâdean, 2005).

The 9/11 punctuation provided the impetus for change, but the goals of the policies enacted had long been documented as necessary pre-2001. According to the neoliberal institutionalist school of thought, the most likely objectives included transparency, low transaction costs, and remittance markets' efficiency. Besides, the constructivist argument previously presented expands on the historical institutional stickiness by which Bretton Woods institutions, among other institutions as well as states, continued to follow neoliberal privatisation, free capital flows, and free-market-oriented ideologies of the previous decade. The policy advocacy coalition framework blends the latter two for a more encompassing approach through which learning and mimicry (Dolowitz and Marsh, 2000; Marsh and Sharman, 2009) of the World Bank's approach to remittances outweighed the efficiency, or lack thereof, of regulation previously favoured by the BIS and others. This policy transfer provides a better understanding of why the 9/11 punctuation, coupled with neoliberal institutionalist and privatisation agendas, led to the alignment of transfer cost reduction policies across security and development institutions.

Understanding the origins of remittance policy formulation is critical given their pervasiveness in international agreements as well as their vital role in global security and development goals. As this research has shown, transfer cost-focused policies largely evolved from a security agenda post-9/11 and have been reframed to meet development targets such as goal 10c of the SDGs aimed at poverty alleviation.

Although there are numerous benefits to formalisation and the development benefits of promoting remittances are substantial, the underlying motives should be carefully examined and critically assessed. Moreover, the vilification of informal remittances should be questioned, and policies aimed at facilitating remittances require supplementary research to ensure the distributional impacts benefit impoverished regions and households. Furthermore still, lower transfer fees may not benefit remittance promotion as intended if a sizeable portion of the growth stems from informal to formal channel substitution, i.e. formalisation.

4.5 Conclusion

Using both policy analysis and international relations theory and blending security and economic development spheres in an interdisciplinary framework, this study has shed light on the causal factors that led to formalisation policies, specifically transfer cost reduction policies instead of regulation. The objective was not to evaluate remittance formalisation policies (i.e., policy evaluation) but instead to analyse the underlying causal mechanisms for taking policy action in the form of transfer cost reductions (i.e., policy analysis).

This research does not aim to question the development impact of remittances or current policies aimed at promoting remittances, but rather to understand how agenda-setting and policy formulation came about. The result is improved insights into how

lowering remittance transaction costs became a primary global policy tool in both intelligence and financial regulation as well as international development circles. Thus, the 9/11 terrorist attacks provided the punctuation that gave institutions the willingness and the policy tractability necessary to act upon privatisation and security agendas, and subsequently reframed as international development promoting strategies. This reframing occurred once regulatory tightening had the adverse effect of encouraging informal remittance flows and both security and development spheres recognised an alignment in policy prescriptions – transfer cost reductions through increased competition and broader market penetration.

Despite having conducted a thorough policy analysis of why states and institutions implemented remittance channel formalisation policies, there remains a glut of different policy evaluation questions that should serve policymakers and scholars alike. Three main avenues of future research include: (1) How effective have transfer cost reductions been for remittance formalisation, and have they had differential impacts across various informal and formal channels? (2) What proportion of the growth in formal remittances over the past decades is attributable to formalisation instead of growth in overall remittances that include informal flows? (3) What are the different development and security impacts across remittance channels, particularly for low and low-middle income country recipients? These questions are fundamental given the need for further data and research in this area. These future inquiry areas will determine the effectiveness of formalisation efforts and provide granular analysis and detail on the numerous forms of distinct formal and informal transfer methods.

Despite its analytical simplicity, the binary treatment of formal versus informal categorisations leading to informality constituting a residual category that regroups an eclectic mix of heterogeneous channels – and often conflated with criminality or illegality. Remittance scholars should acknowledge that the utility of the formal versus informal dichotomisation may have run its course and the study requires delving deeper into the myriad channels clustered within each category. Despite extensive research on the numerous remittance methods at migrants' disposal and their respective security concerns, examining the development impacts disaggregated across distinct channels remains a somewhat nascent study area. Moving forward, the inclusiveness of technologies is key to ensuring the digitalisation of remittances favours recipients, development goals, payment transparency, and lends itself to adequate regulatory oversight (Guermond, 2020).

Understanding the origins of remittance policy formulation is critical given their pervasiveness in international agreements as well as their vital role in global security and development goals. As this chapter has demonstrated, transfer cost-centred policies primarily evolved from a security agenda post-9/11 and have been reframed to meet development targets such as goal 10c of the SDGs aimed at poverty alleviation. Although there are numerous formalisation and development benefits to promoting remittances, the underlying motives should be carefully examined and critically assessed. Moreover, one should question the vilification of informal remittances and additional analysis of the distributional impacts of existing policies should be undertaken. As explored in the next chapter, lower transfer fees may not benefit remittance promotion as much as stated if the growth stems principally from informal to formal channel substitution.

4.6 References

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Chapter 5: Not Formal Enough for You? Global Remittance Channel Substitution and Informal Finance Gaps

Abstract: Before the 2007-2009 Great Financial Crisis (GFC), remittances were heralded as a major source of growing development finance, to the point of being labelled the “new development mantra”. However, after the recession, remittance growth rates have somewhat slowed. Since the GFC, a plethora of government and international institution led initiatives, such as the G20’s “5x5” Objective, the Sustainable Development Goals (SDGs) and objective 20 of the Compact for Safe, Orderly and Regular Migration, to encourage remittances through increasing competition of formal transfer institutions and via a concomitant reduction of transfer costs. Before the GFC, the terrorist attacks of 9/11 gave way to the large-scale formalisation of remittances that saw formal flows soar worldwide. Why has formal channel remittance growth slackened over the past decade? Using inflow and outflow remittance data, this chapter uses informal and grey market activity measures to demonstrate that high levels of informal networks take away from formal remittance flows. Findings suggest that, albeit a sizeable source of development finance, formal remittance growth is partially attributable to formalisation; owing much of its growth to substitution from informal channels. The findings have important implications for remittance growth and policy efforts moving forward, and support the notion that remittance growth is frequently overstated in the development literature.

Keywords: Remittances, formalisation, shadow economy, transfer mechanisms, migration

5.1 Introduction

Remittances, defined as funds or goods sent by migrants to individuals or groups to their region of origin (Adams, 2009), have proliferated since the 1980s. Much of this expansion is attributable to the increasing porosity of borders linked to the globalisation of human migration and international financial flows. Consequently, remittances have become a vital component of the migration literature across a broad range of disciplines. Their policy relevance grew as academics and policymakers realised that these financial flows could significantly assist international development efforts (Adams and Page, 2005; Maimbo and Ratha, 2005). In contrast, others have argued that they have disrupted official assistance flows through the privatisation (or “creative destruction”) of aid that has reshaped the philanthropic landscape (Kharas and Rogerson, 2012). As such, remittances became popular in the development literature. The oft-cited comparisons of these transfers to official development assistance (ODA) and foreign direct investment (FDI) (Adams, 2009; Driffield and Jones, 2013; Benmamoun and Lehnert, 2013) have led certain policymakers and scholars to label remittances as a new development paradigm (Kapur, 2005).

Unfortunately, an array of studies continues to converge solely on formal remittances through official (i.e., regulated) channels such as banks and money transfer operators (MTOs) while leaving unofficial channels understudied. All unregulated or unofficial channels, including sophisticated *hawala* networks⁸³ (El-Qorchi, 2002; Wilson, 2002; Maimbo, 2003; El-Qorchi, Maimbo, and Wilson, 2003; Ballard, 2005; IMF, 2009), networks of taxis and buses crossing borders with cash (Kabbucho et al., 2003; Chisasa,

⁸³ It should be noted that although *hawala* networks are often considered informal in high-income countries, this is not the case in many regions where they are integrated into the formal economy and often included in formal remittance statistics. This is problematic since the definition of what classifies formal and informal methods may vary across geographies.

2014), *fen chien* in China (Basu and Bang, 2015), *viajeros* in Mexico (Orozco, 2002), informal arrangements among diaspora members or family members crossing borders holding cash (Black et al., 2003; Blackwell and Seddon, 2004; IOM, 2016), are lumped together under the encompassing title of informal remittance systems (IRS).

As established in the previous chapter, the impetus to monitor and measure these flows came from both the security and development spheres. As explored in the previous chapter, the New York terrorist attacks on September 11th, 2001, led policymakers to consider these transfers, given the possibility they fund money laundering or terrorist activities. Also demonstrated in the previous chapter, the 9/11 Commission's report led to a dramatic increase in attention to this policy issue as it popularised this form of money transfer service (Roth, Greenburg and Wille, 2004). Although the 2004 commission report (National Commission on Terrorist Attacks upon the United States, 2004; Passas, 2006) has demonstrated that the 9/11 attacks were primarily, if not fully, funded through legal channels, the momentum towards the formalisation of remittance flows had already taken hold (refer back to Chapter 4 for details).

In turn, development circles recognised that the startling increase of formal remittances met the need for supplementary development funds. States and international financial institutions have gone to great lengths to reduce the cost of formal channels that are pricier than informal channels on average (Siddiqui and Arbor, 2003; Sander, 2004; Orozco, 2005; Freund and Spatafora, 2008; Orozco, 2010; Basu and Bang, 2015; Dimbuene and Turcotte, 2019; Orozco and Klaas, 2020). At the 2009 G8 summit in L'Aquila, members opted to set a target to reduce the cost of international remittances. For example, the "5x5" Objective spearheaded by the G20 sought to reduce formal remittance

transfer costs by five percentage points within five years. Yet, average global remittance costs remained above seven per cent in 2017.

More recently, there was a flurry of other initiatives such as the Addis Ababa Action Agenda to reduce overall remittance costs to an average of three per cent globally by 2030. These were reiterated in the Global Compact for Migration in 2018. The Luxemburg Group, in coordination with the International Monetary Fund's (IMF) balance of payments framework, endeavours to improve the estimation of global remittance flows and strives for the inclusion and transparency of unofficial international remittance flows. The reduction of transfer costs is part of the tenth Sustainable Development Goal (SDG) on poverty reduction within the United Nations.

Before the 2007-2009 Great Financial Crisis (GFC), decreases in remittance transfer costs amongst regulated MTOs and banks affected formalising large volumes of informal flows. However, after the recession, Mohapatra and Ratha (2012) pointed out that this trend appears to have slowed. This slowdown of global formal remittance volumes occurred despite remittance transfers' historically countercyclical nature (Orozco, 2002). Whereas the growth of remittances paid grew at an average annual year-over-year pace of 7.7 per cent from 1990 to 1999 and 10.7 per cent from 2000 to 2009, it has only averaged 3.9 per cent growth year-over-year from 2010 to 2017. The reversal of the countercyclical effects is primarily attributable to the crisis disproportionately impacting remittance-sending countries (procyclical) instead of receiving countries (countercyclical).

Given large-scale formalisation efforts (see Figure 5.1) and transfer cost reductions, the formal remittance growth slowdown is a compelling puzzle. The central research questions of this chapter stem from this puzzle: (1) Has remittance growth during the past

decades been attributable to formalisation? If so, to what extent? (2) Why has formal channel remittance flow growth subsided over the past decade, and is it attributable to diminishing formalisation returns? The policy implications of remittance network formalisation are critical, given its emphasis on current global agreements and targets, and evidence of diminishing returns could be critical for future decision-making.

Figure 5.1 Remittances received and the size of the informal economy

Sources: IMF balance of payments data on personal remittances received (constant USD in millions using Bureau of Labor Statistics consumer price index inflation data to convert series to estimates in real terms) and Medina and Schneider's (2018) MIMIC method estimations for the size of the shadow economy. In the second figure (Figure 5.1b), the shadow economy or informal sector size has been adjusted to account for the size of formal remittance flows as a proportion of global flows.

Note: Data from 2005 onwards are based on the sixth edition of the IMF's Balance of Payments Manual (BMP6).

Identifying the factors that drive formal remittances, especially the role of aggregate-level macroeconomic characteristics of remittance-receiving countries, is a critical first step in controlling for factors other than formalisation. To capture the role of formal-informal remittance channel substitution, one must study the trade-offs in growth between formal and informal. As the latter is a latent variable, proxies and estimations of the informal sector are necessary to measure informal growth.

Consequently, the objective of this chapter is to uncover whether substitution between remittance channels played a significant role in undercutting the growth of formal remittance networks post-2008, as Kapur (2005) suggests. This chapter examines the process by which migrants choose their preferred remittance channels. Answering these questions will address gaps in the academic literature while providing valuable insights for policymakers dealing with formal and informal remittances' economic and development implications.

This chapter's core argument suggests formalisation efforts partially fuelled the rise in formal remittances recorded. Consequently, one finds that remittance formalisation has been a contributor to formal remittance growth since 2001, but that this effect has weakened over time (i.e., diminishing returns to formalisation). Otherwise stated, due to protracted formalisation initiatives, substitution away from informal remittance channels plays a decreasing role in formal remittance growth.

These diminishing returns to formalisation are essential to inform policy. It suggests the slowdown in remittance growth could be a long-term trend rather than merely a temporary decline in growth. Moreover, transfer cost reductions, one of the main tools in formalising and promoting remittances, exhibit signs of diminishing returns over the past years. This critical finding suggests that future remittance growth may rely more heavily on fundamental determinants such as economic factors and global migrant stocks.

5.2 Remittances and channel substitution: A literature review

The study of how migrants send money back home is essential to understanding the socioeconomic and development implications for transnational migrant households, diasporas, and recipient countries. Remittances are a significant part of vital efforts to

alleviate poverty and promote development (Kapur, 2005; Ratha and Sirkeci, 2010). The inclusion of remittances as a poverty reduction tool within the SDGs highlights its importance within international development, migration, political, and economic literatures.

Unfortunately, remittance growth analysis is most often limited to the study of formal channel remittances, meaning those flowing through banks and other regulated financial institutions. As discussed in previous chapters, a scanty addressed gap in the migration literature pertains to so-called informal remittances and accompanying formalisation policies. Most statistics only consider formal remittances because informal remittances, whether through undocumented sources (from *hawalas* to digital currencies) or cash hand-carried across borders, are difficult, if not impossible, to measure accurately. This oversight is critical, given that multiple scholars have demonstrated that informal remittance flows outweigh those sent through formal channels in select countries (O'Neill, 2001; Sander, 2004; Maimbo, 2005; Ghosh et al., 2010; Basu and Bang, 2015).

5.2.1 Defining remittances and channel typologies

Statistics and studies focus on monetary remittances and shy away from non-monetary transfers such as goods, services or “social remittances” (Levitt, 1998). While future studies should explore the heterogeneity of remittance transfer types, currently available data limited to the narrower study of monetary transfers entirely fits this chapter’s scope. The narrower definition of monetary remittances lends itself well to this policy analysis since the reduction in transfer fees put forth by the Bank for International Settlements (BIS), G20, and the World Bank only concerns monetary remittance flows.

Data on formal remittance flows, using the personal remittances definition, are defined as regrouping three sets of IMF balance of payment components: “1) workers’ compensation under the income account (of the current account) which includes income earned abroad by seasonal or short-term workers (foreign residents for less than a year), 2) workers’ remittances under the current transfers (of the current account) which includes income earned abroad by migrants (foreign residents for over a year) and sent home, and 3) migrants’ transfers under the capital transfers account (of the capital account) which includes the repatriation of financial assets when migrants return home” (Shelburne and Palacín, 2007; IMF, 2009). The World Bank definition uses the same definition (see details in Section 5.4.1).

Due to inconsistencies in the balance of payments data across countries, there are often discrepancies in remittances recorded as received and sent between countries, hinting at large amounts of informal flows (refer to Section 5.4.1 for details on errors and pathologies relating to data collection). Even harder to measure are informal methods that do not use digital or banking technologies. For example, migrants carrying undeclared cash back “home” is another source of pervasive unofficial flows (O’Neill, 2001). As established in Chapter 4, the informal remittance market size can be extensive and likely outweighs formal remittances across numerous corridors.

Country-specific estimates vary widely. Kupets (2012) estimates Ukrainian informal remittances account for between 15 and 200 per cent of the value of reported remittances. Similarly, Ghosh et al. (2010) estimate that the informal economy and inflow of remittances in India are approximately 150 per cent larger than official estimates based

on nighttime satellite imaging of the country. In Sudan, informal remittances accounted for 85 per cent of total remittance receipts (Choucri, 1986).

Unfortunately, some have accused the informal remittance categorisation merely serving as a residual category for all remittances unaccounted for, thereby *de facto* acting as a “fake” categorisation regrouping non-regulated flows (Pieke, Van Hear and Lindley, 2007). IRSs include a range of channels from sophisticated *hawala* networks to undeclared cash carried by migrants. Other examples include the hiring of taxi and bus drivers in South Africa to move sums across the border to Zimbabwe (Chisasa, 2014) or *encomenderos* and *viajeros* (couriers) in Mexico (Orozco, 2002).

Apart from the regulatory differentiation between both channels, vast differences in transaction costs exist. Informal flows are estimated to carry significantly lower costs. Sander (2004) estimates average global informal remittance costs around three to five per cent of the transfer. For remittances to Bangladesh, Siddiqui and Arbor (2003) estimate that informal remittances cost less than half (approximately 45 per cent) of the cost of those flowing through formal channels. These transaction cost estimates are far lower than those of formal flows through banks and MTOs that can be seven per cent or more, according to 2016 estimates and 2017 preliminary estimates of the World Bank’s *Remittance Prices Worldwide* (RPW) database.

