Analysis of motives and the impact of foreign remittance on financial development, poverty and income inequality: Empirical evidence from Sri Lanka

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Abstract

Foreign remittance is the main external source of finance for Sri Lanka. It contributes immensely towards the country's economy and makes up around 8 per cent of the GDP. However, there is a lack of study on foreign remittance in the Sri Lankan context, which hinders the potential of creating a comprehensive policy on remittance. Hence, this thesis has analysed the motives for foreign remittance and its determinants, the impact of foreign remittance on financial development, alongside its influence on poverty and income inequality in Sri Lanka.

The objective of this research was to provide relevant information to the policy makers to guide them in enhancing the benefits to Sri Lanka from foreign remittance. The study used the autoregressive distributed lag (ARDL) and autoregressive (AR) models, Granger causality, impulse response analysis, variance decomposition and recursive estimation for analysing research data.

At first, the motive for foreign remittance and its nature (static or dynamic) was examined to investigate the relevance of the prevalent notion that remittance motive is static in nature. Based on recursive estimation, the study found that remittance to Sri Lanka was dominated by altruistic motive until 1992 and by self-interest motive thereafter. Therefore, the findings disproved that the motive for remittance is static and confirmed its dynamic nature. This highlighted the need to assess the motive for foreign remittance at an individual country level and adjust migration and remittance policies accordingly since the motives keep changing over time and require continuous monitoring.

The next stage in this study involved determining the key factors of foreign remittance to Sri Lanka by using factor analysis and ARDL model. Through the analysis, it was found

that the per capita GDP and government stability are long-run determinants of remittance and have a positive impact on it. In addition, accountability and socio-economic status were identified as short-run determinants. The findings showed the importance and implications of push factors over pull factors to determine the inflow of remittance. It demonstrated that the Sri Lankan migrants, unlike altruistically driven migrants, are highly attentive to economic and political stability, and send more money when the economic and political conditions of the home country are favourable for investment.

The undertaken research also examined the impact of foreign remittance on financial development in Sri Lanka using ARDL model. It used four proxies to represent financial development: money, deposits, credit and assets. The analysis revealed a significant impact of remittance on money and credit in Sri Lanka. Furthermore, it showed that the nexus between remittance and financial development supports a complementary hypothesis. This highlighted the likelihood of remittance to enhance the credit availability, promote investment and thereby enhance the economic growth of the country.

Finally, the study examined the causal relationships between foreign remittance and poverty, and foreign remittance and income inequality in Sri Lanka with autoregressive model. The analysis showed that foreign remittance has a significant impact on moderate poverty reduction. Apart from the AR model, the Granger causality analysis verified the above-mentioned relationships between foreign remittance and poverty in Sri Lanka. However, the results of the study found no evidence to prove a significant impact or a causal relationship between foreign remittance and income inequality in Sri Lanka, unlike in some developing countries.

All the findings from this research contribute to both the theoretical and the empirical literature. They provide relevant information that are invaluable for migration and remittance policy development, which can enable Sri Lanka to create an investment-friendly environment to attract more remittance by reducing the country's financial risk and by enhancing its economic stability. In addition, since Sri Lankan employment migrants are motivated by self-interest the findings would help the financial institutions to customise their services to migrants, to further enhance their investment motive.

Student Declaration

I, Parahara Withanalage Niroshani Anuruddika Kumari, declare that the PhD thesis entitled 'Analysis of Motives and the Impact of Foreign Remittance on Financial Development, Poverty and Income Inequality: Empirical Evidence from Sri Lanka' is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.
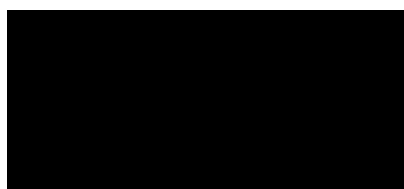
Signature: Date: 14 November 2019

Dedication

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This thesis is dedicated to my loving parents and my two sisters.

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The journey towards completion of this thesis was not easy and I considered giving it up many times. However, I finally achieved my dream despite lots of hardships in my life. I would like to thank Associate Professor Nada Kulendran for being an excellent supervisor who encouraged me to fulfil my dreams. You were a shadow for me, and I learned not only what I need for my study but also what I need for my life. I am obliged to Dr Kumi Heenetigala and Dr Ranjith Ihalanayake for their support throughout my PhD journey. I am also grateful to Professor Anona Armstrong for encouraging me in my studies.

This study has benefited immensely from feedback received generated by the research conferences at which I have presented, including the Higher Degree by Research (HDR) Conference 2017, College of Business, Victoria University; the Accounting and Finance Association of Australia and New Zealand (AFAANZ) Conference 2018; the Western Economic Association International (WEAI) 15th International Conference 2019, Keio University, Tokyo, Japan. Elite Editing edited this thesis, and editorial intervention was restricted to Standards D and E of the *Australian Standards for Editing Practice*. I highly appreciate their contribution to improve the quality of the thesis. Further, I highly appreciate my friend Fairuza for taking time to read my work and helping to improve the quality of the thesis.

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List of Abbreviations

ADF	Augmented Dickey–Fuller
AIC	Akaike Information Criterion
AR	Autoregressive
ARDL	Autoregressive Distributed Lag Model
CARICOM	Caribbean Economic Community and Common Market
CBSL	Central Bank of Sri Lanka
CUSUM	Cumulative Sum
DF	Dickey–Fuller
DL Model	Distributed Lag Model
ECM	Error Correction Model
ETC	Error Correction Term
FDI	Foreign Direct Investment
FED	Financial Efficiency Development
FID	Financial Intermediary Development
GCC	Gulf Cooperation Council
GCM	Global Compact for Safe, Orderly and Regular Migration
GDP	Gross Domestic Product
GNP	Gross National Product
HIES	Household Income and Expenditure Survey
HQC	Hannan-Quinn Criterion
IBRD	International Bank for Reconstruction and Development
ICRG	International Country Risk Guide
IMF	International Monetary Fund
IOM	International Organization for Migration
IRA	Impulse Response Analysis
KNOMAD	Global Knowledge Partnership on Migration and Development
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
KSA	Kingdom of Saudi Arabia
LAC	Latin America and the Caribbean
LSMS	Living Standard Measurement Study
NIM	Net Interest Margin

ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation
OLS	Ordinary Least Squares
OVC	Overhead Cost
PGAP	Poverty Gap Ratio
PHC	Poverty Headcount Ratio
PP	Phillips–Perron
SDG	Sustainable Development Goals
SIC	Schwarz Information Criterion
SPGAP	Squared Poverty Gap
UN	United Nations
USD	United States Dollar
VAR	Vector Auto Regression
VDA	Variance Decomposition Analysis
VEC	Vector Error Correction

List of Awards, Conference Presentations and Publications

Awards

- Second prize for conference paper presented at the Higher Degree by Research (HDR) Conference 2017, College of Business, Victoria University. Paper title: Foreign Remittances and Financial Intermediary Development: A Case Study on Sri Lanka.

Conference Presentation

- Foreign Remittances and Financial Intermediary Development: A Case Study on Sri Lanka. Presented at the Higher Degree by Research (HDR) Conference 2017, Victoria University, Melbourne, Australia.

- Foreign Remittance and Financial Development in Sri Lanka: A Dynamic Modelling Approach. Presented at the Accounting and Finance Association of Australia and New Zealand (AFAANZ) Conference 2018, Auckland, New Zealand.

- Move from Altruism to Self-interest: Review of Motive for Remittance to Sri Lanka. Presented at the Western Economic Association International (WEAI) 15th International Conference 2019, Keio University, Tokyo, Japan.

Publication

- Is the motive for remittance static or dynamic? Review of altruistic vs self-interest motive for foreign remittance. *Applied Economics*, Routledge Taylor and Francis Group, Submission date: 04.08.2019 (under review). ABDC Ranking: A

1   Background, Research Problem, Objectives and Thesis Outline

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1.1   Background: Country of the Study

Since Independence in 1948, Sri Lanka has grown progressively from a low-income country to a lower-middle-income country. Post-independence development in Sri Lanka was strongly backed by former colonial rulers and is noteworthy in numerous ways, including the progress of economic and social conditions. For instance, in Sri Lanka in the 1950s the recorded purchasing power parity gross national product (GNP) relative to that of the United States (USA) was 11.4, compared with that in India, South Korea and Thailand, which were 7.1, 7.6 and 9.6, respectively (Kravis and Lipsey 1983). The post-independence prosperity in Sri Lanka signalled that Sri Lanka would be 'the best bet in Asia' out of all the post-colonial nations, including India and Pakistan (Lal and Rajapatirana 1989).

The high demand for tea, rubber and coconut was one of the main contributors to economic growth during this period and accounted for 90% of foreign exchange earnings. Moreover, relatively high literacy levels, democracy, presence of wide-ranging infrastructure and the absence of extreme poverty and income inequality were some of the other key conditions that led Sri Lanka towards prosperity. Thus, post-independence economic development contributed to ranking Sri Lanka as one of the most prosperous and developed countries in the Asian region (Athukorala 2012). Together with economic stability, peace and order, Sri Lanka became a haven in the region. The post-independence growth trends continued with some slight fluctuations over the next decade. The 3.2% annual average growth of GDP in the 1950s increased up to 4.3% during the 1960s; as shown in Figure 1.1, GDP growth in 1969 was the highest in that decade.

Figure 1-1 GDP Growth 1961–2016
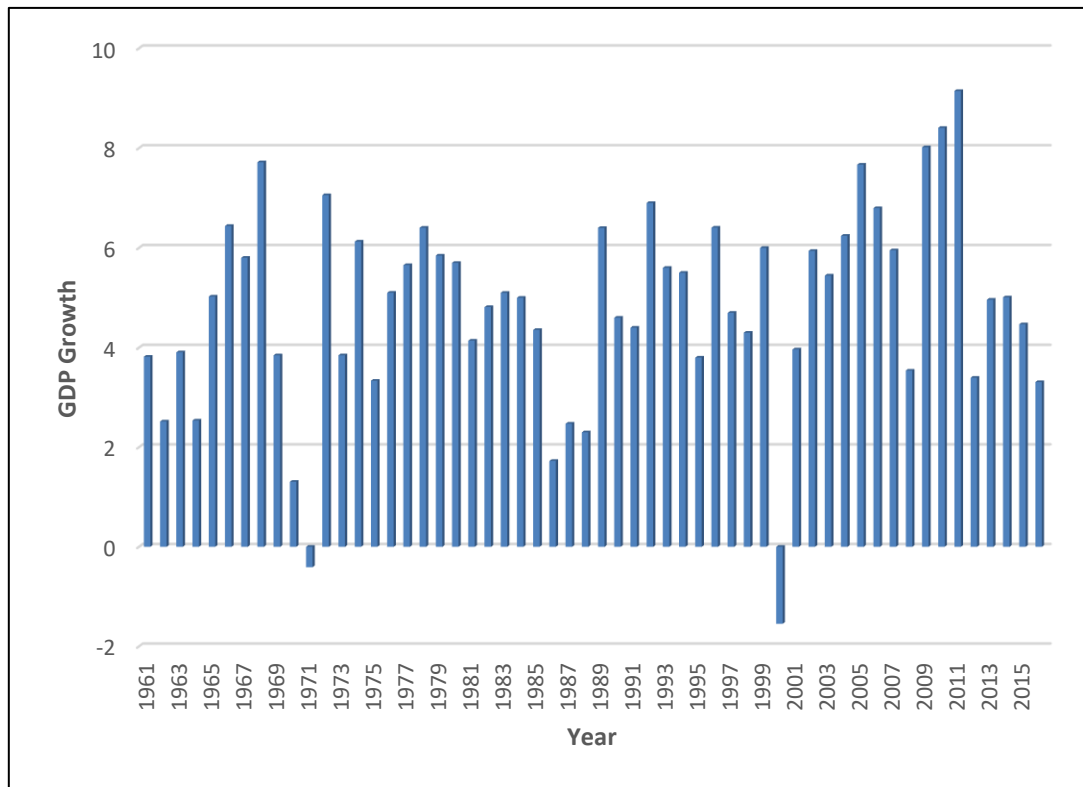
Source: IBRD (2017)

However, the boom in the export of primary products lasted for less than 15 years after independence. The reduction of export commodity prices in the world market began in the mid-1960s and heavily interrupted the post-independence economic growth. Thus, Sri Lanka entered a dark era of its economic history. The lack of long-term policy on export earnings further reduced its benefits as Sri Lanka used it mostly for imports of foods (Kelegama 2000). The low export income combined with the high expenditure on imports necessitated the imposition of import restrictions to overcome the balance of payments crisis.

With the aim of recovering from the balance of payments crisis and developing the economy, the government of Sri Lanka attempted to maintain an extensive state ownership, restrictive trade and exchange and price control. These dominative steps

towards overcoming economic challenges converted Sri Lanka into one of the most inward-oriented economies of the world (Athukorala 2012).

The effects of the nationalisation and inward-oriented economic policies were disappointing for the public, who expected rapid results. In particular, shortage of consumer goods became one of the main issues. The government started food distribution, introducing the 'grow more food' campaign. Nevertheless, these government policies were not decisive, and people opposed them because of hardships resulting from weaknesses in the implementation process. The political and the economic conditions during this period eventually led to a change in the ruling party of the country.

The new government changed the economic policies of the country and introduced liberalisation instead of the nationalisation of the previous government. Over the post-independence economic journey, the previously mentioned open economic policy and the resultant economic and social changes were recognised as turning points in the Sri Lankan economy. Unfortunately, economic growth was again hindered by the separatist conflict, which began in 1983.

As a result of an insurrection in Sri Lanka widely known as 'Black July', the annual average growth of the country declined to 2.2% between 1986 and 1988 (seen in Figure 1.1), which was even lower than for the period from 1970 to 1977. The economic and social conditions were not favourable to the country at large and most of the policies did not help overcome the problems and uplift the economy. Therefore, the people of the country suffered from poverty as well as living with the risks posed by the civil war. Thus, to support the poor who were deprived not only through poverty but also through ethnic

conflicts, in 1989 the government of Sri Lanka initiated *Janasaviya*, a subsidising program.[1]

To overcome the issues that had caused civil insurrection, Sri Lanka started to reinstate law and order; this helped uplift the economy Sanderatne (2014). As shown in Figure 1.1, Sri Lankan economic growth increased during the 1990s. Nonetheless, Sri Lanka was unable to maintain the momentum of the economy, and in 2001, it recorded negative economic growth. This was partly due to ethnic conflicts and the diversion of funds from growth to national security. The economy recovered to a state of growth again, and in the 2000s, there were significant economic and social changes, with 2009 marking the end of 30 years of civil war. Since 2000, the GDP of the country has been above 4% except in 2009, 2013 and 2017, the apex of 9.1% being reached in 2011.

1.1.1 Migration, Foreign Remittance and the Sri Lankan Economy

1.1.1.1 Migration

Overall, the post-independence economic situation of the country was not favourable, and it did not help Sri Lanka to be 'the best bet in Asia'. Nonetheless, the government of Sri Lanka has since strengthened free education, free health services and supportive services to small and medium entrepreneurs with the aim of uplifting the economy by overcoming the problems of low economic growth, poverty and income inequality (Nanayakkkara 2016).

Unfortunately, these policies have limitations that constrained the outcome expected at their initiation. For instance, key issues in the education system include limited

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[1] *Janasaviya* is the foremost subsidy program for poor people in Sri Lanka. It was introduced in 1989 under the presidency of the third executive president in Sri Lanka, Ranasinghe Premadasa. The program continues in Sri Lanka today after having been restructured under preceding governments and renamed on several occasions as *Samurdhi* and *Divi Naguma*.

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opportunities at universities, inadequate pathways for vocational training and the absence of a strong connection between the secondary and higher education systems, despite a high quality of education. Because of the limited opportunities for studying at tertiary education institutions and the lack of vocational training, a significant portion of school dropouts have little chance of undertaking any form of either higher education or training and will inevitably fall into the unskilled labour force.

The open economic policy of the 1970s and the increased demand for unskilled labour from oil export countries (De and Ratha 2012) encouraged people deprived as a result of poor economic conditions to opt for migration. The separatist conflicts further intensified migration, which included the migration of people as refugees or for permanent settlement. From 1986 to 1990, annual migration numbers swelled from 14,456 to 42,625, an upsurge of more than 190% (SLBFE 2016).

The persistent mismatch between the aspirations of the unskilled employees, the job market and the lower wage rate in Sri Lanka during 1990 meant that migration was one of the best solutions for unemployment. Therefore, migration from Sri Lanka increased more than threefold between 1990 and 2000. In 1990, the number of migrants was only 42,625, and by 2000, it had upsurged to 182,188. Migration increased over approximately five decades and it helped Sri Lanka tremendously with a massive inflow of foreign remittance.

1.1.1.2 Remittance

As seen in Figure 1.2, there has been a significant upward trend in the inflow of foreign remittance to Sri Lanka during the past five decades. Foreign remittance was below 1% of GDP until 1978, after which it increased sharply. It reached a peak of 6% in 1982, followed by a slight decline. The gradual upward trend in the 1990s reached a high point

of 6.9% in 1999. Between 2000 and 2010, the inflow of remittance showed the same pattern as in the 1990s, with the highest level of the decade (8.1%) recorded in 2005. After 2010, the inflow of remittance to Sri Lanka was above 7% and reached a peak in 2014. Overall, remittance has experienced an annual average growth of 8% over the past 5 decades with a continuous upward trend (IBRD 2016).

Figure 1-2: Inflow of Foreign Remittance
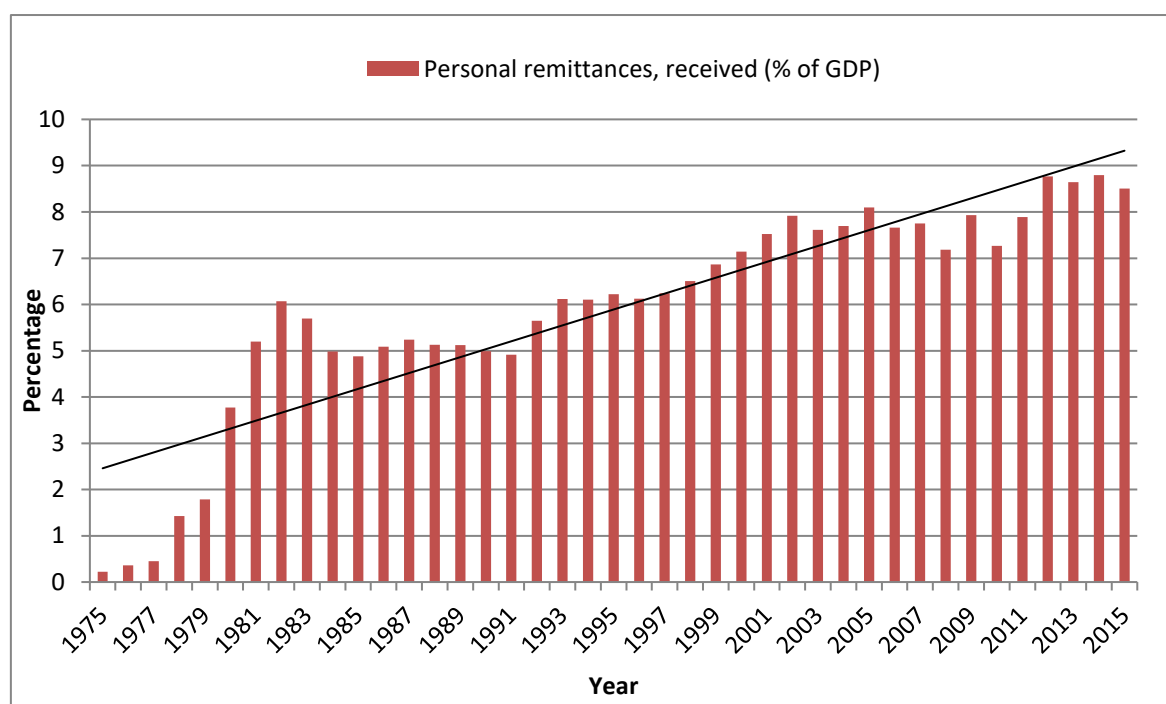
Source: IBRD (2016)

Figure 1.3 illustrates the importance of remittance compared with the other external financial flows such as foreign direct investment (FDI)[2] and official development assistance (ODA)[3] for the period 1995–2016. As shown in the figure, net remittance inflow is the main external finance flow, followed by ODA and FDI, respectively.

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[2] FDI is the value of cross-border transactions related to direct investment during a given period. This includes equity transactions, reinvestments of earnings and intercompany debt transactions OECD. (2019). 'FDI Flows.' Retrieved 05/02/2019, 2019, from https://data.oecd.org/fdi/fdi-flows.htm.(OECD, 2019).

[3] ODA is the term for official grants or loans, including financial flows and technical cooperation, provided to developing countries for the purpose of promoting economic development and welfare ibid.

Remittance has gained relative prominence over time because it is less volatile in nature than FDI and ODA in Sri Lanka (Ruiz-Arranz and Lueth 2007).

Figure 1-3: External Finance Flow—Sri Lanka
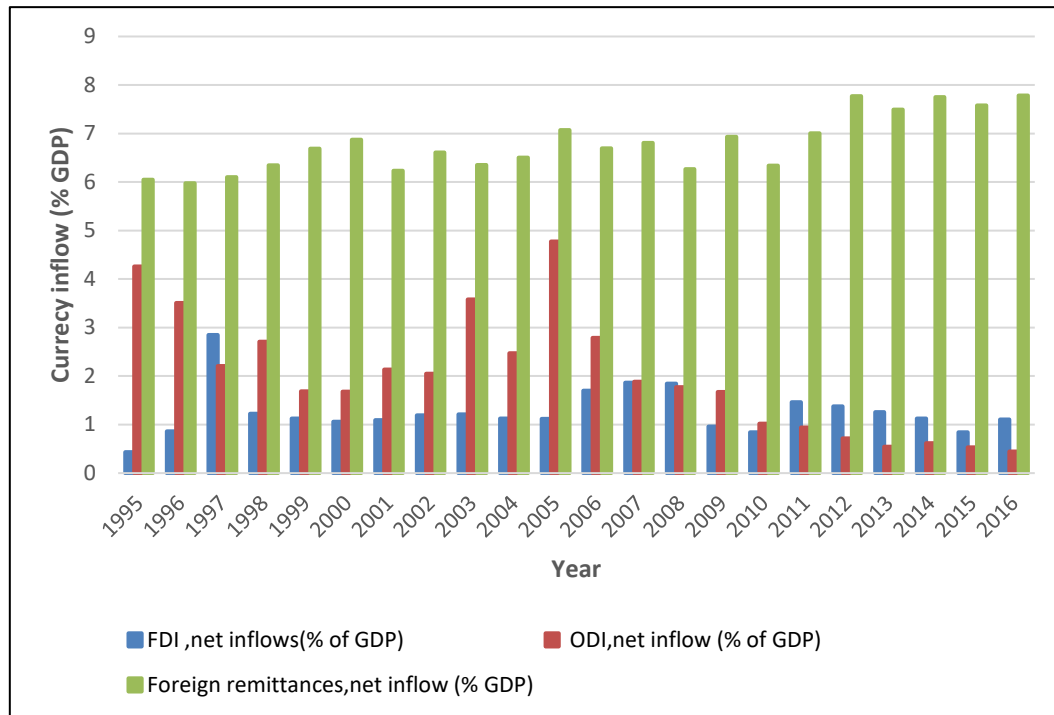
Source: OECD (2017)

Remittance inflows increase the purchasing power of migrant households, allowing them to fulfil their basic needs such as food, shelter and education, and facilitating their activity in the financial system in the form of savings and credits. In addition, as illustrated in Table 1.1, remittance has a crucial effect on the external sector balances of the country by assisting the persistent trade deficit, which is above 10% of the country's GDP. Without foreign remittance, financing this widening deficit would have been a challenge for a country facing the added problem of loan repayments.

Table 1-1 Inflow of Remittance Compared with External Sector Balances

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Trade Balance (% of GDP)	−7.4	−8.5	−14.9	−13.8	−10.2	−10.4	−10.4	−10.9	−11
Remittance (% of GDP)	7.9	7.3	7.9	8.8	8.6	8.9	8.7	8.9	8.2

Source: CBSL (2018)

The relative importance of remittance to Sri Lanka compared with the other southern Asian countries during 2016 and 2017 is illustrated in Figure 1.4. Among seven southern Asian countries, Sri Lanka exhibited the second largest remittance to GDP ratio and was only surpassed by Nepal with a ratio of 28.31% of GDP (KNOMAD 2016).

Figure 1-4: Inflow of Remittance to Southern Asia—Percentage of GDP
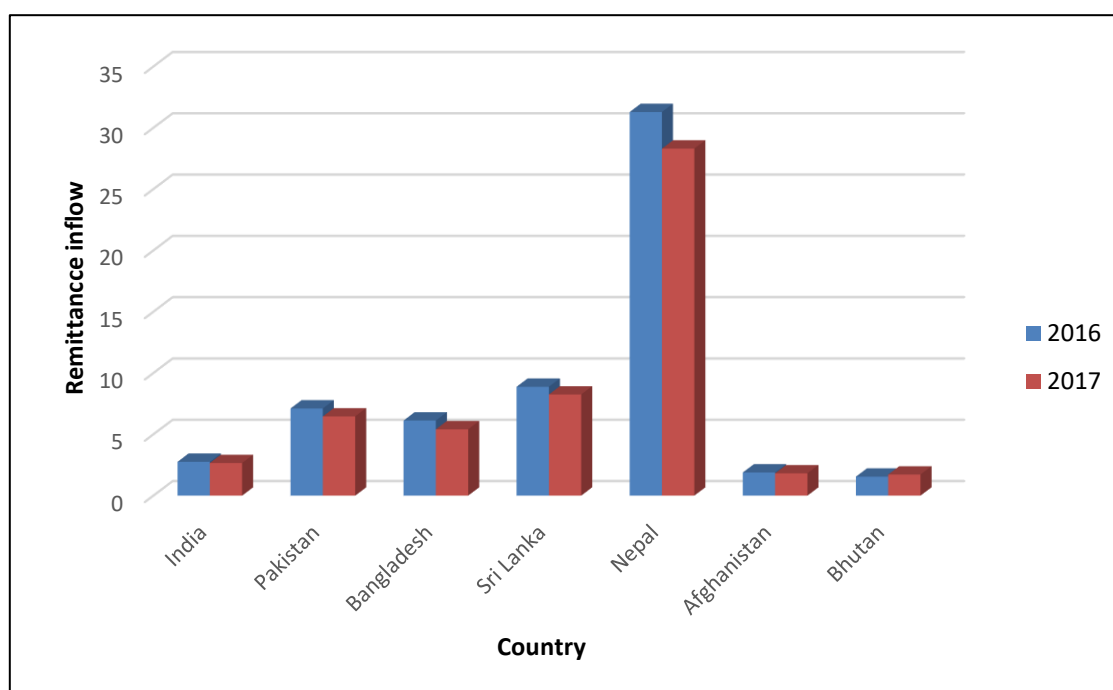
Source: Compiled with data from IBRD (2017)

1.2   Key Issues and Motivation for the Study

The significance and tremendous growth of remittance in developing countries, including Sri Lanka, have attracted the attention of scholars and policymakers. Available studies have contributed to the field by addressing key aspects such as motives for remittance,

determinants of remittance and impact of remittance (Ex:Wagh and Pattillo 2007, De and Ratha 2012). However, a review of the literature helps identify gaps in the theory and empirical literature on (a) motives for foreign remittance, (b) determinants of foreign remittance and (c) the impact of foreign remittance in both global and Sri Lankan contexts. The following sections explain these key issues in order.

In the global context, analysis of the motives for remittance has taken place in various countries and regions (Ex:Czaika and Spray 2013, Abdin and Erdal 2016, Harper and Zubida 2018). Among these many research has considered the context of remittance with respect to the Latin American region widely. Researchers have attempted to identify whether remittance is motivated by altruism or self-interest. Altruism focuses on fulfilment of basic household needs, whereas self-interest focuses on migrants' own future; thus, savings and investment are key concerns. However, no study has examined whether the motive for remittance to a country is static or dynamic in nature.

According to the existing literature, researchers have identified altruism, self-interest or a mix of both as the motive for remittance to their selected country or the region of study (Funkhouser 1995, Gubert 2002, Henry, Moulton et al. 2009, Bouoiyour and Miftah 2015). However, this might vary depending on the economic and social phenomena of the country. For example, if a country is gradually overcoming poverty, remittance may ease the economic burden on a migrant's family. Thus, remittance for consumption, driven by altruistic motives, gradually decreases over time and is replaced by remittance for savings and investment, motivated by self-interest. Similarly, if the financial system of the country and the other macroeconomic conditions such as inflation and interest rates are favourable for savings and investment, migrants motivated by self-interest remit more for their own betterment, and vice versa.

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Further, motives for foreign remittance may also have a direct link with government policy initiatives such as subsidies for the poor. For example, if Sri Lankan government subsidy programs such as *Janasaviya* and *Samurdhi* succeed in achieving their intended aim of eradicating poverty, the families involved may not need to depend on their family migrants. This could divert migrants' earnings from altruism-based consumption to self-interest-based savings and investments. However, as mentioned above, this is unexplored in the existing literature on Sri Lanka as well as in the global context.

In the Sri Lankan context, a study by Ruiz-Arranz and Lueth (2007) is the only one to examine the motives for remittance to Sri Lanka. It helps reverse the paucity of research to a certain extent, although it does not focus on the dynamic nature of the motives for foreign remittance. Nonetheless, the identified limitations of their study make it unhelpful for proposing policies for Sri Lanka. For instance, the study covers only the period from 1996 to 2004. It does not cover the period between the 1970s and 1996 and the decade after 2004. In addition, the study does not provide a confirmation about the nature of the motive for remittance and stresses on re-examining the concept of altruistic and self-interest motives.

Following these gaps related to motives for remittance, the following section briefly explains the gaps in the literature on determinants of foreign remittance. The motives for remittance as well as the volume of remittance are determined by factors within, as well as outside of, the country (Abella and Ducanes 2009, Chami, Barajas et al. 2010, Imai, Gaiha et al. 2014). According to the systematic theory of migration, home country determinants fall under push factors, whereas host country factors fall under pull factors. Identifying the determinants of foreign remittance at a country-specific level is important because these factors and their impact on the inflow of foreign remittance vary from

country to country. Despite this, no study has adequately examined the home and host country determinants of foreign remittance to Sri Lanka. This is vital for policy development since Sri Lanka has higher country risk because it is highly dependent on foreign remittance, especially from oil-exporting countries.

The following section briefly outlines the key issues related to the foreign remittance impact studies and the use of existing studies in policy formulation. As explained at the outset, the impact of remittance on the economy is an important aspect to examine. A closer examination of remittance would help enhance its existing positive impacts while overcoming the negative impacts by implementing appropriate rules and regulations, such as tax and legal restrictions. This has been examined in various country and cross-country studies to a great extent, mostly in the Latin American region (Brown and Carmignani 2015, Coulibaly 2015).

Foreign remittance impact studies on Sri Lanka are mostly restricted to economic development (Ex:Siddique, Selvanathan et al. 2012), and important aspects such as financial development, poverty and income inequality have not been sufficiently studied. Most of the existing studies are based on data from multiple countries, which do not have the exact economic situation as Sri Lanka and therefore make domestic policy making difficult. Thus the notion of a country specific research for policymaking was proposed by (Moriarty 1975).

Another issue in foreign remittance impact studies is ambiguity. For instance, despite the enthusiasm, much ambiguity exists about whether remittance helps advance financial development and reduces poverty and income inequality. This is mainly due to mixed results on the impact of remittance on economic aspects such as financial development, poverty and income inequality. For example, Gupta, Pattillo et al. (2009), found a direct

impact of remittance on financial development in sub-Saharan Africa. In contrast to their study, Karikari, Mensah et al. (2016) found that remittance has a positive impact on financial development in Africa only in the short run but a negative impact in the long run.

Acosta, Calderon et al. (2008) examined the impact of remittance on poverty and income inequality in Latin America. They revealed that remittance helps reduce poverty and income inequality in the region. In contrast, Viet (2008) studied the same aspects in Vietnam and found that remittance has a slightly lesser impact on poverty reduction, despite significant increases in the income and consumption of receiving households. The study further found that remittance increases the income inequality in the country. These findings evidenced the abovementioned mixed results of remittance impact. Moreover, researchers explain the possible Dutch disease[4] effect of foreign remittance (Acosta, Baerg et al. 2009, Lartey, Mandelman et al. 2012) in contrast to the positive impacts of remittance.

Because of the mixed nature of the results and since most of the studies are cross-country studies with panel data, as suggested in Chowdhury (2011), generalising the findings of one country or region to another and making policy decisions accordingly is unadvisable. The diversity of findings may be a result of the uniqueness of the impact of remittance in the contexts of different countries due to factors such as legal and political conditions, diversity in the spending behaviour of remittance-receiving households and the differences among the links between financial service providers and the recipients.

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[4] Negative effects associated with inflow of remittance such as overvaluation of exchange rate and the resultant resource allocation from tradeable to non-tradeable sectors Bussolo, M., L. Molina and H. Lopez (2007). Remittances and the real exchange rate, The World Bank. This may further negatively affect long-term economic growth Rodrik, D. (2008). 'The real exchange rate and economic growth.' Brookings papers on economic activity 2008(2): 365–412.

Moreover, the impact of remittance might be tied to different aspects, and so studying them in isolation could be pointless. For instance, studying the impact of remittance on poverty or income inequality in isolation while ignoring financial development is irrational, because remittance is channelled through financial institutions. Similarly, poverty, income inequality and financial development could be closely tied to the motives for remittance, which makes it reasonable to study them together. However, the existing body of literature reveals the scarcity of empirical studies on the links between foreign remittance, financial development, poverty and income inequality in a macroeconomic framework in Sri Lanka.

1.3 The Research Problem

The gradual expansion of migration over the past five decades, especially migration for employment, has changed the lives of migrant-dependent families and the Sri Lankan economy at large. The growing importance of remittance at both micro and macroeconomic levels highlight the need for a domestic policy that safeguards a continuous and sustainable flow of remittance, to preserve the current economic state of the country.

Section 1.2 outlined the key issues in the existing literature and the importance of comprehensive study of foreign remittance. Therefore, this study addresses the following research problems: (a) what motivates people to remit and the nature of the motive; (b) what are the factors that may cause or determine the flow of remittance; (c) does country risk affect the inflow of remittance, and if so, how; and (d) how does foreign remittance affect the financial development, poverty and income inequality of the country?

Answering the above questions would help policymakers to (i) create a remittance-friendly environment by strengthening factors that may increase remittance flows while

eliminating factors that discourage migrants to remit, (ii) identify factors that cause remittance inflows but are beyond the control of the country, and (iii) formulate policies, which increases the positive impacts while lessening the negative impacts of foreign remittance. These aspects combined help form a comprehensive domestic policy on the inflow of remittance.

In summary, the absence of systemic study on the inflow of remittance to Sri Lanka is a key issue for the economy of the country. The absence is noticeable in all issues: motives for remittance, home and host country determinants of remittance, and impacts of remittance on financial development, poverty and income inequality. Therefore, all the facts listed above, together with the importance of remittance, provide the inspiration for conducting a comprehensive study that could assist policymakers on creating policies to increase the inflow of remittance and to enhance the positive impacts while mitigating any negative consequences.

1.4 Objectives of the Study

Having identified the link between the motives for remittance and the impacts of remittance, this study conducts a comprehensive econometric analysis that helps to analyse the motives and determinants of remittance and its impact on financial development, poverty and income inequality. To do that, the thesis set the following objectives:

- to identify the motives behind the inflow of remittance to Sri Lanka
- to assess whether the motives for remittance are static or dynamic in nature
- to identify the determinants of remittance to Sri Lanka
- to develop an econometric model to assess the short-run and long-run impacts of remittances on financial development, poverty and income inequality

- to examine the impact of possible future shocks to remittances on financial development, poverty and income inequality in Sri Lanka

- to assess the causal relationship between remittances, financial development, poverty and income inequality in Sri Lanka.

1.5 Thesis Outline

The thesis consists of six chapters. Chapter 2 presents the main concepts of the study and gives an overview of both global and Sri Lankan contexts. It begins with an introduction to migration, and then discusses reasons for migration and consequences of migration. This is followed by an analysis of migration trends and the historical evolution of migration in the world and in Sri Lanka. The remainder of Chapter 2 focuses on remittance. It begins with definitions for remittance, followed by measurement problems and the distinctive features of foreign remittance. It then provides an overview of foreign remittance, with a summary at the end of the chapter identifying issues for the current study.

Analyses of related theories and the empirical literature are contained in Chapter 3. Chapter 3 begins with an analysis of migration theories and examination of how they are related to the current study context. The next part of Chapter 3 reviews the foreign remittance-related theories and highlights the most important theories directly linked with the study. This is followed by a review of the empirical literature on motives for foreign remittance and the impact of foreign remittance. The hypotheses and conceptual framework derived from the respective theories and the empirical literature are also given in Chapter 3.

In Chapter 4, the study's data and methodology are presented in detail. The chapter commences with an outline of the data and data sources used. Then it provides an

overview of the time series data analysis followed by the selection of autoregressive (AR) and autoregressive distributed lag (ARDL) models for the study. An explanation is given of the econometric procedure of the ARDL model with the derivation of the long-run and short-run dynamic models of the study.

Chapter 5 focuses on analysis and discussion. It has three main sections. Section 1 analyses the dynamic nature of the motives for foreign remittance and determinants of foreign remittance. This is followed by the impact of foreign remittance on financial development in Section 2. The impact of remittance on poverty and income inequality is given in the last section of the chapter.

Chapter 6 summarises the main findings of the study, highlighting its contribution and proposing policy recommendations. It also discusses the limitations of the study and proposes an agenda for future research.

2 Overview of Migration and Foreign Remittance

2.1 Introduction

The previous chapter overviewed the background, research problems, objectives and the structure of the subsequent chapters of the study. This chapter gives a detailed explanation of migration and foreign remittance. The chapter is divided into two main sections. Section 1 defines migration, analyses the reasons and consequences of migration and discusses the migration trends globally and in Sri Lanka. Section 2 discusses remittance. It explains the definitions and measurement challenges of remittance followed by an overview of the remittance trends globally and in Sri Lanka. This chapter acts as the foundation to Chapter 3, which reviews the theories and empirical literature on migration and foreign remittance.