Despite informality’s role as a “residual category”, informal remittances can still constitute a practical categorisation. While it is a disparate assortment of dissimilar channels, it regroups the array of channels that are targeted by formalisation policies – the main topic of study within this chapter and Chapter 4. The next subsection further explains the distinctions between formal systems and IRSs by delving further into cost differences

and the different economic, reliability, speed and other factors that separate formal from informal flows.

5.2.2 Formal versus informal: Just a matter of dollars and cents?

The remittance literature suggests there are several determinants to channel modality that can inform formalisation efforts. As previously discussed, transfer costs are a pivotal factor since remitters, all else held equal, will opt for the cheapest option (Maimbo, 2003; Sander, 2004; Freund and Spatafora, 2005; Orozco, 2005; Freund and Spatafora, 2008; Orozco, 2010; Kosse and Vermeulen, 2014; Basu and Bang, 2015). However, there exist other factors that influence the cost of remitting. The most striking external factors affecting remittance costs are the exchange rate and interest rate fluctuations (Maimbo, 2003; Freund and Spatafora, 2008). Puri and Ritzema (2008) correctly point out that overvalued exchange rates act as financial repression on formal remittances, meaning they *de facto* act as an implicit tax on official channels. Speed of transfers (see Chapter 3) and regulation (see Chapter 4) are also known to impact modality.

Access to banking and financial tools by senders or recipients is another critical determinant in the choice of remittance systems. For instance, migrants habitually resort to informal systems if they or their recipients cannot access the financial tools necessary to transfer the funds (Puri and Ritzema, 1999; Maimbo, 2003; Amuedo-Dorantes and Pozo, 2005; Freund and Spatafora, 2008). Additionally, barriers to financial access extend beyond the paucity of physical and online access and include educational barriers tied to inadequate financial literacy.

Many examples of financial access affecting channel modality exist. Kosse and Vermeulen (2014) find that, in their quantitative investigation of 501 migrants in the

Netherlands, those with higher education and displaying signs of financial inclusion were more likely to remit through official networks. In an analysis of remittance in the United States, Stanley and Bhattacharya (2008) find similar results concluding that higher educational attainment and English language proficiency significantly increased the probability of having a bank account. Furthermore, Kubo (2017) uncovered links between education and financial literacy whilst studying the remittance methods chosen by Burmese migrants in Thailand. In sum, remittance method decisions are affected by both external accessibility (physical access to financial tools) and internal accessibility (socioeconomic and education-based financial literacy of both migrants and their recipients).

Another categorisation of determinants is the trust that a remitter has in IRSs, and their risk tolerance. The trust within IRSs has received little attention within the literature, but Chisasa (2014) has documented cases of “good customer care” and “convenience” that are absent in formal systems. Faster speeds within Middle Eastern *hawala* systems have also established trust and reliability by outpacing formal remittances that lag behind both regarding speed and cost-competitiveness (Maimbo, 2003). More than trust, remitters have reasons to believe that informal systems are more reliable if they carry the cash themselves across borders, especially in the case of temporary migration (Siegel and Lücke, 2009).

Maimbo (2003) describes the “adherence to unwritten but well-established codes of business practice” within *hawala* networks. This concept alludes to the “unwritten ground rules” literature coined by Steve Simpson (2000), whereby there exists an innate “formalisation” through the development of societal expectations and pressures, or informal network ties (Puri and Ritzema, 1999). However, one could also cite the principal-

agent framework through which the *hawaladars* and other intermediary actors in IRSs could take advantage of asymmetric information at the expense of remitters.

5.2.3 Remittance channel decision theory

A defining model in the literature divides the remittance process into three stages: the first-mile, the intermediary stage, and the last-mile (APEC ARS Working Group, 2003; Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007). This model's value-added comes from itemising the various actors that affect the process during each step – the sender, recipient, and intermediary actors' actions all matter. The model also fits causal factors or determinants of the remittance process split across three stages.

Although recipients may share information and may influence the sender, the decision to remit is ultimately that of the sender (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007). Through a logic of backwards induction, the sender can trace back the decisions faced at each stage. Therefore, despite a string of simultaneous decisions made at the onset, it is noteworthy to follow the path of these remittances from their first-mile to the last-mile travelled and how this influences remitter behaviour.

The first-mile refers to the sender's ability to access formal channels, the financial awareness of the sender, improvements in market information and regulation. The first-mile focuses on accessibility, reduction in transfer costs, market information, and financial awareness impacting the remitter's decision at the onset of the remittance process.

The second stage involves the interaction of market actors and funds transfer services. The spotlight at this stage is on competition of MTOs and banks, technological advancement and innovation in remittance transfer products (or methods), and regulation

affecting market actors. The main innovations and shifts in remittance market competition comprise the integration of businesses and the expansion of low-cost technologies or products. For example, the creation of the Federal Reserve System's Automated Clearinghouse (FedACH) International Mexico Service aims to facilitate financial transactions, including remittances, between the United States and Mexico (Hernández-Coss, 2005b). The FedACH processes remittances and other funds, then send the transfers to Banco de Mexico, taking advantage of massive economies of scale through bulk transactions. It also boasts an average speed of three days which mostly beats its competition at similar prices. Innovations in products include more convenient locations and hours of operation, cash-to-cash service, bilingual staff, and increasingly transparent pricing structures.

Finally, the last-mile refers to the end distribution to recipients. This stage notes the importance of distribution channels, the links between sender and recipient communities, accessibility to banking services, and the needs and effects of remittances on recipient communities. The focus here is on the determinants of recipient actors and their access to distribution channels, whether they are banks, MTOs, microfinance institutions, department stores, exchange houses, or post offices. The promotion of credit unions, or *cajas populares*, is an example of expanding banking services promotion and enhancing financial service accessibility, especially to low-income recipients (Hernández-Coss, 2005b). Ultimately, an important contribution of this model is the focus on the needs of recipients. This aspect fits quantitative evidence that remittances tend to be countercyclical, meaning that dire conditions in cases of natural disasters or other shocks (e.g., economic,

social, natural) correlate positively with increased remittance receipts (Orozco, 2002; Ratha, 2007; Mohapatra and Ratha, 2012).

5.2.4 Regulatory impetus: How security threats drew attention to IRSs

The terrorist attacks of 2001 played a pivotal role in the remittance literature, making IRSs a policy priority (Pieke, Van Hear and Lindley, 2007). As explored in Chapter 4, the security sphere grew concerned about informal remittance transactions after the publication of the 9/11 Commission Report confirmed *hawala* networks as a major source of terrorist funding despite not funding the 9/11 attacks (National Commission on Terrorist Attacks upon the United States, 2004; Roth, Greenburg and Wille, 2004; Passas, 2006).

The security literature revolves around the inclusion of determinants such as regulation and the frequent need for anonymity. Informal remittances, often seen as an obstacle to security and international monitoring efforts, led many researchers and lawmakers in policy circles to propose policies to formalise or regulate remittance flows. McCusker (2005) presented six primary policy options: (1) Regulation; (2) Disruption of underground systems (international policing); (3) Government incentives to regulate; (4) Liberalisation of economies in receiving countries; (5) Improving access to financial tools in recipient countries; and (6) Encouraging microfinance institutions.

As Chapter 4 describes, regulation had the adverse effect of increasing costs and making informal remittances more appealing than their regulated counterparts. Passas (2006) was among the few that questioned regulation as the solution, stating that far more illicit funds travelled via formal remittance networks. Transfer costs became the ideal policy once policy alignment between development and security scholars occurred, achieving formalisation and poverty alleviation goals.

2001 and 2008 thus constitute critical punctuations that affected remittance flows. Whereas the latter is an economic crisis, the former relates to exogenous security concerns and political shifts – both of which contributed to increases in regulation and costs borne by RSPs. The security literature complements that of economics and development since it sheds light on the increased attention to informal flows, particularly amongst government and international monitors. Having explored the determinants of informal versus formal remittance flows, the next section reviews the literature on capital flight and estimating informal markets.

5.2.5 Capital flight and the underground economy: Measuring the unmeasurable

The capital flight literature focuses more specifically on estimating informal flows as a critical portion of the balance of payments errors and omissions. Primarily centred on financial funds leaving the African subcontinent (Brown, 1992; Grey-Johnson, 1992; Boyce and Ndikumana, 2015), the capital flight literature accounts for all debt payments and other outward financial flows. An extensive literature also pertains to capital flight in eastern Europe (Loukine, 1998; Mulino, 2002). The literature converges on two main adjustments utilising the errors and omissions portion of the balance of payments: trade misinvoicing and informal remittances (Eggerstedt, Hall and Van Wijnbergen, 1995; Schneider and Windischbauer, 2008; Boyce and Ndikumana, 2017). The Financial Action Task Force (FATF) is one such institution that studies capital flight to combat money laundering and terrorism financing. The FATF currently consists of 35 member jurisdictions and two regional organisations, namely the Gulf Cooperation Council and the European Commission. Nevertheless, the FATF's enforcement mechanism relies on "name

and shame” policies by publishing a list of detractors and enforcing international financial standards aimed at regulating/monitoring.

There are broadly two ways to estimate informality: direct methods that rely on surveys and indirect methods that rely on various proxies. There is insufficient survey data to construct a global series, and even less so across time, this section focuses on the latter indirect methods. These methods include estimating the discrepancy between national expenditure and national income, the discrepancy between official and actual labour market participation (Contini, 1981), the electricity approach in which electricity is assumed to reflect total economic growth, including the informal sector (Kaufmann and Kaliberda, 1996; Ghosh et al., 2010; Henderson, Storeygard and Weil, 2012), an array of transaction approaches, and the currency demand approach (Schneider, 1997).

Medina and Schneider (2018) and Schneider, Buehn and Montenegro (2011) estimate the size of shadow economies using three fundamental methods in their MIMIC model: (1) national accounts discrepancies, (2) surveys with businesses or households, and (3) the consumption-income gap of households.⁸⁴ Structural equation models are used to estimate the shadow economy, some parts of which could be utilised to model outward and inward flowing shadow economy (informal economy) related remittance flows.

Although these macro techniques of estimating the grey or shadow economy can be crude, they reveal fascinating insights into global trends in informality. Ferriani and Oddo (2019) and Schiopu and Siegfried (2006) find that estimates of the informal, or grey, economy in the sending region yield contradictory positive and negative coefficients for

⁸⁴ The multiple indicator-multiple cause (MIMIC) approach is used to estimate latent informal economic activity using an array of independent variables, which include trade openness, unemployment, size of government, fiscal freedom, rule of law, control of corruption, and government stability.

the amount remitted, respectively. This suggests that the presence of informality can both be correlated with higher remittance flows (most likely due to higher stocks of migrants sending remittances) and with lower remittance flows (most likely due to substitution from formal to informal channels).

5.2.6 From whom, to whom? Limitations in dyadic data

In addition to a near-complete absence of information on global informal flows, bilateral flows data offer limited coverage of corridors or most likely rely on prohibitive assumptions. Data on dyadic global patterns on a “from whom, to whom” basis are sparse and often rely on modelled data. Modelled estimates are problematic since it limits researchers’ possibilities to take sender, recipient, and corridor-specific characteristics. Hence, scholars and policymakers are limited to partial models of remittance inflows in isolation of remittance outflows.

To bridge this gap, Ratha and Shaw (2007) developed a methodology by which bilateral remittance flows are estimated based on IMF balance of payments statistics blended with migrant stock and GNI data to weight corridor sizes. Ratha and Shaw (2007) discuss three allocation methods: migrant stock weights, migrant income weights, and migrant income weights of both abroad and at “home”. The Global Knowledge Partnership on Migration and Development (KNOMAD), led by chief economist Dilip Ratha and housed at the World Bank, publishes these data annually.

Albeit informative and a useful estimation for policy purposes, the data remain limited in the study of remittance channel decision-making. Since migrant stocks and GNI are necessary controls in remittance models, their use in estimating the dependent variable (remittance amount sent by dyad or corridor) is problematic and introduces endogeneity in

the model. More than merely introducing endogeneity, adding GNI and migrant stocks as controls serve only to re-engineer the dependent variable's estimation. Unfortunately, this means a gravity model or other form of model that considers bilateral flows is inadequate for this chapter's purposes – leaving partial models of inflows and outflows as the most likely alternative.

Except for specific corridors, bilateral remittances remain mostly unaccounted for transnationally. Despite Ratha and Shaw's (2007) rather bleak claim that "credible national data on bilateral remittances are not available," bilateral data do exist, but they are limited in scope since the coverage of global corridors is constrained. Docquier, Rapoport and Salomone (2012) have the most encompassing dataset of 89 sending countries and 46 recipient countries from 1985 to 2005, which still includes various estimations. The authors make use of five bilateral remittance datasets: the EU database for 16 EU origin countries to 33 destination countries from 2000 to 2005 used by Jiménez-Martín et al. (2007), an IMF dataset of 69 sending countries and 11 recipient countries from 1980 to 2005 used by Lueth and Ruiz-Arranz (2008), a Romanian database of 17 sending countries to Romania from 2005 to 2008, the International Development Bank dataset for five Latin American countries, and data collected by Schiopu and Siegfried (2006) for 21 Western European countries and seven neighbouring recipient countries from 2000-2005. Other authors have relied on single country bilateral flows such as for Pakistan (Ahmed and Martínez-Zarzoso, 2016) or used a blend of data and estimates such as Azizi (2017, 2018, 2019) using data from 12 recipient countries and Ratha and Shaw's (2007) methodology to estimate the remaining 180.

Although these databases are essential to understanding causal mechanisms underlying remittance decision-making, many missing observations and data gaps exist. Furthermore, the data are relatively dated and offer few insights into the critical 2001 punctuation and do not cover the crucial 2008 punctuation. As for estimates using the methods developed by Ratha and Shaw (2007), they are occasionally misused in studies that regress bilateral flows on explanatory variables that were initially used to model the dependent variable. The accidental inclusion of these variables used to model the dependent variable accidentally reverse-engineers the modelled variable and yields artificially high explanatory power. Hence, researchers should question the use of modelled bilateral estimates as a dependent variable, especially if using income and migrant stocks as control variables – or other independent variables that are highly correlated with these variables.

From the above, three reasons emerge why this chapter does not use bilateral remittances. First, because the use of bilateral flows prohibits the use of crucial remittance determinants, namely income and migrant stocks (Ratha and Shaw, 2007), seeing as they are used to model this dependent variable in the first place. Income and migrant stocks are particularly crucial in this study since it is vital the shadow economy proxy for informality does not capture an income effect whereby, for example, higher-income countries with lower rates of informality send more substantial volumes of remittances. Similarly, bilateral flows modelled based on migrant stocks could introduce endogeneity in analysing the effects of transfer costs, which negatively correlated with diaspora size (Beck and Martínez Pería, 2011), on the amount remitted. Second, sparse data sources, other than modelled estimates, cover the pre- and post-2008 period, which is critical for this study's

purposes. Thirdly, concerns about the accuracy of bilateral flows persist – especially in areas where a significant portion of funds is re-routed through third-party countries, such as the over-reported remittances from the United States to the Philippines, for example (Ratha, 2005; Azizi, 2018).

The use of modelled bilateral flows can undermine the validity of the proposed model. This chapter is constrained to partial analysis using inflows and outflows separately rather than a more encompassing approach that simultaneously addresses first- and last-mile characteristics. Although imperfect, the chapter succeeds in deriving conclusions about remittance substitution over time that complements the static survey-based approaches used in Chapters 2 and 3.

5.3 Theoretical framework and hypotheses

In line with the literature reviewed in the previous section, this section outlines the theoretical framework guiding three core hypotheses and how they relate to the research question on formalisation and main remittance determinants.

5.3.1 First-to-last mile model

Using an adapted form of the first- to last-mile model (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007), the proposed framework identifies macro-determinants and actors at play in global remittance channel decision-making processes. The framework highlights key explanatory variables, hypotheses about their variation and grounds the chapter's empirical findings in theory that sheds light on causal effects. The remainder of this section details the theoretical motivation for each of the chapter's hypotheses and presents them within the parameters of the proposed model (refer to Figure 5.2).

Figure 5.2 Remittance decision-making model

Note: Synthesis and integration of remittance channel decision theories and determinants. For simplicity, only two channels (A and B) are depicted in the figure, but additional channels could be added without compromising the model's validity.

There are three actors in this framework (see Figure 5.2): the sender, the recipient, and funds transfer services or the MTO. There also exist several external effects or barriers: technological and product innovation, external accessibility to financial services (i.e., no access to banks or other transfer services or internet), both macro and micro socioeconomic effects ranging from inflation to exchange rates and employment, as well as external regulatory bodies such as the BIS, FATF, and specific country-level regulators or institutions. Each of these factors affects the choice of remittance channel, and their identification enhances the understanding of causal mechanisms and the various interactions between actors. The framework isolates seven main determinants: financial accessibility (of both sender and recipient), economic conditions (of both sender and recipient), recipient financial needs (besides economic conditions), alternative flows, informal economy size, and the prominence of cash, transfer costs, and regulation.

Through backwards induction logic, the sender can select the appropriate remittance channel by analysing the effects at each stage and deciding upon the most suitable channel based on the information available to them.

5.3.2 Hypotheses

Based on this framework, one can begin to understand the various determinants and actors at play. From the model mentioned above, select hypotheses contribute to testing the dynamic and channel substitution tendencies of global remittances.

First, there need to be viable informal alternatives for substitution from formal to informal remittance channels to occur. Consequently, one can hypothesise that when informal networks and grey markets are more sizeable, then the volume of remittances flowing through formal channels will be relatively smaller, *ceteris paribus* (contrary to findings in Chapter 3 for the Canadian case study).

Second, as formalisation takes hold, its marginal effect of increasing formal remittances globally diminishes – meaning there exist diminishing returns to formalisation.

Third, transfer costs and sensitivity to transfer costs are essential in the choice of remittance channels. These costs include front-end fees, back-end fees, premium exchange rate costs, and interest rates. Unsurprisingly, all else held equal, remitters will choose the cheapest remittance option.

The aforementioned theory and hypotheses set the foundation for the ensuing analysis that demonstrates substitution from informal to formal channels contributes to formal remittance growth but that this effect is weakening over time. As per the model detailed in the previous section, additional control variables are also tested despite not being at the core of the channel substitution and informal remittance use argument.

The main controls are migrant stocks and macroeconomic factors driving the demand and supply of funds. Except for migrant stocks driving higher remittances, macroeconomic conditions are currently the main explanation, other than increased regulation, of the slowdown of aggregate formal remittance growth. However, the effect on remittance channel substitution remains somewhat unclear. If economic conditions deteriorate, such as higher unemployment or investment opportunities fluctuate, making the recipient region's currency more expensive, one expects both types of channels to experience a reduction in remittance flows. This includes exchange rates and lending rates, for instance.

Increased financial needs due to higher dependence based on a larger proportion of older or younger residents could attract additional flows to the region, and therefore constitute vital control variables within the model. Similarly, low employment and GDP could incite a higher need for remittances.

Another key element will be testing whether developing regions are prone to certain types of remittance transfers compared to other development flows such as FDI or ODA that may act as substitutes (Carment and Calleja, 2018). Other crucial mechanisms may be measured through a region's dependency on foreign flows (i.e., their status as either "donor darlings" or "donor orphans"), since this may push remittance seeking donor darlings (e.g., Pakistan and Bangladesh) to further promote remittance attracting financial instruments.

Access to financial services constitutes an important determinant in the remittance channel decision-making process. Financial accessibility refers to regional physical barriers to financial tools and the lack of financial development (this is especially significant in rural versus urban areas).

5.4 Data triangulation and methods

Despite the chapter's primary quantitative focus of measuring the impact of economic informality (as a proxy for informal remittances) on formal remittance flows, a data quality assessment provides the necessary tools to triangulate appropriate methods and datasets. Scoping efforts confirmed that only a few datasets permitted the type of analysis undertaken in this chapter and highlighted key features among competing estimates.

This section is divided into two subsections. The first subsection outlines the lessons learnt from data quality assessments and outlines details on aggregate data compilation processes. The second subsection highlights the quantitative methodology and summary statistics of the data used in this chapter.

5.4.1 Data quality assessment

A review of data quality, alternative methodologies and datasets provides valuable insights that complement the findings outlined in the literature review. More than a mere replication of these findings, the data assessment yields the following:

- ensures the validity of data use as well as the study's feasibility based on currently available data;
- explores differences across geographies, channels and among reporting institutions to better understand the aggregation process within the larger BoP framework; and,
- provides insights into discrepancies that could cloud results.

Three key institutions were selected for the data quality assessment: the IMF, the World Bank, and Statistics Canada. Each institution plays an essential role in estimating remittances and, in the case of Statistics Canada, provides a connection to previous chapters on Canadian remitter characteristics and trends. The information provided within this

chapter aims to weigh the strengths and limitations of various sources and draw linkages between the types of data sources used in the Canadian case study in Part I with global balance of payments aggregates.

International Monetary Fund

Considering the IMF's central role in expanding the understanding of remittances and developing more encompassing international guidelines, it is central to confirm that the tools employed in this research are both relevant and timely. As seen in the previous chapter, 2001 precipitated a slew of research and data collection efforts to better address gaps in remittance knowledge and documentation. In the 21st meeting of the IMF Committee on Balance of Payments Statistics in November 2008, it was stated that: "since at least 2004, the G-8 Heads of State – as well as the G-7 Finance Ministers and others – have been emphasising the importance of improving the availability of statistical data on remittances (as well as reducing the costs associated with sending and receiving remittances through formal channels such as banks)" (IMF, 2008).

The IMF is among the primary sources that compile macro-level global remittance data from various national statistical programs. Although the resulting global balance of payments framework undertakes the principle "country vis-a-vis total rest of the world" (i.e., cannot be used to study bilateral flows), it provides the most encompassing dataset of transnational flows. Moreover, the IMF Statistics Department was at the front line of all international initiatives on statistical issues related to remittances data, such as:

- (i) clarifying the needs of data users and agreeing on a strategy for improving the availability and accuracy of remittances data (2005 World Bank conference jointly organised by the IMF and World Bank);

- (ii) setting up new methodological standards within the work of Interagency Technical Sub-Group on the Movement of Natural Persons; and
- (iii) setting new compilation guidance within the work of the Luxembourg Group as well as other working groups.

The *International Transactions in Remittances Guide for Compilers and Users* (IMF, 2009) is the leading remittance data resource guide internationally. The remittance data guide covers data sources and estimation methods in cases where administrative data sources, regulatory data, or household surveys are unavailable or too costly to produce. The guide categorises remittance sources into four main classifications: (1) International Transactions Reporting Systems (ITRS), (2) direct reporting by MTOs, (3) household surveys, and (4) indirect data sources, including models and econometrics estimations. Regarding estimation methods, the compilation guide covers some of the main remittance determinants, such as years of stay in the host country, household size, transfer costs, exchange rates, and numerous other common factors.

As outlined in the *International Transactions in Remittances Guide for Compilers and Users* (IMF, 2009), the ITRS is a data collection system that acquires transaction-level data from financial institutions, especially banks. Given that MTOs frequently resort to banks for their international payments, the various national ITRSs can generally capture MTO and other money service business, or MSB, flows. However, as stated in the IMF guide, “a separation between settlement arrangements and information flow, as well as the involvement of clearing centers and netting between regional MTOs, may result in the omission of larger gross flows” (IMF, 2009). Hence, data gaps remain, as some MSBs can navigate between inter-jurisdictional reporting schemes and larger aggregated flows may

omit netted transnational flows at either end (though this is presumably small for low-income recipient countries). Moreover, the blend of such sources with household surveys that report MTO and other remittance transfers (occasionally including informal flows) leads to potential double counts. Refer to Figure 5.3 for remittance definitions compiled using these data sources.

The quality of remittance data varies significantly across countries based on the methods of estimation used. The spectrum ranges from countries that do not produce or share information with the IMF to successful cases with the elaborated compilation program that includes a wide range of data sources and sound validation techniques. Each of the major data sources has specific limitations. The reconciliation of data from an array of sources, while a difficult task, has merits and can help detect a country's specific money transfer channels. Both remittance information for each sending and recipient country is available, but under the principle of a particular "country vis-a-vis total rest of the world", the BOP framework is not suitable for compiling bilateral data.

Figure 5.3 IMF remittance definitions using the balance of payments framework

Total remittances and transfers to NPISHs: a+b+c+d+e+f					
Total remittances: a+b+c+d				e	f
Personal remittances: a+b+c				d	
a	b	c	d		
Personal transfers (part of current transfers)	Compensation of employees less taxes, social contributions, transport, and travel	Capital transfers between households	Social benefits	Current transfers to NPISHs	Capital transfers to NPISHs

IMF definitions: Personal transfers. Current transfers through ITRS reporters (i.e., banks and other financial institutions); net settlements of other formal channels (e.g., money transfer operators); no information on transactions through other channels or transfers in kind. **Personal remittances.** Current and capital transfers through ITRS reporters; coverage of compensation of employees or expenditure related to short-term work abroad (travel, taxes, etc.) only in exceptional cases (when payments are made through reporting banks and non-resident workers are identified). **Total remittances.** Current and capital transfers to households, including social benefits and transfer from NPISHs. **Total remittances and transfers to NPISHs.** Current and capital transfers to households, including social benefits and transfer from NPISHs, as well as current and capital transfers to NPISHs.

Source: IMF (2009)

The main takeaway from meetings with the IMF was to confirm the proper use of remittances for this project and provide additional details about past data quality improvements. An instrumental part of the data verification process, IMF sources highlight key efforts undertaken by the Luxembourg group and further confirmation of the literature review's coverage of the topic.

World Bank

The growing data gap between remittances sent and received from the balance of payments data is a serious concern when analysing bilateral flows. As expressed in Ratha (2005) and Azizi (2018), the primary concern is that higher remittances received are attributable to transitory countries where inflows are double counted. For example, the Philippines reports high remittances received from the United States, which can be traced back to the numerous banks that route fund transfers through the United States.

This gap is also linked to informal channel use, which is mentioned in the *World Development Indicators* (WDI) data disclosures. Although it is difficult to account for such methods due to their role as part of the grey or underground economy, another key issue is the disparate measurement of informality across countries. For instance, some countries count *hawala* as formal, whereas others do not demonstrate the informality concept's fluidity and the differences in interpretation that exist. The inconsistency in the statistical treatment of different payment types across geographies and time is a significant obstacle across remittance analyses, including within this chapter. For example, Pakistani balance of payments statistics covers *hawala* transfers since they are part of several monitored channels, whereas *hawaladars* in numerous countries remain unaccounted for. The

differences in remittance transfer measures across borders, like many aggregate global statistics, constitute a significant obstacle in the coverage of global remittance flows.

To overcome these concerns about the accuracy of flows, the gap in remittances received and paid, and gain more knowledge about bilateral flows, the World Bank has dedicated efforts to constructing the bilateral remittance matrix. Developed using models from Ratha and Shaw (2007), the bilateral remittance matrices aim to provide the best global coverage of remittances by bridging data gaps. Using migrant stocks and GNI to model remittances across corridors or dyads, the matrices provide a valuable tool in the study of flows (refer to Section 5.2.6 for details). Unfortunately, the models rely heavily on the immigration and income variables – which is problematic, seeing that they are both key explanatory variables in the regression-based analysis of this chapter. Moreover, there are significant departures from the balance of payments data that appear questionable (see next subsection for the Canadian case study).

Analysis of World Bank sources proved helpful in confirming the importance of existing efforts to bridge bilateral remittance data gaps and details on relatively new data sources such as the *Remittance Prices Worldwide* (RPW) dataset that documents fees charged through banks and MTOs by corridor quarterly.

Statistics Canada

Statistics Canada provides a vital link between the macro study in Part II of this dissertation and the micro-based study of individuals and households in Part I. A more in-depth examination of this national reporting agency offers a more granular look into data fed into the IMF's global balance of payments architecture. This approach highlights the key strengths and limitations that underpin the data.

Contrary to the World Bank efforts to model bilateral flows, described as “indirect” estimations in the International Transactions in Remittances Guide for Compilers and Users (IMF, 2009), Statistics Canada bases Canadian remittance figures on “direct” sources outlined in the guide. Statistics Canada prioritises empirical data collection, such as household surveys and administrative tax sources, over statistical modelling. Although such an approach may lead to more conservative estimates that may not necessarily capture the magnitude of actual flows (e.g., does not necessarily cover informal flows), the methodology is substantiated with more rigorous empirics than through modelling efforts by following proper population sampling and survey procedures. Although cost-efficient, modelling efforts undertake strong assumptions regarding correlational relationships and lead to problems in terms of verifiability of assumptions and the ensuing modelled results (IMF, 2009).

Statistics Canada uses its *Survey of Household Spending* (SHS) to estimate personal transfers, complemented by the more recent *Study on International Money Transfers* (SIMT) used in Chapters 2 and 3 for cross-verification in more recent years, and administrative T1 and T4 Canadian tax data forms were used to capture non-residential compensation of employees.

Regarding the personal transfers component using household survey data, Statistics Canada had relied on the SHS with the SIMT data available as a cross-reference for 2017. Although household surveys are critical in providing in-depth analysis of trends and vital microdata for research, their drawbacks include the necessity for proper sampling and meticulous framing of survey questions. In the case of the SHS, the remittance question refers to the “donations and gifts of money section” where respondents were asked: “In the

12-month period between [survey period], how much did you/your household spend on the following” and the third of three options is framed as “gifts of money given directly to persons living outside Canada”. Framing remittances narrowly as “gifts” could significantly bias survey results.

Moreover, the SHS is a general survey wherein respondents may have limited recollection of all expenditures and is not explicitly aimed at remitters. Furthermore, seeing that the SHS is not aimed at migrant respondents, the survey results could incur statistical weighting issues and potential problems with proper coverage of the studied population. Besides, it is worth noting that the SIMT records higher remittances than the SHS once weighted to represent the Canadian population despite only sampling ODA-eligible country born migrants. This gap suggests that both surveys likely undercount personal remittance flows, albeit in different ways.

Using tax data to cover compensation for employees portion of the IMF definition for the reduced definition of personal remittances (excluding capital transfers), the use of T1 tax forms uses reference individuals’ foreign income. Based on Statistics Canada’s processing of income tax entries, the data use the “centre of economic interest” definition to determine non-resident income.⁸⁵ One limitation is that the amount included is total foreign income, which fails to back out what had been spent within Canada, leading to a likely overcount of remittance outflows.

Table 5.1 summarises the results across the vital source institutions described above. Although there is a clear link in data provision for Canadian remittance outflows,

⁸⁵ Per the IMF’s fifth balance of payments manual, “an institutional unit has a centre of economic interest in a country if it has already interest engaged in economic interest: activities and transactions on a significant scale in the country for one year or more, or if the unit intends to do so” (IMF, 1993).

one immediately identifies the reliance on surveys leading to far more conservative estimates than those of the World Bank’s bilateral flows framework. Although it is entirely plausible that the Statistics Canada surveys undercount remittance outflows, the volume of Canadian flows in the bilateral flows framework vastly outpaces that from any other source. This incongruity, attributable to redistributing the discrepancy between global remittance inflows (higher volume) and outflows (lower volume) using Ratha and Shaw’s (2007) method based on immigrant stocks and gross national income.

Table 5.1 Comparing Canadian remittance outflows in 2017 across sources

	Statistics Canada (\$ CAD)	IMF BoP (\$ USD)	World Bank (\$ USD)
Personal transfers (a)	SHS: \$3.2B SIMT: \$5.2B	BoP: \$2.6B (~\$3.2 CAD)	BoP: \$2.6B (~\$3.2 CAD)
Compensation for employees and capital transfers between households (b + c)	Tax (T1/T4): \$5.1B	BoP: \$3.9B (~\$5.1 CAD)	BoP: \$3.9B (~\$5.1 CAD)
World bank bilateral remittance framework (Ratha and Shaw, 2007)			BRF: \$24.6B

Sources: Statistics Canada (Table 36-10-0014-01), IMF and World Bank

Notes: Based on the approximate 0.7713 annual average of CAD/USD exchange rates.

5.4.2 Data and quantitative methodology

Having established the validity of the data used through the previous data quality assessment, this section covers the methodology and data used to answer the broader question on the impacts of formalisation on global remittance growth. Limited to partial analysis models rather than bilateral flows, the panel regression analysis uses fixed effects as reflected in the Hausman selection model results. One main feature of this type of study is distinguishing between the *within* (countries across time) and *between* (differentiating between countries) explanatory power of models. The robustness checks through the

addition and withdrawal of variables shed light on key differences in explanatory power across countries versus across time. The simple log-linear model can be represented as follows:

$$\ln(R_{i,t}) = \alpha + \beta_1(S)_{it} + \beta_2(X_j)_{it} + \varepsilon_{it}$$

where R represents remittances (inflows or outflows), S represents the relative size of the shadow economy, X_j represents the vector of other independent variables j , i denotes each country, and t represents sample years.

Using an array of merged datasets, the resulting panel consists of data that, for the most part, span from 1991 to 2017 across 99 to 171 countries, depending on data availability. The data stem from a variety of World Bank databases with the addition of data for remittance flows coming from the “personal transfers” and “compensation for employees” line items of the IMF balance of payments. These data are supplemented by external sources such as the UN migrant stocks and estimates of the shadow economy by Medina and Schneider (2018). The goal is to determine the effects of the informal sector’s presence on formal remittance flows at the macro-level (for both the sending and recipient countries). Hence, the dependent variable is aggregate formal remittance flows by country across time, i.e. a panel dataset. A detailed summary of the variables, their source, and the hypothesis they correspond to can be found in Table 5.2.