2.2 Migration: Definitions, Reasons, Consequences and Trends

Migration is an important subject, though it has taken considerable time for it to be established as a key academic matter (Favell 2007). Owing to the economic importance of migration, the United Nations has recognised migration as a key concern of the implementation of the 2030 Agenda for Sustainable Development (UN 2017).

The Oxford English Dictionary defines migration as 'a movement of people to a new area or country in order to find work or better living conditions'. This covers both local and international migration, which could be either temporary or permanent.

According to the United Nations, 'a migrant is a person who has lived outside their country of birth for 12 months or more'. This only focuses on international migration and

ignores migration within a country such as rural to urban migration or migration from one state to the other.

The International Organization for Migration (IOM) defines the concept of migrant as follows:

> Any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of (1) the person's legal status; (2) whether the movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is. (IOM 2018)

More specifically, the UN's International Migration Report 2017 (UN (2017) defines an international migrant as a person who is living in a country other than his or her country of birth. Because this study focuses only on the analysis of foreign remittance, the definition given in the International Migration Report (2017) is considered in the study. However, this study focuses on migration for employment purposes only.

With an understanding of who is a migrant, it is vital to examine why people migrate from their origin and what the consequences of migration might be. Hence, Section 2.2.1 reviews the reasons for and consequences of migration.

2.2.1 Reasons for and Consequences of Migration

There are two types of migration: permanent and temporary. Permanent migrants move from their place of origin to a new country or region. They aim to live there for the rest of their lives and seek better living standards and security for themselves and their offspring. Permanent migrants and refugees are examples of this category; they migrate to higher income countries or to countries with expected security.

Temporary migration is the migration of people for a limited period; it is not intended to be permanent. The motivations for temporary migration include higher salary and future growth prospects that cannot be achieved in their existing occupation or country of residence. However, temporary migrants mostly intend to return home, sometimes being bound by their employment agreements to do so.

Whether permanent or temporary, migration mainly flows from developing to developed countries and this is fundamentally rationalised by the higher wages and better living standards in developed countries. Nevertheless, migration from developed countries to other developed countries is also increasing. This shows that migration is commonly bound by the expectation of an improved, happy life. In a broader perspective, the reasons for migration can be summarised as follows: searching for new opportunities, escaping poverty, conflict or environmental degradation, and seeking to live a contented life (Castles 2009).

Migration, both temporary and permanent, is associated with several advantages to migrants, households and the country of origin at large. First, in most developing countries it relaxes the unemployment problem. O'Neill (2001) states that migration is one of the best solutions to unemployment in most of the southern Asian and Latin American countries. Second, it helps in the acquisition of new knowledge and skills that cannot acquired from the home country. These skills and knowledge help migrants to start new ventures when they return home. For example, most Sri Lankan men who have migrated to South Korea for employment start a business on their return home with the skills they acquired. Third, migrants and their family do not spend remittances frivolously, instead spending them on activities that contribute directly and indirectly to economic development such as education of children, hire of employees, farming and

animal husbandry, and investment in new small and medium enterprises. Fourth, it creates local demand because people have more money. It stimulates local businesses and has a multiplier effect on the economy. Finally, these migrants and their families do not spend all their remittance but instead save some for precautionary or speculative purposes, and it helps money creation in financial institutions through lending.

In addition to the abovementioned advantages, migration has disadvantages to the migrant, the family members left behind and the country at large. The brain drain[5] is one of the main disadvantages of migration for most of the developing countries (Chiswick 2000). The net loss of brain drain is significantly higher for those countries with free education than for others. The identified net losses range from loss of educational investment to reduction of the skilled labour force (O'Neill 2001).

The eventual settlement of temporary migrants overseas is another disadvantage for the home country. As a result of this, migrants gradually reduce the amount they remit or terminate the remittance flow permanently. In some circumstances, they even withdraw their investment from the home country and place them elsewhere (O'Neill 2001). Sometimes, migrants would also sell the properties, which would cause an outflow of foreign currency from their home countries that would significantly influence the economy of the home country. Moreover, if migration and remittance create excess demand for goods and services beyond the productive capacity of the country, it leads to increased inflation. Similarly, the excessive increase in demand for imports negatively affects the balance of payments of a country (Chiswick 2000). In some instances, non-

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[5] 'Migration of trained and talented people from the country of origin to another country resulting in a depletion of skills in the former' IOM (2008). World Migration 2008: Managing Labour Mobility in the Evolving Global Economy. VOLUME 4 - IOM World Migration Report Series, International Organization for Migration (World Migration report, 2008).

acquisition of new skills and under-utilisation of the existing skills abroad creates difficulties for employment back home for the returning migrants (O'Neill 2001).

The negative consequences of migration are not limited to individuals or to the labour-exporting countries. The labour-importing countries may also be negatively affected in some circumstances. Through the gradual permanent settlement of migrants, migration influences the social, economic, political and cultural perspectives of the labour-importing countries, particularly in the long run (Castles 2009).

Having identified why people migrate, it is important to study how migration evolves. Thus, Sections 2.2.2 and 2.2.3 focus mainly on examining the historical evolution of migration globally and in Sri Lanka, respectively.

2.2.2   Global Migration History

People have migrated throughout the world for centuries. It took on a new scale in the sixteenth century with the European expansion which led to the rise of colonial empires across the world (Castles 2009). Until World War I, migration from Europe to North America was at significantly higher levels than today.

Table 2.1 demonstrates the number and annual rate of change of the international migration stock in the world. It shows the international migration stock under different categorisation such as migration stock in developed countries, developing countries, high-income countries, middle-income countries and low-income countries.

Table 2-1 Number and Annual Rate of Change of the International Migration Stock—Migration Stock in Host Countries

	International Migrant Stock (Millions)				Average Annual Change in Migrant Stock (Per Cent)			
	1990	*2000*	*2010*	*2017*	*1990– 2000*	*2000– 2010*	*2010– 2017*	*2000– 2017*
World	152.5	172.6	220.0	257.7	1.2	2.4	2.3	2.4
Developed Regions	82.4	103.4	130.7	146.0	2.3	2.3	1.6	2.0
Developing Regions	70.2	69.2	89.3	111.7	−0.1	2.6	3.2	2.8
High-income Countries	75.2	100.4	141.8	164.8	2.9	3.5	2.2	2.9
Middle-income Countries	68.5	64	70.2	81.4	−0.7	0.9	2.1	1.4
Low-income Countries	8.5	7.7	7.5	10.9	−1.0	−0.2	5.3	2.0
Africa	15.7	14.8	17.0	24.7	−0.6	1.4	5.3	3.0
Asia	48.1	49.2	65.9	79.6	0.2	2.9	2.7	2.8
Europe	49.2	56.3	70.7	77.9	0.2	2.9	2.7	2.8
LAC	7.2	6.6	8.2	9.5	−0.9	2.3	2.0	2.2
Northern America	27.6	40.4	51.0	57.7	3.8	2.3	1.8	2.1
Oceania	4.7	5.4	7.1	8.4	1.2	2.8	2.4	2.7

Note: LAC refers to Latin America and the Caribbean.
Source: UN (2017).

As illustrated in Table 2.1, the recorded international migration in 1990 was 152.5 million; of these, more than 50% lived in developed regions. This grew at an annual average rate of 1.2% between 1990 and 2000, compared with the average growth of 2.4% and 2.3% between 2000 and 2010, and 2010 and 2017, respectively. The upward trend in almost all regions, including Asia, can be clearly seen. The overall upwards trend and the wider coverage are a result of globalisation and technological advancements, which streamline the migration process and help migrants connect with others.

By 2017, approximately two-third of all migrants were hosted by high-income countries. Out of them, the USA, Saudi Arabia, Germany and Russia were the four main host countries. Asia and Europe were the main regions of origin, with 106 million and 61 million migrants, respectively (IOM 2018).

Despite the changes in patterns of migration around the globe, several tendencies of migration (Castles 2009) can be identified. They are as follows:

- **Expansion in the labour market**: The migration-based labour market expands with the entrance of many labour-sending and receiving countries into the market. This globalised market is unique and diverse with different cultural, economic and social backgrounds. High salaries for labour-sending countries and cheap labour for receiving countries make the market attractive for both participants.

- **The acceleration of migration**: Countries that have previously sent a significantly a smaller number of migrants have increased the labour supply in the international labour market over the last three decades.

- **The differentiation of migration**: At present, labour, permanent and refugee migration, all take place simultaneously. Even though governments want to restrict influx of refugees' international laws, prevent them from doing so.

- **The growing politicisation of migration**: Migration is subject to domestic politics, bilateral and regional relationships and national security policies. Developed countries mainly focus on controlling the illegal migration. How political parties react to these conditions and the government action on illegal migrants is a primary area of interest for the international media.

Overall, the growth of migration has outpaced the growth of population (IOM 2018). Following this brief overview of global migration trends, Section 2.2.3 involves a

comprehensive analysis of the migration profile of Sri Lanka. This will help identify the evolution of migration and recent migration trends in in Sri Lanka.

2.2.3   Migration History in Sri Lanka

International migration in Sri Lanka has taken several forms, such as migration for diplomatic affairs, permanent settlement, employment and education, and by refugees. It reportedly commenced in the mid-1950s with migration to commonwealth countries (SLBFE 2014). Over time, Sri Lankans searched for more opportunities around the world and migration gradually increased. According to the Department of Immigration and Emigration, between 1957 and 1971 reported migration was 423,503.

In the middle of 1973, the oil price boom in the world market generated massive profits to the Organization of the Petroleum Exporting Countries. The resultant development in oil-exporting countries led them to become a virtual open market for many Asian, Arab and European workers (IOM 2008). This marked a turning point in Sri Lanka's migration history; since then, significant advancements have occurred in Sri Lankan labour migration (Karunaratne 2008). Conducive policies conducive to migration, such as the relaxation of travel and exchange rates from 1977 to 1978 and the second oil boom in 1979, also contributed positively towards the upsurge of foreign employment. During this period, employment destinations were mainly oil-exporting countries such as Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain and Oman.

In addition, during the 1980s and 1990s refugee migration to Western countries was at a significantly higher level (IPS 2008). This was due to the civil unrest and ethnic hostilities and it continued until the end of the civil war in 2009. Besides that, there was a continuous upsurge of migration for permanent settlement and study purposes. Over the past several decades, total migration figures have increased more than tenfold. Notably, total

migration in Sri Lanka is flourishing and has grown in importance. Nonetheless, because the focus of the study is foreign remittance, the following analysis is confined to international migration for employment[6].

According to SLBFE (2017), the total number of employment migrants in 2016 was 242,930, compared with 14,456 in 1986. Figure 2.1 illustrates the significant upward trend in the migration for employment over the period from 1986 to 2016.

Figure 2-1: Migration Trends in Sri Lanka 1986–2016
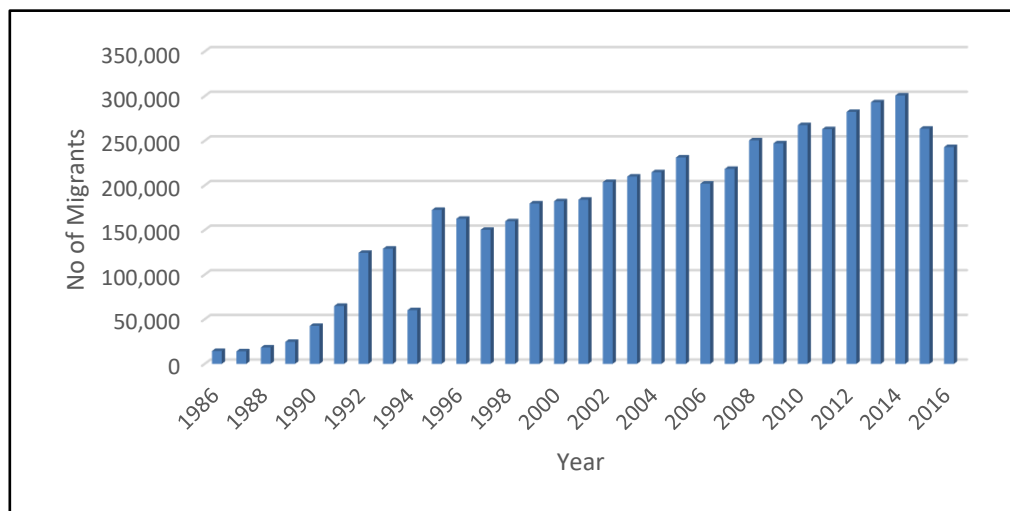
Source: Author, compiled with data from IBRD (2017)

Female migrants dominated total migration until 2010. This was due to the substantial outflow of housemaids to the Middle East. Since then, as shown in Figure 2.2, the trend has gradually shifted towards more male migration. Gender composition (male: female) changed from 48:52 in 2009 to 66:34 in 2016. This was an outcome of stringent government rules on female migration to prevent social problems arising from children being left behind without their mothers' protection (SLBFE 2016).

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[6] As defined by the IOM 2008, labour migration is the 'movement of persons from their home state to another state or within their own country of residence for the purpose of employment'. However, this study does not analyse the movements of labour within the country.

Figure 2-2: Gender Composition of Sri Lankan Migration 1986–2016
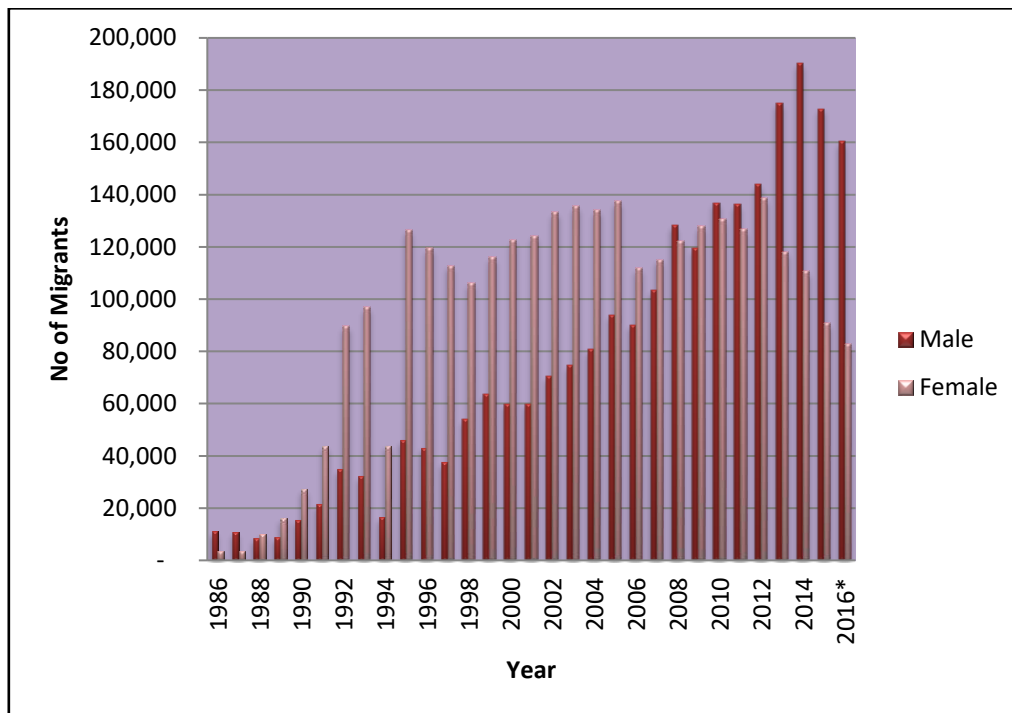
Another positive transformation is the change in skill composition among Sri Lankan migrants. As shown in Table 2.2, in 1994, housemaids' migration was 60% of the total migration, followed by skilled and semi-skilled workers at 21%. The composition of skill levels of Sri Lankan migration showed a gradual change, and in 2017 skilled and semi-skilled migration dominated the Sri Lankan foreign labour pool, followed by unskilled and housemaid migration. Further, a clear upward trend exists in professional and middle-level skill migration in Sri Lanka.

Table 2-2: Migration Trends in Sri Lanka 1994–2017

Year	Professional level No	%	Middle-level No	%	Clerical and related No	%	Skilled and semi-skilled No	%	Unskilled No	%	Housemaid No	%	Total
1994	262	0.44	833	1.38	1,559	2.59	12,586	20.92	8,824	14.67	36,104	60.01	60,168
1995	878	0.51	2,495	1.45	4,594	2.66	27,165	15.75	23,497	13.62	113,860	66.01	172,489
1996	599	0.37	1,944	1.20	3,371	2.07	24,254	14.92	21,929	13.49	110,479	67.96	162,576
1997	573	0.38	1,635	1.09	3,579	2.38	24,502	16.30	20,565	13.68	99,429	66.16	150,283
1998	695	0.43	2,823	1.77	4,896	3.06	31,749	19.87	34,304	21.46	85,349	53.40	159,816
1999	1,253	0.70	3,161	1.76	6,210	3.46	37,277	20.74	43,771	24.35	88,063	49.00	179,735
2000	935	0.51	3,781	2.08	5,825	3.20	36,475	20.02	35,759	19.63	99,413	54.57	182,188
2001	1,218	0.66	3,776	2.05	6,015	3.27	36,763	19.98	33,385	18.14	102,850	55.89	184,007
2002	1,481	0.73	4,555	2.24	7,239	3.55	45,478	22.32	36,485	17.90	108,535	53.26	203,773
2003	1,541	0.73	7,507	3.58	6,779	3.23	47,744	22.75	44,264	21.09	102,011	48.61	209,846
2004	1,827	0.85	6,561	3.06	6,679	3.11	45,926	21.39	43,204	20.12	110,512	51.47	214,709
2005	1,421	0.61	8,042	3.48	7,742	3.35	46,688	20.19	41,904	18.12	125,493	54.26	231,290
2006	1,713	0.85	6,638	3.29	7,911	3.92	45,063	22.31	40,912	20.26	99,711	49.37	201,948
2007	1,653	0.76	3,962	1.81	4,551	2.08	53,762	24.61	52,176	23.88	102,355	46.85	218,459
2008	2,835	1.13	8,667	3.46	6,791	2.71	65,044	25.97	59,239	23.65	107,923	43.08	250,499
2009	2,832	1.15	6,388	2.58	6,719	2.72	67,336	27.25	50,173	20.30	113,678	46.00	247,126
2010	3,057	1.14	6,884	2.57	7,923	2.96	76,469	28.59	60,422	22.59	112,752	42.15	267,507
2011	3,844	1.46	6,134	2.33	9,906	3.77	71,906	27.34	63,680	24.22	107,491	40.88	262,961
2012	4,448	1.57	9,280	3.29	16,184	5.73	70,617	25.00	62,907	22.27	119,011	42.14	282,447
2013	5,151	1.76	16,510	5.63	26,561	9.06	77,119	26.30	70,977	24.21	96,900	33.05	293,218
2014	5,372	1.79	20,778	6.91	29,267	9.73	77,139	25.65	79,519	26.44	88,628	29.47	300,703
2015	6,251	2.37	6,951	2.64	12,501	4.75	86,529	32.85	77,985	29.60	73,226	27.80	263,443
2016	6,578	2.71	8,234	3.39	10,862	4.47	80,471	33.13	71,656	29.49	65,015	26.81	242,816
2017	6,371	3.00	7,126	3.36	9,265	4.37	72,288	34.07	61,057	28.78	56,057	26.42	212,162

Source: SLBFE (2017)

Figure 2.3 depicts the change in skills composition from 1994 to 2017.

Figure 2-3: Migration Trends in Sri Lanka by Skill Levels—1994 and 2017
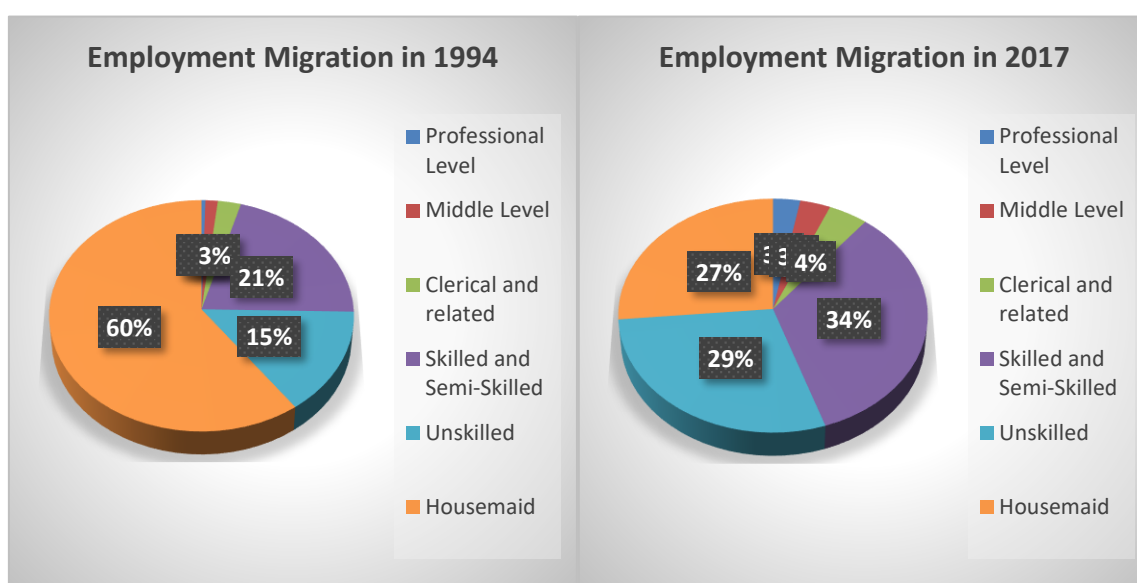
Source: Author, compiled with data from SLBFE (2017)

In terms of destinations for Sri Lankan migrants, the oil-exporting countries have secured a significant share of Sri Lankan workers (approximately 90%). High dependency on foreign remittance from oil-exporting countries could increase the economic vulnerability in Sri Lanka. For instance, the current economic and political situation in the Gulf countries arising from the reduction of the oil price, civil wars, refugee inflows and terrorist attacks have constrained the economic performance of the region, which in turn has affected the labour-exporting countries (IBRD 2016). Moreover, the Gulf Cooperation Council (GCC) has recognised dependency on foreign labour as a key challenge for them (Achoui 2009). With this recognition has come numerous hardenings of stances such as quotas for different countries with respect to the inflow of foreign labour and new rules for migrants. The recorded 7.8% decrease in migration during 2015 and 2016 was a result of the abovementioned factors. Thus, there might be a further reduction of demand for labour from oil-exporting GCC countries in the future.

Besides the recent past declining trend of migration into the oil-exporting countries, new destinations have become lucrative, particularly for semi-skilled workers. According to

the records of SLBFE (2017), South Korea and the Maldives have gained prominence as new migration destinations. In 2016, 8,609 and 6,123 migrants migrated to South Korea and the Maldives, respectively. Compared with 2005 this was an increase of 77% and 123%, respectively. These new directions may help boost new prospects and increase remittance income in the future.

2.2.4 Summary of Migration Profiles in Sri Lanka and the Gaps in the Literature

In summary, the migration profile in Sri Lanka has evolved over the past decades with some key changes. From 1970 to 2010, Sri Lankan migrants in general were predominantly female, typically less educated and mostly migrated to oil-exporting countries. Although migration to oil-exporting countries still dominates, male migration has surpassed female migration and the increasing trend of educated and skilled migration reflects a new dawn for migration in Sri Lanka. Moreover, a trend exists towards industry-based and tourism-focused countries such as South Korea and the Maldives. Nonetheless, the oil-exporting countries remain attractive to both male and female migrants and dominate the Sri Lankan foreign employment market, accounting for over 90% of the total migrant labour force.

Notwithstanding the importance of oil-exporting countries to the Sri Lankan labour market, and the drastic changes in the economic condition in those countries, there is a general shortage of empirical studies examining whether and how the changes in economic conditions in oil-exporting countries affect remittance flows to Sri Lanka. This should be a decisive aspect of policy development aimed at ensuring a sustainable inflow of income from migrant workers. Thus, this critical gap needs further consideration.

Moving further towards ensuring the sustainable flow of income from foreign employment, the following section will focus on the proportion of income channelled home as remittance by migrant workers.

2.3 Remittance: Definitions, Measurement Problems and Distinctive Features

Having examined the importance and consequences of migration, and migration trends globally and in Sri Lanka in previous sections, this section focuses on (i) definitions, (ii) problems in measuring foreign remittance, (iii) the uniqueness of remittance compared with other external currency flows, and (iv) the theoretical underpinning of motives for foreign remittance.

2.3.1 Definitions of Remittance

Remittance is defined and measured differently based on the purpose of study. Bascom (1990) defined remittance as 'transfers made from earnings and/or accumulated stock of wealth by individuals who are residents in a foreign country on a temporary or permanent basis'. It considers transfers made by both permanent and temporary migrants. However, as stated previously, this study examines remittance from employment migration only.

According to Kapur (2004):

> Remittances are primarily money sent by migrants to family and friends on which there are no claims by the sender (unlike other financial flows such as debt or equity flows).

Thus, remittance is a flow of financial resources from the cross-border movement of people and 'one-way transfers of money'. The definition clearly distinguishes remittance from other financial flows such as FDI and ODA but does not specify whether the cross-border movement could include both domestic and international movements.

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The World Bank definition of remittance is broader and widely accepted in the research community. It defines remittances as 'sum of personal transfers and compensation of employees'. According to that, it could be either transfers within the country or cross-border transfers. The International Monetary Fund (IMF) defined foreign remittance as an aggregate currency flow of worker remittance, compensation of employees and migrant transfers to the home country.

According to Ratha and Mohapatra (2007),

> Remittances are person-to-person flows, well targeted to the needs of the recipients, who are often poor and do not typically suffer from the governance problems that may be associated with official aid flows. Fundamentally, remittances are personal flows from migrants to their friends and families. (Ratha and Mohapatra 2007)

This study focuses on foreign remittance only; therefore, from here on in this study remittance refers to foreign remittance. Though various researchers and institutions defined it differently, they intended to reflect the same concept. Nonetheless, the World Bank and IMF definitions reflect the complexity of remittance. Because of the complexity, there are measurement difficulties in practice (McDowell and De Haan 1997, Adams and Page 2005, Ghosh 2006). The following section summarises these.

2.3.2 Problems in Measuring Foreign Remittance

Accurate data on foreign remittance is one of the main challenges in research. Some of the problems behind the challenge are as follows:

1. **Recorded and unrecorded flow of remittance**. In most developing countries, a significant portion of foreign remittance inflow is unreported informal transfers (Adams and Page 2005). The reasons for these informal transfers are twofold. The

first reason is the favourable exchange rate, the low cost of transferring money and greater efficiency of the informal transfers. The second reason is the lack of developed financial sector in some recipient countries and a mistrust of the financial system of the recipient country (El Qorchi, Maimbo et al. 2003, Maimbo and Passas 2004). For these reasons, the true size of remittance is believed to be 50% higher than that recorded in almost all the countries in the world (Ratha and Mohapatra 2007).

2. **Treatments on remittance in a small volume**. In some developing countries, it is not mandatory to report the 'small' remittances; hence they are under-counted (Gupta, Pattillo et al. 2009).

3. **Illegal migrations**. Illegal migration is apparently high in developing countries and is not taken into account in either the calculation of migrants or the records of remittance inflow (Gupta, Pattillo et al. 2009).

4. **Weakness in the maintenance of proper records.** This refers to the non-availability of accurate information on skill categories, employment types and the changes in residential status of the migrants.

5. **Weak approaches to data collection.** Banks and other financial intermediaries have weak approaches to the collection of remittance data (Martínez Pería, Mascaró et al. 2008).

6. **Use of fuzzy approaches.** This refers to the use of Fuzzy approaches by statisticians in remittance calculation. For example, the calculation of total remittance as a number of migrants into average remittance inflow (World Bank 2006).

2.3.3 Importance of Foreign Remittance

Notwithstanding the measurement challenges and complexity, remittance is important to economies for the following reasons:

1. Unlike other external funding sources (ODA and FDI), remittance inflows are small in amount per time (CRUZ ZUNIGA 2011) and in accumulation are on par with or outpace other external finance flows (El-Sakka and McNabb 1999, Ruiz-Arranz and Giuliano 2005, De and Ratha 2012, Imai, Gaiha et al. 2014).

2. Remittance is stable compared with the pro-cyclical private capital flows. For example, most of the other private capital flows reduce during economic recession in the recipient country, whereas foreign remittance may increase during an economic recession to fulfil the consumption needs of migrants' dependents.

3. Remittance inflow is an unrequited currency with no obligations, in contrast to other foreign currency inflows such as FDI and ODA (Ruiz-Arranz and Lueth 2007).

As stated in the 2017 report 'Migration and remittances: Recent development and outlooks' by KNOMAD (2018), as a result of the importance of remittance to developing countries, the United Nations has incorporated the following into the Sustainable Development Goal (SDG) indicators in the 2030 agenda for sustainable development.

1. Reducing remittance costs and recruitment costs for low-skilled migrants.

2. The development of global compact for safe, orderly and regular migration (GCM).

As stated in the same report, nine themes come under the GCM:

1. Income and job creation in poor countries

2. National identity and integration of migrants in host communities

3. Job competition for native workers in host countries

4. Trafficking, abusive employers, recruiters and skill recognition

5. Migrant rights, exclusion discrimination and xenophobic attacks on migrants

6. Mobilisation of remittances and diaspora resources

7. Family left behind

8. Retaining critical skills in countries of origin

9. Congestion in and fiscal costs of social services.

Overall, foreign remittance inflow is an important cash flow for most developing countries, despite the possible drawbacks associated with it. Following this overview of definitions, measurement issues and the importance of foreign remittance, Sections 2.3.4 and 2.3.5 elaborate the trends in foreign remittance globally and in Sri Lanka, respectively.

2.3.4   Global Foreign Remittance Flow

The flow of remittance across countries receives considerable attention because of the immense growth in volume over the past five decades and its importance to receiving economies. Figure 2.4 illustrates the main remittance contributors and the volume of remittance flows across the world in 2017. Developed countries, together with oil-exporting countries, contribute the most; the role of the USA is significantly higher than the second largest remittance sender, Saudi Arabia. In 2017, the total outflow of remittance from the USA was USD 148,488.65 million, followed by USD 46,724.65

million from Saudi Arabia. Although other countries have lower remittance outflows than the USA, they remain important to developing countries.

Figure 2-4: Major Remittance Contributors (2017)
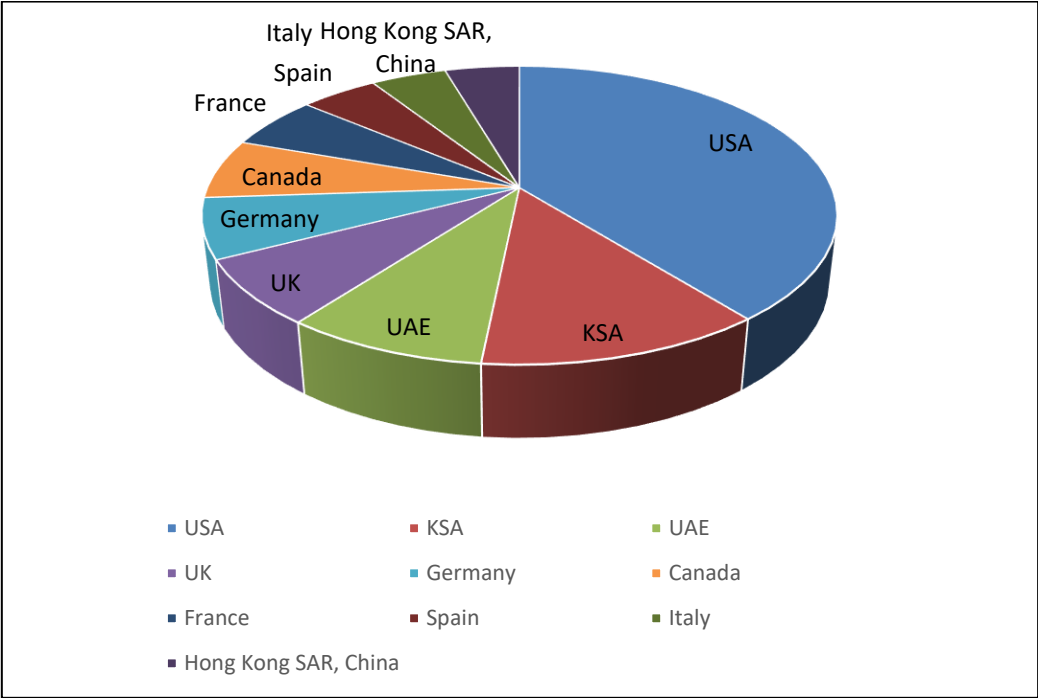
Figure 2.5 shows the major remittance recipients in 2017. According to this figure, in 2017 India was the largest remittance recipient in the world, receiving USD 68,968 million, followed by China with USD 63,860 million and the Philippines with USD 32,808 million. The fact that the three largest remittance recipients were Asian highlights the prominence of remittance in Asia.

Figure 2-5: Major Remittance Recipients (2017)
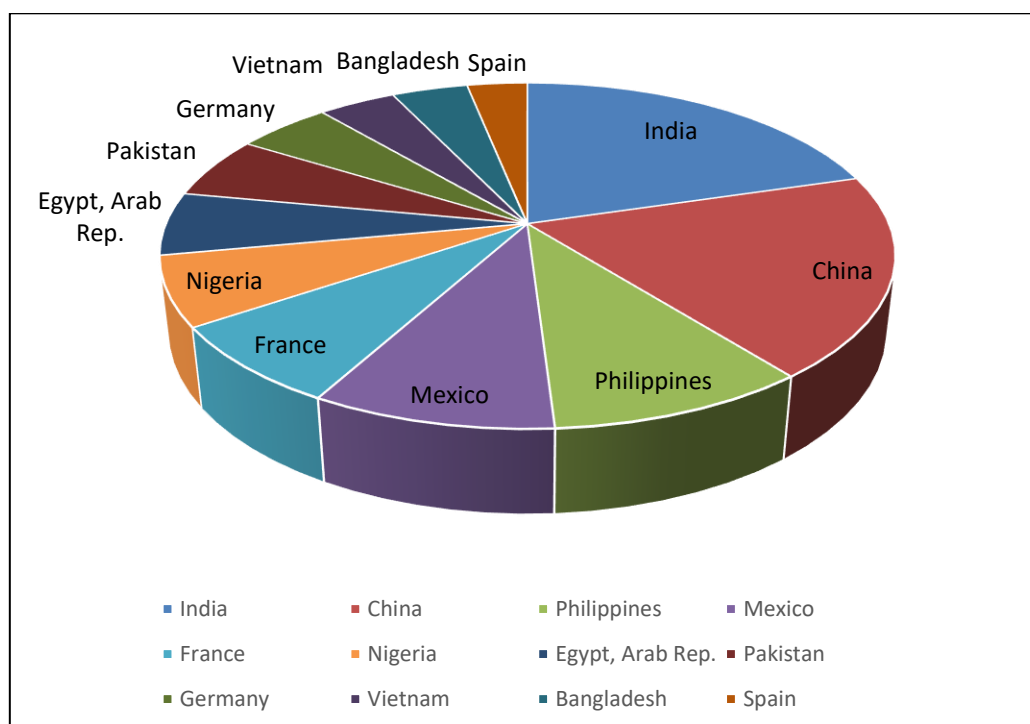
Source: Author, compiled with data from IBRD (2017)

In the South Asian region, India was the highest remittance recipient, receiving USD 68,968 million in 2017, followed by Pakistan and Bangladesh with USD 19,665 million and USD 13,469 million, respectively. Sri Lanka is the fourth highest remittance recipient in the south Asian region, whereas the Maldives is the lowest remittance recipient in the region (IBRD 2017). Figure 2.6 provides the remittance as a percentage of GDP in each country in 2016 and 2017. The inflow of remittance to Nepal is the highest at 31.25% of its GDP followed by the second highest in Sri Lanka. As an emerging economy, remittance as a percentage of GDP in India is only 2.77%. This helps illustrate the level of dependency on remittance; for Nepal and Sri Lanka, remittance is a considerably more important external finance flow than for India.

Figure 2-6: Foreign Remittance to South Asia 2016–2017
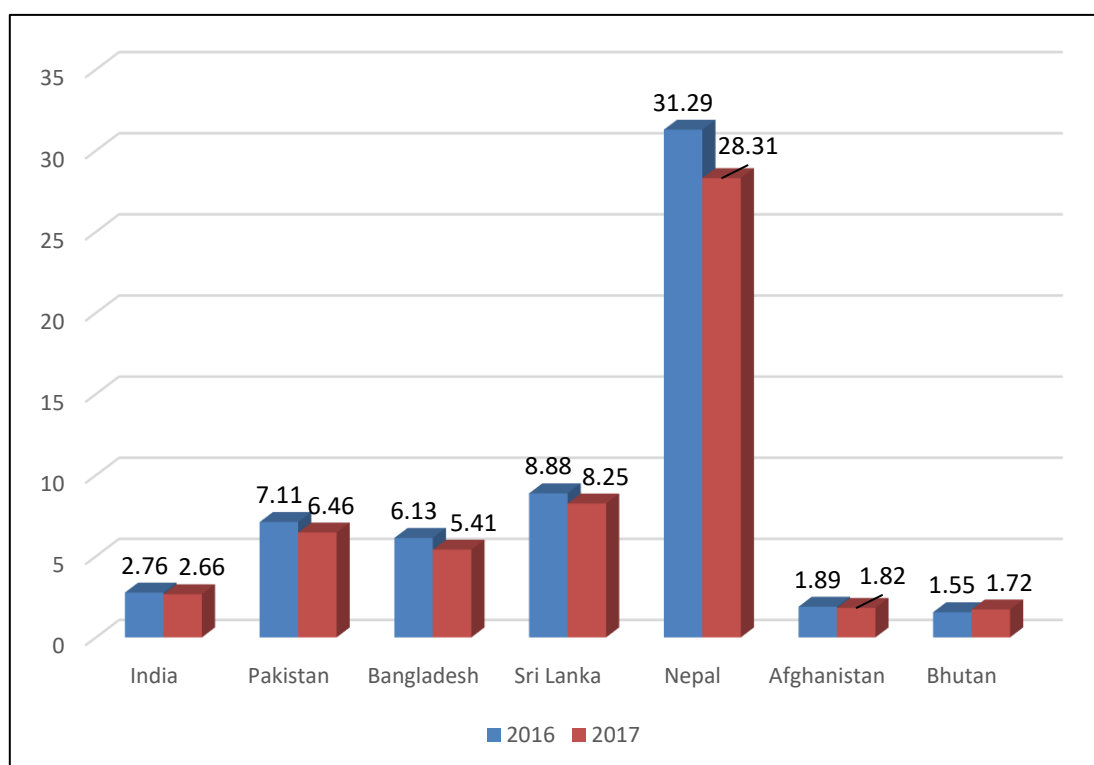
Source: Author, compiled with data from IBRD (2017).

2.3.5   Inflow of Foreign Remittance to Sri Lanka

In the southern Asian region, India is the largest remittance recipient, followed by Pakistan and Bangladesh, in that order (KNOMAD 2016). However, as mentioned in KNOMAD (2016), southern Asian countries have not utilised the maximum benefit from remittance inflows because of limited financial sector development. This is generally applicable to the developing countries in the region, including Sri Lanka.

Figure 2.7 depicts the inflow of remittance to Sri Lanka over the period from 1978 to 2017. In 1978, it was USD 39 million and by 2017, it had increased to USD 6,670 million. Even though 1985 and 2017 disrupt the upward pattern, overall there has been a steady increase in remittance to Sri Lanka.

Figure 2-7: Remittance Inflow to Sri Lanka 1978–2017
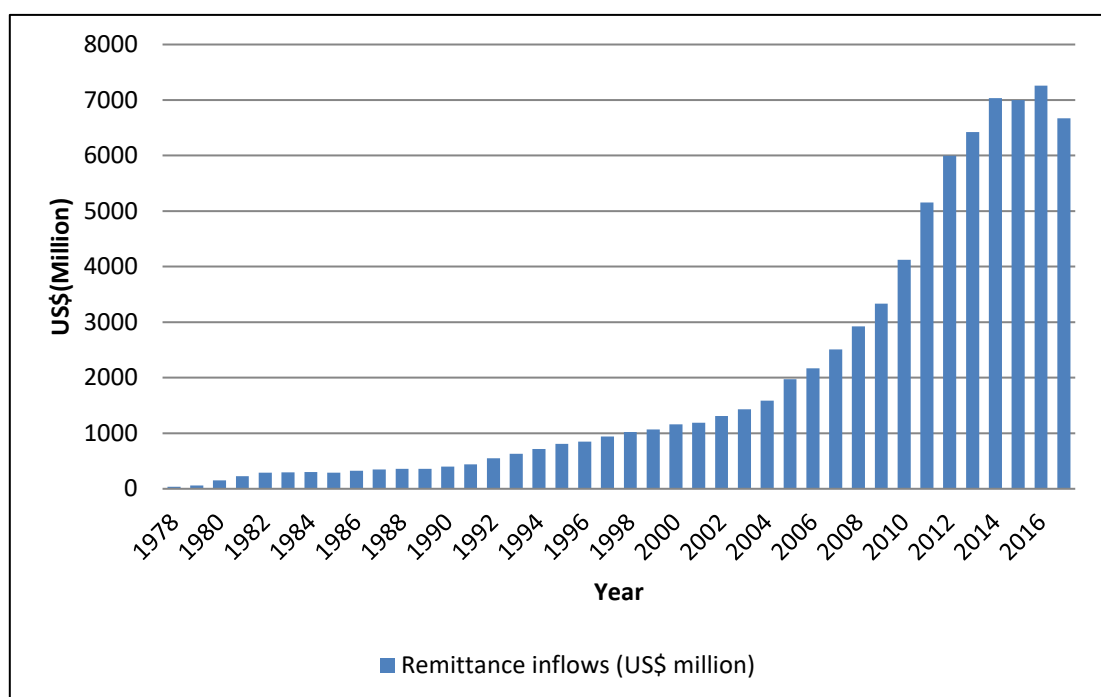
Source: Author, compiled with data from IBRD (2017).

Figure 2.8 shows the change in remittance to Sri Lanka from 1979 to 2017. The percentage change in remittance from 1979 to 1980 was around 153% and it was the highest percentage change. Except for the negative changes in 1985 and 2017, the change in remittance inflow was higher than 10%.

Figure 2-8: Change in Inflow of Remittance to Sri Lanka
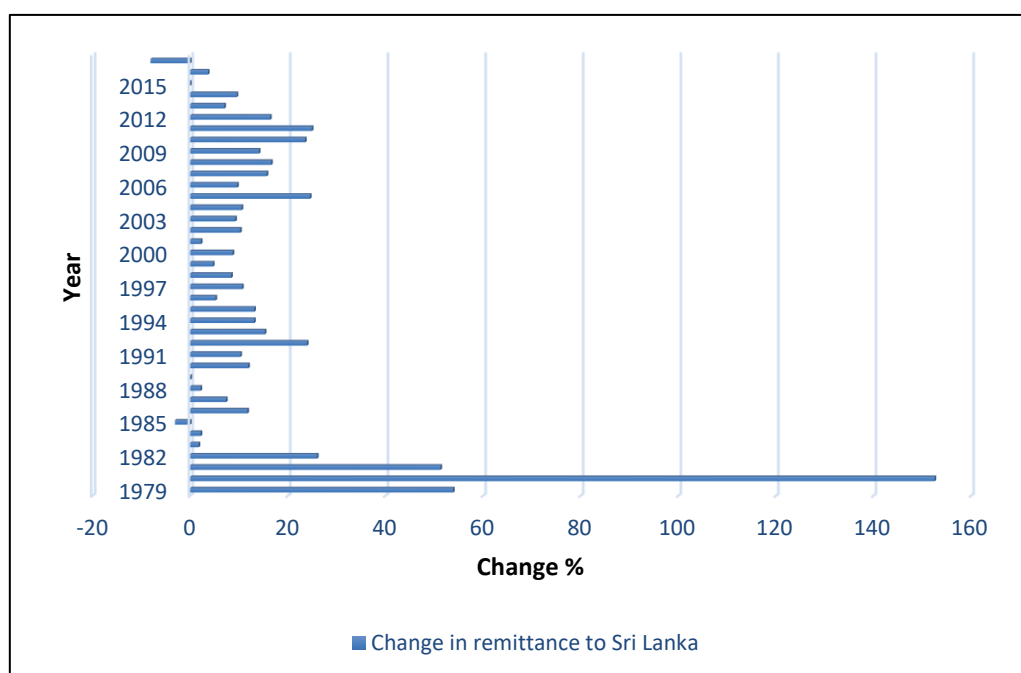
Source: Author, compiled with data from (IBRD 2017).

Together with the above graphical illustrations, Figure 2.9 highlights the importance of remittance over the other external financial flows. As shown in the figure, remittance outpaced the net ODA and net FDI. A distinctive feature of all these currency inflows is the rhythmic pattern. FDI showed a significant upturn from 1996 to 1997, followed by a slight upturn in net remittance inflow. However, ODI recorded a slight downturn. On the contrary, from 2005 to 2006, ODI and foreign remittances recorded significant reductions, whereas FDI grew slightly. The figure shows the prominence of net foreign remittance inflow to Sri Lanka over the other main currency inflows.

Figure 2-9: External Finance Flows in Sri Lanka 1995–2016

External Finance Flow 1995−2016

Legend:
- FDI ,net inflows(% of GDP)
- ODI,net inflow (% of GDP)
- Foreign remittances,net inflow (% GDP)

Y-axis: Currecy inflow (% GDP)
X-axis: Year
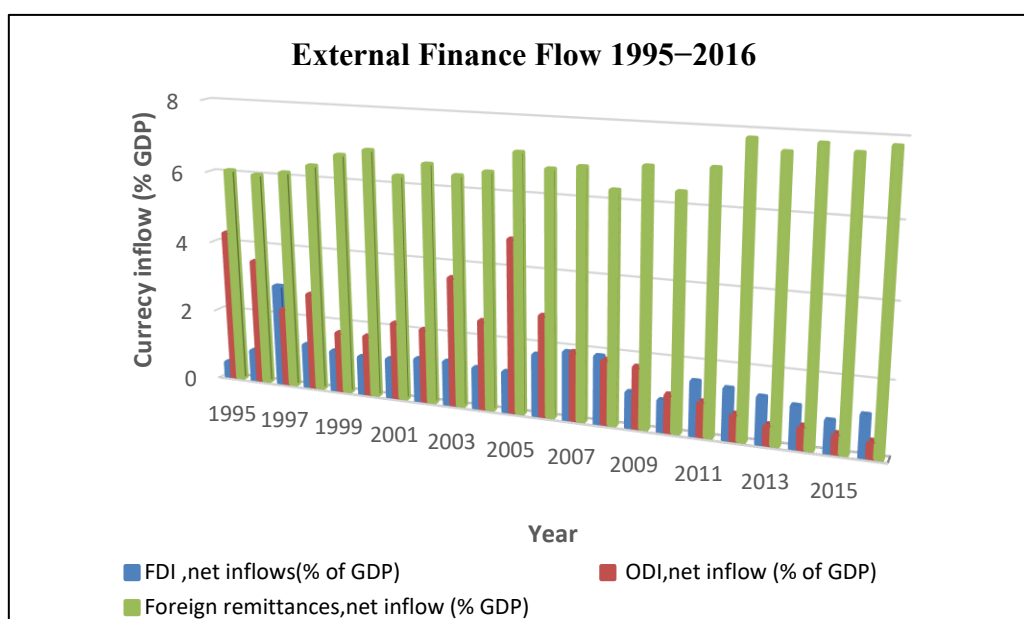
Source: Author, compiled with data from IBRD (2017).

The current context of Sri Lankan migration and the remittance income in Sri Lanka offers an alarming signal to the government. As explained in CBSL (2018), as a result of the decline in departure for foreign employment and the economic conditions in migrant-receiving countries, the inflow of foreign remittance to Sri Lanka in recent years has stagnated around USD 7 billion. In a nutshell, as mentioned by Withers (2019) in *The Nation*, a weekly newspaper in Sri Lanka, the condition can be summarised as follows:

> The comparatively slower growth in Sri Lanka's consistently largest foreign exchange earner, worker remittance from 2015 until today is a major concern given the fact that other predominant revenue streams, such as export, tourism and FDI have also not performed to expectations...If the current trend continued, Sri Lanka would be under severe fiscal pressure owing to the lack of proper revenue mechanisms to match the gap between current expenditure and revenue.

2.4 Summary

This chapter reviewed the background of migration and remittance. At the outset, it elaborated the definitions for migration given by various researchers and institutions. Then it analysed the reasons behind migration and the types of migration. According to the analysis, permanent migration, refugee migration, migration for studies and migration for employment are identified as the main types of migration.

Following the types of migration, it discussed the consequences of migration. It focused on the positive and negative consequences of migration on both the home and the host countries. The acquisition of new skills and knowledge, higher earnings than those in the home country, and the support for members back at home are some of the benefits for migrants and their families, whereas solutions for unemployment and assistance for external deficits are benefits for the country as a whole. The under-utilisation of skills is one of the main negative consequences for most migrants, whereas brain drain and excessive demand are negative consequences at the macroeconomic level.

Next, migration trends in the world and in Sri Lanka were examined. The migration trends in Sri Lanka show the changes in migration profile with reference to gender, skill levels and the destination countries. Male, skilled and semi-skilled migrants show upward trends in the recent past and countries such as South Korea and the Maldives have become attractive destinations. Nonetheless, despite all the changes, the highest levels of migration from Sri Lanka were still to oil-exporting countries.

Following the detailed overview of migration, the next section examined foreign remittance. It reviewed definitions of remittance by researchers and institutions such as the World Bank and the IMF. Next, it illustrated the problems associated with measuring remittance and the unique features of remittance. The high level of unrecorded remittance,

weaknesses in record keeping, weak data collection approaches and use of fuzzy approaches are identified problems associated with remittance measurements. The significance of remittance compared with other external finance flows, stability of inflow relative to other finance flows and absence of obligations to remittance-sending countries are the identified unique features of the inflow of remittance.

The chapter then explained the inward and outward flow of foreign remittance around the world and the inflow of foreign remittance to Sri Lanka. According to the analysis, the USA is the highest remittance-sending country, followed by the Kingdom of Saudi Arabia (KSA). The major remittance-receiving country is India, followed by China and the Philippines, respectively. As revealed by the analysis, Sri Lanka is the second largest remittance recipient as a percentage of GDP in southern Asia, second only to Nepal. Unlike in most other developing countries, foreign remittance to Sri Lanka surpasses all the other external finance flows, such as FDI and ODA, and it helps the Sri Lankan government settle the external financial commitments. In brief, this chapter provided a foundation for the subsequent chapters of the thesis.

3 Literature Review

3.1 Introduction

The previous chapter elaborated on the main concepts of the study: migration and remittance. It gave an overview of the evolution of migration and foreign remittance. The analysis of concepts, trends and the current context of migration and foreign remittance in Chapter 2 highlighted the importance of remittance to developing countries and referred to the recent recognition of the importance of foreign remittance in the United Nations SDG indicators in the UN's 2030 agenda for sustainable development. Followed by the background in Chapter 2, this chapter reviews the theories and empirical literature on migration and foreign remittance. Reviewing the theoretical underpinnings and the empirical literature was beneficial for identifying the gaps in the literature, developing research hypotheses and establishing the conceptual framework of the study.

3.2 Migration Theories

In general, review of theories helps identify gaps and develop research hypotheses for the study. With a general overview to the reasons for and consequences of migration in Chapter 2, it is essential to examine how migration theories evolve in the literature. Therefore, this section analyses the migration theories with the intention to construct a sturdy theoretical foundation for the study.

Researchers have proposed theories to explain the causes, processes and consequences of migration and they were mostly based on their political and ideological beliefs (Massey, Arango et al. 1999). Most of these studies were interdisciplinary and include migration studies in sociology, political science, history, economics, geography, demography,

psychology, cultural studies and law and are a complex and interrelated phenomenon (Brettell and Hollifield 2014).

The following section outlines the main migration theories that have evolved since the nineteenth century. In particular, it covers systematic theory, dual labour market theory, the new economics of labour migration approach, the historical institutional approach and the migration system theory.

3.2.1 Systematic Theory of Migration

This is the foremost theory of migration and was introduced in the nineteenth century (Ravenstein 1885). The theory gives a general statement and discusses the tendencies of people to move (i) from low to high-income areas, (ii) from densely to sparsely populated areas and (iii) as a result of changes in the business cycle.

This is identified as a 'push–pull' theory since it explains migration using the so-called push factors that motivate people to leave their area of origin and the pull factors that attract migrants. Low living standards, demographic growth, lack of economic opportunities and political repression are push factors, whereas demand for labour, availability of land, better economic opportunities and political freedom are pull factors for migration. This further assumes that the decision to migrate is based on cost–benefit analysis of the migration.

According to this theory, potential migrants are fully aware of the wage levels and employment opportunities in the destination country and they make the decision based on those factors; their decision is also influenced by government restrictions. One of the limitations of this theory is that it does not differentiate between permanent migration and temporary migration. Thus, whether the so-called push–pull factors affect both temporary

and permanent migration in the same way is a question worth examining. For instance, according to this theory, political repression in the home country encourages migration. However, how it influences migrants' decisions about things such as remittance is unclear from the theory.

Adding to the idea of Ravenstein (1885), Borjas (1989) stated that economic disparity between countries is by itself enough to generate migration flows. However, that argument is nullified when the costs associated with migration are higher than that of the benefits and when the governments of sending and receiving countries place restrictions on migration.

3.2.2 The Dual Labour Market Theory

The dual labour market theory overcomes the criticisms of the systematic theory of migration. It introduces the importance of gender, race and institutional factors to explain migration. This theory argues that structural demand for skilled and unskilled workers in the advanced economies is a key factor of international migration. According to this theory, with structural demand, the labour market segments into primary and secondary labour markets (Sassen 1991). A primary market consists of employees who have an advantage due to their qualification, skills, being a member of the majority ethnic group, male gender or regular legal status. The employees in the primary market are selected positively based on the above factors. Employees in the secondary labour market are disadvantaged because of insufficient education and vocational training, race, gender, minority status and irregular legal status.

3.2.3 New Economics of Labour Migration Approach

The new economics of labour migration approach Taylor (1987) argued that migration is not a mere individual decision and is rather a collective family decision. Therefore, this

theory challenged the assumptions of the neoclassical approach. The intention of the family decision is to diversify income sources and provide additional investment for existing activities. This approach theorises that migration is a strategy to hedge risk or market constraints in credit and insurance (Harper and Zubida 2018). Like the systematic theory of migration, this approach also addresses the supply side of the migration and does not focus on any aspects of the demand side of the migration; hence, it is different from the segmented labour market approach.

3.2.4 The Historical Institutional Approach and Migration System Theory

The historical institutional approach is another alternative approach to migration. According to this approach, migration is a way of mobilising cheap labour for capital and it makes rich countries richer by exploiting the resources of the poor (Sassen 1991). This approach is different from the new economics of labour migration approach, in that it criticises migration, highlighting how it influences poor countries.

The migration system theory argues that migration is affected by the links between countries due to colonisation, political influence, trade, investments or cultural ties (Portes and Rumbaut 2006). The migration of Asians to Britain could be rationalised based on the migration system theory, since India, Sri Lanka, Pakistan and Bangladesh were all British colonies. Similarly, the migration of Sri Lankan Muslims in Middle Eastern countries is also justifiable based on the same approach.

3.2.5 Neoclassical Theory of Migration

This is the leading theory in explaining the causes of migration. The central argument of this theory is based on wages. According to this theory, migration is a phenomenon that is driven by wage differences between labour-rich and capital-rich countries.

Despite its popularity, the neoclassical theory of migration has been subjected to criticism. One such criticism is its incapability of explaining and predicting migration from developed to developed countries. For instance, migration from Eastern Europe to Western Europe is relatively high and both regions share relatively similar living standards; the so-called neoclassical fundamentals do not help explain this migration (Kurekova 2011).

Another criticism is that not only the wage differential but also the income level of the country are key drivers that explain migration. According to De Haas (2008) and Dustmann (2003), migration depends on whether someone can afford the cost of migration. According to them, poor individuals and poor nations cannot afford the cost of migration and they are eliminated from the international labour market.

However, the current context in the globalised world questioned the validity of De Haas (2008) and Dustmann (2003) arguments because developing countries have taken initiatives to enter into agreements with labour-importing countries. These agreements and the government financial support for migrants crack the barrier of affordability of the cost of migration.

As explained in Kurekova (2011), because of the complexity of migration from past to present,

> Theories of migration also should account for complex migration regimes, which encompass migration flows for industrialising to mature economies, reduced cost of transportation, cheaper and more rapid communication, increasing governmental interventions and a greater circularity of movements in the area of trade interdependence and globalisation.

3.2.6 Importance of Migration Theories for the Current Study

Migration theories bring important aspects into consideration. All the theories together help rationalise the migration and in isolation, none of the theories paint a full picture of the current context of migration in Sri Lanka or in the world. Hence, almost all of the theories outlined above are equally important for this study.

For instance, the push factors of the systematic theory of migration (Ravenstein 1885) can be used to justify the migration of Sri Lankans, which is mainly driven by low living standards in the country, lack of economic opportunities and political repression. Similarly, demand for labour from GCC countries and the economic freedom in labour-importing countries are the pull factors that help explain the Sri Lankan context.

The dual labour market theory is also equally important to explaining migration in Sri Lanka, especially with the recent trends in migration profiles as discussed in Chapter 2. The review of the changes in the migration profile and the rationale behind the dual labour market theory show that the Sri Lankan migration trend moves from the secondary market to the primary market, in which people have an advantage due to the qualifications, skills, male gender and regular legal status. For example, skilled and semi-skilled workers trend upwards as well as the migration of males. Moreover, the migration trend towards South Korea and the Maldives is bound by the legal and official employment contract that is also explained in the same theory.

The segmented labour market theory argues that not only the wage differences but also the government and employers have a role in the migration. This is one of the important factors to study. The new economics of labour migration approach (Taylor 1987) is also important because it explains the migration as a collective family decision for the advancement of the family.

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The historical institutional approach put forward the negative consequences of migration for the migrants' home country. Thus, this study cannot ignore the importance of the historical institutional approach in the process of proposing policies to enhance the positive impact of migration. Obviously, migration system theory is another theory that is mostly relevant to migration in Sri Lanka, since it was a British colony and has strong cultural ties with GCC countries that are dominated by Muslims.

3.3 Theories on Motive for Remittance

The preliminary foundation of remittance theory was the motive for remittance (Lucas and Stark 1985). Notwithstanding the criticisms of the insufficiency of its theoretical underpinnings, motive for remittance evolves as a substitute for general theories (Regmi and Tisdell 2002, Arun and Ulku 2011, Chowdhury 2011, McCracken, Ramlogan-Dobson et al. 2017). Thus, motives and theories have been used interchangeably in the literature and are impossible to detach from one another. The following section analyses the evolution of the theoretical foundation.

3.3.1 Altruistic Motive

The altruistic motive for remittance evolved gradually based on the initial concept of Lucas and Stark (1985). Altruism is a migrant's aspiration to fulfil the needs and wants of family members back at home. This mainly focuses on migrants' selfless support for their families. Lucas and Stark (1985) introduced pure altruism as an extreme form of altruism, whereas tempered altruism, that is, remittance, is a self-enforcing contractual agreement, as a practical prediction model of the same.

Pure altruism involved two main forms of utility (u_m): utility from own consumption (c_m) and utility deriving from the satisfaction of the needs of the members back at home and the utility. The utility from own consumption depends on the amount remaining after

remitting money back home (w-r), whereas utility derived from household depends on altruistic weights attached to various households and per capita consumption of the household (c_h). Thus, migrant's utility maximisation occurs at:

$$u_m = u[c_m(w - r), \sum_{h=1}^{n} a_h u(c_h)] \tag{3.1}$$

where u is the utility, c_m is own consumption, w is the wage, r is the amount of remittance, a_h is the altruistic weights attached to various household members and n is the household size.

As shown in Equation 3.2, per capita consumption (c_h) is a function of per capita income at home before the remittance receipts (*y*) and the household size (*n*):

$$c_h = c\left(y + \frac{r}{n}, n\right). \tag{3.2}$$

Thus, selection of the amount to remit to maximise the utility given in Equation 3.1 subject to the per capita consumption in Equation 3.2 is:

$$r = r(w, y, n). \tag{3.3}$$

It means the utility maximisation level of remittance is a function of wage level of migrant (*w*), per capita income at home before the migration (*y*) and household size (*n*).

The model of pure altruism by Lucas and Stark (1985) has improved gradually. According to Funkhouser (1995), a migrant's total utility (U_m) derives from of his or her own consumption (C_m) and their household's level of per capita consumption (C_h). Thus, the migrant's total utility can be written as follows:

$$U_m = C_m + C_h. \tag{3.4}$$

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Like the Lucas and Stark (1985) model, utility derived from household level per capita consumption (C_h) would vary depending on the level of relationship between migration and household. Hence, Equation 3.4 could be rewritten as:

$$U_m(C_m, C_h) = U(C_m) + z.V(C_h), with\ z > 0 \qquad (3.5)$$

where z is the strength of the relationship with the recipient household and *V* is the vector of household relationship characteristics.

Going beyond the simple introduction, based on behavioural models of pure altruism Funkhouser (1995) derived the following important predictions. First, remittance increases along with increases in migrants' earnings, showing a positive move of remittance and earnings. Second, remittance decreases with increases in per capita household income, showing the negative relationship between remittance and per capita GDP. Third, remittance decreases along with increases in the number of migrants from the same household. This theory of altruism is the foundation of the remittance decay hypothesis, which states that an individual migrant's remittance follows a concave curvilinear or an inverted U-shaped relationship (Czaika and Spray 2013).

3.3.2 Self-Interest Motive

The concept of self-interest motive is also an outcome of the seminal paper by Lucas and Stark (1985). Pure self-interest—purely selfish motivation—considers three self-seeking motives to remit. The first motive is the desire to inherit. If inheritances back at home are conditional upon how they support family members, migrants tend to remit more with the intention to receive those inheritances in the future. Thus, a positive association exists between desire for inheritance and the amount of remittance. The second motive is to invest in assets and ensure the proper maintenance of them. The third motive is the

intention to return home. This is related to the second reason noted above, in which remittance is used to invest in livestock and property, as well as to invest in public assets.

In case of the self-interest motive, there is a positive relationship between per capita income level and the remittance. This is contrary to inverse relationship of the per capita income with remittance in the altruistic motive (Stark and Bloom 1985, Docquier and Rapoport 2005). The self-interest motive also depends on the relationship with the family to a certain extent, as they are the trustworthy agent for the fulfilment of self-interest desires. Thus, it shows how inextricable are the motives of pure altruism and self-interest. Because of the difficulty in drawing clear boundaries between pure altruism and pure self-interest, (Lucas and Stark 1985) introduced another concept, tampered altruism or enlightened self-interest, which strikes a balance between the two contrasting theories.

3.3.3 Tampered Altruism or Enlightened Self-Interest

Tampered altruism or enlightened self-interest is not an intersection of the above two motives (pure altruism and pure self-interest). Instead, it offers a separate set of hypotheses to explain the motive for remittance and it views remittance as a contractual arrangement between migrant and home, which is mutually beneficial and inter-temporal in nature. Lucas and Stark (1985) examined two components, investment and risk, to explain their argument on tempered altruism or enlightened self-interest.

Remittances are initially made to repay the cost and interest of investment made by the family for migrant education. Thus, there is a positive association between the cost of education and the amount of remittance. It means highly educated migrants must remit more than the less educated, since the investment in them is greater. In the meantime, the same positive association could be linked to the higher earning capacity of educated migrants, which positively affects the remittance.

The risk perspective is the second component upon which the tempered altruism or enlightened self-interest motive has been built. This quite precisely depicts the rural context and the countries with underdeveloped insurance and capital markets. The risk in the agricultural industry, low wages in the primary industries and weak economic conditions of the countries are some of the key concerns in this regard. Hence, during crop failures, migrants tend to remit more to family members back home. Similarly, during periods of unemployment for migrants, their family members assist them, since this is a mutual contract between the two parties.

3.3.4 Intra-Familial Implicit Contractual Arrangement

The theory of intra-familial implicit contractual arrangement by Stark (1991) has little recognition. It was initially established based on the concept proposed by Lucas and Stark (1985). It mainly discusses the factors behind the remittance. The theory purports that migrant education, co-insurance, inheritance and migration itself are key factors behind the remittance inflow and formulates that the level of remittance varies with the cost of education, the amount of inheritance and the financial difficulties faced by families. However, it has not been accepted as a complete and advanced concept as the model does not acknowledge the self-interest of the migrants' remittance.

3.3.5 The Implicit Family Loan Theory

The implicit family loan theory Poirine (1997) stipulated different reasons for remittance. It holds that settlement of loans taken for the education of migrants and migration-related endeavours, and loans for younger members of the family, are the main reasons for remittance. According to the theory, an informal internal financial market exists between migrants and non-migrant family members back at home.

This theory explains the three stages of remittance inflows in the previously mentioned informal financial market. In the first stage, migrants remit to settle the informal and implicit loans taken by them. In the second stage, remittance is a form of implicit loans to children for education until they are ready for migration. Then in the third stage, both second and first generations remit money back home. The second generation remits to pay off the loans taken from the first generation, who are assumed to be in the retirement age, whereas the first generation remit to build houses or to start-up businesses for their future. In fact, implicit family loan theory is weighted more towards the self-interest motive, which focuses on migrants themselves.

Poirine (1997) argued that the implicit family loan theory is more advanced than the tampered altruism or enlightened self-interest theory. He argues that money is spent on consumption and housing expenditure rather than agricultural production. Furthermore, this theory explains in detail the altruistic, coinsurance and the implicit loan arrangement hypothesis. The author theorises that, remittance might depend on all three of these factors. Nonetheless, the theory derived in his study emphasised more the importance of the implicit loan hypothesis over the other theories to explain remittance behaviour.

3.3.6 Combined Model for Remittance

The theoretical fundamentals described above were further enriched with the models developed by Docquier and Rapoport (2005) and Schiopu and Siegfried (2006). Following them, McCracken, Ramlogan-Dobson et al. (2017) introduced an advance model on the motive for remittance. The importance of their study is that they have attempted to express the altruistic and self-interest motive (identified as investment in their study) together with one macroeconomic model and subsequently expanded it into a macroeconomic model.

According to McCracken, Ramlogan-Dobson et al. (2017), similar to earlier research, migrants' total utility depends on his or her own consumption and the family's consumption. The optimal level of remittance due to altruism and investment could be reached if the following three conditions are satisfied:

1. The migrant is sufficiently altruistic.
2. The cost of remittance is sufficiently low.
3. The income differential is high enough.

Given the above three conditions, the optimum level of remittance to the home country (j) from a migrant who is in the host country (i) because of altruism ($\hat{X}^{ij}$) and investment ($\hat{A}^{j}$) in the home country is given by following two equations, respectively:

$$\hat{X}^{ij} = \frac{\gamma I^i - (1+\beta)\tau I^j}{\tau(1+\beta+\gamma)} \tag{3.6}$$

$$\hat{A}^{j} = \frac{(pR^j - R^i)}{R^j - R^i} \frac{\beta(I^i \ \tau I^j)}{1+\beta+\gamma} \tag{3.7}$$

where γ is the degree of altruism, I is the income, β is the discount factor, p is the probability and R represent the rate of return on investment.

The total remittance from the host country to the home country is captured by adding the above equations (Equations 3.6 and 3.7). Thus:

$$REMIT_{ij} = \hat{X}^{ij} + \hat{A}^{j} \tag{3.8}$$

$$REMIT_{ij} = \frac{\gamma I^i - (1+\beta)\tau I^j}{\tau(1+\beta+\gamma)} + \frac{(pR^j - R^i)}{R^j - R^i} \frac{\beta(I^i \ \tau I^j)}{1+\beta+\gamma}. \tag{3.9}$$

However, recent studies have criticised the existing theories on migration and remittance. As Harper and Zubida (2018) observed:

This political economic remittance literature focuses on the motivations as if there were a one-time decision on monetary (and goods) flows that run unidirectional, always in the direction of the immigrant-sending country. Regardless of changes in life cycle and experience abroad, motivations for remittances are fixed and remittance practices follow those motivations.

Harper and Zubida (2018) argued that existing motivational aspects of foreign remittance show fundamental assumptions such as:

1. Motivations and recipients are static.

2. There is a unique sending–receiving dyad.

3. Needs, capacity and desire do not change over time.

4. People always keep their promises.

5. New debts never accumulate to service old debts.

6. All debts can settle through monetary exchange.

Criticising the existing theories, the study by Harper and Zubida (2018) examined the motive for remittance from a new perspective, in which they categorised motive for remittance as 'visibility' and 'new family contact' in contrast to 'altruism' and 'self-interest'. Table 3.1 explains these new motives and the given rationale for their recent development.

Table 3-1: New Categories: Typologies of Motive for Foreign Remittance

Motive	Explanation
Visibility	Inflow of remittance to maintain the connections with the home country and boost self-esteem. This highlights those migrants who remit to feel valued by others.
New family contract	Remittance only for intermittent or emergency conditions. Remittance patterns change and many restrictions on the existing remittance pattern occur after migrants have their own nuclear family.

Source: Harper and Zubida (2018)

3.3.7 Summary of Foreign Remittance Theories

In summary, the seminal work of Stark and Bloom (1985) and Lucas and Stark (1985) paved the way for a formal theoretical foundation for foreign remittance theories. They argued that remittance patterns are not merely ad hoc; their work reflects the negotiation, agreements and investments involved. They introduced altruism and self-interest as motives for foreign remittance and laid the foundation for the subsequent evolving theories such as the theory of intra-familial implicit contractual arrangement (Stark 1991) and the implicit family loan theory (Poirine 1997).

Analysis of all the existing theories reveals that none of the theories is alone sufficient to explain the changing nature of the motive for remittance. The literature on motives for remittance has a significant gap; it appears that no one has addressed the possible dynamic nature of motives for remittance. For instance, researchers tried to examine the motive for remittance in different countries and regional contexts. They found either it is mainly altruistic or self-interested in nature. In fact, whether the motive could change over a period has not studied. Hence, this study will contribute to the literature as it attempts to examine the dynamic nature of foreign remittance using a case study in Sri Lanka.

Gradual expansion of the international labour market increases the importance of foreign remittance to developing countries. Along with this, the researchers explored various aspects of foreign remittance such as why migrants remit and how remittance impedes development in the receiving country.

3.4 Empirical Literature: Motives for Foreign Remittance

Section 3.3 contributed to the study with a detailed analysis of the motives for remittance and discussed the important contribution of Lucas and Stark (1985). The paper titled 'Motivation to remit: Evidence from Botswana' by Lucas and Stark (1985) is important not only for theoretical review, but also for an empirical review of motives for and determinants of foreign remittance. The study argued for three distinct sets of motives, namely 'pure altruism', 'pure self-interest' and 'tempered altruism or enlightened self-interest'. This revolutionary paper paved the way for the evolution of empirical literature on motives for foreign remittance. Similarly, the contribution of subsequent studies by Stark (1991) and Poirine (1997) added loan repayment, insurance and exchange as motives for remittance. However, most of the studies have focused on categorising loan repayment, insurance and exchange under altruistic or self-interested motives (Hoddinott 1992, Hoddinott 1994, Cox, Eser et al. 1998, Gubert 2002, Osili 2007, Yang 2008). The volume of remittance is directly linked with the motive for remittance (Azizi 2018); hence, the study of motive helps in the formulation of favourable policies.

Past studies have mainly focused on modelling motives for remittance, applying utility maximisation of individual migrants (McCracken, Ramlogan-Dobson et al. 2017). These models take microeconomic and macroeconomic perspectives. The microeconomic-based studies have two main forms; first, remittance solely motivated by individual factors such as age, education and skill level (Ex:Hay 1980, Todaro and Maruszko 1989),

and second, remittance motivated by household characteristics such as number of family members and number of school-aged students (Agarwal and Horowitz 2002, Jahjah, Chami et al. 2003). The macroeconomic models derive their conclusion regarding the motive for remittance from factors such as GDP per capita and interest rates (McCracken, Ramlogan-Dobson et al. 2017). At last, despite their differences in approach, both models attempted to examine the motives behind the inflow of remittance.

With respect to the motive for remittance, some studies support altruism whereas others support self-interest. Agarwal and Horowitz (2002) undertook a study to test altruistic versus self-interested motives in Guyana. The study was based on the household income and expenditure survey (HIES) and the living standard measurement study (LSMS) in Guyana. The LSMS migration module of the study had personal characteristics data for 524 migrants belonging to 270 households. Of these, only 170 received remittance. Thus, the study used two estimations to analyse the motives behind remittance. The first equation was to assess the decision to remit, which included all 524 migrants. The second equation was to model the amount of remittance. They used the income level of the households and migrants, with the number of members in a household as explanatory variables in the study. The findings of the study support the altruistic motive, revealing that inflow of remittance to Guyana varies significantly depending on the number of migrants in a family. Bouoiyour and Miftah (2015) derived the same conclusion and they found remittance to Morocco is dominated by altruistic motives. As explained in their study, a migrant's decision to remit is highly linked to individual characteristics such as his or her income, gender and age.

Another household survey study by De la Briere, Sadoulet et al. (2002) on the Dominican Republic assessed the motive for remittance. According to the results, it found that the

motive to remit was affected by destination, gender and household composition. The study reveals that, in the Dominican Republic, female migrant remittance is mainly insurance-motivated, whereas male migrants' motive is investment. A decade prior to the De la Briere, Sadoulet et al. (2002) study, Hoddinott (1992) studied the notion that the motive for remittance varies based on gender. He found that Kenyan male migrants are motivated by self-interest. Gubert (2002) also found evidence to support the self-interest motive behind the remittance. However, his study did not distinguish motives based on gender.

Czaika and Spray (2013) studied the drivers and dynamics of internal and international migration in India with the Indian National Sample Survey. Their findings were different from those of Agarwal and Horowitz (2002) and De la Briere, Sadoulet et al. (2002), because they confirmed that both altruistic and self-interest motives influence remittance to India. In addition, Czaika and Spray (2013) challenged the work of Lucas and Stark (1985), rejecting the inter-generational educational loan perspective of motive to remit, which hypothesised the positive association between level of education and volume of remittance. The conclusion of Czaika and Spray (2013) are further reinforced by McCracken, Ramlogan-Dobson et al. (2017) with the analysis of 27 Latin American and Caribbean countries and 18 industrialised countries.

Abdin and Erdal (2016) examined the implications of migration trajectories based on interviews of Pakistani taxi drivers in Barcelona and Oslo. The main aim of the study was to examine how the electricity crisis that occurred in Pakistan during 2007 influenced the decision to remit. The study found that, because of the electricity-lacking families back at home, the migrants' motive for remittance diverted from savings and investment to

expenditure on generators. In addition, the study found that length of emigration and location of family members were key determinants of foreign remittance to Pakistan.

Harper and Zubida (2018) contributed to the remittance research, with new perspectives in their paper titled 'Being seen: Visibility, families and dynamic remittance practices'. They attempted to answer the question of why remittances cease. Their study was based on data gathered through interviews of 43 temporary migrant workers. The researchers argued that migrant reasons for remittance could vary; they remit for one reason at one point and then remit or change remittance patterns at some future date. They examined this from a microeconomic perspective and identified that remittance patterns changed when they had fulfilled their family's needs and investment and credit obligations.

The above literature is all based on household survey or micro-level data for individual countries except for McCracken, Ramlogan-Dobson et al. (2017). Nonetheless, these microeconomic studies found mixed results on motives for remittance. For example, Agarwal and Horowitz (2002) supported altruism whereas Gubert (2002) supported the self-interest motive.