Table 5.2 List of variables, sources, and associated hypothesis

#	Description	Source	Variable type	Hyp.	Dates included
1	Volume of remittance flows (USD constant)	International Monetary Fund, Balance of payments statistics	Dependent		1990-2017
2	Size of the shadow economy estimated using MIMIC model	Medina and Schneider (2018)	Independent	H1/H2	1991-2015
3	Informality proxy: Rural population	World Bank, WDI dataset (based on the United Nations Population Division's World Urbanization Prospects)		H1/H2	
4	Informality proxy: Access to electricity	World Bank, Sustainable Energy for All (SE4ALL) database	Independent	H1/H2	1996, 1998, 2000, 2002-2017
5	Transfer cost average across all institutions (for all four quarters of the year) for dyadic remittance flows. Includes transfer fees and surcharge on exchange rates as compared to the interbank exchange rate at the time of the transaction.	World Bank, RPW dataset	Independent	H3	2011-2017
6	Migrant stocks	United Nations, migrant stock by origin and destination dataset	Control		1990, 1995, 2000, 2005, 2010, 2015, 2017
7	GDP and GDP per capita (constant in 2010 USD)	World Bank national accounts data and OECD National Accounts data	Control		1990-2017
8	Employment rate of the working age population (15 + years)	International Labour Organization, ILOSTAT	Control		1990-2017
9	ATMs per 100,000 adults	World Bank, GFD dataset	Control		2002-2017
10	Net foreign direct investment inflows	World Bank, WDI dataset (from IMF and UNCTAD)	Control		1990-2017
11	Net official development assistance	World Bank, WDI dataset (from Development Assistance Committee)	Control		1990-2017
12	Lending rate	International Monetary Fund, International Financial Statistics and data files.	Control		1990-2017
13	Real effective exchange rate	International Monetary Fund, International Financial Statistics	Control		1990-2017
14	Polity Index	Polity IV Project	Control		1990-2017
15	Country		Fixed effects		1990-2017
16	Year		Fixed effects		1990-2017

Note: Figures are scaled. Migrant stocks are in millions, whereas GDP, FDI and ODA estimates are in billions of constant USD. A United States dollar deflator is used to obtain constant figures.

The leading independent variables of interest are derived from the list of hypotheses outlined in the previous section. First, data on the informal economy come from Medina and Schneider's (2018) estimates (using the MIMIC method) of shadow economy size. These, along with rural population and the percentage of the population without access to electricity as proxies for informal economy size, provide a foundation to test the first and second hypotheses. Although informative, RPW estimates provide limited ability to test hypothesis 3 without discarding numerous observations (see Table 5.3). Remittance transfer costs data are presented for the average transfer cost of 200 USD (including transfer fees and exchange rate surcharges) but are also available for a 500 USD amount (for which there are the expected economies of scale).

Table 5.3 Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Remittances received* (millions of constant USD)	4,407	1,757.7	4,702.3	0.01	71,514.9
Remittances paid (millions of constant USD)	4,254	1,429.4	4,908.0	0.00	68,805.2
Remittances received per emigrant** (constant USD)	4,407	2,086.0	5,453.6	0.02	97,539.1
Remittances received per capita (constant USD)	4,407	214.5	1,125.8	0.00	23,495.7
Remittances sent per immigrant (constant USD)	4,251	1,912.2	4,399.1	0.01	59,269.3
Shadow economy size (percentage of GDP)	3,925	31.77	13.00	6.16	71.95
Rural population (% of total population)	5,958	43.43	24.66	0	94.58
No access to electricity (% of population)	5,667	24.78	33.63	0	100.00
GDP (billions of constant 2010 USD)	5,361	291.6	1,176.7	0.02	17,348.6
GDP per capita (constant 2010 USD)	5,358	13,410.8	20,419.4	161.83	191,586.6
Immigrant stocks*** (in millions)	5,861	0.92	3.05	0.00	49.78
Emigrant stocks (in millions)	5,936	0.87	1.63	0.00	16.59
Employment rate for age 15+ (ILO estimate)	4,995	57.42	11.81	26.29	88.99
Age dependency ratio (% of working age population)	5,367	65.01	19.73	16.45	119.14
Lending rate (%)	3,361	19.08	91.53	0.5	4,774.5
ATMs per 100,000 adults****	2,064	42.75	44.91	0.01	288.63
Net FDI inflows (billions of constant USD)	5,290	6.98	30.53	-40.31	755.30
Official development assistance received***** (billions of constant USD)	6,020	0.35	0.80	-1.10	25.39
Real effective exchange rate	2,586	102.34	29.30	32	740.58
Polity	4,511	3.11	6.57	-10	10
Average transaction cost receiving remittances (%)	650	8.21	4.35	1.04	27.65
Adjusted average transaction cost receiving remittances***** (%)	1,435	8.04	3.40	1.04	27.65
Average transaction cost sending remittances (%)	253	8.41	4.54	1.25	27.64

Notes: *French Polynesia and New Caledonia data are excluded given they report receiving hundreds of thousands of USD in remittances per migrant on a yearly basis. Similarly, remittances received in Uruguay for 2001 were marked as missing since total remittances received amounted to 6,000 in current USD for that year. An erroneous negative amount remitted for Papua New Guinea was rendered positive for remittances paid in 2014. Note that the minimum remittance paid is still quite low reflecting questionable outflows from Sierra Leone in 1997 and 1998. Remittances paid at the country-level equal to zero were re-coded as missing. Although not necessarily inaccurate, these only add to outlier amounts (but do not affect the overall results in any significant manner and were therefore imputed in the name of accuracy). Extreme lending rates may appear absurd but simply reflect kurtoses linked to crises in Peru for 1990, Croatia in 1993, and other crises such as those in Zimbabwe, Argentina, and Ukraine. ** Luxemburg and Bermuda are the main countries with extremely high remittances received per capita and emigrant as well as remittances sent per immigrant in the case of Luxemburg. *** For data that were not available for the entire time period due to periodic surveys that do not span from 1991 to 2015, this chapter resorts to linear interpolations (but no extrapolations) by country and year. The variables affected by these data transformations were the UN migrant stock numbers (which are only available on a quintennial basis from 1990 to 2017 – with 2017 serving as the only exception to the quintennial timeline). Emigrant and immigrant stocks may differ due to interpolation of numbers between available data years. All data transformations of this nature were conducted using Stata's *-ipolate-* command. **** Since ATMs per 100,000 data are only available 2002 onwards, countries' financial development is assumed to be within a similar range in the 1990s. ***** Negative net ODA received corresponds to periods countries repaid more than they received in official development assistance. For the purposes of the subsequent regressions, negative values were simply set to zero since the main focus is on whether inflows of development funds act as substitutes or complements for remittance flows as opposed to studying repayment patterns of these development funds. ***** For those countries missing a remittance cost estimate, regional averages were taken and applied to those countries. The regions were defined as follows: Latin America and the Caribbean; North Africa and the Middle East; Sub-Saharan Africa; Gulf states; East Asia Pacific, South Asia; Eastern Europe and Central Asia; and the EU, North America, Australia and New Zealand. It is also worth noting that the RPW dataset estimates are unweighted by corridor, channel, and region.

Figure 5.4 illustrates how shadow economy size is practically synonymous with countries' economic development, with highly developed economies experiencing lower

levels of informality. However, it is also worth noting the significance of formalisation from 1991 to 2015, which is generalisable across all categories. Although much variation remains across countries, there is a clear acceleration in the rate of formalisation post-2001 and the 2007-2009 GFC contributed to a rise in informality.

Figure 5.4 Shadow economy estimates by economic development (% of GDP), 1991-2015

Source: Medina and Schneider (2018)

Note: Unweighted average of shadow economy size as a percentage of GDP. Medina and Schneider (2018) provide more details of their estimates and characteristics across specific regions. LIC, LMC, UMC and UIC respectively stand for low-income countries, low-middle-income countries, upper-middle-income, and upper-income countries.

Although the data presented provide significant information on remittance patterns, they are not without their limitations. The suggested models' validity was tested, and the necessary modifications were made to prevent violation of underlying assumptions to models using multiple diagnostic tests, standard error corrections, and variable transformations. Three such instances of data testing and modification are worth noting.

First, the massive increase in remittances post-2002, which is, at the least, mainly attributable to accounting changes (Clemens and McKenzie, 2018), introduces non-stationarity issues in the dependent variables. Logarithmic transformations are used to correct this issue. In Appendix 5.1A, the results of the Phillips-Perron test confirm that this

transformation successfully renders the series stationary (strong rejection of unit roots in all panels).

Second, the modified Wald test for groupwise heteroskedasticity (Greene, 2000: 598) and Woolridge test indicate high heteroskedasticity levels and serial correlation in the sample (refer to Appendix 5.2A). All regression analysis conducted use coefficients with clustered standard errors to account for these issues. Fortunately, tests for multicollinearity amongst independent variables indicate no additional issues beyond heteroskedasticity and non-stationarity.

Finally, a Hausman specification test indicates that the panel estimation should use fixed effects rather than random effects by rejecting the test's null hypothesis that differences in coefficients are not systematic.

5.5 Results

This section presents the main empirical results. This chapter's primary objective is to demonstrate that the inclusion of the shadow economy as an independent variable explains the reduction in formal flows and how it has evolved over time. In doing so, the shadow economy size acts as a proxy for informal remittance flows, thereby elucidating trends in substitution between formality and informality. In addition, this section sheds light on the hypotheses discussed in the theory section using the three-staged framework (i.e., first-mile, intermediary stage, and last-mile). This brings attention to both inflows and outflows of remittances and the different determinants that affect the sender, the recipient, and everything in between, including regulation, informality, and transfer costs. The section also covers the importance of transfer costs as well as the effect of remittances on the net

errors and omissions as an indicator of informal remittances being indirectly captured within the balance of payments framework.

5.5.1 Remittances received and the shadow economy

Table 5.4 presents the analysis of remittances received using the logged values of inflows as the dependent variable to correct for stationarity issues (related to the break in the 2000s) and reports robust standard errors (panel cluster by country).

The informal sector or shadow economy analysis focuses both on estimated levels, its growth, and proxies, including proportions of the population that live rurally or have no access to electricity. The shadow economy estimates measure the estimated portion of the economy that is informal as a percentage of GDP. Although this is valuable information, it more directly measures formality levels rather than the process of formalisation. The growth in the shadow economy size, as opposed to the level, is considered an essential formalisation metric.

Table 5.4 contains multiple models testing the sensitivity of the estimations by iteratively including control variables as well as measures of the informal sector to test hypothesis 1. The results demonstrate that a one percentage point drop in the shadow economy size (as a proportion of GDP) leads to an average 12.4 per cent rise in formal remittances (but closer to 9.3 per cent in Model 3 upon inclusion of additional control variables).⁸⁶ Model 4, with shadow economy growth instead of levels, suggests that a one per cent reduction in the size of the informal sector causes a corresponding increase in

⁸⁶ For the interpretation of a log-lin coefficient, $\% \Delta y = 100 \cdot (e^{\beta_k} - 1) \forall k = \ln(j)$ meaning that for a coefficient of -0.132, $\% \Delta y = 100 \cdot (e^{-0.132} - 1) \approx -12.4\%$

formal remittances of 1.1 per cent. Similar results are obtained for the rural population and access to electricity proxies for the informal sector in Models 5 and 6.

Migrant stocks and GDP per capita are important controls for remittance inflows. As expected, regions with higher GDP receive more remittances through formal channels. The base model (Model 1) estimates that formal remittances increase 0.01 per cent for every additional dollar in GDP per capita. However, the additional squared GDP per capita term with a negative coefficient exhibits concavity signs, thereby implying a ceiling GDP after which formal remittances either stagnate or even decrease. Similarly, larger emigrant stocks contribute to higher remittance inflows. The migrant stock coefficient of 0.398 in the base model (Model 1) implies that one million emigrants overseas would increase the average country's formal remittances by 48.9 per cent.

Employment and the age dependency ratio (as a proportion of the working-age population) also help explain the demand for work and foreign flows. Model 3 shows that a one percentage point drop in employment or the proportion of dependents leads to a five per cent or 4.4 per cent increase in formal remittances, respectively. This is in line with the remainder of the literature whereby lower employment prospects and higher dependency on the working-age population increase remittance needs.

Models 7-9 of Table 5.4 test the remaining controls regarding the possible substitution versus complementary relationship with other inflows such as FDI and ODA. As previously theorised (Carment and Calleja, 2018), FDI and ODA have been thought to substitute or complement remittance inflows. The statistical insignificance of the coefficient estimates for FDI demonstrates that theoretical arguments of their importance may be overstated. The data analysis conducted find that although openness to FDI capital

flows is positively associated with remittances received in upper and upper-middle-income countries, this is not the case for lower and lower-middle-income countries. However, results demonstrate that an average increase in ODA by one billion 2010 USD is expected to increase formal remittances by 34.3 per cent.

Other variables of interest that are tested include the lending rate, ATMs per 100,000 inhabitants (financial access), polity, and the real effective exchange rate. The number of ATMs available in each country for every 100,000 adults confirms that financial access is a determinant of remittances. The use of ATMs is vital since the dual causality (endogeneity) between financial access and remittances received can be controlled since there is no reason to believe an increase in remittances in a single year could impact the number of ATMs in that country.⁸⁷ Increases in the lending rate lead to a reduction of formal remittances flowing into that country. A one percentage point decrease in the lending rate increases formal remittance inflows an average of 0.01 per cent.

⁸⁷ It should also be noted that a one or two-period lag of ATMs per 100,000 makes little to no change to the results. This further shows that causality is driven by this measure of financial access on remittances received, not the reverse.

Table 5.4 Regression results for the log of remittances received

	(1) Base	(2) Employment	(3) Dependence	(4) Growth	(5) Rurality	(6) Electricity	(7) FDI/ODA	(8) Lending rate	(9) Fin. access
Informality									
Shadow economy size	-0.1320*** (0.0176)	-0.1340*** (0.0176)	-0.0978*** (0.0187)				-0.0911*** (0.0181)	-0.0852*** (0.0216)	-0.0371** (0.0151)
Shadow economy growth				-0.0109*** (0.0029)					
Rural population, %					-0.0633*** (0.0195)				
No electric access						-0.0404*** (0.0093)			
Other explanatory var.									
GDP per capita	0.0001** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0001** (0.0001)	0.0001* (0.0001)	0.0001** (0.0001)
GDP per capita squared	-0.0006* (0.0003)	-0.0006* (0.0003)	-0.0006* (0.0003)	-0.0014*** (0.0004)	-0.0014*** (0.0004)	-0.0015*** (0.0005)	-0.0008* (0.0005)	-0.0010 (0.0010)	-0.0007* (0.0004)
Migrant stocks	0.398*** (0.120)	0.360*** (0.117)	0.220** (0.0949)	0.260** (0.106)	0.208** (0.0884)	0.200** (0.0988)	0.239** (0.106)	0.178* (0.0931)	0.0614 (0.125)
Employment		-0.0433* (0.0228)	-0.0515** (0.0243)	-0.0544** (0.0244)	-0.0440* (0.0228)	-0.0412* (0.0230)	-0.0484** (0.0237)	-0.0572* (0.0323)	-0.0534** (0.0235)
Age dependency ratio			-0.0450*** (0.0130)	-0.0688*** (0.0133)	-0.0480*** (0.0122)	-0.0380*** (0.0138)	-0.0454*** (0.0129)	-0.0398*** (0.0144)	-0.0514*** (0.0185)
FDI inflows							0.0003 (0.0008)		
ODA							0.2950*** (0.0725)		
Lending rate								-0.0085* (0.0046)	
ATMs per 100,000									0.0043** (0.0020)
Constant	22.31*** (0.827)	24.74*** (1.583)	27.12*** (1.746)	24.61*** (1.763)	25.97*** (1.565)	23.07*** (1.629)	26.50*** (1.728)	27.04*** (2.491)	25.71*** (2.081)
Observations	3,266	3,266	3,266	3,174	3,924	3,731	3,240	2,156	1,503
R ² overall	0.17	0.18	0.19	0.19	0.16	0.19	0.21	0.12	0.10
R ² within	0.32	0.32	0.36	0.32	0.33	0.35	0.38	0.35	0.18
R ² between	0.15	0.16	0.19	0.20	0.16	0.21	0.21	0.09	0.09
Number of countries	151	151	151	151	171	171	151	114	142

Robust standard errors in parentheses (cluster by country panel). ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects as controls. The dependent variable is logged remittance inflows (remittances received) in constant USD. Although the data are from 1991-2015, 1991 was dropped for growth rate calculations. GDP per capita squared scaled to per one million to limit decimals. Models 8 and 9 have more missing observations due to the inclusion of series with limited year or country coverage. Other variables such as the real exchange rate and polity were statistically insignificant and therefore not included.

In Appendix 5.3A, logged remittances received per migrant (RPM) and per capita (RPC) are estimated. Although the results are analogous and offer the same interpretation as those presented above, it is interesting to test whether the size of migrant stocks or diaspora play a role in influencing individual remittances.

5.5.2 Remittances sent and the shadow economy

The results section turns to the analysis of remittance outflows from remittance-sending countries (see Table 5.5). Going back to the proposed model (Figure 5.2), this section focuses on the first-mile, wherein senders decide which channel to opt for based on select determinants in the sending region.

Table 5.5 establishes that a one percentage point drop in the size of the average shadow economy as a percentage of GDP (i.e., formalisation) would lead to a 7.9 per cent increase in formal remittance outflows (based on Model 3 with control variables). Although the goodness of fit of remittance outflows is greater than for remittance inflows (see Table 5.4), differences in low and upper-income countries (Models 6 and 7) suggests formalisation has a larger impact when targeting high-income countries that typically are the primary sources of remittances globally.

GDP per capita and GDP per capita squared are important determinants of remittance outflows and contribute to high goodness of fit relative to the modelling of remittance inflows. Similarly, as for inflows, the squared term introduced captures the parabolic relationship (inverse U-shape) between GDP and remittance flows whereby a ceiling GDP was associated with higher outflows (i.e., remittance outflows tend to decrease following this threshold or ceiling).

Table 5.5 Regression results for logged remittances sent

	(1) Base	(2) Employment	(3) Dependence	(4) Lending rate	(5) Fin. access	(6) Low & low- mid. inc.	(7) Upper & upp- mid. inc.
Shadow economy size	-0.1200*** (0.0146)	-0.1110*** (0.0146)	-0.0824*** (0.0149)	-0.0795*** (0.0192)	-0.0296** (0.0127)	-0.0478** (0.0226)	-0.0617** (0.0241)
GDP per capita	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0004*** (0.0001)	0.0001* (0.0001)	0.0033** (0.0013)	0.0002*** (0.0000)
GDP per capita squared	-0.0013*** (0.0003)	-0.0013*** (0.0004)	-0.0013*** (0.0003)	-0.0033*** (0.0010)	-0.0009* (0.0005)	-0.4470** (0.2032)	-0.0013*** (0.0004)
Migrant stocks		0.364*** (0.101)	0.229*** (0.0835)	0.192** (0.0778)	0.237* (0.128)	-0.139 (0.165)	0.343* (0.186)
Immigrant stocks		-0.0532 (0.0343)	-0.0671* (0.0349)	0.0144 (0.0480)	0.1050 (0.1150)	-1.0210* (0.5500)	-0.0585 (0.0369)
Employment		-0.0487** (0.0191)	-0.0553*** (0.0170)	-0.0609*** (0.0212)	-0.0159 (0.0190)	-0.0479 (0.0314)	-0.0497** (0.0206)
Age dependency ratio			-0.0414*** (0.0078)	-0.0404*** (0.0090)	-0.0531*** (0.0136)	-0.0275** (0.0134)	-0.0435*** (0.0095)
Lending rate				-0.0028 (0.0023)			
ATMs per 100,000					0.0123*** (0.0037)		
Constant	19.95*** (0.717)	22.04*** (1.336)	24.32*** (1.330)	24.43*** (1.816)	21.77*** (1.636)	21.83*** (3.198)	21.70*** (1.829)
Observations	3,163	3,163	3,163	2,084	1,465	1,311	1,852
R ² overall	0.45	0.46	0.45	0.42	0.50	0.02	0.41
R ² within	0.29	0.39	0.42	0.39	0.25	0.34	0.54
R ² between	0.51	0.49	0.49	0.43	0.53	0.01	0.43
Number of countries	152	152	152	115	143	66	86

Robust standard errors in parentheses (cluster by country panel). ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects as controls. The dependent variable is logged remittance outflows (remittances sent) in constant USD. GDP per capita squared scaled to per one million to limit decimals.

Migrant and immigrant stocks provided some unexpected results. Although immigrant stocks are only weakly significant, the negative coefficient implies that a higher stock of immigrants reduces outflows. The counterintuitive result is best explained in comparing Models 2 and 3, whereby controlling for age dependency renders the coefficient statistically significant. This result suggests that immigrants who predominantly tend to be of working age could offset the age dependency variable where the working-age population is the denominator. As for migrant stocks, this positive impact of increased emigration raising remittance outflows is largely driven by higher-income countries (Model 7), and appears to capture remittance support of emigrants.

Surprisingly, higher levels of employment do not appear to favour higher remittance flows. Although the expectation was that higher employment would increase remittances, the negative impact on remittances once controlling for GDP per capita is likely attributable to larger numbers of lower-paying employment or wage stagnation. Note that lags yield analogous results.

Financial access (i.e., ATMs per 100,000 adults), as was the case for remittance inflows, has a positive coefficient estimate and contributes to larger formal remittance flows (Model 5). Appendix 5.5A corroborates the results above using the natural logarithm of remittances sent per immigrant in the host country as the dependent variable. The lending rate had no statistically significant effect on remittance outflows (Model 4).

5.5.3 From static to dynamic: The impact of the shadow economy over time

With declining sizes of informal, shadow, or grey economies worldwide, the effect has been large scale formalisation of remittance flows and, therefore, an increase in formal flows captured in the balance of payments. However, as shown in Figure 5.5, the

remittance-shadow economy elasticity has increased over time, which means that a decrease in the size of the shadow economy leads to ever smaller increases in formal flows. This declining effect is believed to largely be due to global formalisation and the overall decrease in the possibility of expansion related to formalisation. This is important to policymakers that are targeting formalisation efforts to increase formal flows. Whereas a one per cent decrease in the informal sector's size (or shadow economy) led to a slightly higher than one per cent increase in formal remittances in the 2000s, it has led to a less than one per cent increase post-2008. Moreover, the elasticity has hovered around -0.5 from 2013 onwards, signalling that a one per cent decline in shadow economy size only leads to a 0.5 per cent increase in formal remittances on average globally.⁸⁸ Policymakers would be wise to note this trend and the limitations of formalisation efforts to increase formal remittance flows.

Table 5.6 contains the results of remittances received across different periods. As is the case in Figure 5.5, the noteworthy finding is that the shadow economy size has a lower impact on remittances received over time. This is a crucial finding in policy terms. Plateauing remittances worldwide should not be considered a temporary drop but rather a trend that should be expected to persist. Consequently, one can infer that formalisation efforts have contributed to the considerable growth in remittances from 2001 to 2013. Findings suggest that, albeit a good source of development finance, formal remittance growth appears to be attributable primarily to formalisation, owing much of its growth to

⁸⁸ The log-log model form facilitates interpretation by providing elasticities. The elasticity of remittance inflows stems from taking the first derivative with respect to x of the logged form on each side of the equation: $\frac{dY}{dX} \frac{1}{Y} = \beta_2 X \Leftrightarrow \beta_2 = \frac{dY}{dX} \frac{X}{Y}$

substitution from informal channels rather than actual growth in funds flowing to recipient regions.

In terms of treating remittances as a source of peer-to-peer finance, scholars and policymakers would be advised not to rely on remittance growth as a key source of development finance. A crude calculation multiplying shadow economy growth by the shadow-remittance elasticity implies that formalisation from 2001 to 2015 contributed to a roughly 41 per cent increase in formal remittances.⁸⁹ Although this constitutes a somewhat simplistic estimate, it provides a rapid glimpse of the changes' magnitude.

Figure 5.5 Remittance per migrant received to shadow economy elasticities

Notes: This figure illustrates coefficient estimates of logged formal remittances received per migrant regressed on logged shadow economy estimates to obtain remittance to shadow economy elasticities. Note that this univariate regression does not control for economic development and several other factors. It indicates that the elasticity has risen over time, later depicted in regression analysis using several control variables (see Table 5.6).

⁸⁹ Given the shadow economy was estimated at around 33.2 per cent of GDP on average in 2001 and 27.8 per cent in 2015, this constitutes 5.4 percentage point drop. If the percentage point drop is multiplied by the remittance-informality log-lin model interpretation of the coefficient of Model 4 from Table 5.4, this corresponds to an approximately 41 per cent increase in formal remittances.

Given a coefficient of -0.0978, a 5.4 percentage point change in informality would lead to $\% \Delta y = 100 \cdot (e^{-0.52812} - 1) \approx -41\%$

As previously stated, Figure 5.5 and Table 5.6 address hypothesis 2 regarding the reduced formalisation impact on remittance growth over time due to diminishing marginal returns as formal sectors constitute an increasingly large portion of economic activity.

Table 5.6 replicates the prior analysis of remittance inflows, yet splits the sample by time period to demonstrate the slowdown in formalisation. Models 1-4 depict the regression results with shadow economy size as the primary independent variable, whereas Models 5-8 have shadow economy size as their main independent variable. Both illustrate the diminishing role of formalisation over time (hypothesis 2) and the critical period following the 2001 9/11 attacks (see Chapter 4).

Model 3 from 2002 to 2008 depicts how an increase in shadow growth led to a more considerable decline in remittances than in the previous or subsequent period. From 2009 until 2015, a one per cent drop in the size of the informal sector translates to an average of 0.7 per cent additional dollars (in 2010 constant USD) formally remitted globally, down from 1.1 per cent in the previous nine years (Model 4). Although further formalisation remains attainable, formal remittance growth will decreasingly rely on formalisation. For development practitioners, especially regarding international development commitments to promote remittances, this means relying on other methods.⁹⁰

⁹⁰ Section 5.5.4 elaborates on the importance of transfer costs, but it should be noted that cost reductions have largely been successful due to formalisation and the reduction of the informal sector's market share of global remittances.

Table 5.6 Regression results for logged remittances received across periods

	Shadow growth				Shadow economy size			
	(1) 1992-2015	(2) 1992-2001	(3) 2002-2008	(4) 2009-2015	(5) 1991-2015	(6) 1991-2001	(7) 2002-2008	(8) 2009-2015
Shadow economy	-0.0116*** (0.0029)	0.0031 (0.0035)	-0.0113*** (0.0040)	-0.0069*** (0.0018)	-0.132*** (0.0176)	-0.0127 (0.0291)	-0.0878*** (0.0195)	-0.0449*** (0.00968)
GDP per capita	0.0003*** (0.0001)	0.0000 (0.0000)	0.0003*** (0.0000)	0.0002*** (0.0001)	0.0001** (0.0000)	0.0000 (0.0001)	0.0002*** (0.0000)	0.0001 (0.0001)
GDP per capita squared	-0.0019*** (0.0005)	-0.0002 (0.0004)	-0.0018*** (0.0004)	-0.0017*** (0.0006)	-0.0006* (0.0003)	-0.0000 (0.0004)	-0.0010*** (0.0003)	-0.0010 (0.0007)
Migrant stocks	0.595*** (0.157)	0.633** (0.272)	0.627*** (0.184)	0.584* (0.323)	0.398*** (0.120)	0.629** (0.288)	0.411*** (0.148)	0.503 (0.309)
Constant	16.24*** (0.425)	17.90*** (0.453)	15.78*** (0.420)	17.89*** (0.640)	22.31*** (0.827)	18.46*** (1.311)	20.05*** (0.955)	20.02*** (0.884)
Observations	3,174	1,197	967	1,010	3,266	1,289	967	1,010
R ² overall	0.17	0.23	0.15	0.19	0.17	0.23	0.14	0.19
R ² within	0.21	0.03	0.25	0.07	0.32	0.03	0.30	0.09
R ² between	0.19	0.23	0.16	0.19	0.15	0.23	0.14	0.19
Number of countries	151	138	143	145	151	138	143	145

Robust standard errors in parentheses. ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects as controls. The dependent variable is logged remittance inflows (remittances received) in constant USD. Shadow growth estimates start in 1992 instead of 1991 to account for growth calculation relative to previous year. GDP per capita squared scaled to per one million to limit decimals.

5.5.4 Price elasticities: A crude measure of informal market size

Transfer cost reductions are among the main policy tools used to promote remittances in conjuncture with financial development. Unfortunately, this section is limited to a partial analysis of the effect of costs on remittances received since the data by sending country are limited in observations and suffer from a higher-income country or Global North-to-South bias (lack of South-South corridors covered). Therefore, this section's primary goal is to study the cost elasticity of remittances received, and the ramifications of the informal versus formal dichotomy discussed throughout this chapter.

Table 5.7 incorporates transfer cost into the model. In Model 1, simple averages of costs across corridors and channels are used by sending country. However, the sample is somewhat limited. To increase the sample size, missing countries were added (cost adjusted variable) by taking regional averages and applying those rates to countries within that region that were previously not in the sample (Models 2-10). Although this magnifies the sample substantially, the results in terms of the coefficients are mostly the same, suggesting it does not substantially skew or bias results.

Interestingly, when one adds interaction effects of cost by the level of development, the higher the income for a country, the more sensitive (more elastic) the country is to transfer costs (Model 3). Migrant stocks significantly impact remittance flows across countries and years (Models 4-10).

Table 5.7 Cross-sectional regression results for logged remittances received by year using transfer cost estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	2017				2016	2015	2014	2013	2012	2011
	Cost	Adjusted cost	Develop.	Mig. stocks						
ln(cost)	-0.825** (0.394)									
ln(cost adj.)		-0.823*** (0.314)	-1.459*** (0.347)	-0.492 (0.305)	-0.557* (0.283)	-0.417* (0.236)	-0.562* (0.195)	-0.711*** (0.225)	-0.819*** (0.216)	-0.800** (0.308)
ln(GDP)	0.579*** (0.0819)	0.597*** (0.0424)	0.683*** (0.0419)	0.219*** (0.0520)	0.219*** (0.0524)	0.247*** (0.0462)	0.218*** (0.0478)	0.252*** (0.0486)	0.265*** (0.0495)	0.304*** (0.0525)
ln(cost adj.) x LIC			0.721*** (0.137)							
ln(cost adj.) x LMC			0.677*** (0.174)							
ln(cost adj.) x UMC			0.505*** (0.143)							
ln(migrant stocks)				0.756*** (0.0727)	0.754*** (0.0757)	0.726*** (0.0705)	0.746*** (0.0719)	0.690*** (0.0794)	0.657*** (0.0832)	0.588*** (0.0919)
Shadow econ. growth										
Constant	8.400*** (2.410)	7.357*** (1.394)	5.645*** (1.386)	16.45*** (1.533)	16.48*** (1.529)	15.59*** (1.244)	16.67*** (1.298)	16.11*** (1.295)	15.95*** (1.281)	14.92*** (1.386)
Observations	99	169	169	168	169	169	139	171	172	172
R ²	0.421	0.516	0.572	0.673	0.675	0.706	0.638	0.686	0.681	0.618

White's robust standard errors in parentheses. ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The dependent variable is logged remittance inflows (remittances received) in constant USD. For those countries missing a remittance cost estimate, regional averages were taken and applied to those countries. The regions were defined as follows: Latin America and the Caribbean; North Africa and the Middle East; Sub-Saharan Africa; Gulf states; East Asia Pacific, South Asia; Eastern Europe and Central Asia; and the EU, North America, Australia and New Zealand. It is also worth noting that the estimates from the RPW dataset are unweighted by corridor, channel, and region. Moreover, the estimates are administrative data for an amount sent of 200 USD, which does not consider economies of scale. Therefore, the estimates only serve as rough approximations and do not necessarily reflect the exact costs borne by global remitters. LIC, LMC and UMC respectively stand for low-income countries, low-middle-income countries, and upper-middle-income countries.

However, the most important finding is that the overall cost elasticity has diminished over time from 2011 onwards (Models 4-10). This means that, notwithstanding the negative coefficient signalling that increased transfer costs have the anticipated effect of reducing the amount remitted, there are diminishing returns to lowering costs over time. As was the case for formalisation, transfer cost reduction policies will be even more limited over the course of the latest few years. Again, this is a critical policy finding that suggests the slowdown in remittance growth is likely a broader trend rather than a correction, as was the case during the 2007-2009 GFC.

Ultimately, although a relatively crude method of estimating the volume of informal flows, the transfer cost elasticity provides a rough approximation of informal remittances. Given informal remittance transfer costs are estimated to be a much lower percentage of their volume than for formal methods (Siddiqui and Arbor, 2003; Orozco, 2005; Orozco, 2010; Basu and Bang, 2015; Dimbuene and Turcotte, 2019) across multiple geographies, one can multiply the first difference in cost between informal and formal with the cost elasticity.⁹¹ The resulting amount represents a crude estimate (see Basu and Bang, 2015) of how much larger the formal market would be if higher costs are the only barrier to substitution across both channels. This approach, albeit intriguing, oversimplifies barriers to substitution and does not consider the granularity of price structures across different channels. For example, it does not shed light on how cash transfers, which carry an explicit cost of zero, may have several hidden, implicit or risk-related costs. Moreover, most informal networks are corridor and culture-specific – factors that cost differentials

⁹¹ However, this crude estimate requires strong assumptions about existing differences in cost between formal and informal remittances, and the compounding complexity of this not being feasible across channels, corridors and years. Although such rough estimates exist, they should be interpreted with an abundance of caution.

alone cannot explain. For this reason, this chapter will not delve into this relatively unrefined method of informal remittance size approximation. However, it should serve as a helpful starting point for those that attempt such an endeavour in the future.

5.5.5 Hiding in plain sight? Remittances and the BoP errors and omissions

Another method of gauging informal remittance magnitude is to assess its link to the net errors and omissions portion of the balance of payments. As the capital flight literature suggests, this balancing item captures flows such as informal transfers that are not explicitly included elsewhere within the balance of payments infrastructure. In their study, Freund and Spatafora (2008) find that net errors and omissions as a proportion of GDP are weakly correlated with the proportion of remittances to GDP.