Besides the above microeconomic studies, researchers have also attempted to study the same notions using a macroeconomic framework in both country and cross-country contexts. Alleyne (2006) studied the motive to remit using a dynamic unbalanced panel of nine countries in the Caribbean Economic Community and Common Market (CARICOM). The study found that the inflow of remittance to CARICOM was driven by investment motives rather than by pure altruism. However, Henry, Moulton et al. (2009) concluded that motives for remittance to Jamaica were a combined result of both altruistic and self-interest motives. Jamaica is a CARICOM country, but the review of findings showed the diversity of results based on the composition of the sample. For example,

(Alleyne 2006) study is a cross-country study, whereas the study by Henry, Moulton et al. (2009) is a case study on a single country.

Ruiz-Arranz and Lueth (2007) assessed the motive for remittance to Sri Lanka. As discovered in the study, remittance is a pro-cyclical inflow; remittance increases with the acceleration of economic performance, showing a positive association (proxy with GDP in Sri Lanka) and vice versa. The pro-cyclicality concluded that inflow of remittance to Sri Lanka is driven by investment or the self-interest motive. The findings of the study are admissible because Ruiz-Arranz and Giuliano (2005) established same pattern (pro-cyclicality) in two-thirds of all countries and the counter-cyclicality in the rest.[7] Moreover, Ruiz-Arranz and Lueth (2007) confronted the verdicts of Docquier and Rapoport (2005), who claimed that remittance is largely if not solely based on altruistic motives. The study concluded with a call for further research in a Sri Lankan context. As mentioned in Ruiz-Arranz and Lueth (2007) 'the pro-cyclicality of remittance calls into question the notion that the remittance is largely motivated by altruism'.

Making use of the research direction in Ruiz-Arranz and Lueth (2007), the cyclicality of remittance has been further investigated by Mughal and Ahmed (2014). The study was based on four remittance-receiving countries in Asia, including Sri Lanka. Their findings strengthened the findings of Ruiz-Arranz and Lueth (2007), because they investigated the pro-cyclicality of remittance in Sri Lanka and Bangladesh with respect to both the home and the host countries' economic conditions. Further, they found that remittance to India and Pakistan are counter-cyclical to the home country's economic condition but pro-cyclical to the host country's economic condition. Nonetheless, this study has not

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[7] Counter-cyclicality of remittance means the inverse relationship between the remittance and the economic performance of the country.

sufficiently addressed the question about motives for remittance in Sri Lanka, unlike the Ruiz-Arranz and Lueth (2007) study.

Fonchamnyo (2012) conducted a panel data analysis for sub-Saharan Africa to examine the motive for remittances. The study was based on unbalanced panel data of 36 countries in the sub-Saharan region from 1980 to 2009. The results of random effect estimation found positive and statistically significant coefficients for age dependency ratio and the per capita income differential between home and host country. A negative and statistically significant coefficient for per capita income of the country supports the altruistic motive for remittance in sub-Saharan Africa.

Nnyanzi (2016) studied the drivers of international remittance to Africa. The study was based on a random effect framework and used both home and host country determinants of foreign remittance. According to this study, the home country income coefficient was negative, implying an altruistic motive for remittance. Moreover, the interest rate differential was positive, supporting the investment motive for remittance. Researchers used an income differential coefficient to ensure the conclusion was based on the home country income coefficient and it confirmed the existence of an altruistic motive for remittance. Based on the above two findings, the study concluded that foreign remittance to Africa is driven by a mix of altruistic and self-interest motives.

One of the most recent studies on remittance is the study by Ali and Alpaslan (2017) that used the panel co-integration method. The study was based on 47 developing and emerging economies and used share of investment to GDP and share of remittance to GDP as the main variables. The objective of the study was to examine the presence of the long-run relationship between investment and remittance inflow. The title of the study was 'Is there an investment motive behind remittances? Evidence from panel co-

integration'. However, careful analysis of the title, objectives, variables and findings reveal that this study is not about the motives for remittance but rather examines the impact of remittance on investment. Following the above review of literature, Table 3.2 summarises the different notions about the motive for remittance with respect to the country and the time frame of the study.

Table 3-2: Summary of the Literature on Motives for Remittance

Study	Context of the Study	Motive
Hoddinott (1992)	Kenya	Self-interest
Cox, Eser et al. (1998)	Peru	Exchange
De la Briere, Sadoulet et al. (2002)	Dominican Republic	Male: investment Female: insurance Young: investment Returning migrants: investment
Bouoiyour and Miftah (2015)	Morocco	Altruistic
Agarwal and Horowitz (2002)	Guyana	Altruistic
Gubert (2002)	Western Mali	Self-interest
Czaika and Spray (2013)	India	Mix of altruistic and self-interest
Alleyne (2006)	CARICOM	Investment
Henry, Moulton et al. (2009)	Jamaica	Mix of altruistic and self-interest
Ruiz-Arranz and Lueth (2007)	Sri Lanka	Investment/self-interest
Fonchamnyo (2012)	Sub-Saharan Africa	Altruistic
De Brauw, Mueller et al. (2013)	Ethiopia	Insurance
Nnyanzi (2016)	Africa	Mix of altruistic and self-interest

Source: Author compiled.

3.4.1 Summary and Gaps in the Literature—Motives for Remittance

The previous section analysed the empirical literature on the motive for remittance. The studies are at both microeconomic and macroeconomic levels. The microeconomic studies deal with household surveys of migrants, whereas macroeconomic studies deal with aggregate-level economic variables. The above literature review helps identify limitations and gaps, which will be addressed in this thesis. This new knowledge will provide valuable insights into the motives for remittance and will assist in the development of policies for enhancing the remittance inflow. According to the above review, there are key aspects and gaps to highlight.

First, the motive for remittance varies depending on the economic, financial and political circumstances of countries. To date, there is no consensus on migrants' motive to remit back to the home countries. Researchers support altruism (Agarwal and Horowitz 2002) and self-interest (De la Briere, Sadoulet et al. 2002) as well as a mix of altruism and self-interest (Czaika and Spray 2013). Lack of compromise on the motive behind remittance weakens the generalisability of one country's findings to another with respect to domestic policy. For example, if Sri Lanka applied the findings of Agarwal and Horowitz (2002), who support altruistic motives, policies that stimulate saving and investment would not work because altruism believes remittance focuses on meeting the basic needs of family members. However, if Sri Lanka applied the findings of De la Briere, Sadoulet et al. (2002), Hoddinott (1992) and Gubert (2002), which support self-interest, the use of such policies would stimulate the migrants. Therefore, unlike other aspects, examination of motives behind inflow of remittance at an individual country context is vital for successful policy formulation. It helps policymakers to customise policies in a manner that promotes the sustainable inflow of remittance. However, compared with other countries, there exists little research on the above matter within the Sri Lankan context.

Second, a study by Ruiz-Arranz and Lueth (2007) is the only study examining the motives behind inflow of remittance to Sri Lanka. As explained in the literature review, Ruiz-Arranz and Lueth (2007), challenged the validity of the notion that remittance to Sri Lanka is motivated by altruistic motives. However, the constraints of the study dilute the value of the findings. For instance, the study was based only on quarterly data from 1996 to 2004, during which time the Sri Lanka Freedom Party ruled under the presidency of Chandrika Kumaratunga. It did not cover the periods before or after this time, which saw significant changes with respect to economic, political and social conditions in Sri Lanka. A study covering a broader time frame would contribute to domestic policy while also addressing the question posed by Ruiz-Arranz and Lueth (2007), which has not been answered for a decade.

Third, the empirical findings categorised motive for remittance as altruistic, self-interested or a mix of both. Even within one country, researchers had different findings depending on the period studied. For example, Alleyne (2006) considered the period from 1982 to 2002 and found that remittance to Jamaica was motivated by altruism; however, Henry, Moulton et al. (2009) examined the same for the period from 1995 to 2008 and concluded that it was motivated by a mix of altruism and self-interest. These contradictions in past studies bring up the question of whether motives for remittance in a country stay the same, or whether they may change over time. However, this is one of the untouched areas of research in motive for remittance—the probable dynamic nature of motive for remittance over time. To date, review of the literature found no study that attempted to examine this aspect.

Another key finding is the association between the motive for remittance and the gender of the migrants. Review of the literature strongly supports the notion that male migrants

are motivated by self-interest whereas female migrants are motivated by altruism. This, along with changes in the gender profile of Sri Lankan migrants (a gradual increase of male migrants relative to female migrants) illustrates the importance of studying how these changes influence the motive for remittance to Sri Lanka.

In summary, the following are the gaps in the empirical literature, which will be addressed in the upcoming chapters. First, lack of clarity on the motive for remittance to Sri Lanka. Second, absence of research examining the probable dynamic nature of motive for remittance. With the examination of all the above facts, this study draws the following hypothesis on motives for remittance to Sri Lanka.

H_0: Motive for remittance to Sri Lanka is static over time (Motive for remittance to Sri Lanka is not dynamic over time)

3.5   Empirical Literature: Determinants of Remittance

Foreign remittance is a major source of foreign exchange to the developing countries around the globe. The existing migration theories and foreign remittance theories such as the systematic theory of migration, the dual labour market theory and the implicit family loan theory help identify the determinants of foreign remittance. For instance, according to the systematic theory, migration of people from one place to another is mainly due to push and pull factors. As explained in Section 3.2.1, push factors are the factors that force people to migrate whereas pull factors are the factors that attract migrants.

Hence, based upon both the theory and empirical literature, inflow of foreign remittance is determined by the microeconomic and macroeconomic conditions (Adams 2009) of both the home and the host countries (Swamy 1981, El-Sakka and McNabb 1999). The home country determinants of foreign remittance are similar to the push factors whereas

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the host country determinants are similar to the pull factors in the systematic theory of migration. However, notwithstanding the constraints and measurement difficulties discussed in Chapter 2, empirical evidence of the determinants of inflow of foreign remittance have been mixed across countries (Alper and Neyapti 2006).

Among the home country determinants, level of economic performance of the home country, for which GDP is proxy, is common in the literature (Lucas and Stark 1985, El-Sakka and McNabb 1999, Coulibaly 2015). Because GDP is linked with consumption and savings (Alleyne 2006), the impact of remittance depends upon the motive to remit. There is a negative relationship between per capita GDP and inflow of remittance when the altruistic motive dominates, that is, migrants send money mainly for consumption (Docquier and Rapoport 2005), showing the role of remittance as 'insurance' against shocks (Ruiz-Arranz and Lueth 2007). Low economic growth signals the inability of migrants' families to fulfil their needs from home country income.

High levels of inflation, instability of foreign exchange markets, unemployment and low wage levels are the consequences of weak economic performance. Thus, households seek support from migrated family members, which leads to high remittance. In contrast, the GDP of a country has a positive relationship with the inflow of remittance when the motive is self-interest; migrants send money mainly for savings and investment (Stark and Bloom 1985). This reflects the need of a healthy economy for investment because self-interest-oriented migrants send more money during times of strong economic performance. The role of GDP as a determinant of inflow of remittance and the above review is in par with the analysis of (Ruiz-Arranz and Giuliano 2005), who examined the pro-cyclical and counter-cyclical nature of remittance in the world.

Supporting the above notion that the effect of GDP on remittance depends on the motive for remittance, there are mixed results on GDP as a determinant of remittance. For example, based on a sample of 113 countries, Jahjah, Chami et al. (2003) found a negative relationship between remittance and economic growth. They concluded that remittance to those sample countries is compensatory in nature. Further, the existence of negative shocks in the economy might increase the need to remit more. Nonetheless, following the same model as Jahjah, Chami et al. (2003), a study by Catrinescu, Leon-Ledesma et al. (2009) found a highly robust positive association between the same variables.

The flow of remittances can also be determined by the level of poverty in the home country (Wagh and Pattillo 2007). They found a positive association between remittance and poverty that proved the existence of altruistic motives for remittance, since migrants must remit more when the level of poverty is high. Their study found the existence of reverse causality between poverty and remittance in sub-Saharan African countries. In contrast to the finding of (Wagh and Pattillo 2007), Adams (2009) argued that poverty does not have a positive association with remittances. The findings by Adams (2009) are debatable since he does not take into account remittance inflow from GCC countries although they are the main destination for developing countries' migrants.

The level of inflation in the home country is an another key determinant of remittance (Elbadawi and Mundial 1992, El-Sakka and McNabb 1999). It signals economic stability, whereas high inflation means high risk of economic instability and vice versa (Elbadawi and Mundial 1992). Moreover, it might signal a lack of trust in the economic policy of the country. Nevertheless, the sign of the coefficient was uncertain and mixed results exist in the literature. The presence of mixed results is justifiable based on the motive of remittance. For instance, erosion of the value of foreign currency resulting from higher

inflation discourages migrants with self-interested motives, whereas more remittance may be transmitted by migrants with altruistic motives since the purchasing power and the welfare of receiving households declines (El-Sakka and McNabb 1999) and Alleyne (2006). The net effect of inflation on inflow of remittance eventually depends on which motive dominates the other.

Foreign remittance flow is affected by the rate of return of both the home and host countries. A high relative rate of return on investment in the home country encourages migrants to save in the home country and a low rate of return motivates them to save in the host country (Adams 1991, Higgins, Hysenbegasi et al. 2004, Ruiz-Arranz and Lueth 2007). However, what Straubhaar (1986) stated is contradictory to the findings of Adams and Page (2005) and Ruiz-Arranz and Lueth (2007). Straubhaar (1986) found that neither exchange rate nor real return on investment in the home country act as key determinants of remittances in Turkey. According to the study, remittance is more dependent on the migrants' confidence in the country's stability of government than on incentives to attract remittances.

Financial development acts as another determinant of foreign remittance (Aggarwal, Demirgüç-Kunt et al. 2006, Mundaca 2009, Lartey 2013). If a country has a developed financial system, that is reflected by low fees for remittance transfers and effective transferring. Low fees and effective transfer mechanisms encourage remittance flow and help reduce the black market (El-Sakka and McNabb 1999) for foreign currency. Financial sector development could encourage migrants despite their motive to remit, but it could be used as a stimulant for self-interest-oriented migrants. For example, migrants with self-interested motives would send more money when the cost of transferring is low and if banks offer lucrative investment opportunities for them.

Exchange rate restrictions and black market premiums might discourage the flow of remittance. Specifically, they divert inflow of remittance from formal to informal channels (El-Sakka and McNabb 1999). The study by Aydas, Metin-Ozcan et al. (2005) found evidence against the role of exchange rate policies on the flow of remittance. In Turkey, neither exchange rates nor interest policies make a significant impact on remittance flow.

Other determinants are the level of education and the skill composition of the migrants. More educated and skilled migrants have a higher propensity to stay in the host country; hence, they remit at lower levels to the home country than less educated and unskilled migrants (Rapoport and Docquier 2006, Adams 2009).

Number of child dependents is another determinant that is positively associated with foreign remittances. Adams (2009) has discussed it in detail and provided findings in support of it.

Adams (2009) has also used exchange rate spread and the presence of civil war as significant determinants of foreign remittances and tested them with respect to different country contexts. Even though these factors had no effect in determining the findings of his cross-country research, they are of importance to a specific country context because of their impact on the economy and society.

Foreign remittance is also affected by the rate of return in both the home and the host countries. The high relative rate of return on investment in the home country encourages migrants to save in the home country and low rates of return motivate them to save in the host country (Adams 1991, Higgins, Hysenbegasi et al. 2004, Adams and Page 2005, Lueth and Ruiz-Arranz 2007). However, what Straubhaar (1986) stated in his research is contradictory to the findings of Adams and Page (2005) and Ruiz-Arranz and Lueth

(2007). He found that neither exchange rate nor real return on investment in the home country act as key determinants of remittances in Turkey. According to him, it is highly dependent on the migrants' confidence on government stability than the incentives to attract remittances. The findings of Straubhaar (1986) date back two decades and are only based on Turkey. However, Nnyanzi (2016) revisited the role of interest rate as a determinant of foreign remittance to Africa and the study found it to be a statistically significant determinant of foreign remittance.

As explained in Chapter 1, this study had discussed the significance of examining how host countries' economic factors affect the inflow of remittance. El-Sakka and McNabb (1999) has attempted to contribute to the literature in this regard. Researchers have used an average of per capita income level in Arab countries as a proxy for wage level and the lending and deposit interest rate as proxies for interest rates (El-Sakka and McNabb 1999). They found that host country wage levels, as well as interest rates, are key determinants of remittance inflow to labour-exporting countries. The findings of El-Sakka and McNabb (1999) were supported by Sander, Nistor et al. (2005), who found that host country wage level was a key determinant of remittance. Further to that, the cost of living in the host country was found to be a key determinant of remittance inflow. Conversely, compared with home country factors, host country determinants are rare in the literature.

Alleyne (2006) examined both home country and host country determinants of foreign remittance in CARICOM using a dynamic unbalanced panel of nine countries in CARICOM. The GDP of remittance-receiving country (idgdp), trade-weighted average of per capita in remittance-sending countries (ifgdp), real effective exchange rate (lreer), and the difference between the domestic Treasury bill rates and the average foreign

interest rates (lird) were the explanatory variables of the model, along with per capita remittance (lrp) as the dependent variable of the model. As per the model, lagged lrp and all the explanatory variables except lreer were statistically significant. The significant positive coefficient of ifgdp statistically proved the probable increasing nature of remittance along with the increase of migrant wage in host countries. The findings are consistent with the early studies by (El-Sakka and McNabb 1999, Sander, Nistor et al. 2005)

In conclusion, the motives for and the volume of remittance could vary from country to country as a result of the diverse economic, social and political factors (Arun and Ulku 2011). Table 3.3 summarises the determinants of foreign remittance under three main categories: home country determinants, host country determinants and the combined factors of home and host country.

Table 3-3: Determinants of Foreign Remittance

Determinant	Identified Relationships	Studies
Level of income $_{\text{home country}}$ (PCGDP $_{\text{home}}$)	Altruistic—negative Self-interest—positive	(Lucas and Stark 1985, Coulibaly 2015), (El-Sakka and McNabb 1999), (Docquier and Rapoport 2005) and (Stark and Bloom 1985)
Poverty $_{\text{home country}}$ (Pov $_{\text{home}}$)	Altruistic—positive	(Wagh and Pattillo 2007)
Level of inflation $_{\text{home country}}$ (Inf $_{\text{home}}$)	Self-interest—positive Altruistic—negative	(Elbadawi and Mundial 1992), (El-Sakka and McNabb 1999)
Rate of return	Home country—positive Host country—negative	(Adams 1991), (Higgins, Hysenbegasi et al. 2004), (Adams and Page 2005), (Ruiz-Arranz and Lueth 2007)
Financial Development	Positive	(Aggarwal, Demirgüç-Kunt et al. 2006), (Mundaca 2009) and (Lartey 2013)
Exchange rate restrictions	Negative	(Aydas, Metin-Ozcan et al. 2005) and (El-Sakka and McNabb 1999)
Black market premium	Negative	(Aydas, Metin-Ozcan et al. 2005) and (El-Sakka and McNabb 1999)
Level of education/skill composition	Negative	(Rapoport and Docquier 2006) and (Adams Jr 2009)
Child dependency	Positive	(Adams Jr 2009)

Source: Author compiled.

The empirical literature above shows that macroeconomic factors in both the home and the host country of the migrants play a decisive role in determining the inflow of remittance. Moreover, it helps identify the following gaps, which are unattended despite the importance of them.

1. None of the existing studies focuses on country risk and its impact on remittance inflow. Nevertheless, this is generally applicable to the existing studies and equally important for almost all the developing countries.

2. No study covers both the home country and host country determinants of foreign remittance to Sri Lanka.

3. Even though Sri Lanka is the most affected country because of the volatility of remittances and mainly depends on oil-exporting countries for labour exports, no study focuses on examining the impact of oil price fluctuations and the changes in economic conditions in oil-exporting countries on remittance-receiving developing countries.

Based upon the literature and the identified gaps, the following hypotheses will be tested within the context of Sri Lanka:

Objective 1: Identify the determinants of foreign remittance to Sri Lanka

H_{0a}: Foreign remittance to Sri Lanka is not affected by home country macroeconomic conditions

H_{0b}: Foreign remittance to Sri Lanka is not affected by host country macroeconomic conditions and changes in oil price

Objective 2: Identify the impact of country risk on inflow of foreign remittance to Sri Lanka

H_{0a}: There is no impact of country risk on foreign remittance to Sri Lanka

3.6 Empirical Literature: Impact of Foreign Remittance

Impact studies on remittance date back many decades. The work of Lopez and Seligson (1990), who studied the impact of remittance on small businesses in El Salvador, was the first recorded study on remittance after which all the others followed suit. Because of the growing nature of remittance inflow over the last period, studies on the effect of foreign

remittance on different socio-economic dimensions are voluminous (Bhattacharya, Inekwe et al. 2018), covering a wide range of aspects including at the micro- and macroeconomic levels. Financial inclusion, consumption and human capital development of recipient households are some of the key aspects at the microeconomic level (Rubenstein 1992, Newland and Patrick 2004, Buch and Kuckulenz 2010, Guha 2013) whereas economic growth, poverty and income inequality are at the macroeconomic level.

Besides the impact of remittance on micro and macro-economic aspects discussed above, the study by Berrak Chatterjees et al 2016 examined the dynamic absorption of remittance at macroeconomic level. Researchers found that whether the effects of remittance are contractionary or expansionary is depends on the group of recipients. Further they found that if the distribution of remittance is skewed towards entrepreneurs it would leads to a welfare gain.

The panel data study by Bettin, Presbitero et al 2017, contributed to literature by studying remittance and vulnerability in developing countries using bilateral remittance from 103 Italian provinces to 107 developing countries. They found that remittance negatively correlated with the business cycle and increases in response to adverse shocks such as natural disasters.

Nonetheless, despite the growth in volume and the importance of foreign remittance, especially to developing countries, researchers have not yet come to a compromise over the impact of remittance on any economic aspects such as economic growth, poverty, income inequality and financial development. The demographic, economic, financial and social differences are some of the factors that account for the diverse findings in the literature.

Beside the study of the impact of remittance on economic growth (Taylor 1999, Jahjah, Chami et al. 2003, Freund and Spatafora 2005) there is little research on whether and how it affects financial development, poverty and income inequality. However, it is vital to study the impact of foreign remittance on the above key aspects because they are interconnected and determine the economic development of a country. For instance, financial development is the robustness of financial intermediary services and the stock market in an economy (Huang 2010). The financial intermediary services connect the senders and receivers of foreign remittance. The relationship between these two parties might help strengthen the financial sector development of a country. This could happen when financial intermediaries, financial instruments and financial markets together reduce the cost of transferring remittances and enhancing the efficiency of transfer mechanism, which leads to the expansion of the business activities of financial institutions. Thus, assessing whether and how remittance affects the financial development of a country is a key consideration for successful policy formation, to strengthen the relationship between two parties and reap the indirect benefit of the economic development of a country as posited in the remittance–growth literature.

Similarly, the study of the impact of remittance on poverty and income inequality are also vital aspects because they are top priorities in development agendas, especially in developing countries (Beyene 2014).

Considering these factors, Section 3.6.1 - 3.6.4 reviews the empirical literature on the impact of foreign remittance on financial development, followed by the impact of remittance on poverty and income inequality thereafter.

3.6.1 Impact of Foreign Remittance on Financial Development

3.6.1.1 Financial Development

Financial development is the development of the overall financial sector of a country, which mainly consists of different types of financial institutions. Financial institutions are important for every economy because they play a critical role of financial intermediation between surplus and deficit units of an economy.

As depicted in Figure 3.1, financial development can be categorised under four main aspects: financial intermediary development, financial efficiency development, stock market development and financial size development (Huang 2005, Huang 2010). In this broad categorisation, financial intermediary development and financial size development relates to banking sector development, whereas the two latter categories relate to stock market development. Overall, financial development is vital because it fosters the overall health of an economy.

Figure 3-1: Categorisation of Financial Development
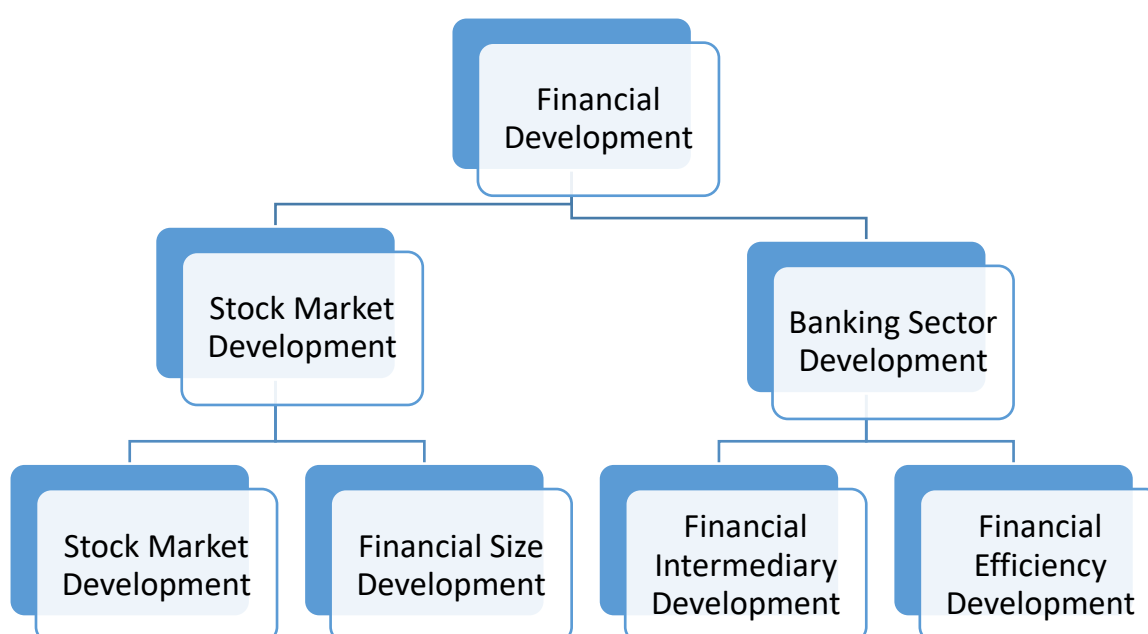
In the literature, researchers used different types of measurements as proxies for financial development. However, studies by (Huang 2005) and (Huang 2010) received significant attention compared with the others. Huang expanded the idea of (King and Levine 1993) and introduced a comprehensive framework on measurements of financial development for all the four categories mentioned above.

According to that, liquid liability ratio, private credit ratio and commercial–central bank ratios are used as measurements of financial intermediary development, whereas overhead cost ratio and net interest margin ratio are used as measures of financial efficiency development. The stock market capitalisations, size index, total ratio of total value traded and the turnover ratio are the measures of stock market development (Huang 2005, Huang 2010). Nevertheless, use of all these measurements, covering all the aspects of financial development, are rarely found in the literature.

The study conducted by Wagh and Pattillo (2007) measured financial development only through liquidity ratios such as ratio of bank deposits to GDP and ratio of money supply(M_2) to GDP. However, some studies expanded the idea incorporating few other aspects. For instance, (Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011, Coulibaly 2015) used a ratio of bank deposits to GDP and bank credit to private sector as a ratio of GDP to measure financial development. Other than the two aforementioned measurements, M_2 money supply as a ratio of GDP was the additional measurement used in Chowdhury (2011) and (Masuduzzaman 2014). A new addition in Chowdhury (2011) and Masuduzzaman (2014) provides a broad scale measurement of financial development that covers central banks, deposit banks and other financial institutions (Masuduzzaman 2014).

Bettin and Zazzaro (2012) introduced a new direction for financial development measurements. They categorised financial development into two categories: quantity-based indicators and quality-based indicators (Figure 3.2). The previously mentioned financial intermediary development measurements are categorised under the quantity-based indicators, whereas bank inefficiency index comes under the quality-based index. As mentioned in their study, the bank inefficiency index is based on the widely used cost to income ratio and it is as follows:

$$Bank\ Inefficancy_{it} = \sum_{b=1}^{B_i} \left(\frac{Operating\ Expenses}{Net\ Interest\ revenue + other\ income} * 100 \right)_{it} * w_{bit} \quad 3.10$$

where Bi is the number of banks in country i and wbt the market shares of bank b in terms of total assets.

Figure 3-2: Financial Development Measurements
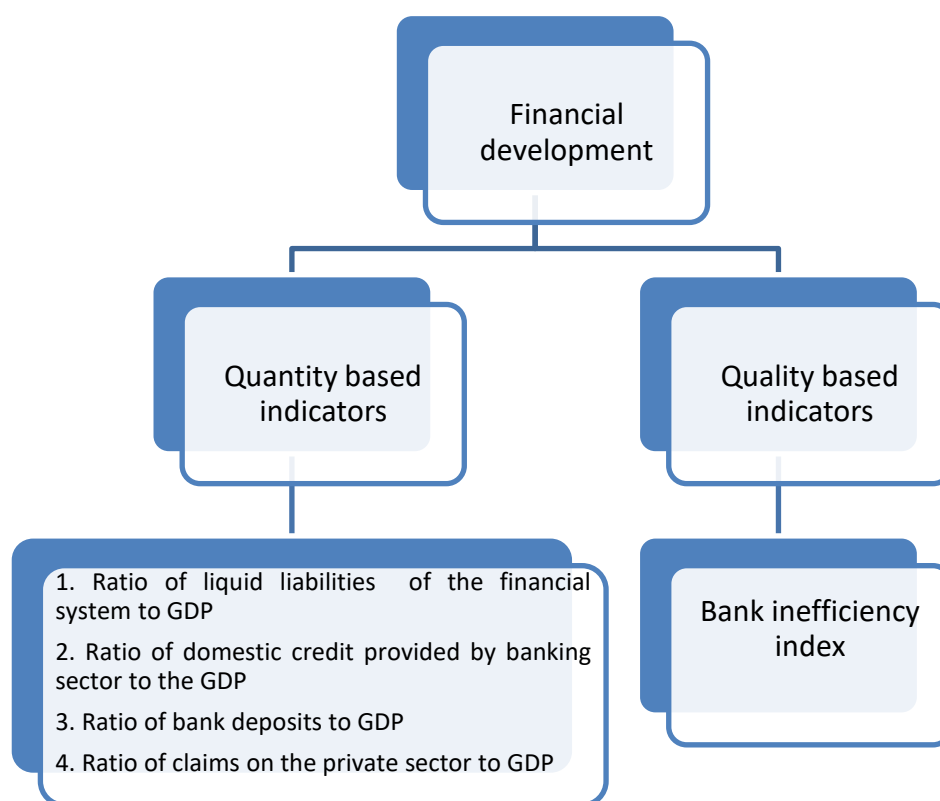
Source: Adapted from Bettin and Zazzaro (2012)

In summary, the variables, definitions[8] and the measurements of financial development, which are derived from the literature, are as shown in Table 3.4.

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[8]The definitions of the variables are based on International Financial Statistics IMF. (2016). 'International Financial Statistics ' Retrieved 08/12/2016, 2016, from https://www.imf.org/en/Data#imffinancial. and World Development Indicators IDA, I.-. (2016). Data. T. W. Bank.

Table 3-4: Measurements of Financial Development

Variable	Measurement	Definition
Financial intermediary development (FID)	Money supply	Liquid liabilities of banks and non-bank financial intermediaries over GDP
	Deposits	The total value of demand, time and savings deposits at domestic deposit banks as a share of GDP
	Credit	Credit issued to the private sector by banks and other financial intermediaries divided by GDP(LOAN/GDP)
	Assets	Total assets held by deposit banks as a share of the sum of the deposits, banks and central bank claim on the domestic nonfinancial real sector
Financial efficiency development (FED)	Overhead costs (OVC)	Ratio of overhead costs to total bank assets
	Net interest margin (NIM)	Differences between bank interest income and interest expenses divided by total assets
	Bank inefficiency index	Cost to income ratio

Source: Author compiled.

3.6.1.2 *Foreign Remittance and Financial Development*

The nexus between foreign remittance and financial development has not been sufficiently examined to put forward a solid idea. It is unclear in the literature despite its influence on economic development (Bhattacharya, Inekwe et al. 2018). Hence, the question of whether, how and to what extent foreign remittance can contribute to the financial development of a country is still being examined. The review of literature found

evidence that ranged from no impact (Faini 2007) to significant positive impact (Aggarwal, Demirgüç-Kunt et al. 2011, Chowdhury 2011).

One of the main strands of the remittance – financial development literature is the review of demand versus supply side impact. The demand side impact hypothesises that the transfer of money via formal financial services increases financial literacy (Brown, Carmignani et al. 2013). This affects both the formal and informal remittance recipients. The informal remittance recipients are more likely to enter into the financial system through new bank accounts to deposit and manage the remittance, whereas existing banked recipients widen the use of the products and services of the financial institutions. The demand side impact may not become a reality if they purposely ignore the use of financial services despite being financially literate. Thus, as stated in Orozco, Lowell et al. (2005), fostering financial literacy is necessary to stimulate the demand side impact of foreign remittance.

In contrast to the above demand side impact, the supply side impact focuses on how remittance affects credits or the loanable funds of financial institutions. This supply side impact laid the foundation for the so-called substitutability versus complementary hypothesis.

3.6.2 Substitutability Versus Complementary Hypothesis

The 'substitutability hypothesis' posits that remittance acts as a substitute for credits from financial institutions (Ruiz-Arranz and Giuliano 2005, Giuliano and Ruiz-Arranz 2009). The argument of the so-called substitutability hypothesis is that, whether it is motivated by altruism or self-interest, it reduces the need for borrowing because households rely on migrants rather than on domestic banks (Giuliano and Ruiz-Arranz 2009). For example, remittance motivated by altruism limits the requirements for short- or long-term loans for

household consumption, shelter and education, whereas remittance driven by self-interest reduces borrowing for investments. From the financial institutions' perspective, the substitutability hypothesis shows a situation somewhat contractionary in nature for institutional lending because the role of migrants as an 'informal bank' to their households replaces the need for bank loans (Ambrosius 2012).

The concept behind the substitutability hypothesis is linked with the fundamentals of the new economics of labour migration approach. For instance, the new economics of labour migration argued that migration is a collective family decision and acts as a hedging technique to risk or market constraints in credit, whereas the substitutability hypothesis argues that remittance relaxes the need for credits from banks and financial institutions as households rely on migrants. Thus, the idea behind the complementary hypothesis and the new labour migration theory is closely related and helps strengthen the complementary hypothesis.

On the contrary, the complementary hypothesis focuses on the interdependency of foreign remittance and financial development. It assumes that remittance supports financial development, and in the meantime, the developed financial systems boost inflow of remittance. The competition among financial institutions leads to increases in their efficiency, reduction of the cost of transfer of remittance and the introduction of customised products to migrants and the recipients of foreign remittances (Nyamongo, Misati et al. 2012). Further, deposits of remittance increase the lending capacity of banks and financial institutions to both remittance-receiving and non-remittance-receiving households (Brown, Carmignani et al. 2013), particularly to the former, because remittance is perceived as a significant and stable source of income that serves as collateral (Aggarwal, Demirgüç-Kunt et al. 2011, Chowdhury 2011, Coulibaly 2015,

Fromentin 2017). This win-win situation for both remittance recipients and the financial institution has been identified as the complementary hypothesis and is reflected through the significant positive coefficient between foreign remittance and the financial development measurements such as deposits and credits of banks and financial institutions.

The notion behind the complementary hypothesis is similar to the induced financial literacy hypothesis, which deals with the tendency of recipients to be exposed to the formal financial market, become educated about the system and seek out greater use of other financial products and services (Gupta, Pattillo et al. 2009, Aggarwal, Demirgüç-Kunt et al. 2011).

3.6.3 Empirical Findings on the Foreign Remittance–Financial Development Nexus

Aggarwal, Demirgüç-Kunt et al. (2011) studied whether foreign remittance promotes financial development in developing countries. It covered 109 developing countries over the period between 1975 and 2007 and found a significant positive association between remittance and financial development, particularly at the aggregate level of deposits and credits, which support the complementary hypothesis. Moreover, the identified positive effects of remittance include increased client savings, clients seeking other bank products or services and increased demand for credits due to relaxed credit constraint on remittance recipients, which follows the induced financial literacy hypothesis (Bhattacharya, Inekwe et al. 2018). Their study used significant empirical approaches to address the issues such as unobservable country characteristics, common shocks and trends across the sample countries, and the transfer of remittance through non-bank financial institutions or informal channels. Moreover, it captures the biases that occur because of reverse causality

and the potential endogeneity of remittance arising as a result of measurement errors, omitted factors and reverse causation.

Nyamongo, Misati et al. (2012) also found evidence to support the complementary hypothesis in the context of African countries. Financial institutions in Africa stimulate remittance through low-cost transfer at a minimum risk. Conversely, remittance helps financial institutions to enhance investment portfolios and extend more credits. They also stated that the volatility of remittance has adverse effects on economic growth in countries in the African region.

Aggarwal, Demirgüç-Kunt et al. (2011) examined the remittance–financial development nexus in Mexico and found significant positive impacts of remittance on financial development. The identified significant positive impacts were on both the breadth[9] and the depth[10] of the banks and financial institutions in Mexico.

Following Aggarwal, Demirgüç-Kunt et al. (2011), Chowdhury (2011) examined the impact of foreign remittance on financial development in Bangladesh and revealed the presence of significant positive impacts of remittance on the financial development of the country. However, the study found no significant reverse causality from inflow of foreign remittance, concluding that financial sector development in Bangladesh is not significant in determining the inflow of remittance.

Brown, Carmignani et al. (2013) found that remittance does not cause increase in credit in the private sector in Kyrgyzstan and Azerbaijan. Their study tested whether there is any relationship between remittance and the households' likelihood of holding a bank

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[9] Breadth of banking and financial institutions is measured using the number of bank branches and deposit accounts.
[10] Depth of banking and financial institutions is measured using volume of deposits and credits to GDP.

account. According to the results, there is a negative relationship between the above two aspects in Azerbaijan and a positive association in Kyrgyzstan. As mentioned in the study, these diverse findings might depend on the stage of economic development of the country and the quality of institutions and legislations.

Nonetheless, Coulibaly (2015) studies the causal relationship between remittance and financial development in 19 sub-Saharan African countries over the period from 1980 to 2010 and found no evidence to prove either a significant impact of remittance on financial development or a significant influence of financial development on foreign remittance in those countries. The findings of Coulibaly (2015) are contradictory not only with Nyamongo, Misati et al. (2012) but also with Wagh and Pattillo (2007), who supported the positive impact of remittance on financial development in sub-Saharan African even after factoring the reverse causality among them. As mentioned in (Bhattacharya, Inekwe et al. 2018), these inconclusive findings could account for the differences in econometric methods, data and the period of study used in the analysis.

A recent study by Fromentin (2017) establishes a new thought by assessing the short-run and long-run impacts of remittance on financial development in 102 developing countries ranging from low to upper middle income. The study asserts that there is a significant positive impact of foreign remittance on financial development in the long run in the low and upper middle-income countries. However, in the short run, remittance has a significant effect on financial development only in middle and upper middle-income countries. There is no short-run significant impact on low-income countries. The results of this study are consistent with the finding of Masuduzzaman (2014), which focused on the long-run and the short-run association between remittance and financial development in Bangladesh.

Masuduzzaman (2014) studied whether remittance to Bangladesh affects the financial development of the country. According to the findings, inflow of remittance has significant positive impact in both the long run and the short run. The Granger causality results of the study found bidirectional causality between remittance deposits and remittance money supply only. Further, it found that credit caused remittance, although the reverse is not significant. This study did not focus on the examination of the complementary verses substitutability hypotheses, despite the importance of them for policy formation.

A more recent study by Bhattacharya, Inekwe et al. (2018) reinforced the positive impact of remittance on financial development in both developed and developing countries. Importantly, they found lower elasticity values in remittance in developing countries than in developed countries. These lower elasticity values in remittance for developing countries need to be taken into consideration and further study is needed to assess why elasticity values are low in developing countries, because they are more dependent on remittance than the developed countries.

In summary, the above two hypotheses i.e. substitutability and complementary focus mainly on the impact of foreign remittance on the credit of banks and financial institutions. Whether it enhances lending or reduces the demand for lending by migrants and remittance recipients of the migrants' family is a main concern. Putting these two premises in order of priority, diverse findings exist on the overall impact of remittance on financial development, including how it affects other key aspects such as deposits, assets of banks and financial institutions and the money supply of the country.

3.6.4 Summary and Gaps for the Current Study

Analysis of the literature shows that the impact of foreign remittance on financial development is indistinct. Empirical literature supports both the substitutability hypothesis (Ruiz-Arranz and Giuliano 2005, Giuliano and Ruiz-Arranz 2009) and the complementary hypothesis (Nyamongo, Misati et al. 2012) and shows diverse views on the impact of foreign remittance on financial development ranging from positive (Aggarwal, Demirgüç-Kunt et al. 2011, Masuduzzaman 2014) to no impact (Coulibaly 2015). The above mixed findings caution against the use of the suggested policies in different country contexts.

Moreover, studies examining the impact of foreign remittance on financial development in an Asian context are rare in the literature and virtually non-existent for Sri Lanka. However, investigation of whether there is a significant impact and a causal relationship between remittance and financial development in Sri Lanka is vital and a timely consideration for several reasons.

First, despite the large inflow of remittance, the southern Asian region has been the victim of economic contractions in the labour-demanding countries (IBRD 2016). These economic contractions mainly occurred in the oil exporting GCC countries because of oil price fluctuations in the global market. Sri Lanka is the most affected country in the region (Jawaid and Raza 2014). If foreign remittance has significant impacts on the financial development of the country, in particularly on money supply, deposits, credits and the assets of banks and financial institutions, the abovementioned economic changes in oil-exporting countries might lead to the deterioration of entire financial system of the country. Hence, exploring whether there is a significant impact of remittance on financial

development and the study of causation between remittance and financial development is an urgent need.

Second, despite the amount of research on the effect of remittance on economic growth and poverty (Adams and Page 2005, Jalilian and Kirkpatrick 2005, Imai, Gaiha et al. 2014), research on remittance and financial development is limited. The existing cross-country studies constrain the application of findings to other contexts and are not sufficient to propose policy directions (Rubenstein 1992, Adams and Page 2005, Ruiz-Arranz and Giuliano 2005, Gupta, Pattillo et al. 2009, De and Ratha 2012, Siddique, Selvanathan et al. 2012) because of the heterogeneity of geographic, demographic, macroeconomic and financial conditions of countries. With regard to policy formation, a test of the impact of remittance on financial development at the individual country is vital as opposed to cross-country studies (Chowdhury 2011) because of the low explanatory power and the presence of measurement issues in the cross-country studies (Adams Jr and Page 2005)

With the identification of gaps in the literature, this study extends the body of literature examining the impact of foreign remittance on measures of financial development within the context of an individual country, focusing more on policy formation. Thus, this study has main four aims to fulfil. The first aim is to assess the long- and short-run impact of remittance on the financial intermediary development of Sri Lanka, particularly on money supply, deposits, credits and assets of banks and financial institutions. The second aim is to examine whether substitutability or the complementary hypothesis are appropriate to the Sri Lankan context. The third aim is to conduct Granger causality analysis to establish whether the relationships are indeed of a causal nature and the fourth aim is to propose policy implications that would strengthen the favourable nexus between remittance and

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financial development. The review of the empirical literature helps formulation of the following hypothesis. The measurement of financial development is based on the four key variables of money supply, deposits, credits and assets of financial institutions, which are discussed in detail in Chapter 5.

Hypotheses

Objective 1: Assess the impact of foreign remittance on financial development

Long-run impact

Hypothesis 1

H_0: Remittance has no long-run positive impact on financial development in Sri Lanka

H_{0a}: Remittance has no long-run positive impact on money supply

H_{0b}: Remittance has no long-run positive impact on deposits in banks and financial institutions

H_{0c}: Remittance has no long-run positive impact on the assets of banks and financial institutions

H_{0d}: Remittance has no long-run positive impact on credits in banks and financial institutions in Sri Lanka

Short-run impact

Hypothesis 2

H_0: Remittance has no positive impact on financial development in the short run

H_{0a}: Remittance has no short-run positive impact on money supply

H_{0b}: Remittance has no short-run positive impact on deposits in banks and financial institutions

H_{0c}: Remittance has no short-run positive impact on the assets of banks and financial institutions

H_{0d}: Remittance has no short-run positive impact on credits in banks and financial institutions in Sri Lanka

Objective 2: Assess the substitutability versus complementary hypothesis

Hypothesis 3

H_0: The link between foreign remittance and financial development support the substitutability hypothesis

Objective 3: Study the causal relationship between foreign remittance and financial development

Hypothesis 4

H_0: There is no causal relationship between inflow of foreign remittance and financial development in Sri Lanka

H_{0a}: There is no bidirectional causality between remittance and money supply

H_{0b}: There is no bidirectional causality between remittance and deposits in banks and financial institutions

H_{0c}: There is no bidirectional causality between remittance and assets of banks and financial institutions

H_{0d}: There is no bidirectional causality between remittance and credits in banks and financial institutions

3.6.5 Impact of Remittance on Poverty and Income Inequality

Prior to the discussion of the impact of foreign remittance on poverty and income inequality, the following section explains poverty and income inequality in brief. It discusses different classifications and measurements of poverty and income inequality.

3.6.6 Poverty and Income Inequality

Poverty is a multifaceted phenomenon connected to peoples' lives. It is a focus of most disciplines such as economics and social sciences. It is vital to study poverty to know the condition (cognitive purposes), to comprehend the factors influencing poverty (analytical purposes), to project how government and official establishments need to intervene (policymaking purposes) and to gauge the effectiveness of implemented policies (monitoring and evaluation purposes) (Coudouel, Hentschel et al. 2002).

Poverty analysis could be based on the important aspects of highlights and the point of views adopted. As stated in De (2017) poverty can be classified according to the types of information used and the scale of thresholds. Objective poverty and subjective poverty are based on the information used, whereas absolute and relative poverty are based on the scale of the threshold. Objective poverty studies most frequently use household expenditure and income as variables in their studies. These variables give a high degree of objectivity since they come from direct observations. On the contrary, subjective studies are based on the perception that individuals and households have their own situations, which are different from one another.

As mentioned in De (2017), absolute poverty is a condition in which people are unable to fulfil their basic necessities such as food, housing and clothing. This concept is commonly found throughout the world. Relative poverty is a condition in which a person is disadvantaged either financially or socially. One of the special features of the latter concept is that it depends on the degree of development in the society and hence cannot be compared between two different contexts.

3.6.7 Measurements of Poverty and Income Inequality

There are two main types of poverty measurements: monetary and non-monetary. As illustrated in Figure 3.3, income and consumption are the most common monetary measures of poverty. Nevertheless, consumption receives the highest recognition as a monetary indicator of poverty compared with that of income indicators (Coudouel, Hentschel et al. 2002). This is mainly due to the following factors:

- Consumption is a better outcome indicator. Actual consumption is an important indicator for measuring poverty. It is more closely related to wellbeing. Even if people have enough income, if they do not have access to their consumption requirements they do not show improved wellbeing.

- Consumption is a more accurate measure than income. Aggregate income measure has its own limitations: fluctuation of household income in rural areas due to the agricultural harvesting cycle; erratic nature of income in urban areas due to the large informal economies; non-monetary income from households' own consumption or the exchange of goods.

- Consumption is a better indicator of actual standard of living and ability to meet necessities. Consumption is a broader concept that includes consumption of goods and services from their current income as well as savings and credit. When there are financial difficulties, people spend their accumulated wealth or they use it to obtain credit facilities from financial institutions to fulfil their requirements. In this kind of condition, consumption is a better indicator of standard of living.

However, researchers should not underestimate income as a monetary measurement of poverty. It allows the distinction to be made between different sources of income. Hence, researchers can use both the variables and make comparison when the data are available.

Non-monetary indicators focus on dimensions such as health, nutrition, literacy, self-esteem and power (Coudouel, Hentschel et al. 2002). Hence, the following aspects are identified as non-monetary poverty dimensions.

- **Health and nutrition poverty**. The status of health of household members is an important qualitative indicator of wellbeing. Therefore, nutritional status of children, incidence of diseases such as malaria and respiratory diseases, and life expectancy of different age groups are used as a proxy to measure health and nutrition poverty.

- **Education poverty**. Literacy level and number of years of education completed are some common measures of educational poverty.

- **Composite indexes of wealth**. This is an indicator with a mix of different aspects of poverty. The main limitation of such a composite index is difficulty of defining the poverty line.

Figure 3-3: Measurements of Poverty
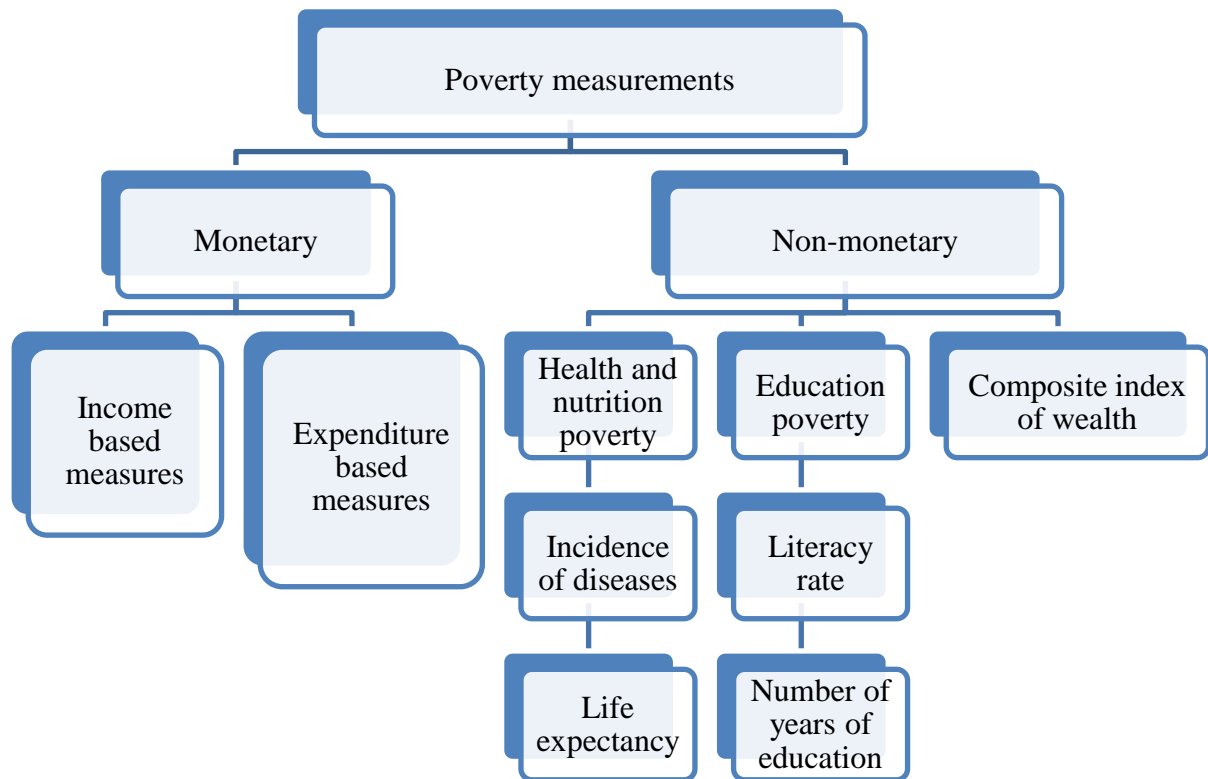
Source: Adapted from Coudouel, Hentschel et al. (2002).

3.6.7.1 Aggregate Poverty Measurements and the Poverty Line

After the above description of poverty and the categorisation of poverty, the following section outlines the main aggregate-level poverty measurements that are commonly used in research.

- **Poverty headcount (PHC) index**. It measures the incidence of poverty or the share of the population whose income or consumption is below the stated poverty line. Simply, it shows the percentage of population that cannot fulfil their necessities. Poverty headcount ratio is calculated using either poverty or extreme poverty. Moreover, it is possible to calculate the non-monetary poverty headcount

index based on different dimensions of poverty. To do that, it is necessary to set a poverty line before estimating the headcount ratio. Calculation of poverty headcount ratio (PHC) is as follows:

$$PHC = \frac{P}{n} \qquad (3.11)$$

where P is the number of poor people and n is the total number of people in a country.

- **Poverty gap (PGAP) ratio.** This ratio is used to measure the depth of poverty. It implies how far off the poor are from the poverty line. This measure shows the mean aggregate income shortfall of the population relative to the poverty line. Simply, it implies the total resources needed to bring all the poor to the level of the poverty line. It is possible to use this ratio with both monetary and non-monetary poverty measurements. Calculation of the poverty gap ratio (PGAP) is as follows:

$$PGAP = \sum_{i=1}^{p}(u - x_i) \qquad (3.12)$$

where u is the poverty threshold, xi is the equivalent income of person i and p is the number of poor people in the population.

- **Squared poverty gap (SPGAP).** This measures the severity of poverty. This ratio captures both the distance of the poor from the poverty line and the inequality among them. In this calculation, higher weight is assigned to those people who are further away from the poverty line.

There are three poverty lines, namely $1.9, $3.2 and $5.5. Calculations of the abovementioned aggregate poverty measurements are based on these three poverty lines. The uses of these poverty line are varied and they address different perspectives of poverty. For instance, the $1.9 poverty line helps measure extreme poverty and is the

most commonly used (IBRD 2017). Nonetheless, it does not help identify the moderate poverty in the world. Therefore, based on the economic trends and the changes in purchasing poverty parity in the world, the World Bank introduced the remaining poverty lines and they basically help measure the moderate poverty. The introduction of new poverty lines enhances the strength of the poverty measures because they represent the real condition of world poverty. Based on the critical overview of the poverty measures, unlike existing studies, this study uses the $1.9 and $5.5 poverty line to measure both extreme and moderate poverty in Sri Lanka.

3.6.7.2 Income Inequality

Income inequality is generally measured using the Gini coefficient, Theil's L index of inequality and the Theil's T index of inequality (Viet 2008). However, the most commonly used measure of income inequality is the Gini coefficient and it can be calculated as follows.

$$Gini = \frac{1}{2n(n-1)\bar{Y}} \sum_{i=1}^{n} \sum_{j=1}^{n} |Y_i - Y_j| \qquad (3.13)$$

where $\bar{Y}$ the average per capita expenditure and n is the number of people in the sample.

3.6.7.3 Review of Impact Studies

With the general overview of poverty and income inequality in the previous section, this section intends to discuss the impact of foreign remittance on poverty and income inequality. The impacts of remittance on poverty and income inequality are difficult to separate in research because these two areas are closely related. Hence, the following section reviews the existing literature on the impact of both poverty and income inequality together.

The relationship between remittance, poverty and income inequality has been explored to a considerable extent in the past. This has long been a primary interest of economists and policymakers. However, findings are contradictory, with mixed results ranging from significant positive impact to no impact at all. These contradictions might partially account for the lack of differentiation between the forms of remittance, the period of study and the country of study (WouTerSe 2010). They constrain the generalisability of findings from country to country and over the period.

In the very early literature, interaction between remittance, poverty and income inequality was confined to remittance from internal migration. This was mainly due to the lack of viable data on out migration and the inflow of remittance.

Oberai and Singh (1980) conducted a study to examine the impact of rural-urban migration on income inequality in India. According to the findings, rural-urban migration led the higher disparity between poor and rich in Punjab, India. Nevertheless, this was not experienced in Kenya and according to the findings of Knowles and Anker (1981), the impact of internal migration on income distribution was significantly low.

Adams Jr (1989) expanded the research from internally generated remittance to foreign remittance and used the counterfactual estimation method[11] to assess the impact of foreign remittance on income inequality. According to the findings of the study, foreign remittance increases the income inequality in Egypt. With a similar approach to Adams Jr (1989), Rodriguez (1998) reinforced the findings of Adams Jr (1989) because they found remittance increases the income inequality in Philippines.

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[11]Counterfactual estimation makes a comparison between what happened and what would have happed in the absence of the intervention. For instance, counterfactual estimation with reference to the foreign remittance–poverty nexus compares the poverty level with the inflow of foreign remittance compared with the absence of foreign remittance.

The study by Adams (1991) is an extension of his early study in 1989. In his new study, Adams (1991) examined both the remittance–poverty and the remittance–income inequality nexus. As stated in his study, foreign remittance helps poverty reduction; however, it increases the income inequality in Egypt. Barham and Boucher (1998) confirmed the findings of Adams (1991).

Adams, Lopez-Feldman et al. (2008) unveiled significant findings on the impact difference between internal and external remittance, that is, rural to urban migration and international migration. According to them, in Mexico internal remittance contributes to income equality whereas external remittance contributes to income inequality. Further to that, researchers found that international remittance leads to greater poverty reduction than does internal migration. However, the findings of Adams, Lopez-Feldman et al. (2008) are contradictory to the early findings of Oberai and Singh (1980), who found that internal or rural-urban migration contributes to income inequality. These contradictory findings mean that researchers must continually assess the remittance–poverty and remittance–income inequality nexus because the impact may vary depending on the period being considered.

Cross-country-level studies by Adams and Page (2005) and Maimbo and Ratha (2005) are also highly cited in the literature on the impact of foreign remittance on poverty. Adams and Page (2005) found that foreign remittance helps reduce the level, depth and severity of poverty, and its effect on the reduction of the severity of poverty is higher than the reduction of the level and depth of poverty. According to them, a 10% increase in per capita remittance reduces the number of people below the poverty line by 3.5%. A similar magnitude of remittance impact was also found in the study by Maimbo and Ratha (2005).

The study by Adams and Page (2005) could be summarised based upon their three main findings and the two policy implications that are vital for developing nations. The authors reported that foreign remittance has a strong significant impact on poverty reduction. They suggested migration and remittance are endogenous to poverty, that is, variation in poverty causes changes in the number of migrants and the level of official remittance (more work needs to be done on this since the extent of endogeneity bias on poverty was not large in absolute terms). Apart from the above, Adams and Page (2005) emphasised the collection and publication of sophisticated data on migration and international remittance to enhance the quality of further research in these areas. As mentioned in their study, the lack of a sophisticated database is a general limitation of migration and remittance-related studies, which reduces the significance of the conclusion drawn. This is still a burning issue for development research.

Importantly, Adams and Page (2005) suggested two policy implications that could offer more benefits to developing countries: (i) integrated migration policy and (ii) lowering the transaction cost of remittance. To a certain extent, these policy suggestions have been adopted, because in 2015 the United Nations incorporated two remittance-related goals into the SDG: (a) reducing remittance costs and recruitment costs for low-skilled migrants and (b) development of the GCM (KNOMAD 2018).

Acosta, Calderon et al. (2008) conducted a cross-country study on the remittance–poverty nexus. According to their study, the magnitude and elasticity of the impact of foreign remittance on poverty reduction differ from country to country and are higher for richer countries than poorer countries. Further, they argued that the low cost of migration, established migration networks and relative proximity to the migration destination are

key considerations that determine the impact of remittance and the elasticity of remittance on poverty.

Whether remittances flow towards the high, middle or low-income countries depends on the cost of migration. As argued in McKenzie and Rapoport (2007) and Massey and Espinosa (1997), the cost of migration is lower in countries with established migration networks and a long history of migration. They stated that availability of proper information and other support from existing migrants to new migrants is the main reason for the low cost of migration, which could enhance the probable poverty reduction impact and the capacity for income equalisation. However, the validity of the given argument might vary depending on the policy decisions of the respective labour-exporting countries on migration.

Viet (2008) also confirmed the findings of Adams and Page (2005) on poverty; he found that foreign remittance alleviates poverty. His study further found that foreign remittance increases the income inequality in Vietnam. However, as explained in the same study, the magnitude of the impact is small on both aspects despite the significant increase in household income and consumption in remittance-receiving households.

The study titled 'Extent of Poverty Alleviation by Migrant Remittance in Sri Lanka' by Kageyama (2008) is one of the key studies in the Sri Lankan context. The researcher argued that foreign remittance to Sri Lanka helps poor households only in the short run and it has many negative social effects on Sri Lanka. Thus, he concluded that foreign remittance is not a viable long-term solution to poverty alleviation in Sri Lanka.

De and Ratha (2012) conducted a study on the impact of foreign remittance on Sri Lanka. According to the findings of the study, foreign remittance helps income mobility and asset accumulation. Further, the study revealed that foreign remittance to Sri Lanka goes

largely to those households in the bottom quintiles of the income distribution. Another significant long-term impact of foreign remittance in Sri Lanka is its positive effect on children's health and education. This is noteworthy contribution because a healthy and educated labour force can contribute to the economy greatly. Further, the researchers found that Sri Lankan foreign remittance is not spent mainly on general consumption or asset accumulation.

Beyene (2014) explained the same concept as Acosta, Calderon et al. (2008) and Viet (2008), in a different way. As mentioned in his study, remittance could lead to higher income inequality if it is skewed in favour of the better-off or the high-income households, whereas remittance could lead to reduction of income inequality if it is transmitted more towards the poor households. Nonetheless, high income inequality is not desirable for the social and economic stability of a country (Ravallion 2005, Easterly 2007).

As explained above, Beyene (2014) argued that remittance could lead to higher income inequality if it is skewed to better-off households. De and Ratha (2012) found that in Sri Lanka, remittance largely goes to low-income households. Thus, these two arguments together assume that remittance to Sri Lanka should reduce the income inequality of the country. However, there is no study examining the impact of remittance on income inequality in Sri Lanka.

One of the most recent study by Bang, Mitra et al (2016) studied whether remittance improve income inequality in Kenya. Researchers used instrumental variable quantile analysis using sample of Kenyan household in 2009. Based on the analysis, they found there is a statistically significant impact of remittance on poverty reduction and strong equalizing impact of remittance on distribution of expenditure.

In summary, the review of the literature shows the mixed nature of results for the impact of foreign remittance on poverty and income inequality. Thus, it is impossible to generalise the findings of one country to another, since no decisive results were found and the findings vary from study to study (Beyene 2014). The findings of Beyene (2014), together with the findings of McKenzie and Rapoport (2007), therefore highlighted the importance of examining the impact of foreign remittance on poverty and income inequality at different country contexts prior to the development of country-specific policies.

In conclusion, both theoretically and empirically, the debate over the developmental impact of international migrant remittances has remained vague. To contribute to this debate, null hypotheses H_5 and H_6 will be tested with respect to Sri Lanka:

H_5: International remittance inflows do not affect poverty

H_6: International remittance inflows do not influence income inequality

Further, the following null hypotheses will be tested to examine the causal relationship between foreign remittance–poverty and foreign remittance–income inequality.

H_7: There is no causal relationship between foreign remittance and poverty

H_8: There is no causal relationship between foreign remittance and income inequality

3.7 Conceptual Framework of the Study

Based on the literature review above, the conceptual framework in Figure 3.4 has been developed. It is an overview of the study explaining the objective of the study together with variables and measurements.

Figure 3-4: Conceptual Framework of the Study

Foreign Remittances, Financial Development, Poverty and Income Inequality

Flow of foreign remittances to Sri Lanka (Rem)

Flow of official foreign remittances through financial system

Measurements

Remittances as a percentage of GDP (Rem/GDP)

Financial Development (FD)

Financial intermediary development (FID)

Credit

Deposits

Money

Assets

Poverty

Level: poverty headcount ratio (PHC)

Depth: poverty gap ratio (PGAP)

Severity: squared poverty gap (SPGAP)

Alternative measure: per capita expenditure

Income Inequality

Gini coefficient

Determinants

PCGDP, Size, Inf, Int $_{home,}$ OPENCU, OPENCAP

Determinants

PCGDP, Inequality, Inflation, OPENCU, OPENCAP, Interest rate

Determinants

PCGDP, Inequality, Inflation, OPENCU, OPENCAP, $_{Interest}$ rate

4 Research Process and Methodology

4.1 Introduction

Chapter 3 reviewed the theoretical and empirical literature. It commenced with the theories on migration and then explained the history of migration in the world. Subsequently, it reviewed theoretical underpinnings and provided an overview of foreign remittance in the world. It focused on the empirical literature on motives, determinants of foreign remittance and the impact of foreign remittance. Based on the empirical literature, it derived the research hypothesis and developed the conceptual framework accordingly. Following Chapter 3, this chapter focuses on the research process and methodology. The chapter has four sections. Section 2 is an overview to the types of data and the sources of data collection. Section 3 is about time series data analysis; it gives a detailed explanation of the steps and associated preliminary tests. Section 4 of this chapter details the processes of the ARDL model, causality test, recursive estimate, variance decomposition and impulse response analysis.

4.2 Data and Data Sources

Econometric estimation for this thesis uses time series data. Time and the data sources vary depending on the individual study; however, this study has collected data from the period between 1975 and 2016. In general, this research uses data collected from the following sources.

- IMF Balance of Payments Statistics Yearbook and International Financial Statistics
- World Bank World Development Indicators and PovcalNet databases
- Department of Census and Statistics (Sri Lanka) HIES reports

- Central Bank of Sri Lanka (CBSL) annual reports and socio-economic data booklets

- PRS Group International Country Risk Guide (ICRG)

4.3 Econometric Procedures for Data Analysis

This section explains the econometric procedures for data analysis. It begins with a general overview of key considerations in econometric model selection. Then it gives a detailed overview of time series data analysis and the selected econometric model of the study.

4.3.1 General Overview of the Selection of Econometric Model

Selection of a correct econometric model is the basic of sound econometric analysis. As stated in Thomas (1993) and Song and Witt (2000), econometric model selection should satisfy the following six criteria. First, the econometric model should be consistent with the economic theory. If the model is not consistent with an economic theory, it invalidates its use for forecasting and policy evaluation. Second, it should assess the data coherency; the selected econometric model should be subject to all the relevant diagnostic checking to accept it as a valid model.

Third, the model should be parsimonious. This relates to the importance of a simple model over a more complex model. If two models with a different number of explanatory variables have the same explanatory power, it is advisable to select the one with the smaller number of variables, because adding extra variables leads to little gain and excess variables could lead to inadequate degrees of freedom and imprecise estimation. Fourth, the model should be encompassing; models should be able to incorporate all or most of the previously developed models. Fifth, the model should have parameter consistency.

This is an important criterion when the econometric model is used for forecasting. It states that the parameters of the model should be constant over time. Finally, the model should be exogenous; explanatory variables of the model should not be contemporaneously correlated with the error term. Having understood the important perspectives of econometric model selection, the following section gives a detailed overview of time series analysis in advance of the upcoming chapters, which are based on time series data.

4.3.2 Time Series Analysis

Time series analysis models the variables using their past values and the past and future error terms to capture empirically relevant features of the observed data (Brooks 2014). This data analysis technique begins with the test of stationarity to overcome the spurious regression problem. Generally, time series data could be stationary or non-stationary(Song and Witt 2000, Brooks 2014). As specified in Song and Witt (2000), a time series that satisfies the following conditions is treated as a stationary time series:

1. Constant mean $\quad\quad E(y_t) = \mu$

2. Constant variance $\quad E[(y_t - \mu)^2] = Var\ (y_t) = \sigma^2$

3. Constant covariance $\quad E[(y_t - \mu)(y_{t-p} - \mu)] = Cov(y_t - y_{t-p}) = \Omega_p$

A time series that does not meet the above conditions is known as a non-stationary time series. It also known as a time series that has unit roots (Song and Witt 2000). The number of unit roots in a time series is determined by the number of times it should difference to convert into a stationary time series. In statistics, *I(d)* states the unit roots in a time series. For example, y_t ~ *I(1)* denotes that y_t need to be differenced only once to convert into a stationary time series, where y_t ~ *I(0)* means time series is stationary at level.

In research, there are several statistical tests to test the stationarity of a time series. The following section explains them in brief.

4.3.3 Tests for Stationarity or Unit Root Tests

Unit root tests have evolved and improved over time. The following section briefly discusses the unit roots tests such as the Dickey–Fuller (DF) test (Dickey and Fuller 1979), Augmented Dickey–Fuller (ADF) test (Dickey and Fuller 1981), Phillips–Perron (PP) Test (Phillips and Perron 1988) and Ng–Perron test (Ng and Perron 2001) procedures, including their associated strength and weaknesses.

4.3.3.1 Dickey Fuller Test

As mentioned in Song and Witt (2000)**,** the hypothesis for unit root for the time series modelled by an autoregressive (AR (1)) are as follows:

$H_0: \beta_1 = 1$ (non-stationary/ unit root)

$H_1: \beta_1 < 1$ (stationary)

The time series equation with AR (1) process is $y_t = \beta_0 + \beta_1 y_{t-1} + e_t$. To test the hypothesis, it is necessary to use the *t* ratio:

$$t = \frac{\hat{\beta}_1 - 1}{SE(\hat{\beta}_1)}$$
(4.1).

The *t* ratio has a non-standard distribution and therefore conventional critical values are not applicable to test the above null hypothesis (Song and Witt 2000)**.** Thus, the alternative is the DF test (Dickey and Fuller 1979).

The critical values of the DF test are based on the Monte Carlo simulations. When the calculated *t* statistic is lower than the DF test table values, the null hypothesis of non-

stationary should be rejected. Non-rejection of the null hypothesis implies the presence of unit roots, and therefore, it is necessary to repeat the test with the differenced data until the series becomes non-stationary. As stated in Brooks (2014), it can be conducted with three forms: intercept only, intercept and deterministic trend, and neither. These three forms are based on the different assumptions implied by their names. The following three equations represent these three forms (Song and Witt 2000):

1. Intercept-only model $\qquad$ $\Delta y_t = \beta_0 + \emptyset y_{t-1} + e_t$

2. Intercept and deterministic trend $\qquad$ $\Delta y_t = \beta_0 + \lambda T + \emptyset y_{t-1} + e_t$

3. No intercept or deterministic trend $\qquad$ $\Delta y_t = \emptyset y_{t-1} + e_t$

4.3.3.2 Augmented Dickey Fuller Test

The ADF test is an extension of the DF test. The difference between the DF and ADF test is that the latter has augmented using the lagged dependent variables. With that, it solves the problem of autocorrelation in the error term. Like the DF test, ADF also has three different forms:

1. Intercept-only model $\qquad$ $\Delta y_t = \beta_0 + \emptyset y_{t-1} +$

$\sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + e_t$

2. Intercept and deterministic trend $\qquad$ $\Delta y_t = \beta_0 + \lambda T + \emptyset y_{t-1} +$

$\sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + e_t$

3. No intercept or deterministic trend $\qquad$ $\Delta y_t = \emptyset y_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + e_t$

The null hypothesis of the non-stationary time series (H_o: non-stationary/ unit root) is a test against the alternative hypothesis of the stationary time series (H1: stationary) using the ADF test statistic calculated based on:

$$t = \frac{(\hat{\emptyset})}{SE\,(\hat{\emptyset})} \qquad\qquad\qquad (4.2).$$

The choice of a model out of the previously mentioned three models depends on the nature of the time series. This is based upon the time series plots and the ADF regression coefficients. As explained in (Metes 2005), when three models give divergent views on the acceptance or rejection of null hypothesis (H_o: Time series has unit root), the researcher should check the coefficient of the regression. For example, assume that based on the ADF critical values, a model with constant and a model without constant and trend ended up with acceptance of the null hypothesis, whereas a model with constant and trend rejected the null hypothesis. In this condition, the researcher should check the trend coefficient to make the final decision.

4.3.3.3 Phillips-Perron (PP) Test and Ng- Perron Test

The PP test (Phillips and Perron 1988) is a generalisation of the DF test and relaxes the assumptions of no autocorrelation or heteroscedasticity in the DF test (Song and Witt 2000). This is similar to the ADF; thus, it gives same conclusion as it, and is associated with the limitations similar to those of the ADF test (Brooks 2014).

The Ng–Perron unit root test (Ng and Perron 2001) overcomes the weaknesses of existing unit root tests such as the ADF and PP tests. According to Ng and Perron (2001), there are two main problems associated with existing tests. The first problem is the low power when the root of the autoregressive polynomial is close to but less than unity. The second problem is the size distortion that could arise when a large negative root is in the moving average polynomial of the first difference. Therefore, as mentioned in Wickremasinghe (2011), compared with other unit root tests, the Ng–Perron unit root test possesses a better power and size property.

4.3.3.4 Unit Root Tests and Model Selection

Time series data could be stationary at different stages. They could be at level I(0), first difference I (1) or second difference I (2). The econometric model selection for a research study depends on the stationarity. If all the variables in the study are I (0), linear regression analysis should be used. When variables are a mix of I (0), and I (1), the ARDL model is suggested. If all the variables in the model are I (1), researchers must test the co-integration of the model.

Figure 4-1: Unit Root and Model Selection
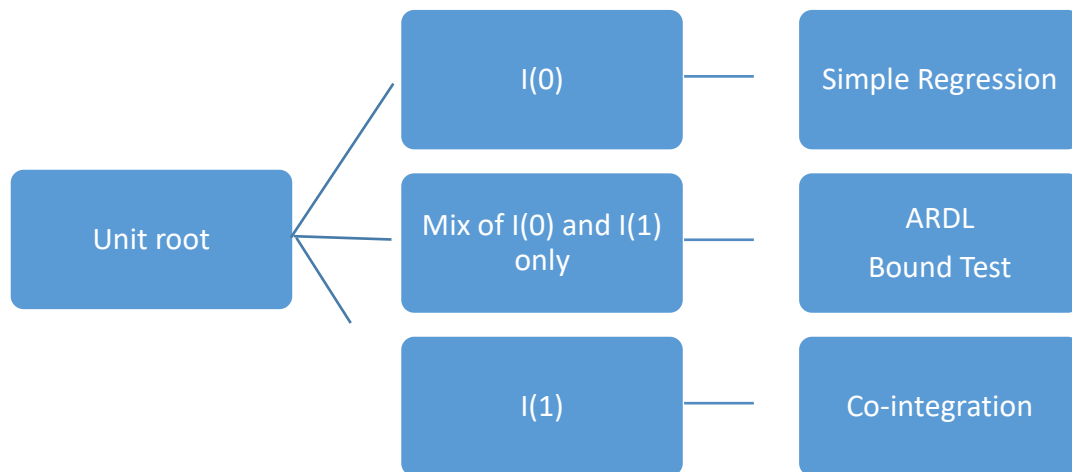
Note: I(0)—stationary at level; I(1)—stationary at first difference.
Source: Author, compiled based on Brooks (2014).

4.4 Model Selection: Autoregressive Distributed Lag Model

The data of the study are found to be a mix of I (0) and 1 (1) variables. Therefore, this thesis uses the ARDL model and the following section gives a detailed overview of the model.

Co-integration techniques are widely used in research that is based on macroeconomic variables (Pesaran, Shin et al. 2001). A common feature of these co-integration techniques is that all variables under consideration should be integrated on order one. Hence, these

techniques entail pre-tests to confirm whether the variables are integrated on order one or stationary at first difference or neither.

Nevertheless, these co-integration techniques are not very powerful in certain conditions. Further, they are not suitable for small samples because of the probable uncertainties in the so-called pre-tests. Alternatively, Shin, Smith et al. (1998) introduce the ARDL bound test procedure, which does not require pre-tests like most of the aforesaid models. The model specification in the ARDL model used lags of both explanatory and explained variables (Brooks 2014). The ARDL model was extended further by Pesaran, Shin et al. (2001) and it has been widely used in research. This model is widely accepted in finance and business research because of the potential for capturing the dynamic structure of the explained (dependent) variable that might be affected by inertia[12] of the dependent variable and the overreactions[13] (Brooks 2014).

As highlighted in Pesaran, Shin et al. (2001), the ARDL model has sound statistical properties compared with other co-integration methods. First, this model can be used irrespective of whether the variables are I (0), I (1) or a mix of I (0) and I (1). However, a test of stationarity is required to ensure that there will not be a model crash due to the presence of integrated stochastic trend of I (2) (Nkoro and Uko 2016). Second, the ARDL model yields consistent estimates of long-run coefficients that are asymptotically normal irrespective of whether the regressors are purely I (0), purely I (1) or mutually co-integrated. Third, the ARDL model has superior statistical properties in small samples. Finally, in comparison to the traditional Johansen-Juselius co-integration method, the

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[12] Probable impact of change in explanatory variables that could affect the dependent variable with a lag over several time periods.
[13] Overreaction to the good or bad news in the market.

ARDL model is more efficient and the estimates are robust (Nkoro and Uko 2016, Tursoy and Faisal 2016).

In summary, the ARDL bound testing procedure has the following advantages over conventional co-integration testing (Pesaran, Shin et al. 2001, Narayan 2004, Duasa 2007).