Despite being unable to reproduce the same results within the studied timeframe (2005-2017) as Freund and Spatafora (2008), Figure 5.6 finds weak correlations that corroborate these results by plotting the natural logarithm of net errors and omissions as a proportion of GDP against the proportion of remittances to GDP.⁹² Although there appears to not be any correlation amongst those countries with remit-to-GDP ratios below five per cent, those countries receiving remittances worth five per cent of their GDP or more tend to experience higher absolute net errors and omissions as part of their balance of payments. This positive relationship between formal remittances to GDP and larger errors and omissions indicates that a considerable portion of uncaptured remittances are most likely counted within the net errors and omissions line item. However, due to large discrepancies in statistical processes, these results should be interpreted with caution. Further study of

⁹² Although the logarithm of absolute net errors and omissions fails to distinguish between positive and negative errors, the trend was the same in both cases. As such, this method captures the magnitude of the error without obfuscating differences across positive and negative errors.

this relationship could further shed light on the size of informal remittances as well as the evolution of informal remittances over time.

Figure 5.6 Scatter plot of BoP errors and omissions with remittances received

Source: IMF balance of payments

Figure 5.7 goes one step further by plotting the net errors and omissions portion of the balance of payments against the informal economy's size as estimated by Medina and Schneider (2018). Again, albeit weakly statistically significant, a pattern emerges wherein more informal economies are correlated with marginally higher errors and omissions amounts if their remittance inflows to GDP ratio is lower than five per cent. Above the five per cent threshold, the relationship is reversed, and more informal economies tend to experience lower absolute errors and omissions values. It is worth underscoring that the results are not statistically robust when correcting for heteroskedasticity and autocorrelation using country-level clusters. As such, the results should be interpreted with caution.

Figure 5.7 Scatter plot of BoP errors and omissions with informal economy size

Sources: IMF balance of payments and Medina and Schneider (2018)

5.6 Conclusion

This research provides insights into a global macro-scale view of substitution across formal and informal channels. Key contributions of this chapter include quantifying the effect of the shadow economy in reducing formal remittance flows and understanding the diminishing effect of formalisation and transfer cost reductions over time. Other findings include testing a wide range of remittance channel determinants, which mainly point to the importance of financial development and inclusion as key factors.

The results of this chapter contend that the remittance to shadow economy elasticities (as well as cost elasticities) have become more inelastic, meaning that the effect of economy-wide formalisation or transfer cost reductions will have less of an effect moving forward than it did in past decades. Policymakers must understand the extent to which this effect is diminishing over time and how remittance growth has been overstated in the past. Most likely, this means that the slowdown in the growth of remittances is a

long-term trend, despite high growth in 2017 and 2018 that is largely attributable to economic and remitting currency appreciation rather than a short-term drop.⁹³

The limits of formalisation are apparent, and the seemingly endless growth of remittances might falter over the next decades if other factors such as economic growth and the growth in human migration do not persist. It is recommended that development practitioners account for this trend and how substitution from informal flows has been an essential driver of remittances in the past two decades, but this effect has diminishing returns to promoting returns as more countries formalise. This is especially relevant to Bretton Woods institutions, the United Nations, and states that actively pursue formalisation efforts as the main engine to promote remittances for development purposes.

In terms of future research avenues, the study of informal remittances remains replete with additional puzzles and questions. Two significant improvements stand out within the context of this study. First, developing better data capture processes for remittances by corridor would significantly contribute to expanding the analysis to encompass both remittances sent and received simultaneously rather than studying them in isolation. Although efforts to model bilateral flows using host and home state incomes as well as migrant stocks (Ratha and Shaw, 2007) is vital, further improvements would enhance scholars' ability to include income and migrant stocks as explanatory variables without reverse-engineering the estimates of their dependent variable (i.e., bilateral flows).

Second, in addition to better estimates, it would be beneficial to obtain aggregate data on different remittance transmission channels, whether they be cash, MTOs, banks and credit unions, or other mechanisms. The binary nature of informal and formal

⁹³World Bank press release (2018). <https://www.worldbank.org/en/news/press-release/2018/04/23/record-high-remittances-to-low-and-middle-income-countries-in-2017>

remittances may be a helpful distinction in the context of currently available data sources, but it obfuscates more granular findings and distinctions by grouping channels with vastly distinct characteristics. Although an abundance of detail is available through surveys, aggregate and administrative data sources with this level of detail are lacking. Additional data sources comparable across geographies are necessary to better study emerging themes in transnational household finance and their economic development role to inform broader global policymaking.

5.7 Appendices

Appendix 5.1A Phillips-Perron Fisher-type tests for stationarity

In testing variables for stationarity, multiple cases of non-stationarity were detected using unit-root tests on the panel samples. Instead of using ARDL or other correction models, non-stationarity is handled through simple variable transformations on a case-by-case basis to correct different types of trend stationarity. The results from the Phillips-Perron tests below demonstrate that once transformed (shadow economy growth was not transformed, but shadow economy levels showed signs of non-stationarity), key variables no longer exhibited signs of non-stationarity. All the Phillips-Perron tests used one Newey-West lag, yet results with 2-year lags also rejected the null-hypothesis of non-stationarity with all panels containing unit-roots. It is also worth noting that the Fisher-type augmented Dickey-Fuller test yielded analogous results demonstrating that growth (as well as first differences) in the shadow economy size, as well as natural logarithms of other core variables, rendered series stationary.

Natural log of constant remittances received in USD

Number of panels	190	
Average number of periods	23.23	
	Statistic	p-value
Inverse chi-squared (380) P	743.2779	0.0000
Inverse normal Z	-3.0713	0.0011
Inverse logit T(939) L*	-6.7657	0.0000
Modified inv. chi-squared Pm	13.1775	0.0000

Natural log of constant remittances sent in USD

Number of panels	190	
Average number of periods	22.35	
	Statistic	p-value
Inverse chi-squared (376) P	711.6845	0.0000

Inverse normal Z	-1.4841	0.0689
Inverse logit T(924) L*	-5.2462	0.0000
Modified inv. chi-squared Pm	12.2412	0.0000

Natural log of constant remittances received in USD per emigrant

Number of panels	189
Average number of periods	23.28

	Statistic	p-value
Inverse chi-squared (378) P	817.4099	0.0000
Inverse normal Z	-5.3986	0.0000
Inverse logit T(929) L*	-9.5702	0.0000
Modified inv. chi-squared Pm	15.9812	0.0000

Natural log of constant remittances received in USD per capita

Number of panels	190
Average number of periods	23.23

	Statistic	p-value
Inverse chi-squared (380) P	748.2911	0.0000
Inverse normal Z	-3.9512	0.0000
Inverse logit T(939) L*	-7.4431	0.0000
Modified inv. chi-squared Pm	13.3593	0.0000

Natural log of constant remittances sent in USD per immigrant

Number of panels	189
Average number of periods	22.38

	Statistic	p-value
Inverse chi-squared (374) P	762.4393	0.0000
Inverse normal Z	-4.0048	0.0000
Inverse logit T(919) L*	-7.8910	0.0000
Modified inv. chi-squared Pm	14.2027	0.0000

Year-over-year growth in the shadow economy

Number of panels	157
Average number of periods	24.0

	Statistic	p-value
Inverse chi-squared (314) P	3549.0117	0.0000
Inverse normal Z	-50.6161	0.0000
Inverse logit T(789) L*	-78.0976	0.0000

Modified inv. chi-squared Pm	129.0910	0.0000
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Natural log of constant errors and omissions (absolute value) in USD

Number of panels	169
Average number of periods	12.37

	Statistic	p-value
Inverse chi-squared (336) P	1477.5128	0.0000
Inverse normal Z	-25.1449	0.0000
Inverse logit T(834) L*	-30.6749	0.0000
Modified inv. chi-squared Pm	44.0348	0.0000

Appendix 5.2A Testing for heteroskedasticity and autocorrelation

The lack of constant variance across observations, or heteroskedasticity, affects the efficiency of the estimator and would violate OLS's attributes as the best linear unbiased estimator or BLUE.

The modified Wald test for groupwise heteroskedasticity in the fixed effect regression model (Greene, 2000: 598) tests the null hypothesis $H_0: \sigma^i \forall i$ (homoskedasticity). As an example, results are obtained using the specification for Model 1 from Table 5.4 although similar results detecting non-constant variation was detected across all models. Given the test yields a chi-score of $X^2(151) = 1.5e5$, or a p-value of 0.0000 the null-hypothesis of homoskedasticity is rejected in favour of groupwise heteroskedasticity.

As is common practice, the standard errors are clustered by country (the panel identifier) to correct for the inconsistent variability of variables across observations. Therefore, all regressions in the chapter rely on clustered standard errors or White's correction using robust standard errors for cross-sectional regressions. Furthermore, the results are also presented in Appendix 5.3A using Driscoll-Kraay standard errors for variance and serial correlation correction.

Autocorrelation is yet another concern with panel data that spans over time since this leads to inflated t-statistics that underestimate standard errors. To test for serial correlation in a panel, the Woolridge test (Drukker; 2003; Woolridge, 2010) of variable first-differences determines whether the sample exhibits signs of first-order autocorrelation. For the same model specification, with logged constant remittances received as the dependent variable, one obtains an F-statistic of $F(1, 150) = 29.15$ or a p-

value of 0.0000. This means rejecting the null hypothesis that the sample exhibit no signs of autocorrelation in favour of the alternate hypothesis that there is a presence of autocorrelation. To account for within-panel correlation, the variance-covariance matrix of the estimators is adjusted for clustering at the panel level (i.e., by country). This corrects for both autocorrelation and heteroskedasticity problems within the panel.

Appendix 5.3A Alternate correction for heteroskedasticity and serial correlation using Driscoll-Kraay standard errors

To correct for heteroskedasticity and serial correlation, this chapter has used clustered standard errors to test the validity and efficiency of estimation. This appendix illustrates the results of several regressions used in this chapter using Driscoll-Kraay standard errors to authenticate previous results (Driscoll and Kraay, 1998; Hoechle, 2007). The estimations show that the results are unsurprisingly analogous to those in this chapter. Although the models have somewhat lower t-scores compared to non-clustered models, t-scores remain higher than clustered models and the statistical significance thresholds remain the same or greater across all coefficients.

	(1) Inflow levels	(2) RPM	(3) RPC	(4) Outflow levels	(5) RPI
Shadow economy	-0.0978*** (0.0121)	-0.0919*** (0.0115)	-0.0926*** (0.0110)	-0.0824*** (0.00822)	-0.0922*** (0.00873)
GDP per capita	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0002*** (0.0000)	0.0002*** (0.0000)
GDP per capita squared	-0.0006*** (0.0002)	-0.0006*** (0.0002)	-0.0007*** (0.0002)	-0.0013*** (0.0001)	-0.0010*** (0.0001)
Migrant stocks	0.220*** (0.0452)			0.2290*** (0.0771)	
Immigrant stocks				-0.0671*** (0.0132)	
Employment	-0.0515*** (0.0081)	-0.0552*** (0.0069)	-0.0545*** (0.0077)	-0.0553*** (0.0117)	-0.0689*** (0.012)
Age dependency ratio	-0.0450*** (0.0040)	-0.0294*** (0.0040)	-0.0388*** (0.0042)	-0.0414*** (0.0062)	-0.0330*** (0.0049)
Constant	27.12*** (0.609)	41.01*** (0.515)	10.73*** (0.510)	24.32*** (1.021)	40.84*** (0.915)
Observations	3,266	3,266	3,266	3,163	3,163
Number of countries	151	151	151	152	152

Driscoll-Kraay standard errors in parentheses and t-statistics calculated using two-tailed tests. ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects. GDP per capita squared scaled to per one million to limit decimals. F-statistic has a p-value of 0.0000 across all five models. RPM – remittances received per emigrant; RPC – remittances received per capita; RPI – remittances sent per immigrant in host country.

Appendix 5.4A Remittances received by emigrant and per capita

Dependent: RPM (remit per migrant)	(1) Base	(2) Shadow growth	(3) Employment	(4) Dependence	(5) FDI/ODA	(6) Lending rate	(7) Fin. access
Shadow economy	-0.118*** (0.0165)	-0.0119*** (0.0028)	-0.1180*** (0.0162)	-0.0919*** (0.0172)	-0.0862*** (0.0165)	-0.0810*** (0.0204)	-0.0307** (0.0148)
GDP per capita	0.0001** (0.0000)	0.0003*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001** (0.0001)	0.0001 (0.0001)	0.0001** (0.0001)
GDP per capita squared	-0.0006** (0.0003)	-0.0019*** (0.0005)	-0.0007** (0.0003)	-0.0006** (0.0003)	-0.0008* (0.0005)	-0.0009 (0.0010)	-0.0007* (0.0004)
Employment			-0.0527** (0.0225)	-0.0552** (0.0232)	-0.0527** (0.0229)	-0.0604** (0.0304)	-0.0557** (0.0221)
Age dependency ratio				-0.0294*** (0.0112)	-0.0301*** (0.0111)	-0.0239* (0.0130)	-0.0371** (0.0179)
FDI inflows					0.0008 (0.0010)		
ODA					0.2710*** (0.0756)		
Lending rate						-0.0076* (0.00455)	
ATMs per 100,000							0.0034* (0.0020)
Constant	36.91*** (0.762)	31.58*** (0.405)	39.78*** (1.471)	41.01*** (1.586)	40.52*** (1.584)	41.03*** (2.273)	39.55*** (1.892)
Observations	3,266	3,174	3,266	3,266	3,240	2,156	1,503
Overall R-squared	0.238	0.131	0.250	0.271	0.285	0.246	0.114
Number of countries	151	151	151	151	151	114	142

Robust standard errors in parentheses. ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects. The dependent variable is logged remittance inflows (remittances received) per million emigrants (scaling) in constant USD. Similarly, GDP per capita squared scaled to per one million to limit decimals.

Dependent: RPC (remittance per capita)	(1) Base	(2) Shadow growth	(3) Employment	(4) Dependence	(5) FDI/ODA	(6) Lending rate	(7) Fin. access
Shadow economy	-0.127*** (0.0166)	-0.0122*** (0.0028)	-0.1270*** (0.0165)	-0.0926*** (0.0179)	-0.0870*** (0.0173)	-0.0794*** (0.0209)	-0.0328** (0.0144)
GDP per capita	0.0001*** (0.0000)	0.0003*** (0.0001)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0002*** (0.0001)	0.0002** (0.0001)	0.0001** (0.0001)
GDP per capita squared	-0.0007** (0.0004)	-0.0021*** (0.0006)	-0.0008** (0.0004)	-0.0007** (0.0003)	-0.0010** (0.0005)	-0.0016 (0.0011)	-0.0008* (0.0004)
Employment			-0.0512** (0.0250)	-0.0545** (0.0259)	-0.0520** (0.0257)	-0.0646* (0.0339)	-0.0515** (0.0215)
Age dependency ratio				-0.0388*** (0.0121)	-0.0394*** (0.0121)	-0.0326** (0.0137)	-0.0422** (0.0169)
FDI inflows					0.0009 (0.0011)		
ODA					0.2540*** (0.0787)		
Lending rate						-0.0087* (0.0047)	
ATMs per 100,000							0.0042** (0.0020)
Constant	6.324*** (0.797)	0.587 (0.451)	9.113*** (1.634)	10.73*** (1.734)	10.23*** (1.727)	10.61*** (2.425)	8.854*** (1.796)
Observations	3,266	3,174	3,266	3,266	3,240	2,156	1,503
Overall R-squared	0.269	0.155	0.280	0.314	0.325	0.311	0.151
Number of countries	151	151	151	151	151	114	142

Robust standard errors in parentheses.***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects as controls. The dependent variable is logged remittance inflows (remittances received) per capita in constant USD. Similarly, GDP per capita squared scaled to per one million to limit decimals.

Appendix 5.5A Remittances sent by immigrant

Dependent: RPI (remittance outflows per immigrant)	(1) Base	(2) Shadow growth	(3) Employment	(4) Dependency	(5) Lending rate	(6) Fin. access
Shadow economy	-0.1170*** (0.0159)	-0.0020 (0.0033)	-0.1170*** (0.0153)	-0.0922*** (0.0154)	-0.0917*** (0.0196)	-0.0371*** (0.0122)
GDP per capita	0.0002*** (0.0000)	0.0003*** (0.0001)	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0003*** (0.0001)	0.0001** (0.0001)
GDP per capita squared	-0.0010** (0.0004)	-0.0022*** (0.0006)	-0.0011*** (0.0004)	-0.0010*** (0.0004)	-0.0026** (0.0010)	-0.0009* (0.0005)
Employment			-0.0675*** (0.0186)	-0.0689*** (0.0175)	-0.0848*** (0.0184)	-0.0273* (0.0165)
Age dependency ratio				-0.0330*** (0.0081)	-0.0329*** (0.00942)	-0.0456*** (0.0125)
Lending rate					-0.0027 (0.0021)	
ATMs per 100,000						0.0112*** (0.0035)
Constant	35.69*** (0.775)	30.40*** (0.454)	39.38*** (1.305)	40.84*** (1.357)	41.87*** (1.693)	37.78*** (1.439)
Observations	3,163	3,071	3,163	3,163	2,084	1,465
Overall R-squared	0.281	0.182	0.300	0.324	0.309	0.199
Number of countries	152	152	152	152	115	143

Robust standard errors in parentheses. ***, **, *, represent statistically significant at the 1%, 5% and 10% level respectively for two-tailed tests using Student's t-distribution. The estimation includes country fixed effects as controls. The dependent variable is logged remittance outflows (remittances sent) per million emigrants (scaling) in constant USD. Similarly, GDP per capita squared scaled to per one million to limit decimals.

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Chapter 6: Conclusions and policy implications

6.1 Tying it all together to bridge micro-macro knowledge gaps

This dissertation's overarching goal has been to blend theoretical frameworks while empirically testing remittance behaviour, emphasising substitution across channels. Using large-N data across both micro (Part I) and macro levels (Part II) of analysis, this dissertation sheds light on broad global remittance formalisation trends and more granular Canadian outflows, emphasising channel modality and transfer costs. The quantitative study of micro-channel modality and transfer costs (Part I) constitutes the first systematic exercise in the Canadian context. It complements other contributions to the formalisation policy and global informal remittance literature (Part II).

Both micro- and macro-determinants are distinguished and later reconciled through this multi-level analysis of channel modality and formalisation. This approach provides a better understanding of the gaps in each level of analysis. As such, the complementary micro and macro findings yield a more holistic portrait of the cross-border financial architecture that migrants and diaspora have at their disposal.

For instance, despite evidence in Chapter 5 that macro-level economic informality correlates with a decrease in formal flows and the omissions and errors portion of the balance of payments, Chapter 3 demonstrates that informal recipient economies tend to favour informal methods and money transfer operators (MTOs). Despite being favoured by informal economies for their cash delivery options to recipients, the latter is a formal and regulated remittance channel.

Moreover, in the Canadian context, informal methods and cash are used quite differently from one another, with the latter used by opportunistic travellers swayed by the

absence of transfer costs rather than favouring informal markets. Canadian geographical positionality and isolation from most countries, especially ODA-eligible countries, contributes to this specificity. Hence, Canadian migrants' use of cash is quite distinct in contrast to other countries and regions that commonly opt for the use of cash as an informal transfer where migrants make frequent cross-border trips (mainly temporary migrants), often in the absence of viable alternatives (O'Neill, 2001; Orozco, 2002; Black et al., 2003; Kabbucho et al., 2003; Blackwell and Seddon, 2004; Chisasa, 2014; IOM, 2016). These results emphasise the need to examine both micro- and macro-level findings across channels and contexts.

There exist substantial differences across macro and micro studies regarding transfer costs. In Part I, or Chapters 2 and 3, the micro findings suggest that remitters using banks and credit unions experience lower fees since users often resort to larger lump-sum payments that exhibit high economies of scale. Conversely, macro studies using sources such as the *Remittance Prices Worldwide* (RPW) dataset do not capture these economies of scale at the aggregate level (see Chapter 5). Due to limited collection methods based on 200 USD and 500 USD remitted globally, which often fail to represent the average amount sent through any specific corridor, the RPW dataset cannot obtain this level of detail. However, the RPW dataset provides a better glimpse of broader global trends than self-reported surveys. For instance, the RPW dataset includes exchange rate costs and hidden fees that household surveys may omit or only partially cover based on respondent interpretation. To add further to this complexity, Chapter 4 documents the processes by which transfer costs became the main policy tool underlying global formalisation efforts. Understanding the policy process by which transfer costs became the main tool for

remittance formalisation bridges the micro and macro chapters and outlines the impacts of overarching policies.

This research also contributes to theoretical debates about remitter decision-making by disentangling distinct remittance decisions and their interdependencies. The choices include the binary decision to remit and the second-stage decisions once migrants have self-selected into remitting of how much, how frequently, and through which channel(s). The breakdown of migrant decision-making allows one to build a more coherent framework that explores the sequencing of these decisions, the actors involved, and the numerous underlying factors as well as preferences across individuals and households.

Understanding each outcome's implications sheds light on the complexities migrants face and substantiates better policy designs – both those aimed at promoting international development and those more narrowly centred on formalisation. For example, while useful to know that women remit less per transaction, it is far more insightful to comprehend that this is primarily due to their lower propensity to remit and their preference for specific channels. In knowing this, those framing new policies can aim programs at the specific factors forcing women out of the remittance market as well as the diversification of their transmission methods rather than encouraging those who remit more. All in all, the disaggregation of these decisions serves as a valuable tool in teasing out various trends and, through empirical and theoretical linkages of each decision, inferring causal mechanisms.

This interdisciplinary approach provides academic contributions and highlights implications that are tangible, applicable, and policy relevant. As previously stated in this dissertation, remittances are an integral part of the Sustainable Development Goal on poverty reduction (SDG 10c) and Objective 20 of the 2018 Global Compact for Safe,

Orderly and Regular Migration. The practical applications of the findings relating to modality and formalisation should not be understated, given the prominence of remittance and migration goals in a range of recent multilateral agreements and international commitments. Taking this dissertation's findings into account will allow countries supporting the SDGs and other remittance objectives to adjust their programming to help meet their goals by addressing cross-corridor inequalities and addressing potential adverse income and wealth disparity impacts.

The remainder of this concluding chapter is divided into five parts. The first summarises the findings and lessons learnt in each of the four papers (Chapters 2-5). The second section provides insights into the main implications of the findings for policymakers and practitioners in the international development sphere. The third part focuses on specific policy prescriptions derived from findings concerning the global remittance architecture's pervasive inequalities. The fourth part recommends paths for future research and features some of the principal outstanding data gaps and caveats that should be addressed in upcoming years or are in the process of being addressed. Finally, the fifth part broadens this study's scope to emerging international affairs trends and discusses how this dissertation's findings relate to these latest developments.

6.2 Four papers, many more lessons learnt

Chapter 2 underscores the importance of transfer costs in determining remittance amounts and transfer frequency, aligning with international commitments as the primary remittance formalisation policy tool. Findings suggest more attention should be paid to significant economies of scale, how they differ across channels and the estimation of remittances' cost-elasticity. By logical extension, transfer cost reductions disproportionately benefit

remitters of higher amounts and those with higher incomes, which undermines the redistributive role of remittances as a source of development funds flowing to the most impoverished. Policies can be improved and better geared towards a more equitable distribution by assisting lower socioeconomic status remitters. For example, policies aimed at promoting the flow of remittances to low-income recipient (or transnational) households would benefit from devising incentives based on the intentions of use and the desired frequency of transfer (especially in cases where remittances serve a subsistence role).

In theory, a trade-off between remittance amounts sent and the frequency exists. However, in practice, those that remit more frequently also tend to remit more on average. The discrepancy lies in lower-income remitters that are often constrained to send less frequent remittances than desired to pay fewer fees (economies of scale argument). This finding highlights inequalities in the current remittance pricing structure that run counter to certain development goals – namely, reducing income and wealth inequalities.

Chapter 3 contributes to the growing literature on remittance channel modality and consists of the first large-N study in this area for Canada. Although the frequent dichotomisation of formal versus informal flows can be a useful analytical distinction, it often discards nuances and granularity across channels. More importantly, this chapter underscores Canada's uniqueness and how, due to its geographic isolation from ODA-eligible countries, uses of cash and other informal methods differ vastly from the global average. This latter finding adds to the growing critique of informal methods acting as a catch-all or residual category (Pieke, Van Hear and Lindley, 2007) despite it regrouping an array of heterogeneous channels. The chapter further supports the need to unpack this grouping in light of its differences across cultures and corridors. It also highlights key gaps

in formalisation efforts that ignore the rationale that low-income, and less financially literate remitters, face when selecting informal channels. This gap casts doubt on the compatibility of current formalisation efforts with poverty alleviation and the equity of benefits across socioeconomic groups.

Other notable results from Chapter 3 concern the heterogeneity across formal channels. For instance, banks and credit unions operate differently from MTOs and their respective digital variants and attract different remitters. Whereas individuals that send larger remittance volumes, have higher incomes, and are more educated tend to favour banks, remitters use MTOs more frequently when remitting to more informal economies. This pattern is critical since it suggests MTOs are the best alternative to informal flows and are a closer substitute. MTOs are currently the most frequently used across the array of existing channels since smaller amounts incur smaller fees on average (despite potentially steeper economies of scale using other channels). Moreover, MTOs offer a more comprehensive array of options to recipients, such as cash-pickups that are better suited for recipients with limited financial access or those who are unbanked.

Part II, Chapters 4 and 5, widens the study's extent to global remittance trends in formalisation. Although initial reactions to 9/11 resulted in increased regulation, policymakers in the security sphere soon realised that the promotion of transfer cost reductions in the development sphere achieved far better results. Chapter 4 finds that the 9/11 terrorist attacks provided the punctuation that gave institutions the willingness and the policy tractability necessary to act upon privatisation and security agendas, subsequently reframed as international development promoting strategies. Coupled with remnants of the Washington Consensus, notions of the privatisation of development finance through

increased migrant transfers permeated international and state institutions. Neoliberal ideas of transparency and free capital flows contributed immensely to formalisation efforts – namely transfer cost reduction policies.

To extend the analysis of Chapter 4, Chapter 5 determines the extent to which substitution from informal to formal channels has fuelled much of the past decades' growth in remittances. The greater external validity established in this chapter, by testing hypotheses of informal remittance at the aggregate level, complements the previous two chapters' micro determinant findings.

Chapter 5's main takeaway is that remittance formalisation has weakened over time despite contributing to remittance growth. Therefore, due to decreasing marginal returns to formalisation for formal remittance growth, the past two decades' remittance growth is often overstated. Instead of substitution away from informal transfer mechanisms, future growth in formal remittances will increasingly rely on fundamentals such as economic growth, migrant stocks, and a variety of other factors (e.g., exchange rate fluctuations and investment opportunities, or natural disasters and other crises). The slowdown in remittance growth related to formalisation also appears to be tied to an increasingly inelastic price-elasticity of demand for remittance services, decreasingly favouring substitution away from cheaper informal channels.

6.3 Implications for remittance formalisation programs and policy

This section highlights crucial takeaways that would enhance evidence-based policymaking. There are four main findings of relevance to policymakers: the volume of informal flows, the importance of distinguishing channels, how to better target programs

to promote international development, and the need to solve key data gaps to enrich the evidence base and allow for more rigorous program evaluation.

Due to their nature of only accounting for formal or official remittances, current remittance estimates vastly underestimate total transfers and only offer a partial portrait of migrant monetary flows. The remittance market's partial depiction is especially visible in comparing remittance outflows to inflows – yet improper reporting by transit countries accounts for a large part of this gap (Ratha and Shaw, 2007). Remittance inflows have more comprehensive coverage since surveys provide the necessary data to estimate informal remittances received, and recipient countries have a higher propensity to account for informal flows. The large discrepancy in remittances received and remittances sent is a testament to the need for more data and research in this issue area (see Figure 6.1). Even crude estimates of the informal sector serve as valuable tools to measure the efficacy of formalisation efforts (such as that presented in Chapter 5 or, albeit using dated data, research by Freund and Spatafora, 2008). However, additional research is needed to study the evolution of informal flow dynamics over time.

Nonetheless, lumping all unregulated or undocumented flows into a single informal category is also problematic, given the heterogeneity across channels and corridors. It is important to demystify the pejorative image of informal methods and unpack their frequent treatment as a homogeneous category. A better understanding of various remittance channels is necessary for the evolving study of remittances. Although the 9/11 attacks in New York marked a shift towards a more nuanced grasp of transfer mechanisms in the security sphere, the study of remittance channels remains limited in terms of economic, international development, and sociocultural analysis.

Figure 6.1 Discrepancy between remittances received and remittances sent

Source: *World Development Indicators (WDI)*, World Bank

Note: The discrepancy between amounts received and sent is both due to the double counting of funds received through transit countries (for which amounts sent are not recorded; Ratha and Shaw, 2007) in addition to the inclusion of certain informal remittances in recipient country aggregates.

Remittance channel availability is continually growing and evolving, both in terms of complexity and sophistication. The remittance market is increasingly dynamic, and the porosity of borders with rising migrant stocks worldwide – and along new pathways such as the swelling proportion of South-South migration worldwide (Ratha and Shaw, 2007) – underlines the need to better capture how remittances are sent and how they vary across geographies and cultures. Moreover, policymakers face the continuous need for additional evidence on the security, economic, and development impacts across transfer mechanisms.

Findings also contribute to improving knowledge on how to better design programs that strive to promote remittance for international development reasons (Kapur, 2005). The link between theory and empirics is vital to uncovering causality and enhancing the value-add to the literature by bridging theoretical-empirical rifts. Splitting choices allows

researchers to analyse the breakdown of choices more methodically, while distinguishing decision nodes facilitates the analytical task of linking correlational findings with underlying theories to establish causality. Although such an approach risks over-rationalising remitters,⁹⁴ it provides a critical steppingstone for future research in this area that aims to introduce imperfect information and risk elements into the model. Rigorously testing existing and new theories regarding remitter intentions is important and support more targeted programs.

Fragmentation of decision nodes is especially crucial when it comes to targeting the three categories of actors of the first-to-last mile framework (Hernández-Coss, 2005a; Hernández-Coss, 2005b; Hernández-Coss and Bun, 2007) used in Chapters 3 and 4. The three-tiered framework refers to the senders (first-mile), the intermediaries, and the recipients (last-mile). Programs should target all three actors if the objective is to promote remittances, as stated in international commitments.

Problems with regards to targeted programs remain. For example, first-mile approaches, or policies aimed at the sender, mainly centred on financial literacy, such as the World Bank's Greenback 2.0 initiative (International Fund for Agricultural Development and the World Bank, 2015: 25-26) or diaspora bonds (Ketkar and Ratha, 2010), while beneficial in promoting remittance flow volumes, rarely serve to attract funds for large-scale projects that yield higher social returns (Rosenzweig, 2005). Other programs and policies, such as transfer cost reductions geared towards intermediaries, remain prone

⁹⁴ As opposed to focusing on payment habits, knowledge of alternative methods, and imperfect information. See Dimbuene and Turcotte (2019) and Chapter 3 for more detailed results on knowledge of alternate methods of transfer. Moreover, there exist swathes of literature on corridor and culture specific tendencies that are more aptly suited in the analysis of case studies than this dissertation aimed at establishing external validity mainly through quantitative analysis.

to persistent inequalities across corridors, as seen in Chapter 2. Furthermore, projects based on expanding financial access (Alliance for Financial Inclusion, 2011: 7) and improving financial literacy rates for recipients (Alliance for Financial Inclusion, 2011: 48-51) are viable options that address core modality issues. However, they remain geographically targeted (i.e., narrow in scope) and relatively expensive to implement.

Innovations and the digitalisation of payment systems are often heralded as pivotal instruments in reducing transfer costs and promoting the poverty alleviation goals attributed to remittances. These efforts are often limited in terms of their trickle-down benefits for lower-income and less financially literate remitters. Despite these initiatives lifting cost barriers, evidence in Chapters 2 and 3 (and the broader literature) indicates that access to simple technologies that benefit lower-income and education tiers is essential to address remittance-related income and wealth inequalities. Innovations in digital currencies and Payment Canada's latest Lynx real-time high-value transfer system⁹⁵ offer considerable benefits in data collection and cost-savings that service providers generally pass onto consumers. However, it remains unclear to what degree such savings will reflect current fee structures and whether they can solve certain inequalities linked to economies of scale currently favouring wealthier and more educated remitters – not to mention specific corridors.

⁹⁵ Payments Canada is an organisation that operates a payment clearing and settlement system in Canada. Broader access, increased speeds, and lower costs through new fund transfer capabilities in real-time could support the development of account-to-account overlay services and benefit current and potential future remitters. However, concerns about persistent inequalities in fee structures as seen in Chapters 2 and 3 as well as doubts about whether domestic systems enhancements will reduce remittance costs to low- and middle-income countries without recipient-end access to such real-time systems could exacerbate inequalities across international remittance corridors in terms of cost, speed, and ease of access (i.e., convenience).

6.4 Policy prescriptions for refocusing efforts to combat inequalities

Layers of intervention that address sender, recipient and remittance intermediary needs are required. This multi-faceted intervention requires engaging with civil society and inter-jurisdictional and international cooperation to tackle these various challenges in a truly transnational environment. This section aims to narrow down several key policy prescriptions that aim to complement, not replace, myriad existing initiatives. For this reason, policymakers should also consider current programs such as those aimed at financial access in recipient regions, diaspora bonds to leverage funds for far-reaching endeavours with higher social returns, fostering competition and multiplying remittance service provider options, and the development of innovative new low-cost remittance options.

Three main remittance policy prescriptions aimed at combatting inequality stand out as a result of the dissertation's findings: a focus on more targeted transfer cost reduction goals to reduce income-based disparities, enhanced leverage of economies of scale through diaspora groups, and, although less novel, improving financial literacy among both sender and recipient members of transnational households.

First, redirecting efforts towards transparency in costs and addressing inequality concerns are more likely to yield the desired effect of formalising flows to address security concerns, as explored in Chapter 4. Moreover, this approach would address the disparities across corridors explored in Chapter 2, especially in the case of Haitians and other groups that face near extortionary transfer fees relative to some of their remitting peers in Canada. As Chapter 3 demonstrates, the formalisation efforts have had the adverse effect of

targeting the most vulnerable, forcing many relying on informal channels to switch service providers despite their potential limited formal alternatives.