1. It is able to be used with a mixture of I (0) and I (1) variables.

2. It is easy to implement and interpret because it involves a single equation setup.

3. It is possible to use different lag lengths for variables in the model.

4. The model is feasible with a limited sample size. A researcher can use this with even 30 to 80 observations in their research.

5. This method uses a single reduced form equation in contrast to the conventional system of equations and avoids the use of many specifications.

With these statistical properties, the following section provides a detailed explanation of the model.

4.4.1 The Process of ARDL in E-Views

Step 1: Assessing the stationarity of the data

Stationarity tests such as ADF, PP test, Ng–Perron test or Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test could be used to assess that none of the variables is I (2). Selection of the suitable test is based on the study; detailed explanations of the strengths and weaknesses of each of the above tests has been discussed in Section 4.3.3.

Step 2: Selection of appropriate lag structure

The selection of the number of lags in the model could be based on the following criteria: Akaike's information criterion (AIC), Schwarz information criterion (SIC) and Hannan-Quinn criterion (HQC). AIC is superior when the sample size is less than 60 and HQC and SIC are appropriate for quarterly Vector Auto Regression (VAR) with sample size above 120 (Liew 2004). Thus, this study used AIC to choose appropriate lags for the mode that is given in E-Views.

Step 3: Determining the model validity

Tests of serial autocorrelation and stability are the main diagnostic tests to determine the model validity in the ARDL model.

Step 3.1: Serial autocorrelation

The Breusch–Godfrey serial correlation Lagrange multiplier test (Breusch and Godfrey 1980) is the suggested test for serial autocorrelation in ARDL. This test is statistically more advanced than the Durbin Watson D statistic. Further, this is identified as a statistically sound test to check the presence of first order autocorrelation and this can be used in both the ARDL model and the distributed lag (DL) model.

Step 3.2: Model stability test

Model stability is tested using the cumulative sum (CUSUM) test. According to the test, if all the inverse roots of the characteristic equation in the model lie inside the unit circle it indicates the dynamic stability of the model.

ARDL model development

In general, most of the econometric models are static in nature and hence consider only the contemporaneous relationship between variables; that is, the change in explanatory variables at time *t* causes the exploratory variable at time *t*, as shown in Equation 4.3.

Static model

$$y_t = \beta_1 + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 x_{4t} + u_t \qquad (4.3)$$

where *y* is the dependent variable, x_2, x_3 and x_4 are explanatory variables, β_1 is the intercept coefficient, β_2, β_3 and β_4 are slope coefficients, *t* is time and *u* is the error term of the model.

The extension of the static model in Equation 4.3 helps derive two models, the DL model and the ARDL model. The DL and ARDL models are shown in Equations 4.4 and 4.5, respectively. As shown in Equation 4.4, the DL model contains the lags of explanatory variables only and the ARDL model contains the lags of both explanatory and explained variables, as shown in Equation 4.5 (Brooks 2014).

Distributed lag model

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \sum_{i=1}^{k} \beta_{2i} X_{2t-i} + \sum_{i=1}^{k} \beta_{3i} X_{3t-i} +$$
$$\sum_{i=1}^{k} \beta_{4i} X_{4t-i} + u_t \qquad (4.4)$$

Autoregressive distributed lag model

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \sum_{i=1}^{k} \beta_{2i} X_{2t-i} + \sum_{i=1}^{k} \beta_{3i} X_{3t-i} +$$
$$\sum_{i=1}^{k} \beta_{4i} X_{4t-i} + \sum_{i=1}^{k} \beta_{5i} Y_{t-i} + u_t \qquad (4.5)$$

The ARDL model (Pesaran, Shin et al. 2001) has been in use for a longer time; however, in the recent past, this has been well recognised for testing the co-integration between economic time series. With the above general overview, the overall process of the ARDL model involves three steps in analysis: (i) test of the presence of co-integration, (ii) estimation of the coefficients of the long-run model and (iii) estimation of short-run dynamic coefficients (Sari, Ewing et al. 2008).

Co-integration

Suppose y_t, x_1 and x_2 are I(1) and x_3 is I(0); the basic form of the ARDL model is given in Equation 4.6, as shown in (Pesaran, Shin et al. 2001):

$$\Delta y_t = a_0 + \sum_{j=1}^{n} \emptyset_j \Delta y_{t-j} + \sum_{j=1}^{n} \theta_j \Delta x_{1\ t-j} + \sum_{j=1}^{n} \gamma_j \Delta x_{2\ t-j} + \sum_{j=0}^{n} \vartheta_j x_{3\ t-j} +$$

$$\delta_1 y_{t-1} + \delta_2 x_{1t-1} + \delta_3 x_{2t-1} + \varepsilon_t \tag{4.6}$$

where

Δ is first difference, *y* is the dependent variable, a is the intercept of the model, *x₁, x₂* and *x₃* are independent variables where *x₁* and *x₂* are I(1) and *x₃* is I(0), *j* is the lag term, *n* is the total number of lags, $\emptyset$, θ, γ, ϑ and δ are slope coefficients and ε is the residual of the model.

The above ARDL model is used to assess the null hypothesis of no co-integration, against the alternative hypothesis of co-integration in the variables of interest.

Null hypothesis $H_0 = \delta_1 = \delta_2 = \delta_3 = \ldots = \delta_k = 0$

Alternative hypothesis $H_1 = \delta_1 \neq \delta_2 \neq \delta_3 \neq \ldots \neq \delta_k \neq 0$

The rejection or non-rejection of the null hypothesis is based on the *F* statistic of the Wald test. Even though the *F* test is used in ARDL modelling, there is no exact critical value for the model with a mix of I (0) and I(1) variables in the *F* statistics. Hence, alternative approaches are the Pesaran, Shin et al. (2001) bound test critical values or Narayan (2004) critical values.

Based on the number of regressors and the presence of trend and intercept of the model, there are two sets of critical values. In both methods, the lower bound critical value assumes that all variables are I (0), whereas the upper bound assumes all are I (1). As stated in Pesaran, Shin et al. (2001) and Narayan (2004), if the *F* statistic is below the lower bound, it means that variables are I (0) and no co-integration is possible in the model. When the *F* statistic is above the upper bound, it testifies to the existence of co-integration. However, if it lies in between the upper and the lower bound, it leads to an inconclusive decision. In comparison, the bound test critical values of Narayan (2004) are stronger than those of (Pesaran, Shin et al. 2001) for comparatively smaller sample sizes.

Estimation of the coefficients of the long-run model

Based on the results of the co-integration test, the next step is to estimate the long-run model.

The long-run model is given in Equation 4.7, below.

$$y_t = \beta_1 + \beta_2 x_{1t} + \beta_3 x_{2t} + u_t \tag{4.7}$$

The ordinary least squares (OLS) method is used to estimate the long-run coefficients of the model stated in Equation 4.7. In the OLS estimation, it is assumed that the coefficients are constant over time. This study used recursive estimation to assess whether the coefficients are constant or dynamic in nature.

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Recursive estimation

Recursive estimation (sometime known as on-line estimation or parameter tracking) is widely used to test the parameter consistency (Hansen and Johansen 1993). This can be used in the case of both constant and time-varying parameters (Ledolter 1979). The null hypothesis of the recursive estimation is the parameter consistency; however, this does not formulate a specific alternative hypothesis.

The recursive estimates produce sample of parameters and summary statistics, where the time path of the parameters is graphically presented and used as a diagnostic test in recursive estimates. This mainly take three different forms: (i) forward recursion, (ii) backward recursion and (iii) window of fixed length.

Recursive OLS initially involves estimating the model using OLS from a small subsample of data ($t = 1, 2\dots$ n, where n $\geq k$ and k is the number of explanatory variables in the model). In the next step, the sample period is extended by one observation to $t = 1, 2\dots$, n + 1 and model is re-estimate using the OLS until all the observations in the sample are used.

Step 8: Short-run estimation (error correction model)

As explained by Engle and Granger (1987), when two variables are co-integrated, there exists an error correction model (ECM). This ECM explores another channel of causality, which is not explained through traditional Granger causality tests if variables are I(1). According to that, causality can be tested in the following three ways. The first way involves testing the statistical significance of the error correction term (ECT) using the t test. The second way involves testing the joint significance of the lags of all explanatory variables by an F test or Wald χ^2 test. The third way involves testing the ECT and the

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lagged terms of each explanatory variable simultaneously by a joint F or Wald χ^2 test (Wickremasinghe 2011). As explained in (Brooks 2014), the ECM is shown in Equation 4.8:

$$\Delta y_t = a_0 + \sum_{j=1}^{n} \emptyset_j \, \Delta y_{t-j} + \sum_{j=1}^{n} \theta_j \Delta x_{1\,t-j} + \sum_{j=1}^{n} \gamma_j \, \Delta x_{2\,t-j} + \sum_{j=0}^{n} \vartheta_j x_{3\,t-j} +$$

$$\delta_1 y_{t-1} + \delta_2 x_{1t-1} + \delta_3 x_{2t-1} + \omega ECT_{t-1} + \varepsilon_t \qquad (4.8)$$

The above analysis gives a detailed explanation of the main econometric model used in the upcoming chapter. The next section briefly explains the Granger causality test and the recursive estimates, which have also been used in the analysis of causality and the dynamic nature of the derived remittance model in Chapter 4.

4.5   Granger Causality Test

As mentioned in Foresti (2006), the Granger causality test (Granger 1969) can be applied in three different situations. First, it can be applied as a simple Granger causality test with two variables and their lags. Second, it can be applied as a multivariate Granger causality test when there are more than two variables that could influence the results. Finally, this multivariate model can be tested in a VAR framework to demonstrate the cause and effect relationship between variables. However, Granger causality test is not necessarily a test for real cause and effect relationships.

The Granger causality test is in both linear and nonlinear forms. The linear Granger causality is used in implementing the test and is only used to assess the causality in the means between economic variables (Granger and Newbold 2014). This well-known test of causality involves estimation of the linear reduced form of VAR. As stated in Hiemstra and Jones (1994), bivariate Granger causality can be shown as follows:

Suppose

$$X_t = A(L)X_t + B(L)Y_t + U_{X,t}$$

$$Y_t = C(L)X_t + D(L)Y_t + U_{Y,t}, \ t = 1,2, ...,$$

where *A(L), B(L), C(L)* and *D(L)* are one-sided lag polynomials of orders a, b, c and d in the lag operator L. The null hypothesis is that *Y* does not cause *X* and the alternative hypothesis is therefore *Y* causes *X,* which can be tested with *F* or χ^2 test. The null hypothesis would be rejected if the coefficients of the elements in *B(L)*, that is, $B_i\,(i=1\,...,\,b)$, are jointly significantly different from zero. Bidirectional causality exists if Granger causality runs in both directions where the coefficients on the elements in both *B(L)* and *C(L)* are jointly different from zero (Hiemstra and Jones 1994).

As mentioned in (Foresti 2006), the following four hypotheses could be tested for OLS coefficients in the above two equations.

1. Unidirectional Granger causality from variable X to Y: X Granger causes Y, but not vice versa. Therefore, $\sum_{j=1}^{n} \tau j \neq 0$ and $\sum_{j=1}^{q} \psi j =0$.

2. Unidirectional Granger causality from Y to X: Y Granger causes X, but not vice versa. Therefore, $\sum_{j=1}^{n} \tau j = 0$ and $\sum_{j=1}^{q} \psi j \neq 0$.

3. Bidirectional Granger causality: X Granger causes Y and vice versa. In this, $\sum_{j=1}^{n} \tau j \neq 0$ and $\sum_{j=1}^{q} \psi j \neq 0$.

4. Independent X and Y: there is no Granger causality in any $\neq$ direction; hence, $\sum_{j=1}^{n} \tau j = 0$ and $\sum_{j=1}^{q} \psi j = 0$.

4.6 Impulse Response Analysis and Variance Decomposition

This is mainly used in structural or semi-structural Vector Auto Regression (VAR) models and VAR models estimated in vector error correction (VEC) form. The impulse responses identify the response of the dependent variables in the VAR to shock the other variables in the model (Brooks 2014). Simply, in the process of impulse response analysis (IRA), a unit shock is applied to the error in each variable in the equation. Then the effect upon the VAR over time is recorded. The number of impulse responses created in the system is equal to the square of the number of variables in the model.

As stated in Brooks (2014), following bivariate VAR (1) illustrates how impulse response operates. Suppose the bivariate VAR is as given in the following equation:

$$y_t = A_1 y_{t-1} + u_t \qquad (4.9)$$

where $A_1 = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix}$.

Further, Equation 4.9 can be written as follows using the elements of the metrics and vectors.

$$\begin{bmatrix} y_{1\,t} \\ y_{2\,t} \end{bmatrix} = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix} \begin{bmatrix} y_{1\,t-1} \\ y_{2\,t-1} \end{bmatrix} + \begin{bmatrix} u_{1t} \\ u_{2t} \end{bmatrix}$$

Now, if we consider the effect at time $t=0, 1\ldots$ of a unit shock to y_{1t} at time $t=0$,

$$y_0 = \begin{bmatrix} u_{10} \\ u_{20} \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

$$y_1 = A_1 y_0 = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 0.5 \\ 0 \end{bmatrix}$$

$$y_2 = A_1 y_1 = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix} \begin{bmatrix} 0.5 \\ 0 \end{bmatrix} = \begin{bmatrix} 0.25 \\ 0 \end{bmatrix}$$

It is now clear that it is possible to drive the impulse response function of y_{1t} and y_{2t} to a unit shock in y_{1t}.

If we further consider the effect of a unit shock to y_{2t} at time $t = 0$,

$$y_0 = \begin{bmatrix} u_{10} \\ u_{20} \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

$$y_1 = A_1 y_0 = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 0.3 \\ 0.2 \end{bmatrix}$$

$$y_2 = A_1 y_1 = \begin{bmatrix} 0.5 & 0.3 \\ 0.0 & 0.2 \end{bmatrix} \begin{bmatrix} 0.3 \\ 0.2 \end{bmatrix} = \begin{bmatrix} 0.21 \\ 0.04 \end{bmatrix}$$

The variance decomposition analysis (VDA) gives a similar analysis to the IRA. VDA traces the proportion of the movement in dependent variables that is attributable to its own shock and the shocks to the other variables too. According to this method, a shock to a variable in the system equation affects the variable itself directly and then it is transmitted to the other variables in the system through the dynamic structure of the VAR. In both the IRA and VDA, ordering of the variable is an important aspect to consider.

4.7 Summary

This chapter introduced the research process and methodology of the study. First, it provided information about the types of data and the data collection sources. Second, provided an overview of the key considerations of econometric model selection. Third, it explained the steps involved in time series data analysis, including details about different types of stationarity tests.

Fourth, it explained the selection of time series analysis based on the stationarity of the data. As explained in the chapter, if all the variables are I(0) the researcher has to use regression analysis and if all the variables are I(1) an autoregressive model is

recommended. When the variables are a mix of I (0) and I (1), use of the ARDL model is recommended.

Moving further with time series model selection, this chapter gave a detailed review of the ARDL model. It explained the estimation of co-integration, long-run model estimation and short-run ECM. Finally, it outlined the Granger causality test and recursive estimates, which are used together with ARDL and AR models in the upcoming data analysis chapter.

5 Analysis and Discussion

5.1 Introduction

The previous chapter explained the research methodology of the study, giving a detailed overview of the data collection sources, types of data and the selection of the data analysis technique. It explained the ARDL model with the sequential steps to be followed. Based on the research methodology discussed in Chapter 4, this chapter analyses and discusses the main findings of the study. The chapter has divided into three sections. Section 1 is on the motive for and determinants of remittance and it (i) examines the motive for remittance to Sri Lanka with the aim of reviewing whether it is dynamic or static over the period, and (ii) assesses the determinants of remittance to Sri Lanka. Section 2 analyses the impact of foreign remittance on financial development in Sri Lanka. It examines whether foreign remittance helps financial development and investigates the causality between the two aspects. This section examines the substitutability versus complementary hypothesis in the Sri Lankan context. Section 3 examines the impact of foreign remittance on poverty and income inequality in Sri Lanka.

5.2 Analysis 1: The Dynamic Nature of Motives for Remittance and Determinants of Remittance to Sri Lanka

Foreign remittance can be motivated by altruism, self-interest or a combination of both (Lucas and Stark 1985, Agarwal and Horowitz 2002, Fonchamnyo 2012, Nnyanzi 2016). Understanding what motivates migrants to remit is important because different motives lead to a different amount of remittance aggregate. Further, the development impact of remittance also varies depending upon the motive for remittance. Thus, identifying the

underlying motive for remittance helps policymakers to customise policies accordingly and ensure the sustainable flow of remittance while enhancing the development impacts.

The relevant literature on the motive for remittance and the determinants of remittance has been discussed in detail in Chapter 3. Thus, Section 5.2.1 summarises the identified gaps, objectives and hypotheses of the study.

5.2.1 Gaps in the Literature

The review of existing literature revealed several noteworthy gaps that are deserving of attention. First, it showed the non-availability of research examining the probable dynamic nature of the motive for foreign remittance. Except for studies by Abdin and Erdal (2016), other studies provide evidence only on whether the motive for remittance is dominated by altruism, self-interest or a mix of both.

As discussed in Chapter 3, Abdin and Erdal (2016) examined the dynamic nature of the motive for foreign remittance of Pakistani taxi drivers residing in Barcelona and Oslo. They focused only on the electricity crisis in Pakistan and studied how the crisis deviated migrants' motives from investment to altruistic motive. However, whether the motive for remittance could be static despite changes in economic conditions over a period has not been sufficiently examined at a macroeconomic level. This is an important aspect for migration and foreign remittance policy development.

Second, the motives and determinants of foreign remittance to Sri Lanka have not adequately been examined in the existing studies. In most cases, cross-sectional analysis has taken Sri Lanka as a sample country, but too little attention has been given to a detailed analysis, which hinders the development of country-specific foreign remittance policies, despite its importance over the other external currency flows. At the same time,

existing literature has also emphasised several reasons for the importance of country-specific study of determinants of remittance to Sri Lanka. This is due to the fluctuation in the country's inflow of foreign remittance and excessive dependence on GCC countries for earning foreign currency. There is also limited information on how this higher dependence on the gulf countries for foreign remittance pose risks to Sri Lanka and influence its economy.

Third, most of the remittance-dependent countries are developing countries with higher political instability. As explained in Chapter 3, the systematic theory of migration explained that political repression increases migration. Political repression is directly linked with the country risk. Nonetheless, the study of whether and how the political conditions (e.g. stability or instability) could influence inflows of foreign remittance has received little attention. Political stability has been taken into consideration in several studies, but they have used per capita GDP as proxy for political stability. The use of per capita GDP as proxy for political stability is to a certain extent debatable.

This study used ICRG political risk indicators to develop measures on country risk. This has significant theoretical and practical implications as this is the first study that has used ICRG indicators to develop a sound explanatory variable on political stability. To the best of the researcher's knowledge, whether and how political stability affects inflow of foreign remittance to Sri Lanka has not been explored despite the ever-changing political conditions in the country.

In summary, both home and host country determinants are important to analyse foreign remittance behaviour. The effect of these variables might vary depending on the country context and the period. Thus, the development of country-specific policy should be based

on the standalone study. Based on all these facts, the following research objectives are examined in the upcoming analysis.

5.2.2 Objectives and Hypotheses

Objective 1: Examine whether the motive for remittance is static or dynamic over the period

> H_o: Motive for remittance to Sri Lanka is static over time (Motive for remittance to Sri Lanka is not dynamic over time)

Objective 2: Identify home and host country determinants of foreign remittance to Sri Lanka

> H_{0a}: Foreign remittance to Sri Lanka is not affected by home country macroeconomic conditions
>
> H_{0b}: Foreign remittance to Sri Lanka is not affected by host country macroeconomic conditions and the changes in oil price
>
> H_{0c}: There is no impact of country risk on foreign remittance to Sri Lanka

5.2.3 Data and Methodology

5.2.3.1 Variables of the Study

Table 5.1 shows the variables and their definitions. Variable selection was constrained by the data availability. Hence, some of the variables discussed in the literature have not been incorporated in this study.

Table 5-1: Variables of the Study

Variable	Name	Definition
Rem	Remittances	Remittances as a percentage of GDP
PCGDP (home)	Gross Domestic Product (per capita) in Sri Lanka	Log of GDP[14] per capita in Sri Lanka (GDP per capita (current US$))
PCGDP (host)	Gross domestic product (per capita) in Saudi Arabia	Per capita GDP in Saudi Arabia
Oil rent	Oil rents (% of GDP) in Saudi Arabia	Oil rent is the difference between the value of crude oil production at world prices and total costs of production
LM	No. of male migrants	Log of number of male migrants
LF	No. of female migrants	Log of number of female migrants
OPENCU	Current account openness	Imports and exports as a ratio of GDP
OPENCAP	Capital account openness	Flow of FDI plus ODA as a ratio of GDP
INTLEND	Lending interest rate	Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector[15]
Intdep	Deposit interest rate	Deposit interest rate is the rate paid by commercial or similar banks for demand, time or savings deposits
Price	Price level	Consumer Price Index
Risk	Country Risk	ICRG political risk indicators*
Poverty		Poverty headcount index at $1.9/day, $3.2/day and $5.5/day
Policy 1	Subsidy policy in 1989	Dummy Variable 1
Policy 2	Policy on female migration	Dummy Variable 2

Note: Details of the country risk categorisation are explained separately.
Source: Author, compiled through literature review.

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[14] GDP per capita is gross domestic product divided by mid-year population where GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

[15] This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing.

Beside the conventional variables, this study incorporated three new variables, namely PCGDP in host, oil rent in host and country risk to examine the motive and the determinants of inflow of foreign remittance to Sri Lanka. Impressionistic justification for the inclusion of the aforementioned factors follows.

PCGDP in host countries

As explained in Chapter 2, most Sri Lankan migrants go to GCC countries. This is one of the key features of the migration profile in Sri Lanka. Despite the recent trend towards countries like South Korea and the Maldives, GCC countries are still attractive for Sri Lankan migrants. For instance, in 2016, 86% of Sri Lankans migrated to GCC countries and only 14% migrated to the rest of the world. Therefore, it is timely to examine whether and how economic conditions in these countries could affect the inflow of foreign remittance to Sri Lanka.

In the literature, researchers used average per capita GDP as a proxy for economic conditions in GCC countries. They emphasised the importance of weighted average of per capita GDP in GCC countries instead of average GDP because it can capture the relative importance of each country. However, non-availability of data in some countries from 1970 to 1980 constrained the development of a composite index (weighted average per capita GDP). Therefore, the KSA is used as a proxy to represent the GCC economic condition. This is justifiable because it has been the main migration destination and the main remittance-sending country for Sri Lanka over the last three decades. According to SLBFE (2017), more than one-quarter of Sri Lankans migrated to KSA in 2016 and it was 26% of the total migration.

Oil rent in host countries

The income from oil exports is the main income of GCC countries. Thus, fluctuation of the oil price in world markets could limit the economic activities of oil-dependent countries. This might affect the demand for labour from foreign countries and the inflow of remittance to labour-exporting countries. Ruiz-Arranz and Lueth (2007) proposed oil price as a good proxy for host country economic activities, showing that a $2.80 per barrel increase in the oil price increases remittance by $14 million (1%) in the first year and another $3 million in subsequent years.

This thesis put a step forward by incorporating oil rent as an explanatory variable of the model. Oil rent is the difference between the value of crude oil production at world prices and the total costs of production. This may vary with oil-exporting countries' cost effectiveness and price fluctuations in the world market. Hence, oil rent is more realistic than the oil price. High oil rent indicates higher net income from the export of crude oil, and a positive relationship is expected between oil rent and the remittance inflow.

Country risk

The country risk in developing countries is a topic of interest in most economic forums as well as in development research. It might influence the domestic economic activities as well as the international relationships of the country.

However, no study has examined whether and how country risk affects inflow of foreign remittance to developing countries. Filling the gap in the literature, this study developed three country risk assessment indicators, namely political stability, accountability and socio-economic status with regard to Sri Lanka. These indicators derived from the ICRG indicators (Howell 2011). The following section provides a detailed overview of risk

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measures, their definitions, Sri Lankan risk behaviour and the derivation of the three above-mentioned indicators.

5.2.3.2 Country Risk in Sri Lanka

The aim of the risk rating in ICRG is to provide a means of assessing the stability of countries on a comparable basis. This has been done by assigning risk points to a present group of factors, termed political risk components (Howell 2011). The minimum number of points that can be assigned to each component is zero, whereas the maximum number of points depends on the fixed weight that component is given in the overall risk assessment. In every case, the lower the risk point total, the higher the risk and the higher the risk point total, the lower the risk. Table 5.2 depicts the 12 risk variables, their definitions and the maximum scores.

Table 5-2: Definitions of Risk Categories

Component	Definition	Max Score
Government stability	The government capability to carry out acknowledged programs and the ability to stay in office. This covers government unity, legislative strength and popular support.	12
Socio-economic conditions	The socio-economic pressure at work. This covers unemployment, consumer confidence and poverty.	12
Investment profile	The investment-related risk factors, which do not cover the political, economic and financial risk components. This includes contract viability/expropriation, profit repatriation and payment delays.	12
Internal conflict	Actual and probable influence of political violence on governance. It includes civil war/coup threat, terrorism/political violence and civil disorder.	12
External conflict	War, cross-border conflicts and foreign pressures. It covers both non-violent and violent pressures.	12
Corruption	The severity of corruption within the country's political system.	6
Military intervention in politics	Involvement of military forces in politics.	6
Religious tensions	The extent of a country's main religious group's domination of political and government decisions by replacing civil law with their religious law.	6
Law and order	Law—the strength and impartiality of a country's legal system. Order—popular observance of the law.	6
Ethnic tensions	The tension attributable to the diversity of races, nationalities and languages.	6
Democratic accountability	The government's responsiveness to the people.	6
Bureaucracy quality	The strength and quality of government policies and the extent to which they would change with changes to the governing political party.	4

Source: Author, compiled from Howell (2011).

Based on the ICRG, the following section analyses the country risk in Sri Lanka.

Government stability

Government stability assess the government capability to carry out acknowledged programs and the ability to stay in office. There are three subcomponents in this category: government unity, legislative strength and popular support.

Figure 5.1 illustrates the government stability in Sri Lanka during the period from 1984 to 2016. As shown in the figure, the Sri Lankan government was unstable during 1990, with the lowest stability score of 1.83. This period immediately followed the civil unrest in the country. Gradually, the government became stable and reached the highest score of 9.83 in 1997. Nonetheless, Sri Lankan government stability did not show an upward trend then, nor was it stable for the rest of the period. After 1997, Sri Lankan government stability was highly volatile, and in 2016 the stability score was 7.29.

Figure 5-1: Government Stability Index
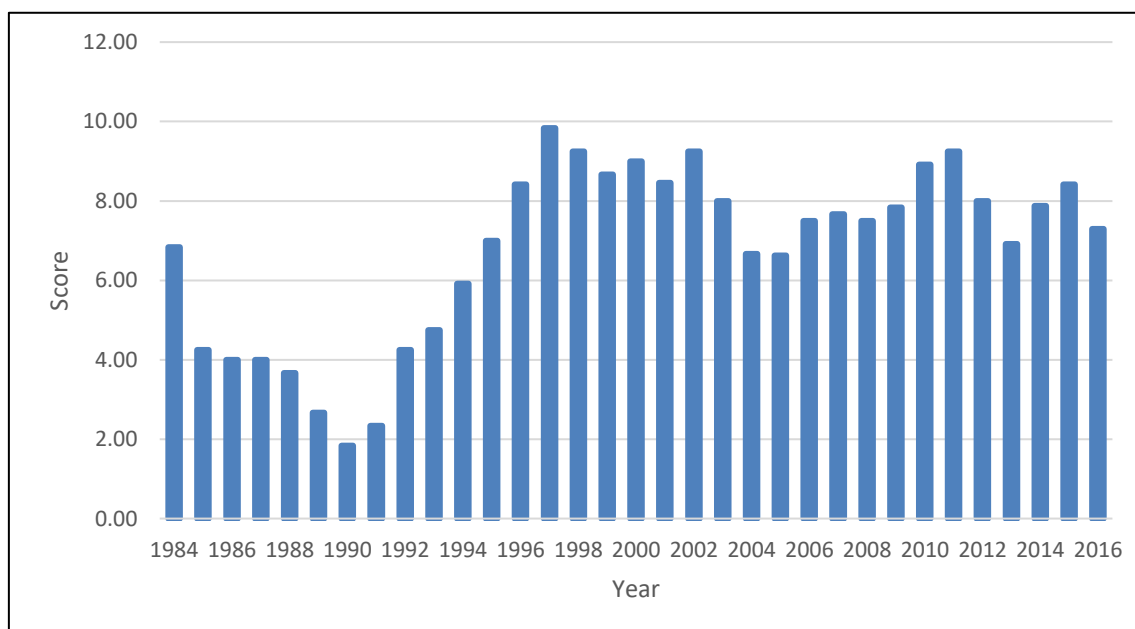
Source: Author, compiled from ICRG data.

Socio-economic conditions

This measures the socio-economic pressure acting on a country. This indicator covers combined unemployment, consumer confidence and poverty together. Figure 5.2 represents the Sri Lankan socio-economic condition.

According to Figure 5.2, the Sri Lankan socio-economic condition is at relatively high risk; except for in 1994 and 1995, the score is below the average value. In 1987 and 1988, the country recorded its lowest score (which shows the highest risk), whereas in 1994 Sri Lanka recoded its highest score ever, 6.92. After 2010, the socio-economic condition was relatively stagnant at between 4 and 5. In summary, according to the ICRG, the Sri Lankan socio-economic condition is not healthy because it reflects high unemployment, low consumer confidence and high levels of poverty.

Figure 5-2: Socio-economic Condition Index
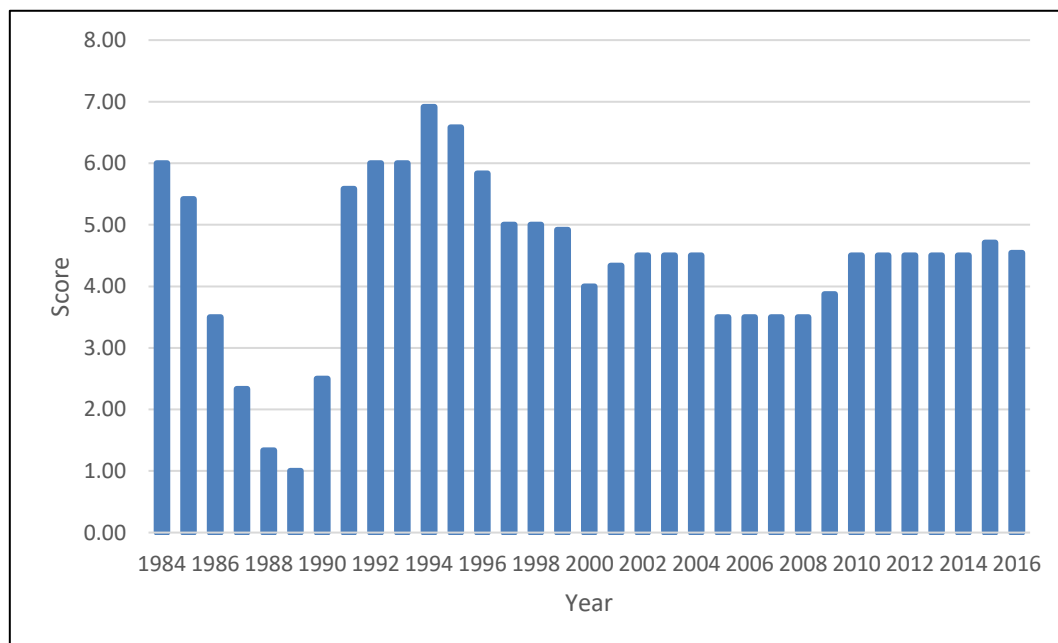
Source: Author, compiled from ICRG data.

Investment profile

This measures the investment risk factors, which do not cover the political, economic and financial risk components. The investment profile score is a composite index of three subcomponents: contract viability or expropriation, profit repatriation and payment delays.

The investment profile in Sri Lanka is depicted in Figure 5.3. As shown in the figure, the investment profile of the country reflects relatively low risk, except for the period from 1987 to 1992.

Figure 5-3: Investment Profile Index
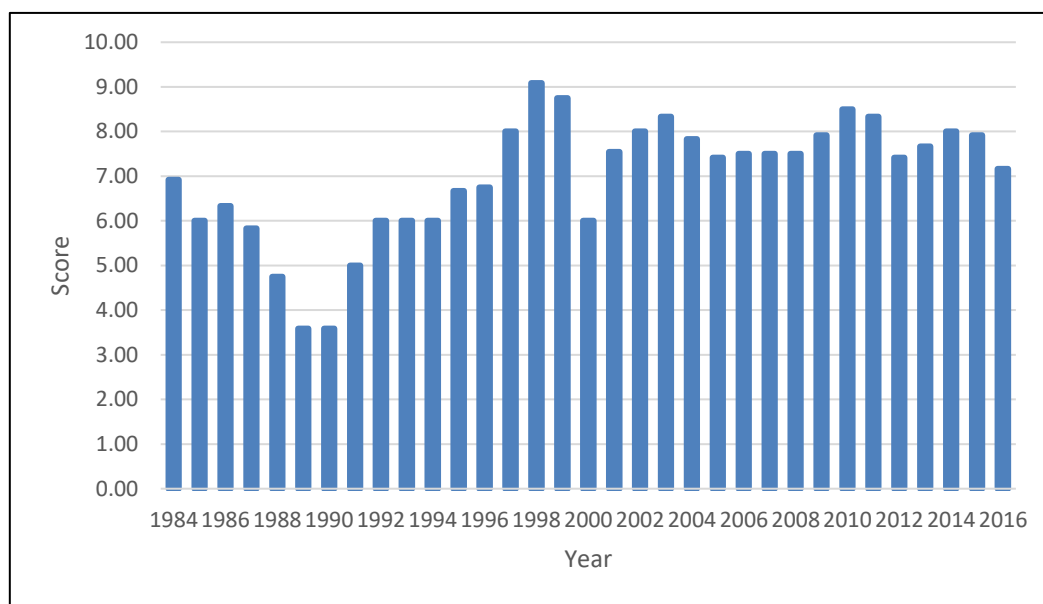
Source: Author, compiled from ICRG data.

Internal conflicts

This measures the actual and probable influence of political violence on the government. This indicator is a composite index of civil war or coup threat, terrorism or political violence, and civil disorder.

As shown in Figure 5.4, the internal conflict index was zero during the period from 1989 to 1992, which is the highest risk level. This was mainly due to the civil unrest of the country during this period.

In 2000, the score recoded the next lowest value of 0.42, showing the high risk of internal conflict in the country. However, Sri Lanka recorded the highest score in 2016, which was 9.29, showing the low risk level of the country at that time.

Figure 5-4: Internal Conflicts Index
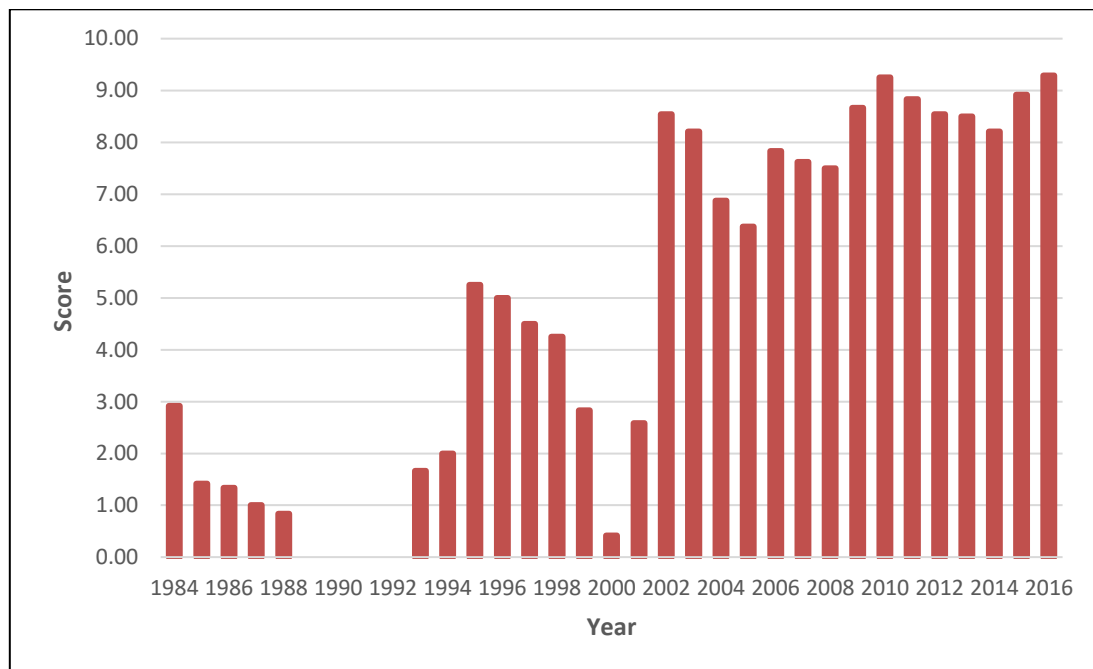
Source: Author, compiled from ICRG data.

External conflicts

This is a composite index of war, cross-border conflicts and foreign pressures. It mainly specifies the extent of foreign pressure on government. It covers both non-violent and violent pressures. Non-violent pressure includes diplomatic pressure, withholding of aid, trade restrictions, territorial disputes and sanctions. Violent pressure includes cross-border conflicts.

In Sri Lanka, non-violent pressure is comparatively higher than violent pressure. For instance, the abovementioned diplomatic pressure, withholding of aid, trade restrictions, territorial disputes and sanctions are key factors. However, cross-border conflicts are not currently an issue. The external conflict score in Sri Lanka for the period from 1984 to 2016 is shown in Figure 5.5. According to that, Sri Lanka has been on average a low-risk country, except for the period between 1986 and 1993.