The first step in developing equitable global remittance structures and practices requires reformulating remittance goals, especially those surrounding transfer costs, around low-income corridors rather than the current simple average (across both corridors and providers). The way the SDGs are measured by only taking a simple average is part of the problem. By providing only a simple average that ignores channel and corridor specificities, governments are incentivised to collect data for lower cost corridors and channels. Consequently, a country such as Canada may have the perverse incentive of not collecting ample providers for more expensive corridors, instead favouring low-cost corridors and providers. This effect is also compounded by not considering differences in economies of scale across channels, as emphasised in Chapter 3. As a simplistic example, Appendix 3.2A shows how different banks and money transfer operators charged wide-ranging fees in 2017. For instance, the Philippines, a country that benefits and depends substantially from remittance income, even had negative rates (if considering exchange costs) resulting from some remittance service providers choosing to pass on the savings from their beneficial exchange rates.

The SDGs and other remittance goals must be more specific in reducing costs for the most vulnerable rather than overall cost reductions that concentrated within higher-income and education echelons. The current approach is overly focused on maximising overall flows globally and does not distinguish between high and low-income remitters. Although targets aimed at reducing inequalities are hardly sufficient, it would be a significant step towards improving the development potential of remittance flows

worldwide. Policies and programs aimed at capping the percentage spreads between the highest and lowest transfer charges would narrow the corridor-specific disparities and increase remittance, particularly formal remittance, funds to low-income countries and families. Additionally, from a public sector policy perspective, such efforts could be spearheaded at a relatively low cost and yield a permanent form of peer-to-peer source of countercyclical development finance (in addition to ODA flows).

Second, as concluded in Chapter 2, policymakers should facilitate remitters' ability to leverage economies of scale or reduce the gap in scale economies. Approaches to tackling this issue include government-led initiatives to cap fees or increase data transparency surrounding fee structures as well as civil society and diaspora-led projects that include the pooling of funds to incur lower costs. The latter diaspora-led initiatives could borrow concepts from the *hawala* and microfinance models, wherein transfers are pooled and sent as one cheaper transfer while intermittent flows are netted out at either end by dipping into liquidity reserves. Provided adequate money to support the fund reserves on the recipient end, this cooperative method of sending bulk transfers addresses both the need to lower fees and remit more frequent (and generally smaller) sums by dipping into reserves and replenishing these same reserves. This approach would also solve problems surrounding gaps in the frequency of payments in current policies that incentivise lump-sum payments that are only possible among higher-income remitters. Moreover, it would benefit increasing competition among remittance service providers (RSPs) to deliver a larger share of remittances.

Government and international institution led initiatives could include providing seed funding to adequately capitalise cooperative reserves, focusing on data transparency

to bring attention to the significance of existing economies of scale, and regulating provider spreads between the highest and lowest offered rates. Not only will better data lead to increased transparency and awareness of transnational trends, but it will also enhance policymakers' ability to evaluate the effectiveness of programs and to adjust current policies to reflect the latest evidence available. The work presented here also indicates the necessity for additional migrant surveys in Canada and abroad – especially repeated surveys across years to offer researchers a better understanding of trends. In the same vein, the next section provides a brief outline of the main existing data gaps and recommendations for prioritising future research in remittances.

Third, although far from a novel policy prescription, the findings emphasise the role of financial literacy programs that enhance the accessibility of formal finance – as discussed in Chapters 3 and 5. The inequalities in remittance sending, and the focus on overall remittances compounded by the tapering off effect of formalisation in augmenting formal flows, underscore the need for micro approaches that are targeted towards low-income and more vulnerable remitters. The need for financial literacy geared at both senders and recipients is crucial, as underlined in the first-to-last mile framework. Addressing gaps in education and access to information is key in tackling some of the root problems underlying the ubiquitous inequalities in remittance transfers.

As stressed throughout this dissertation, the chapters' multi-level component reinforces the requirement for paired micro and macro approaches, otherwise described as complementary bottom-up and top-down approaches. Whether it be non-governmental organisations promoting financial literacy on the ground or international institutions fostering increased competition and transparency across RSPs to reduce transfer fees

incurred by remitters, the empirical evidence in this dissertation indicates the need for informed decision-making. Alternative approaches could include standards or binding regulations surrounding information provision or cost disclosures for RSPs.

6.5 Advancing remittance research: Next steps

Although this dissertation has covered significant ground in using novel data sources and its multi-level analysis, a dearth of research on the intricacies of channel modality and remittance formalisation – particularly transfer costs – persists. Since several data and research lacunae remain, this section highlights some of these major obstacles to understanding remittance channel modality and formalisation policy – the data gaps and recommendations for future research below outline future study paths.

6.5.1 Bridging data omissions and gaps

There remains a lack of data at both the micro and macro levels. First, despite current efforts to expand the coverage and quality of RPW database estimates, transfer cost data remain insufficient. Not only are the costs limited to formal methods such as banks and MTOs, with occasional separation of digital mechanisms, these estimates overlook other formal channels, and they are not weighted by channel or volume when taking corridor or country averages. This omission is especially consequential in terms of policy, given that simple cost data are used as the primary, and in most cases the sole, indicator of progress in attaining the three per cent target per the SDGs and various other goals. Furthermore, surveys and other alternative data sources tend to be static rather than dynamic, thereby inhibiting analytical capabilities over time. Panel datasets using longitudinal surveys, especially if standardised across countries, would enhance awareness of transfer cost and channel trends.

Second, data on bilateral remittance flows remain limited. The most commonly used estimates are those published by the World Bank and KNOMAD using GNI and migrant stocks (which are themselves modelled) to estimate a to-whom-from-whom matrix (Ratha and Shaw, 2007) to bridge the gap in the balance of payment remittances received and paid. Albeit a step forward, these estimates rely on strict assumptions and can be challenging to implement when using macro models and regression analysis of global flows. For example, one cannot use gravity models and other analyses using income and migrant stocks as control variables in conjunction with these data without introducing endogeneity into the model. For more on this issue, refer to Section 5.2.6 of Chapter 5. Moreover, additional data on transfer frequency are necessary to ensure policies favour lower-income remitters that typically resort to smaller yet more frequent amounts as a form of transnational household sustenance.

Third, and probably most importantly, coupled with the discrepancy in remittances sent and remittances received worldwide (see Figure 6.1), the gaps in measuring informal remittances need to be bridged to reflect the reality of transnational flows adequately. At both the micro and macro levels, the inclusion of additional remittance channels is necessary to capture an evolving sector that increasingly relies on new transfer methods.

Although surveys are valuable tools at the micro-level, they are not systematic or dynamic given they are generally sporadic, and the surveys themselves vary considerably, both across studies and geographies. To solve this, surveys should better align themselves with the growing body of literature and guidelines in estimating remittances, including relevant topics and questions for future surveys (Brown, Carling, Fransen and Siegel, 2014; Dimbuene and Turcotte, 2019).

At the macro-level, estimates need to evolve beyond equating informal activity to the use of informal remittances, as the findings in Chapter 3 suggest (although it is not entirely without merit as explored in Chapter 5). Furthermore, globally standardised definitions of the formal and informal dichotomy are necessary given some channels, such as *hawala* or *hundi*, may be defined differently across geographies (i.e., formal in countries such as Pakistan, yet treated as informal in most high-income countries).

Understandably, the nature of informal remittances as a catch-all category that regroups everything not deemed formal or regulated is challenging to render comparable across corridors, cultures, and subregions. Nevertheless, delving deeper into granular details and characteristics across channels would provide scholars and policymakers with a wealth of currently unobtainable information.⁹⁶ Longitudinal surveys comparable across geographies, and capturing corridor specificities, would be challenging and possibly costly. However, such surveys would provide an in-depth understanding of remittance patterns and better tools for evaluating current remittance related programs.

6.5.2 Recommended future avenues of research

In addition to bridging these data gaps, the following three main research avenues would constitute vital advances in the remittance scholarship.

First, more research on the sequencing of remitter decision-making and how this sequencing may differ across groups in other settings would extend the external validity of the empirical findings within the Canadian context. Although this dissertation separates the

⁹⁶ Additionally, another frequent gap is the lack of information regarding the exclusion of migrants from the remittance market. In instances where migrants do not remit, it would be interesting to acquire information as to why they opt not to send funds. Questions to non-remitters about their desire to remit could shed some much-needed light on the issue of remittance motivations and the propensity to remit. For instance, the absence of family members to remit to is patently distinct from a situation in which migrants cannot, due to financial means or other factors, but would remit under alternate or more favourable circumstances.

intrinsic decisions remitters face, the analysis remains dominated by regression analysis at the average (other than the quantile regressions employed in Chapter 2) rather than focusing on whether different groups make distinct sequencing decisions. In this vein, it would be insightful to conduct further research on sequencing variations across socioeconomic categories, cultures and demographics, corridors, and most frequently used channels.

Second, research on the usage and distribution of remittances has largely ignored variance across channels. The development potential of remittances by channel is largely undocumented, notwithstanding efforts to expand bank access, financial literacy, and digitalisation efforts. Though remittance formalisation efforts are beneficial in various instances – especially in risky transfers, such as those that can endanger transnational households’ wellbeing – the development effects of informal remittances remain largely unknown. Besides, in formalisation cases, the optimal alternative methods are also frequently unknown given the lack of research on the differential development effects by channel. Considering that remittances constitute a significant source of development finance globally, knowledge of how distinct transfer methods impact recipient households and regions is vital. Furthermore, it could nuance debates regarding the equitable distribution across income and education groups by addressing fears that certain remittance flows contribute to the exacerbation of income inequalities.

Third, as both a research agenda and data compilation exercise, students of migrant finances should strive to broaden the definition of remittances beyond monetary transfers analysis. For example, for Venezuelan migrants, higher costs dissuaded higher monetary amounts remitted and promoted the substitution towards in-kind flows (Orozco and Klaas,

2020: 10). Non-monetary remittances can include a vast number of alternative flows such as goods and services (i.e., in-kind remittances), technology transfers, cultural and social norms, political mobilisation, and a wide array of other intangibles (Levitt, 1998; Orozco, 2002; Kapur, 2005; Brinkerhoff, 2012; Boccagni and Decimo, 2013; Clemens, Özden and Rapoport, 2014). Narrowing the research scope to monetary flows may be convenient given the absence of data, but it is inherently biased towards formal methods. This bias towards currency exchanges ignores various transnational support mechanisms and forms of diaspora mobilisation (Brinkerhoff, 2016; Carment and Sadjed, 2017; Koinova, 2017; Koinova and Karabegović, 2017). Therefore, future research efforts should endeavour to incorporate these additional forms of non-monetary flows that often serve as substitutes or complements to the more traditional monetary flows studied in this dissertation.

6.6 Final remarks on emerging trends and policy relevance

Moving forward, the rise of global anti-immigration sentiments and notions of remittance outflow taxation as a form of nationalist protectionism could further complicate the study of remittance behaviour. Whether it be the Oklahoma tax on outgoing international remittances,⁹⁷ the threat of remittance fees issued to Guatemala (Donald J. Trump on July 23rd 2019, via Twitter), or other capital control policies outside the United States, increasing transfer costs through the means of taxation would only serve to reverse the formalisation trend of the last decades.

⁹⁷ At the time of writing, Oklahoma taxes international remittances (wire-transfers) in the order of \$5 for first \$500 and one per cent of the volume sent thereafter. The taxation revenues are labelled as “Drug Money Laundering & Wire Transm. Rev. Fund” in the 2019 (fiscal year of July 1st to June 30th) Annual Report of the Oklahoma Tax Commission (https://www.ok.gov/tax/Forms_&_Publications/Publications/Annual_Reports/).

Not only would such policies run counter to development goals and international commitments, but they are grounded in a fundamental misunderstanding of the remittance market and substitution across channels. This is especially true given they would likely have the adverse effect of raising volumes remitted through unofficial channels with substantially less legal and regulatory oversight. Furthermore, this form of taxation is hardly economically viable given the administrative costs and lack of current data available for appropriate enforcement. It also introduces problematic double-taxation on individuals who have already paid income tax at the source.⁹⁸ Although fears of capital flight in the form of remittances are not entirely baseless, the free flow of capital and lack of government involvement in the form of capital controls remain essential factors in the current global financial infrastructure. Political pressure aimed at inhibiting migrants from remitting via increased costs serves as a perfect example of some of the political and social challenges ahead. Not only do such policies highlight an inadequate grasp of underlying trends in formalisation, but they overlook critical global remittance market dynamics.

Economic downturns and the ongoing COVID-19 health pandemic could also substantially impact remittance flows and echo fears of plummeting remittance funds, as was the case in the last global financial crisis in 2008 to 2009 (Mohapatra and Ratha, 2012). The 2020-2021 inter- and intra-state closures due to the spread of SARS-CoV-2, the virus causing the disease now widely known as COVID-19, could also affect global migrant stocks and consequently the amounts remitted by transnational households (Jewers and Orozco, 2020). The preliminary research on the pandemic's effects to date indicates it could lead to dire circumstances in remittance-dependent regions (United Nations, 2020).

⁹⁸Dilip Ratha, Supriyo De, and Kirsten Schuettler. (2017). "Why taxing remittances is a bad idea." World Bank Blogs, <https://blogs.worldbank.org/peoplemove/why-taxing-remittances-bad-idea>

Numerous developing regions face the dual impact of local income and employment disruptions in addition to remittance income interruptions caused by lockdowns in remittance-sending countries (Committee for the Coordination of Statistical Activities, 2020). Preliminary estimates forecasted a drop of approximately 20 per cent in global remittance flows (World Bank, 2020), which would severely squeeze transnational household finances. Such a drop would disproportionately impact highly dependent areas such as El Salvador and Nepal, where remittance inflows halved in April 2020 on a year-to-year basis (Karim, Islam and Talukder, 2020; The Economist, 2020). However, more recent evidence shows that fears of remittance decline were largely overblown despite minor declines in 2020 relative to 2019 (World Bank, 2021).

The pandemic can also impact remittance formalisation, whereby a drop in informal remittance possibilities with border closures could contribute to higher formal flows, as is suspected to be the case for Kenya (Central Bank of Kenya, 2021). Within this pandemic context, low cost and financially inclusive options could be more important than ever to address recipient needs as well as to attain broader poverty alleviation and formalisation goals (Bisong, Ahairwe and Njoroge, 2020).

Although arguments about recipient country remittance counter-cyclicity exist, remittance outflows are largely procyclical, and such shocks could dry up the supply of remittances worldwide. These trends have the potential to reverberate throughout the globe and disrupt current international remittance growth targets. They also stand to influence formalisation trends, as cash and certain other types of transfers become trickier to carry across international and intra-state borders. Moreover, according to the International Labour Organization, informal workers and the shadow economy are among the most

vulnerable and affected labour networks (ILO, 2020). Despite decreased attention to remittance formalisation favouring a poverty alleviation narrative often singularly focused on the size of flows, one should not underestimate the policy relevance of other factors such as remittance frequency and modality.

No matter what trends lie ahead, in an era that increasingly questions globalisation and where migrant resentment is increasingly part of political discourse, it is crucial to remind sceptics and non-sceptics alike of both the merits and costs of immigration, particularly in the Canadian context (MacIsaac, 2020). Migrants' contributions are even more important, considering their potential to harness remittances for global development. There is contradictory evidence regarding whether the distribution of remittance flows may be unequal across and within corridors (Stark, Taylor and Yitzhaki, 1988; Acosta et al., 2008; Taylor et al., 2008). However, remittances tend to promote business development (Straubhaar and Vâdean, 2005), education (Lim and Simmons, 2016), as well as improve health outcomes (Adams and Cuecuecha, 2013; Amuedo-Dorantes, 2014), and overall economic growth in low-income countries – yet the latter hinges on institutional quality in recipient regions (Catrinescu et al., 2009). Moreover, restrictive immigration policies and suboptimal investment environments that hinder the free flow of people are a drag on the development potential of remittances (De Haas, 2005). Remittance development potential should not be discarded and should preferably be reinforced with more nuanced policies across channels and corridors. Additionally, programs could better target those remitters and recipients that mobilise frequent and sizeable flows destined to low-income countries.

Although much work remains to be done in this area, this dissertation should serve as a guide to scholars and policymakers interested in the economic, development, and

security implications of person-to-person transnational transfer modality and formalisation policies. It would be a shame to resort to introducing new barriers to remittance flows, especially seeing that, as this dissertation argues, these barriers could serve to fuel underground remittances. The growth in informal or underground remittances would undoubtedly inhibit adequate surveillance by existing regulatory institutions, thereby undermining the presumptive goal of addressing money laundering and terrorist financing concerns. Although formalisation itself is not a sustainable strategy for remittance growth given diminishing returns over time, understanding the variance across channels is essential to remittance related programs and international development initiatives.

Finally, remittances should not replace traditional official development funds as a form of privatised peer-to-peer transnational finance (Dade, 2006; Kharas and Rogerson, 2012). Skeldon (2008) cautions policymakers should not rely excessively on migrant agency at the expense of institutional and state-level change necessary for development. While remittances are a necessary form of development funding, policymakers should ensure they do not reduce other international assistance forms or contribute to exacerbating existing income and wealth disparities.

6.7 References

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