Figure 5-5: External Conflicts Index
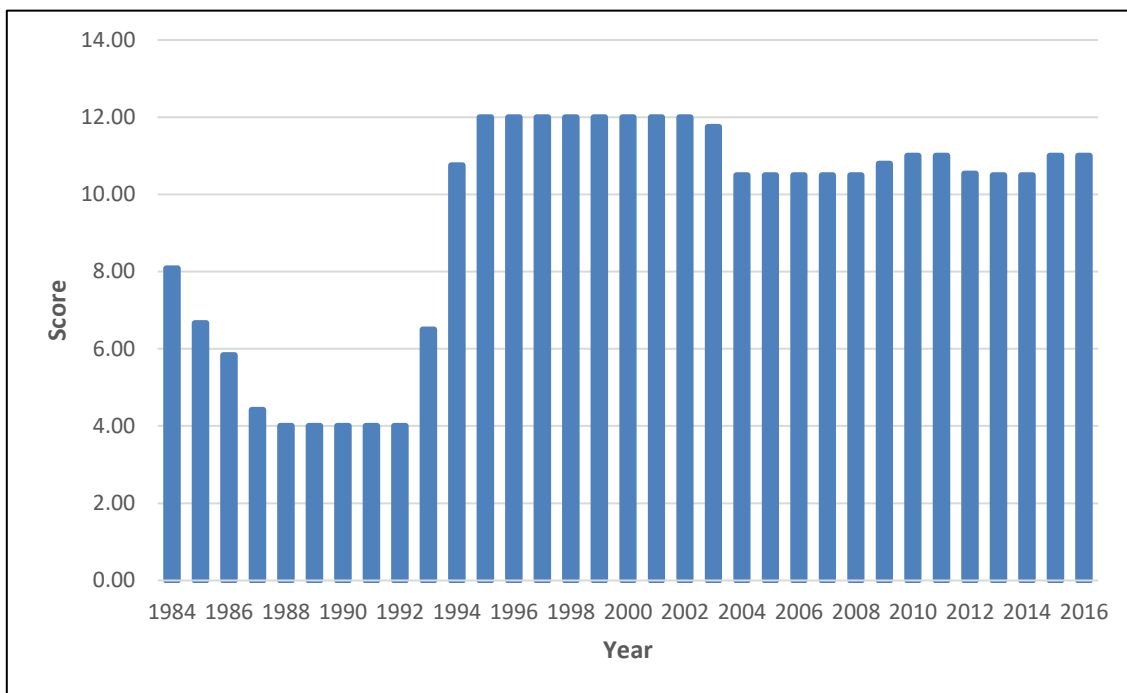
Source: Author, compiled from ICRG data.

Corruption

This index shows the severity of corruption of the political system. This is one of the main issues since it distorts the economic and financial environment, reduces the efficiency of government actions and fosters instability in the country. The highest score of 6 indicates low risk of corruption and 0 indicates high risk of corruption.

The corruption index in Sri Lanka is shown in Figure 5.6. As shown in the figure, between 1984 and 2004, the index was above 3. Nonetheless, after 2004, it was below 3, showing the high risk of corruption in Sri Lanka.

Figure 5-6: Corruption Index
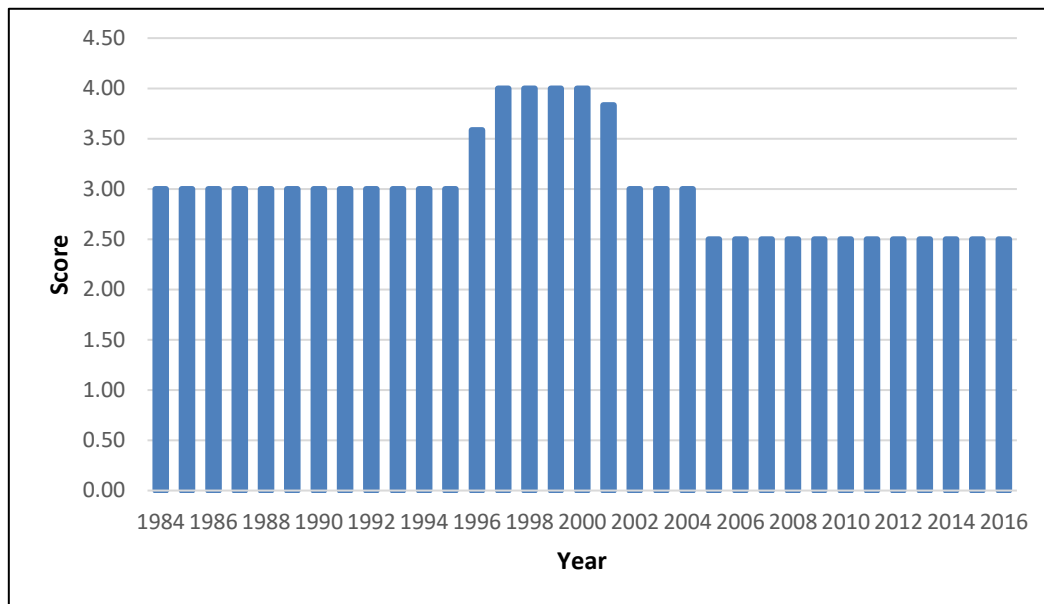
Source: Author, compiled from ICRG data.

Military intervention in politics

Military intervention in politics leads to a reduction of the democratic accountability of a country. The highest score of 6 shows the lowest risk of military intervention in politics and zero shows the highest risk. The context in Sri Lanka is shown in Figure 5.7. According to that, until 1994, the index was on average above 3, showing relatively low risk of military intervention in politics. Nonetheless, the gradual decrease in the index shows the high risk of military intervention in politics during the period from 1997 to 2014. Since 2014, it has started to recover and in 2016 it reached the average value of 3.

Figure 5-7: Military intervention in politics Index
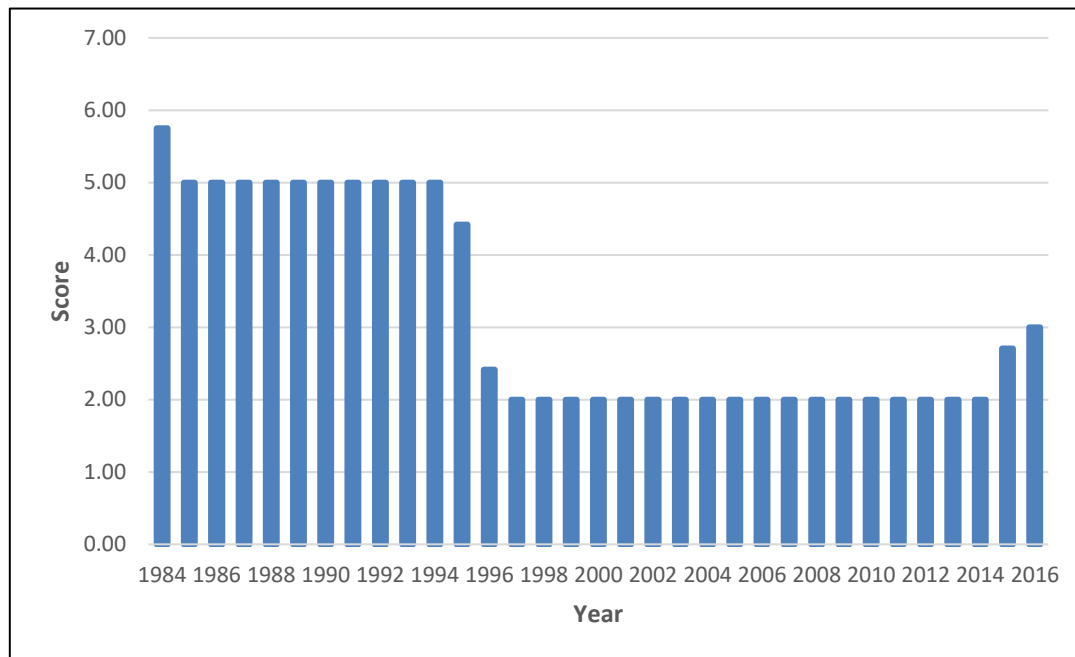
Source: Author, compiled from ICRG data.

Religion in politics

This mainly assesses the extent of a main religious group's domination of political and government decisions by replacing civil law with their religious law. Religious tension in a country adversely influences the overall performance of a country because it suppresses religious freedom.

As shown in Figure 5.8, the involvement of religion in politics in Sri Lanka was at a minimum prior to 2001, indicating a comparatively low risk. After that time, the risk increased greatly and over the last decade there has been no significant positive change in the index.

Figure 5-8: Religion in Politics Index
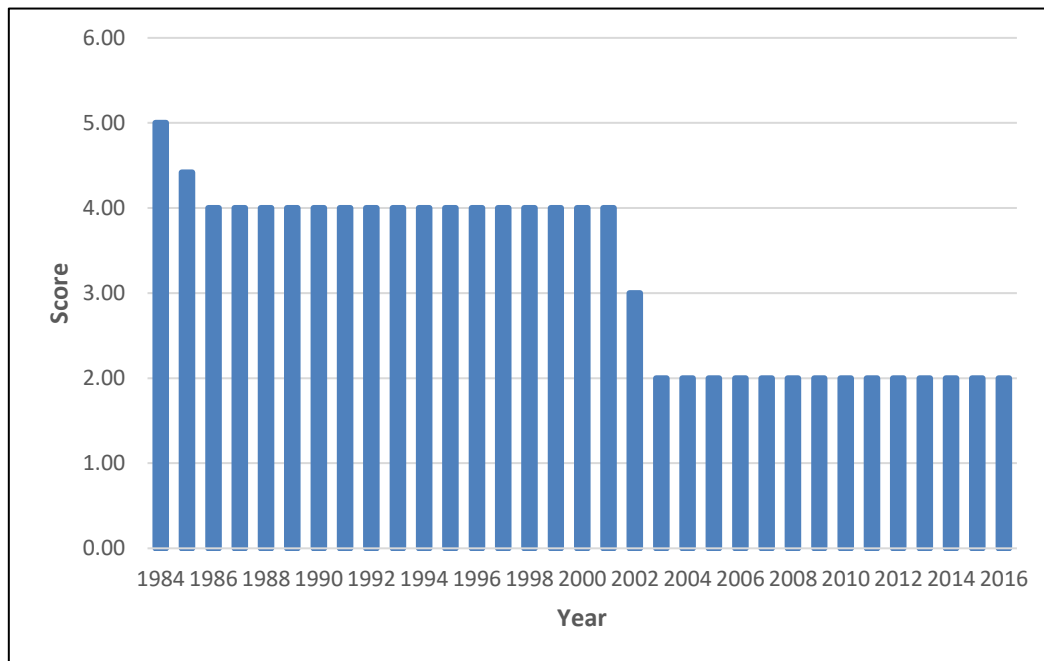
Source: Author, compiled from ICRG data.

Law and order

The strength and impartiality of a country's legal system is the 'law', whereas popular observance of the law is the 'order'. The condition in Sri Lanka is critical; it recorded below the average score from 1984 to 1994 and from 2010 to 2014. Overall, the condition in Sri Lanka shows a high risk and it is not favourable for a healthy economy.

Figure 5-9: Law and Order Index
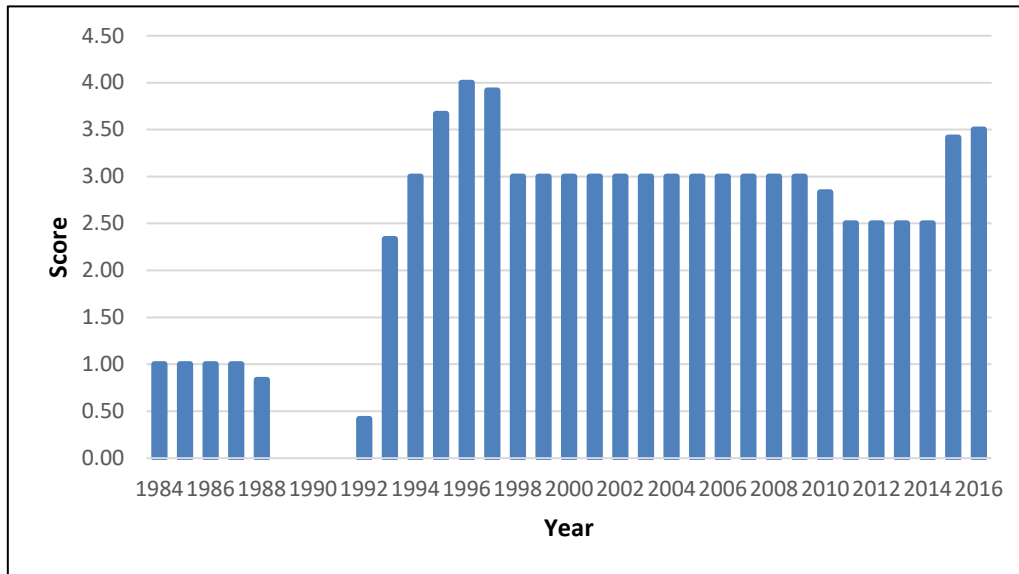
Ethnic tension

This measure assesses the tension attributable to diversity of races, nationalities and languages. A low score indicates intolerance and unwillingness to compromise, whereas a high score indicates minimum ethnic tension. As depicted in Figure 5.10, Sri Lanka suffers from high levels of ethnic tension and the country score is always below the average score.

Figure 5-10: Ethnic Tension Index
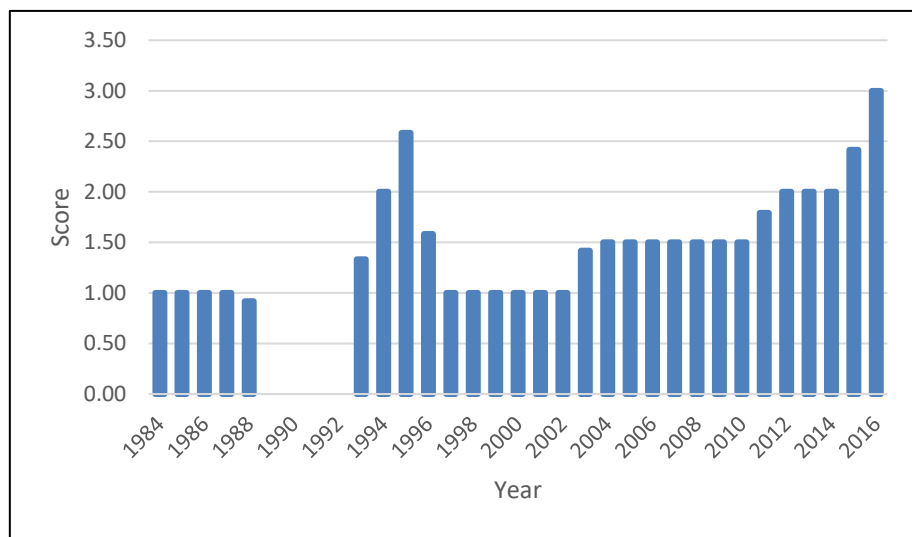
Democratic accountability

This measures the government's responsiveness to the public. ICRG has identified five main governance types: alternating democracy, dominated democracy, de facto one-party state, de jure one-party state and autarchy. ICRG has assigned the highest score to alternating democracy and the lowest to autarchy. According to the analysis of ICRG, Sri Lanka is leans towards being a de facto one-party state; despite the holding of regular elections as per the constitution, there is disproportionate media access to the governing party and the opposition parties, harassment of opposition parties and electoral fraud. Similar to the other categories, a higher index indicates lower risk and a lower index indicates higher risk.

Figure 5-11: Democratic Accountability Index
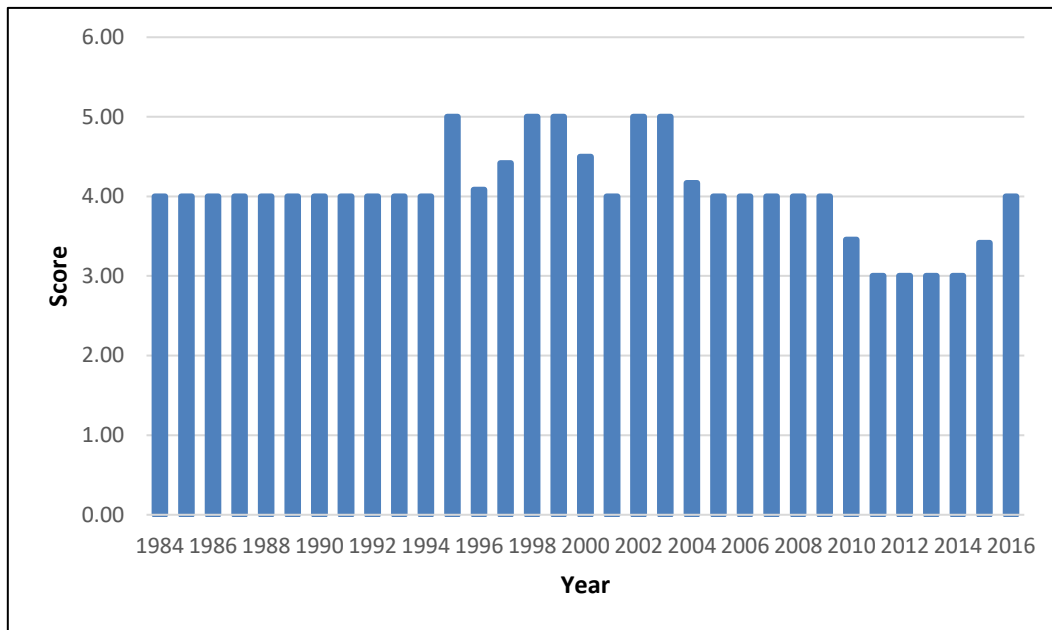
Bureaucracy quality

This measures the strength and quality of government policies and to what extent they change with changes to the governing political party. The maximum score of 4 has been assigned to the highest quality and the lowest score of 0 to the lowest quality. As shown in Figure 5.12, over the sample period, the score of the bureaucracy quality index was 2.

Figure 5-12: Bureaucracy Quality Index
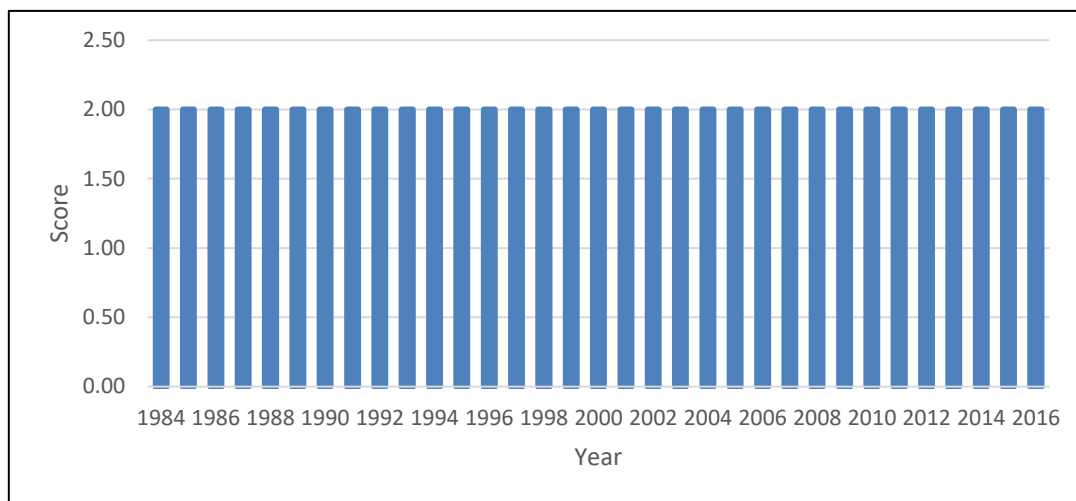
Source: Author, compiled from ICRG data.

5.2.3.3 Construction of Country Risk Variables

The previous section analysed the risk categories and their risk behaviour in Sri Lanka. The following section explains the construction of composite country risk indexes using the previously explained risk categories.

The process starts with the bivariate correlation between 12 risk factors. At the outset, this study removed bureaucracy quality because of the non-variability of the time series and Table 5.3 shows the bivariate correlation between the rest of the risk factors. As shown in the table, the risk factors have strong significant correlations with each other.

For instance, investment profile, internal conflicts, external conflicts, law and order and ethnic tension have significant positive correlation with government stability, whereas military intervention in politics and religion in politics have significant negative correlation with government stability. The significant correlation between risk factors suggests the use of factor analysis to construct composite indexes.

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Table 5-3: Bivariate Correlation between Risk Factors

	Government Stability	Socio-economic Condition	Investment Profile	Internal Conflicts	External Conflicts	Corruption	Military Intervention in Politics	Religion in Politics	Law and Order	Ethnic Tension	Democratic Accountability
Government stability		0.304	.872**	.684**	.935**	0.16	−.832**	−.417*	.863**	.535**	0.094
Socio-economic condition	0.304		0.336	0.081	.370*	0.171	0.029	0.178	.353*	0.302	0.126
Investment profile	.872**	0.336		.749**	.815**	−0.014	−.785**	−.535**	.744**	.525**	0.047
Internal conflicts	.684**	0.081	.749**		.690**	−.541**	−.743**	−.876**	.671**	.725**	−0.268
External conflicts	.935**	.370*	.815**	.690**		0.132	−.816**	−.442*	.936**	.646**	0.165
Corruption	0.16	0.171	−0.014	−.541**	0.132		0.003	.686**	0.092	−.402*	.617**
Military intervention in politics	−.832**	0.029	−.785**	−.743**	−.816**	0.003		.692**	−.754**	−.407*	0.032
Religion in politics	−.417*	0.178	−.535**	−.876**	−.442*	.686**	.692**		−.451**	−.564**	.414*
Law and order	.863**	.353*	.744**	.671**	.936**	0.092	−.754**	−.451**		.724**	0.171
Ethnic tension	.535**	0.302	.525**	.725**	.646**	−.402*	−.407*	−.564**	.724**		−0.242
Democratic accountability	0.094	0.126	0.047	−0.268	0.165	.617**	0.032	.414*	0.171	−0.242	

Note: ** significant at 1% and * significant at 5%.

5.2.3.3.1 Factor Analysis

Factor analysis starts with the test of sample adequacy. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's tests were used to test this, and the result is given in Table 5.4. According to the results, the KMO measure is 0.676. Being above 0.6, it confirmed the sample adequacy. Further, Bartlett's test of sphericity was used to test the following hypothesis to assess the validity of factor analysis.

H_0: The correlation matrix is an identity matrix[16]

H_1: The correlation matrix is not an identity matrix

According to the results in Table 5.4, the null hypothesis is rejected at the 1% significance level, indicating that the correlation matrix is not an identity matrix. In conclusion, KMO and Bartlett's test confirmed the adequacy of sample size and the usefulness of factor analysis, respectively.

Table 5-4: KMO and Bartlett's Test

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy		.676
	Approx. chi-square	474.560
Bartlett's Test of Sphericity	Df	55
	Sig.	.000

Note: KMO refers to Kaiser-Meyer-Olkin.

Table 5.5 presents the results from principle component analysis. For the first three components, Eigen values were higher than one and in total accounted for 87.477% of the variation. The scree plot in Figure 5.13 confirmed the same findings as those in the

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[16] Identity matrix is a matrix that consists of one for diagonal elements and zero for off-diagonal elements.

Eigen value table. Therefore, the first three components were selected to continue the
factor analysis and identity the most important factors and the factor loading in country
risk in Sri Lanka.

Table 5-5: Eigen Value Table

	Initial Eigen Values		
Component	*Total*	*% of Variance*	*Cumulative %*
1	5.996	54.51	54.51
2	2.507	22.79	77.31
3	1.119	10.17	87.48
4	0.547	4.977	92.45
5	0.426	3.873	96.33
6	0.185	1.683	98.01
7	0.102	0.925	98.94
8	0.046	0.422	99.36
9	0.036	0.323	99.68
10	0.024	0.222	99.9
11	0.011	0.098	100

Note: Extraction method was principal component analysis.

Figure 5-13: Scree Plot

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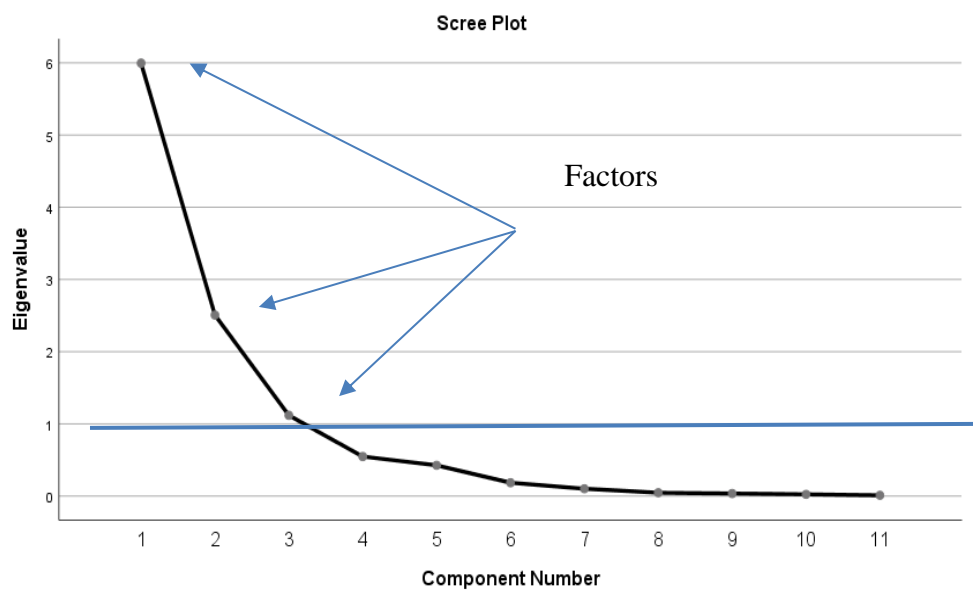
Table 5.6 illustrates the rotated component matrix. Based on that, individual variables were categorised into the component with the highest coefficient. Thus, government stability, investment profile, internal conflicts, external conflicts, military intervention in politics, law and order and ethnic tension were categorised under Factor 1. Corruption, religion in politics and democratic accountability were categorised under Factor 2 and socio-economic condition was categorised under Factor 3. Upon the selection of variables in each factor, three of them were renamed as shown in Figure 5.14 and the factor scores spawned from SPSS used for further analysis.

Table 5-6: Rotated Component Matrix

Rotated Component Matrix[a]

	Component		
	1	*2*	*3*
Government stability	.941	.087	.159
Socio-economic condition	.157	.133	.919
Investment profile	.886	-.061	.164
Internal conflicts	.782	-.570	.021
External conflicts	.941	.068	.254
Corruption	.052	.951	.056
Military intervention in politics	-.933	.076	.241
Religion in politics	-.602	.712	.247
Law and order	.899	.024	.293
Ethnic tension	.576	-.504	.455
Democratic accountability	.129	.793	.025

Note: Extraction method was principal component analysis.

Rotation method was varimax with Kaiser normalisation.

a. Rotation converged in four iterations.

Figure 5-14: Country Risk

Factor 1 (Stability)
Government Stability
Investment Profile
Internal conflicts
External conflicts
Military in Politics
Law and Order
Ethnic Tension

Factor 2 (Accountability)
Corruption
Religion in Politics
Democratic accountability

Factor 3 (Socioeconomic Status)
Socio economic condition
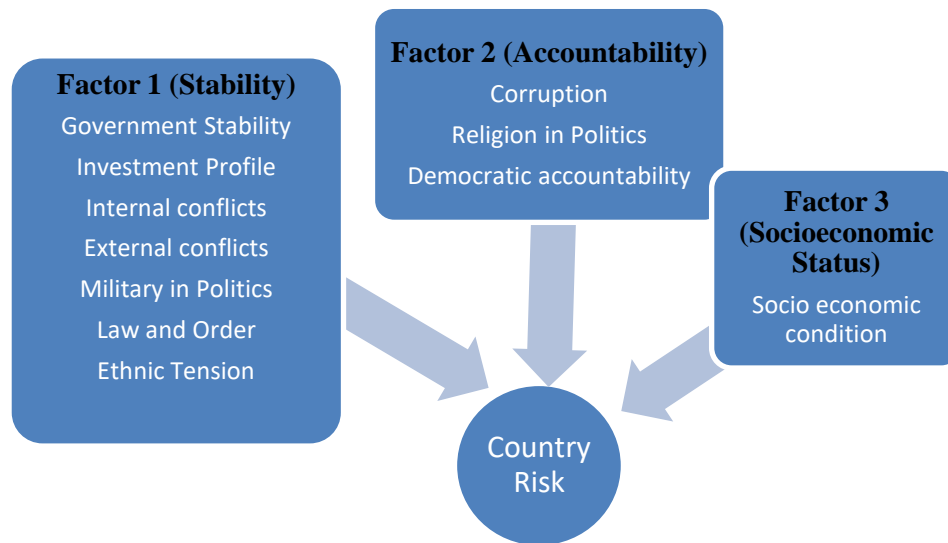
Country Risk

Source: Author compiled.

In summary, construction of country risk variables started with the analysis of correlation between country risks indicators of ICRG. Presence of significant correlation between country risk indicators suggested the use of factor analysis and factor analysis helped derive the three country risk indicators shown in Figure 5.14.

Figures 5.15, 5.16 and 5.17 illustrate these three new variables. The negative values indicate the government instability, absence of accountability and the unsatisfactory socio-economic condition, whereas the positive values indicate government stability, accountability and satisfactory level of socio-economic status.

Figure 5-15: Stability
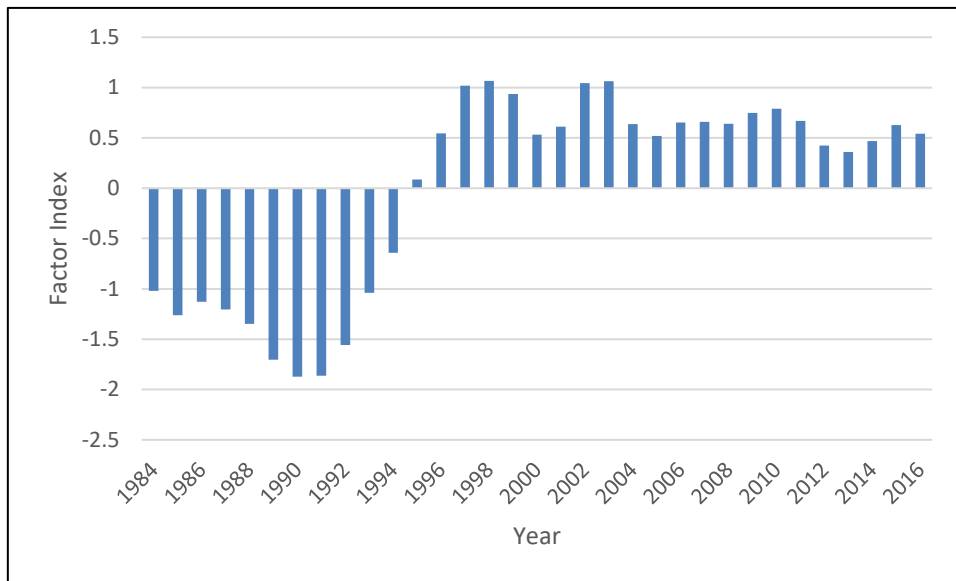
Source: Author, compiled with factor analysis results.

Figure 5-16: Accountability

Source: Author, compiled with factor analysis results.

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Figure 5-17: Socio-economic Status
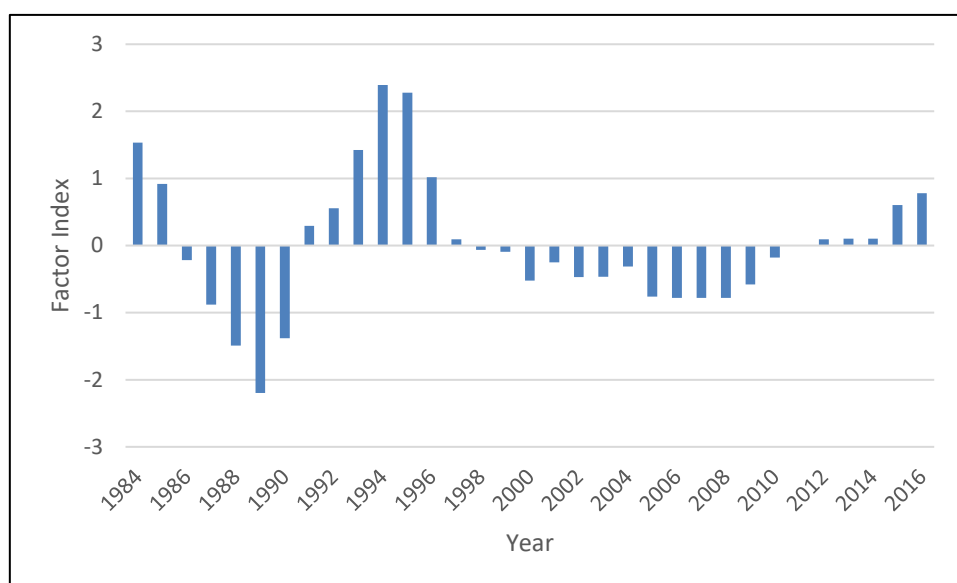
Source: Author, compiled with factor analysis results.

5.2.4 Data Analysis and Discussion

The data analysis begins with the correlation between explanatory variables to aid robust statistical analysis. The test of correlation between explanatory variables is not a prerequisite for the ARDL model. However, it is used to filter the variables for the model. Based on the correlation analysis, PCGDP in Sri Lanka, lending interest rate in Sri Lanka and oil rent in KSA are used as explanatory variables in the model, together with the three previously identified country risk indicators: government stability, accountability and socio-economic status. Table 5.7 summarises all the variables taken into consideration and the variables removed based on the correlation matrix.

Table 5-7: Variables of the Study

Remittance: Foreign Remittance as a Percentage of GDP				
Home Country Determinants			*Host Country Determinants*	
Ln Male *	Ln Male *	Ln PCGDP $_{(SL)}$	Ln PCGDP $_{(KSA)*}$	
OPENCU $_*$	OPENCAP $_*$	Int$_{Lend}$	Ln Oil rent $_{(KSA)}$	
Int$_{Dep*}$	P*	Poverty*		
Stability $_{Gov}$	Accountability	Socio-economic		

Note: * Variables removed based on the correlation.

Following the initial variable selection, time series analysis of the study is explained in the following section.

5.2.4.1 Time Series Plots

The time series plots are used as the first step of the analysis. The cautious evaluation of the time series plots helps in understanding the nature of the time series data to be considered in the analysis. According to that, as shown in Figure 5.18, stability (Factor 1) shows an upward trend with a negative intercept and accountability (Factor 2) shows a downward trend with a positive intercept. The socio-economic status (Factor 3) has a positive intercept; however, there is no clear trend in the data.

The negative coefficient with an upward trend in stability portrays the overall political stability of the country, which moves from instability to stability. Accountability has weakened during the time of study, which is indicated by the downward trend. The socio-economic status of the country does not show a clear-cut trend throughout the period, and as per the plot, the score was negative in most of the years during the period.

The lending interest rate does not show a clear trend, since there are significant fluctuations. However, the rest of the variables shown in Figure 5.18 depict an upward trend during the sample period.

Figure 5-18: Time Series Plots
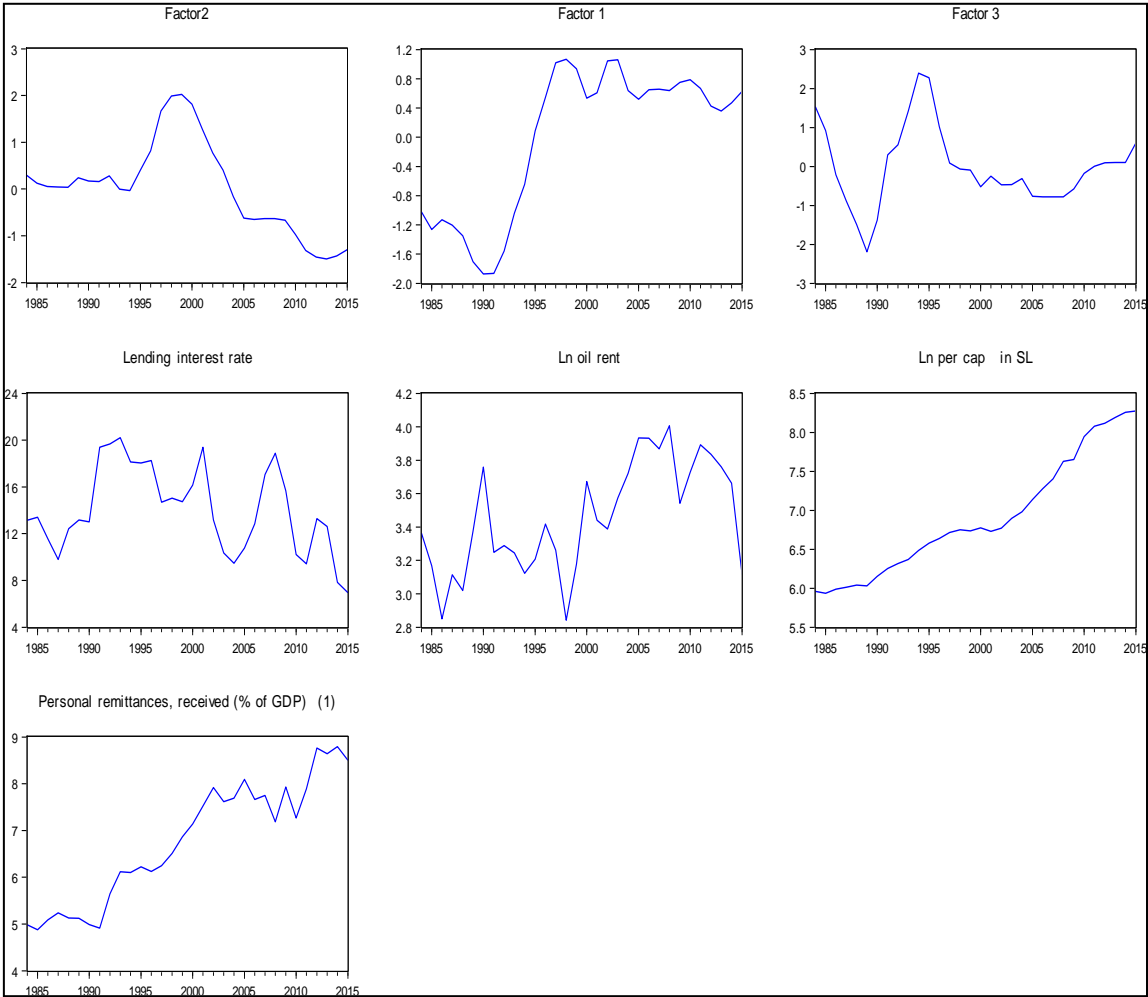
Note: Factor 1: stability. Factor 2: accountability. Factor 3: socio-economic status.

5.2.4.2 Test of Stationarity

Table 5-8: ADF Statistics

Series	Level			First Difference			Second Difference			Stationarity
	Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*	
	Prob.	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	
Stability	0.3513	0.4394	0.0585	0.0652	0.1659	0.0076(a)	0.0002	0.0013	0.0000	I(1)
Accountability	0.2801	0.2701	0.0399(b)	0.1948	0.4367	0.0234	0.0002	0.0015	0.0000	I(0)
Socio-economic status	0.0174	0.0167	0.001(c)	0.0458	0.1488	0.0033	0.0000	0.0004	0.0000	I(0)
Int$_{Lend}$	0.1105	0.1874	0.3626	0.0009	0.0035	0.0000	0.0010	0.0061	0.0000	I(1)
Oil rent (KSA)	0.1927	0.2100	0.5451	0.0001	0.0006	0.0000	0.0000	0.0000	0.0000	I(1)
PCGDP(SL)	0.9990	0.7698	1.0000	0.0015(d)	0.0053	0.1842	0.0000	0.0001	0.0000	I(1)
REM	0.7967	0.1789	0.9645	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	I(1)

Note: Model 1: Model with constant only.
Model 2: Model with constant and linear trend.
Model 3: Model without constant and linear trend.
According to the ADF results, country risk factors (stability, accountability and socio-economic status) do not have significant trend or constant value.
(a) Model 3 is significant at 1% and has a significant coefficient. Thus, Factor 1 is stationary at first difference.
(b) Model 3 is significant at 5% and has a significant coefficient. Thus, Factor 2 is stationary at level.
(c) Model 3 is significant at 1% level and has a significant coefficient. Thus, Factor 3 is stationary at level.

Table 5.8 summarises the results of the ADF test. According to the test results, accountability and socio-economic status are I(0) and rest of the variables are I(1). The PP test was used to confirm the conclusion made based on the ADF results. The only contradictory results found were those with reference to accountability, since it is I(1). The presence of a mix of I(0) and I(1) variables suggests using the ARDL model for the analysis.

Table 5-9: PP Test Statistics

Variable	Level			First Difference			Second Difference			Stationarity
	Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*	
	Prob.	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	*Prob.*	
Stability	0.6734	0.8159	0.1867	0.0998	0.3501	0.0098	0.0000	0.0000	0.0000	I(1)
Accountability	0.7385	0.8112	0.2472	0.1445	0.3460	0.0160	0.0002	0.0015	0.0000	I(1)
Socio-economic status	0.1048	0.3405	0.0108	0.0458	0.1327	0.0033	0.0000	0.0003	0.0000	I(0)
Int_{Lend}	0.4039	0.7770	0.3798	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	I(1)
Ln oil rent(KSA)	0.1847	0.2100	0.5465	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	I(1)
Ln PCGDP(SL)	0.9970	0.7041	1.0000	0.0010	0.0037	0.0142	0.0000	0.0000	0.0000	I(1)
Rem	0.8249	0.1846	0.9901	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	I(1)

5.2.4.3 ARDL Model

Based on the variables identified through the literature and the nature of the time series data, this study has been developed using the ARDL model for analysis.

As explained in section 5.2.4.2, ADF test and PP test confirmed that accountability and socio-economic status are I (0) whereas rest of the variables in the following model such as remittance, per capita GDP, oil rent, lending interest rate and stability are I (0). The presence of mix of I(0) and I(1) variables suggests using ARDL model for the analysis.

$$\Delta Rem = a_0 + \sum_{j=1}^{2} \emptyset_j \Delta Rem_{t-j} + \sum_{j=1}^{2} \theta_j \Delta PCSL_{t-j} + \sum_{j=1}^{2} \lambda_j \Delta Oil_{t-j} + \sum_{j=1}^{2} \varphi_j \Delta Intlend_{t-j} + \sum_{j=1}^{2} \vartheta_j \Delta Stability_{t-j} + \sum_{j=0}^{2} \Theta_j Accountability_{t-j} + \sum_{j=0}^{2} \ell_j Socioeconomic_{t-j} + \delta_1 Rem_{t-1} + \delta_2 PCSL_{t-1} + \delta_3 Oil_{t-1} + \delta_4 Intlend_{t-1} + \delta_5 Stability_{t-1} + e_t \qquad (5.1)$$

where

Rem is foreign remittance, *PCGDP* is per capita GDP in Sri Lanka, *Oil* is oil rent in KSA, *Intlend* is lending interest rate, *Stability* is government stability in Sri Lanka, *Accountability* is accountability in Sri Lanka, *Socio-economic* is socio-economic status, Δ is first difference, α is the intercept coefficient, j is the lags and $\emptyset, \theta, \lambda,$ $\varphi,$ $\vartheta, \Theta, \ell, \delta_1, \delta_2, \delta_3, \delta_4, \delta_5$ are respective slope coefficients and e_t is the error term of the model.

The following section discusses the ARDL model of the study, including each of the sequential steps of the analysis: lag order selection, test of serial correlation, test of stability, co-integration analysis, long-run elasticity and short-run dynamic model.

5.2.4.4 Lag Order Selection

To commence the ARDL model, Table 5.10 shows the lag order selection based on AIC, SIC and HQ criterion. According to that, the model with two lags has the lowest AIC

value and the same decision was based on the other two criteria. This selection is comparable with that of Pesaran, Shin et al. (1999), who suggested a maximum of two lags for annual time series data.

Table 5-10: Lag Order Selection

No of Lags	Akaike Info Criterion	Schwarz Criterion	Hannan-Quinn Criterion
1	0.770284	1.470882	0.994411
2	0.252098	1.289357	0.576955

5.2.4.5 Test of Serial Correlation and Stability

As the second step of the analysis, the study tested the serial correlation of the model. The null hypothesis of no serial correlation was tested against the alternative hypothesis of serial correlation using the Breusch–Godfrey serial correlation LM test.

Table 5-11: Test of Serial Correlation in the Model: Breusch–Godfrey Serial Correlation LM test

F statistic	0.853625	Prob. F	0.4659
Obs*R-squared	5.686093	Prob. chi-square (2)	0.0582

Note: Null Hypothesis: No serial correlation. Alternative Hypothesis: Serial correlation.

According to the test result in Table 5.11, the Chi-square is 0.0582, which is higher than the 5% significance level. Hence, the null hypothesis of no serial correlation cannot be rejected at the 5% level. It is concluded that there is no serial correlation in the model.

Figure 5.19 show the stability test for the selected model and it shows that the model is a stable model. Finally, the serial correlation and the stability test suggest the possibility of continuing the analysis.

Figure 5-19: Stability Test: Determinants of Foreign Remittance
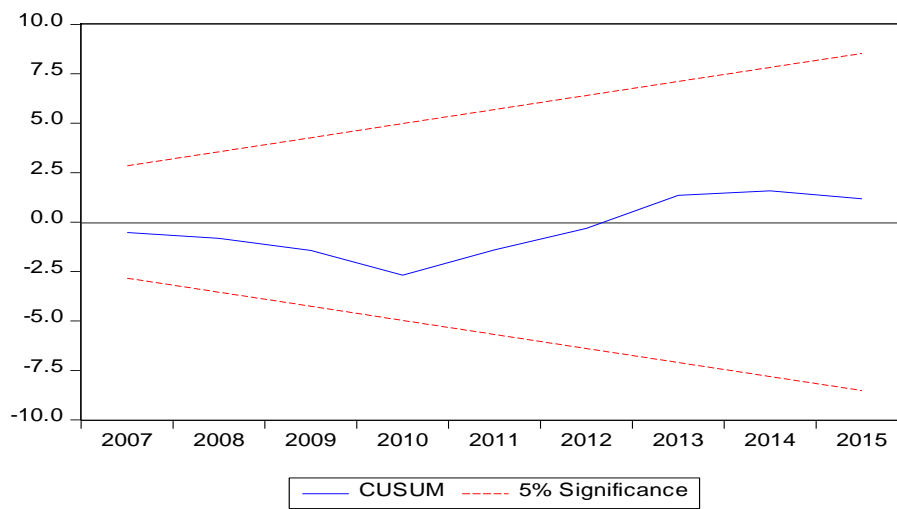
5.2.4.6 Co-integration of the Model

Along with the above preliminary analysis, Wald test results in Table 5.12 were used to ascertain the presence of a long-run relationship. The null hypothesis of no co-integration among variables (H$_0$: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$) was tested against the alternative hypothesis of co-integration (H$_1$: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$).

Table 5-12: Wald Test

Test Statistic	Value	Probability
F statistic	5.399483	0.0114
Chi-square	37.79638	0.0000

According to Table 5.12, the *F* statistic is 5.399483. This non-standard distribution of the *F* test depends on three main factors: (i) level of stationarity, that is, I(0) or I(1); (ii)

number of explanatory variables in the model; and (iii)presence of intercept or a trend in the model (Duasa 2007). Given the small sample size, this study used the critical value table of Narayan (2004). The *F* statistic, which is higher than the upper bound critical value, leads to the rejection of the aforementioned null hypothesis, resulting in a conclusion of co-integration among the variables. This means there is a long-run association between the variables in the model, namely remittance, per capita GDP in Sri Lanka, oil rent in KSA, lending interest rate, government stability, accountability and socio-economic status. The presence of a long-run association suggests the estimation of long-run elasticities in the model. The following section discusses this in detail.

5.2.4.7 Estimation of Long-run Association

With the confirmation of co-integration, the following long-run model was estimated and the results are given in Table 5.13.

Estimated long-run model

$$Rem_t = 0.3629 + 0.7970\ PCSL_{t-i} + 0.2593\ Oil_{t-i} + 0.0013\ Intlend_{t-i} +$$

$$0.5944\ Stability_{t-i} - 0.1588\ Accountability_{t-i} - 0.0422\ Socioeconomic_{t-i} \quad (5.2)$$

Table 5-13: Long-Run Elasticities 1984–2016

Variable	Elasticity
PCGDP Home	0.796959*
Oil Rent Host	0.259324
Lending interest rate Home	0.001291
Government stability	0.594434**
Accountability	−0.158835
Socio-economic status	−0.042239

Note: * Significant at 5% level. ** significant at 1% level.

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According to Table 5.13, the coefficient of PCGDP is 0.796659 and is significant at the 5% level. This is a log variable; hence, the coefficient indicates the elasticity. A one percent increase in the per capita GDP increases the remittance (remittance as a percentage of GDP) by 0.00796659%. A significant positive coefficient of per capita GDP supports the presence of self-interest motives in sending remittance to Sri Lanka. This is compatible with the findings of Arun and Ulku (2011), who found a strong association between volume of remittance and the savings and land acquisitions of southern Asian migrants. Moreover, this finding answers the question posed by Ruiz-Arranz and Lueth (2007), who specifically questioned the pro-cyclicality of remittance and the altruistic motive with reference to Sri Lanka. Nonetheless, this finding is contradictory to the findings of Docquier and Rapoport (2005), who concluded that remittance to developing countries is largely, if not solely, based on altruistic motives.

Unlike altruistic motives, self-interest motives have greater development impact. Thus, the identified relationship has strong developmental policy implications. Self-interest based remittance focuses on savings and investments. These savings and investments could help the economy in various ways. When migrants save their money in financial institutions, it helps the financial institutions to increase their lending portfolio and indirectly it helps the economic growth of the country. Similarly, when migrants invest their savings to start new businesses, new job opportunities are created, and this helps relax unemployment. Nonetheless, no previous study has clearly pointed out the motive for foreign remittance to Sri Lanka despite it being a key limitation to developing country-specific policy on migration and foreign remittance.

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Figure 5-20: Long-Run Elasticities

Long-run elasticity: Government stability = 0.594434

Government stability ⟹ **Foreign remittance**

Government stability
      Government unity
      Legislative strength
      Popular support

> **Remittance as a percentage of GDP**

Investment profile
      Contract variability
      Profit repatriation
      Payment delays
Internal conflicts
      Civil war
      Terrorism
      Civil disorder
External conflicts
      War
      Cross-border conflicts
      Foreign pressure
Law and order
      Strength and impartiality of country's legal system
Ethnic tension
      Tension attributable to diversity of races, nationalities and languages

Note: The lower the value, the higher the risk and vice versa.

The coefficient of stability is also positive and significant at 1%. As shown in Figure 5.20, it is a composite index of government stability, investment profile, internal conflicts, external conflicts, military intervention in politics, law and order and ethnic tension. The increase of the index indicates increase in stability (reduction of the risk of instability). This is also a significant finding for most developing countries like Sri Lanka.

The government focus on enhancing the stability of the country by reducing the risk associated with government stability, investment profile, internal conflicts, external conflicts, military intervention in politics, law and order and ethnic tension is an important consideration to increase the inflow of remittance to Sri Lanka. Further, government stability is a vital factor for investment. Thus, enhancing government stability can attract

more remittance that is driven by self-interest motives. Nonetheless, remittance driven by altruistic motives would increase when government stability is low.

According to the systematic theory of migration, political repression is a push factor that explains migration. Thus, the identified remittance–government stability is in line with this theory, and to a certain extent, this is an extension of migration theory to explain the foreign remittance to developing countries.

Another main objective of this study is to establish whether the GCC countries' income and oil price fluctuations influence the inflow of foreign remittance to Sri Lanka. However, this study did not find statistically significant evidence to prove that they have an impact on the inflow of remittance.

The following section analyses the results of the short-run dynamic model, which helps to establish whether the above long-run model is statistically significant or not for further analysis and to develop policy implications.

5.2.4.8 Estimation of Short-Run Dynamic Model

Equation 5.3 shows the ECM used to assess the short-run dynamics of the model. The coefficients in the model are short-run dynamics of the model's convergence to equilibrium and they shows the speed of adjustment (Duasa 2007).

$$\Delta Rem_t \ = \ a_0 + \sum_{i=1}^{2} \emptyset_i \, \Delta \, Rem_{t-i} + \sum_{i=1}^{2} \theta_j \, \Delta PCSL_{t-i} + \sum_{i=1}^{2} \lambda_j \, \Delta Oil_{t-i} +$$

$$\sum_{i=1}^{2} \varphi_j \, \Delta Intlend_{t-i} + \sum_{i=1}^{2} \vartheta_j \, \Delta Stability_{t-i} + \sum_{i=0}^{2} \Theta_j Accountability_{t-i} +$$

$$\sum_{i=0}^{2} \mathfrak{b}_j Socioeconomic_{t-i} + \psi ECM_{t-1} \ + e_t \tag{5.3}$$

The results of the above short-run dynamic model are shown in Table 5.14. The significant (1% level) negative coefficient (−0.893851) of lagged ECT shows that the

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model is valid. The coefficient shows the 89% speed of adjustment or rate of convergence to equilibrium. This result further reveals the possibility of at least unidirectional causality. In the short-run model, accountability and socio-economic condition are significant determinants of remittance; both are significant at the 5% level.

Table 5-14: Estimation of Short-Run Dynamic Model (1984–2016)

Variable	Coefficient	Std. Error	*t* statistic	Prob
C	0.273079	0.123037	2.219484	0.0371
d (REM (−2))	0.248953	0.173072	1.438437	0.1644
d (PCGDP $_{Home}$ (−1))	−2.389990	1.420222	−1.682828	0.1065
d (Lending interest rate (−1))	0.022255	0.021292	1.045261	0.3073
d (Accountability (−1))	−0.598442	0.266432	−2.246132	0.0351
d (Socio-economic status (−2))	0.236279	0.113326	2.084947	0.0489
ECT (−1)	−0.893851	0.250055	−3.574624	0.0017

Figure 5-21: Short-Run Elasticity-Accountability

Short-run elasticity = −0.598442

Accountability   **Remittance**

Reduction in Corruption[17]

Reduction in Religion in politics[18]

Increase in democratic accountability[19]

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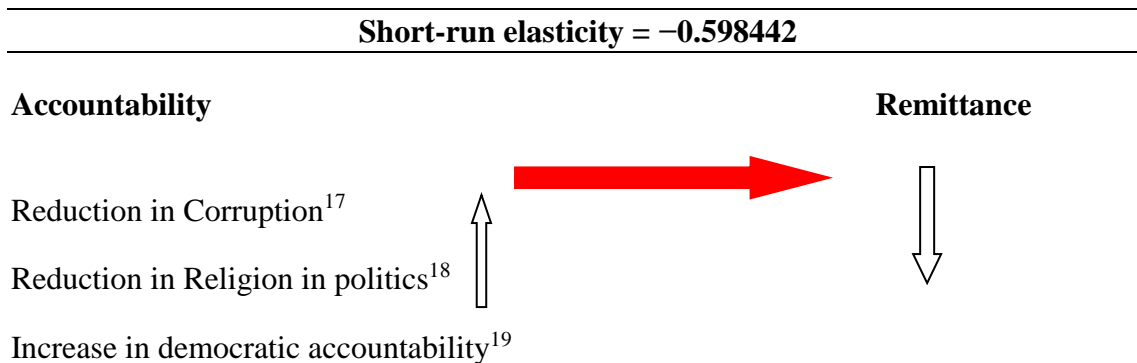
[17] Corruption within the political system.

[18] Extent of a main religious group's domination of political and government decisions by replacing civil laws with their religious laws.

[19] Government responsiveness to the people.

Figure 5-22: Short-Run Elasticity—Socio-economic Status

Short-run Elasticity = 0.236279

Socio-economic condition ⇧   ⇧ **Remittance**

Reduction in unemployment

Increase in consumer confidence

Reduction in poverty
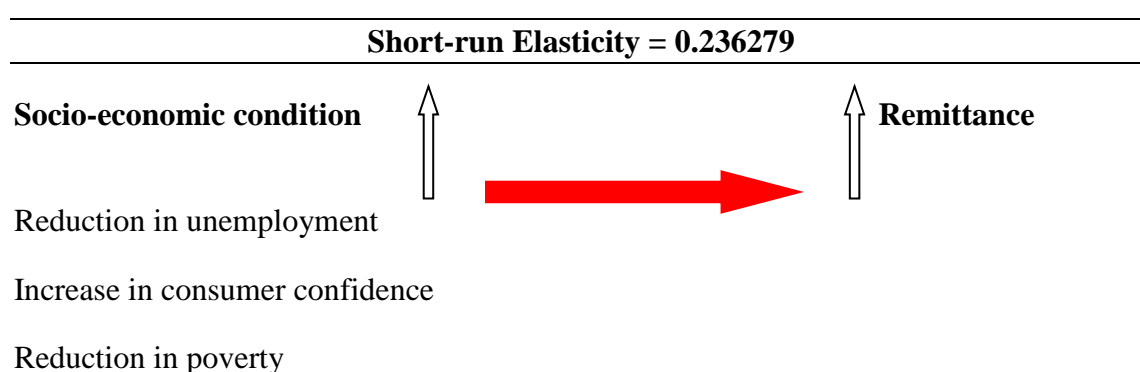
Figures 5.21 and 5.22 shows the impact of accountability and socio-economic condition on inflow of foreign remittance to Sri Lanka. According to Figure 5.21, reduction of corruption, reduction in religion in politics and increase in democratic accountability lead to the reduction of inflow of foreign remittance. This is not supported by the preliminary expectation of positive association between accountability and inflow of remittance. Hence, further investigation is suggested in future research.

As shown in Figure 5.22, there is a direct relationship between socio-economic status and inflow of foreign remittance to Sri Lanka. Socio-economic status is a composite index of unemployment, consumer confidence and poverty. This means reducing unemployment and poverty and increasing consumer confidence will help increase the inflow of foreign remittance to Sri Lanka.

The analysis above helps identify key determinants of foreign remittance, the importance of country risk on inflow of foreign remittance and motives for foreign remittance. Nonetheless, the above analysis does not support assessment of the dynamic nature of the motive for foreign remittance. To assess that, this study used recursive estimates and Section 5.2.4.8 elaborates the analysis in detail.

5.2.4.9 Recursive Estimates: Move from Altruism to Self-interest

The analysis of recursive estimation starts with the OLS analysis of the remittance and the significant explanatory variables in the previous long-run model. According to the analysis, the coefficient of per capita GDP and government stability are 1.0897 and 0.4519, respectively, and both are significant at a 1% level. The significant positive coefficients are consistent with the self-interest or investment motive (McCracken, Ramlogan-Dobson et al. 2017). The OLS estimate assumes that these coefficients are to be constant over the sample period. If this assumption is valid, it proves that motive to remit is constant (static); that is, the self-interest motive is valid for Sri Lanka over the sample period. However, this study further wanted to statistically verify that the motive for remittance is not a static concept and could be dynamic over time.

To examine this, this study used recursive estimation (Song and Witt 2000). Following the steps in Song and Witt (2000), the study chose a subsample that satisfied the following conditions: t = 1, 2…. n, where n ≥ k and k is the number of explanatory variables (including the constant term) in the model. The subsample selection was based on the least square break method and it helped to identify the structural breaks in the sample and to determine the estimates for each subsample. According to that, it generated six subsamples and the first subsample was used to estimate the initial model of recursive estimates. The chosen subsample ends in 1991; the sample period then extended by one observation to t = 1, 2 …n + 1 and the model was re-estimated. This process continued until the last observation of the sample. The coefficients of each model and the recursive estimates of coefficient are given in Table 5.15 and Figure 5.23, respectively.

As shown in Table 5.15, the coefficient of PCGDP in initial model is −0.8688, which is consistent with the altruistic motive. However, coefficients of per capita GDP have

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changed significantly over the estimation period. For example, when the initial model extended by n+, the slope coefficient changed to positive and became 1.5539. The positive coefficient is consistent with the self-interest or investment motive. This is further evidenced by Figure 5.24, which shows the significant change in 1991. Thus, according to the recursive estimates, motives for remittance to Sri Lanka were altruistic prior to 1992, and self-interest or investment-driven thereafter.

From 1992 to 2005, per capita GDP recursive coefficient increased gradually; however, from 2006 to 2011, the value of the coefficient shows a declining trend. It began to increase again in 2012 but nonetheless is comparatively lower than in the period from 2003 to 2006.

The identification of these changes is important for policymakers because their policies should match with peoples' motives to remit. For, example, if the motive for remittance is altruistic, migrants might not be very sensitive to interest rates, cost of remittances, taxation and government stability. On the contrary, if their motives are more investment-driven, as investors they are sensitive to the factors affecting their investment decision.

At present the motive for remittance is investment or self-interest, so migrants might be more sensitive to economic factors, which are significant to their investment. This is evidenced through the positive and significant coefficient of government stability.

Table 5-15: Recursive Estimates of Coefficient

Time up to	GDP per Capita	Government Stability	Time	GDP per Capita	Government Stability
1991	−0.8688	0.0382	2004	2.2390	0.1783
1992	1.5539	0.6330	2005	2.4501	0.1290
1993	1.9481	0.7926	2006	2.0678	0.2190
1994	1.5442	0.5944	2007	1.7845	0.2887
1995	1.3755	0.3818	2008	1.2147	0.4397
1996	1.3474	0.2359	2009	1.1691	0.4513
1997	1.3654	0.1609	2010	0.8415	0.5428
1998	1.3654	0.1608	2011	0.7964	0.5567
1999	1.3988	0.1906	2012	0.9682	0.4962
2000	1.7015	0.1561	2013	1.0458	0.4676
2001	1.9111	0.1594	2014	1.0980	0.4495
2002	1.8975	0.2341	2015	1.0897	0.4519
2003	2.0229	0.2233			

Figure 5-23: Recursive Estimates of Coefficients in the Model
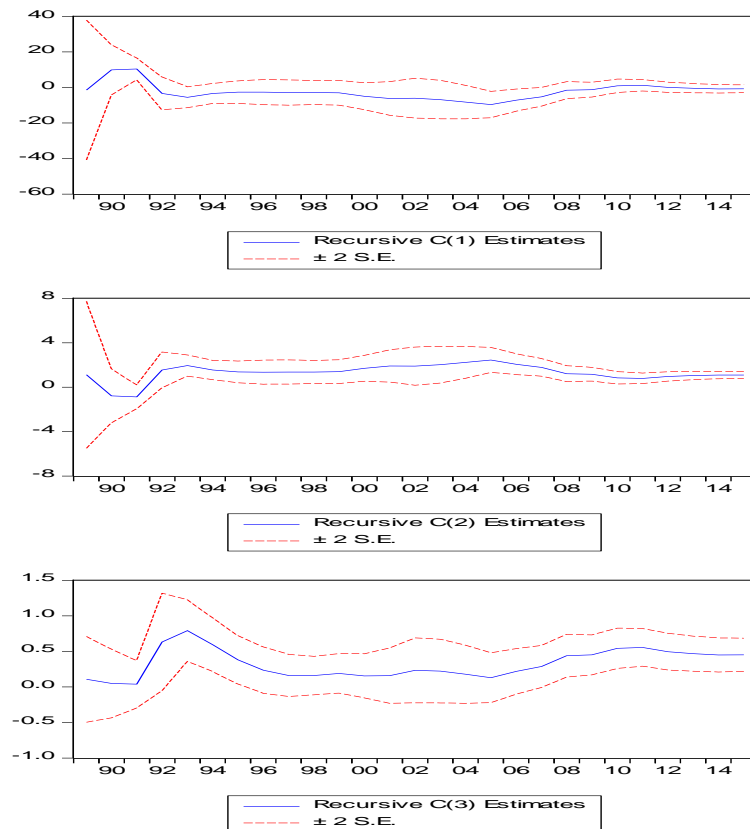
Figure 5-24: Change in Coefficient of Per Capita GDP
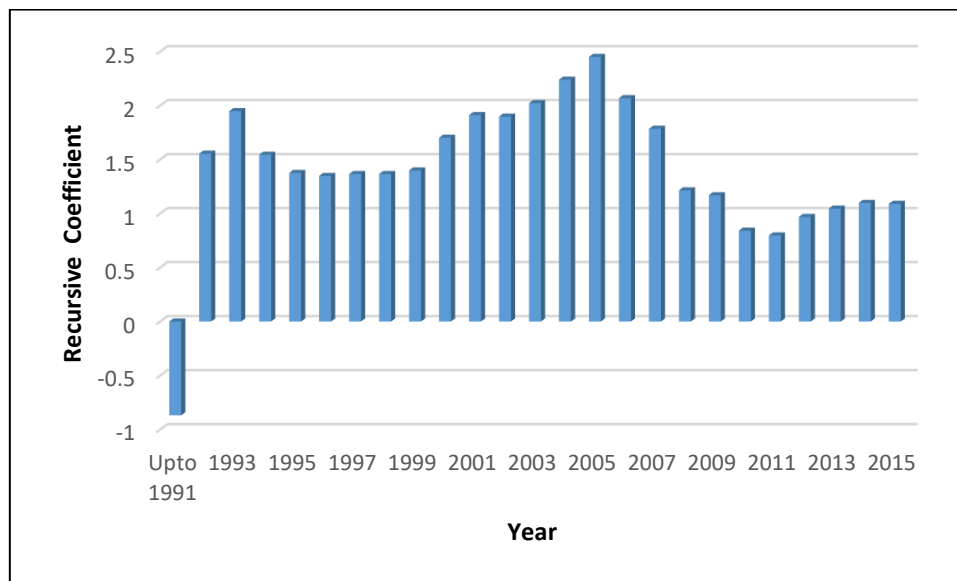
Figure 5-25: Change in Coefficient of Stability
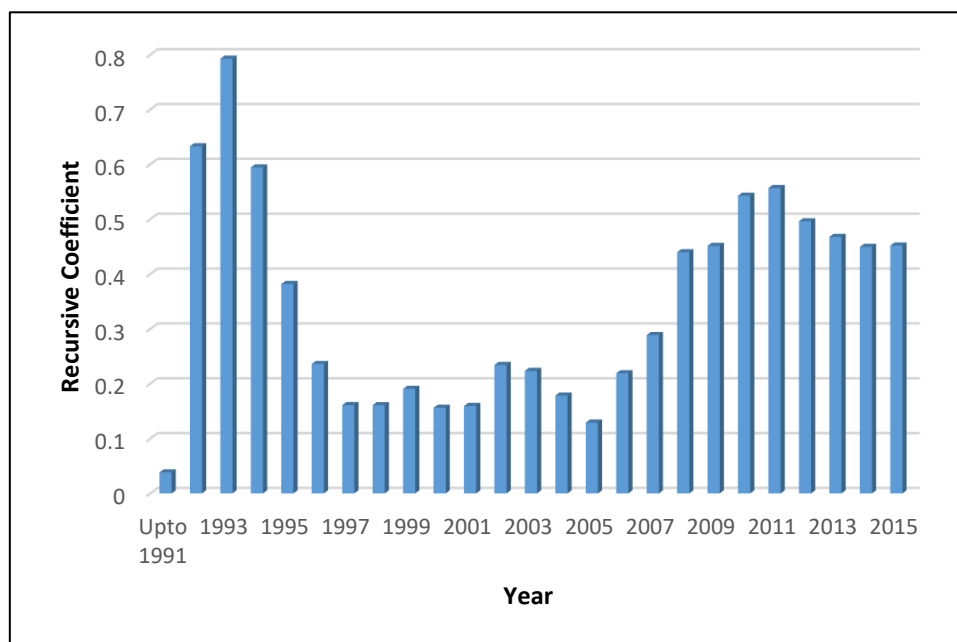
After assessing the dynamic nature of motives for foreign remittance, this study wanted

to explore the possible reasons behind the dynamic nature. To identify possible reasons

behind the changes of motive for foreign remittance, this study used two dummy

variables. Dummy Variable 1 represents the introduction of subsidy programs[20] for the

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[20] In 1989, the Sri Lankan government introduced *Janasaviya*, a subsidy program for the poor. This was mainly aimed at assisting the poor for their basic consumption. The program continues today after some changes and restructuring. It was renamed on several occasions as *Samurdhi* and *Divi Naguma* and is currently named as *Samurdhi*.

poor in October 1989. Dummy Variable 2 represents the 2010 government policy on female migration.[21] However, none of the dummy variables was significant.

5.2.4.10 Impulse Response Analysis and Variance Decomposition

The above analysis helped examine the short-run and long-run determinants of foreign remittance. Nonetheless, it was not capable of explaining (i) the response to innovation in other variables (for instance, the ARDL model cannot be used to examine the dynamic effect of a unitary shock measured by one standard error to a particular regression equation) (Song and Witt 2000) and (ii) the causality out of the sample period (Ahmad and Du 2017).

Therefore, this study used IRA and variance decomposition. The IRA explores the effect of a unitary shock to one variable on all the other variables in the model. It is usually represented in graphical form and in this study it shows the time paths of remittance to unitary shocks in its own and other series in the equation. The VDA shows how much a shock to one variable affects the variance of the forecast error of another in the model. Based on the work of Engle and Granger (1987), this study used the VAR model for IRA and variance decomposition.

The results of the IRA are depicted in Figures 5.26 and 5.32. The blue lines of the graphs show the impulse response function and the red lines show the 95% confidence intervals. The impulse response of remittance to its own shock is given in Figure 5.26. As shown in the figure, initially, a one standard deviation positive shock on remittance leads it to go up by twice the shock amount, thus, the initial value of 2. As time passes, the effect of the

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[21] In 2010, the Sri Lankan government made a policy decision to encourage male migration while reducing female migration. This was a significant policy decision and resulted in female migration changing from 51.69% in 2009 to 48.84% in 2010. Female migration to GCC countries was the main migration income flow during that period.

shock decays, reaching 0 in period 4. The impulse response of remittance on its own is negative in Periods 4 to 8, followed by a positive impulse response afterwards.

Figure 5-26: Impulse Response of REM to One SD Shock to Remittance
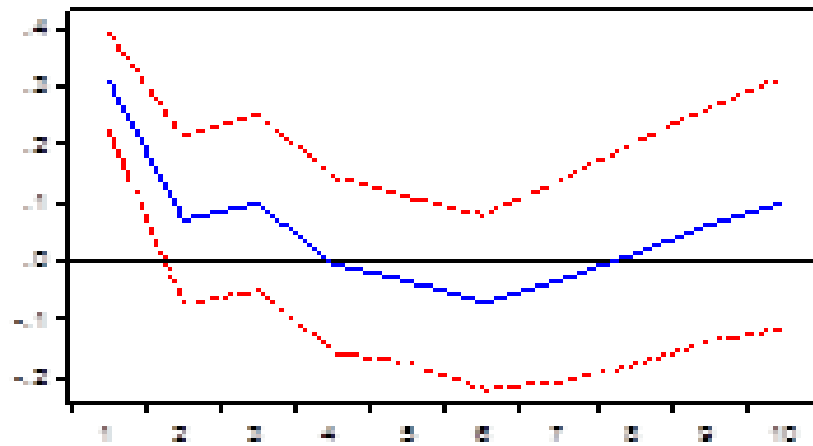
Figure 5.27 shows the impulse response of remittance to per capita GDP. Initially, a positive shock to per capita GDP has no impact on remittance; hence, the value is zero. However, it can be clearly seen that a one standard deviation shock to per capita GDP has a positive impact on remittance over the rest of the period.

Figure 5-27: Impulse Response of REM to One SD Shock to PCGDP
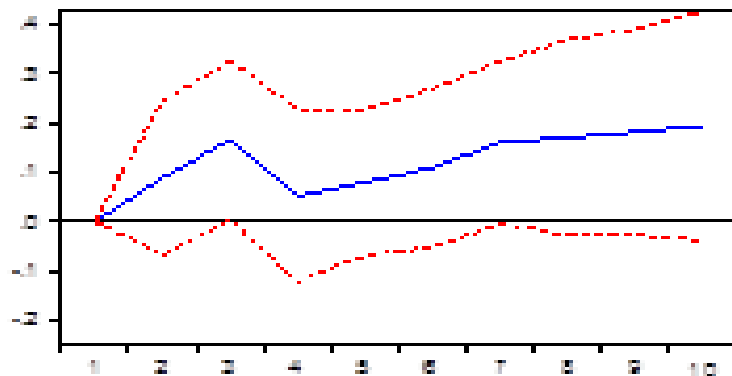
As shown in Figure 5.28, a one standard deviation shock to oil rent does not cause much impact on foreign remittance over the stated ten periods. However, except for Period 4, it has a positive response in all the other periods.

Figure 5-28: Impulse Response of Rem to One SD Shock to Oil Rent
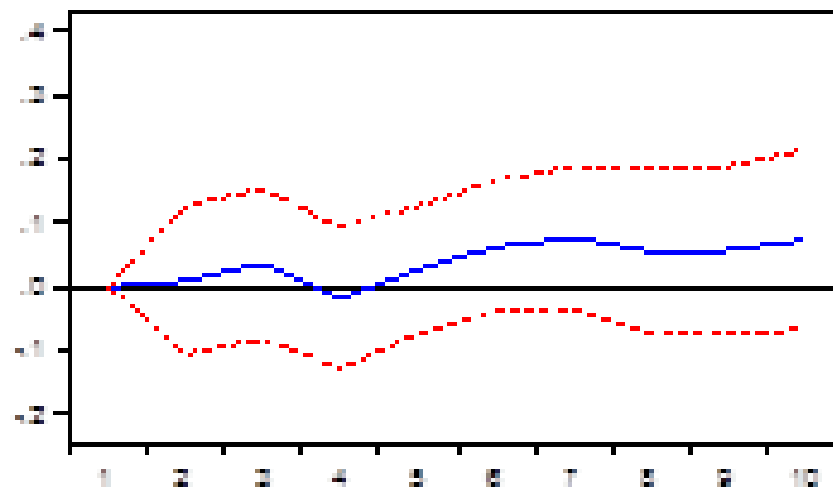
The response of remittance to lending interest rate is shown in Figure 5.29. A one standard deviation shock to lending interest rate leads to a reduction in remittance for up to three periods, improving thereafter. As depicted in the figure, commencing from Period 4, the response shows a positive trend up to Period 6 and stagnates around 1 during the rest of the period.

Figure 5-29: Impulse response of REM to One SD Shock to Lending Interest Rate
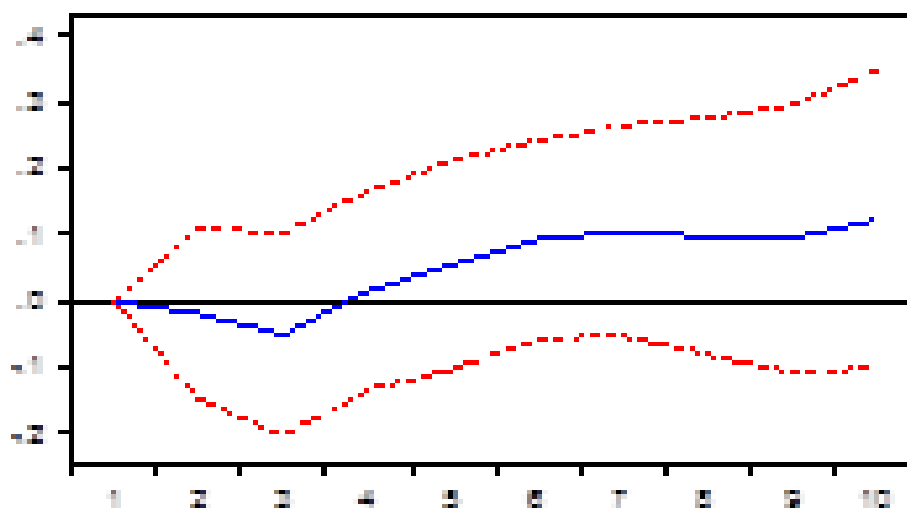
The analysis of response of remittance to a one standard deviation shock to country risk variables are given in Figures 5.30 to 5.32. As shown in Figure 5.30, a one standard deviation shock to government stability initially reduces foreign remittance to below zero

until Period 4. The pattern of response changes after that, starting to move to a positive response. However, as shown in the figure, the response of remittance to a one standard deviation shock on stability does not move above 1 over the time.

Figure 5-30: Impulse Response of REM to One SD Shock to Stability
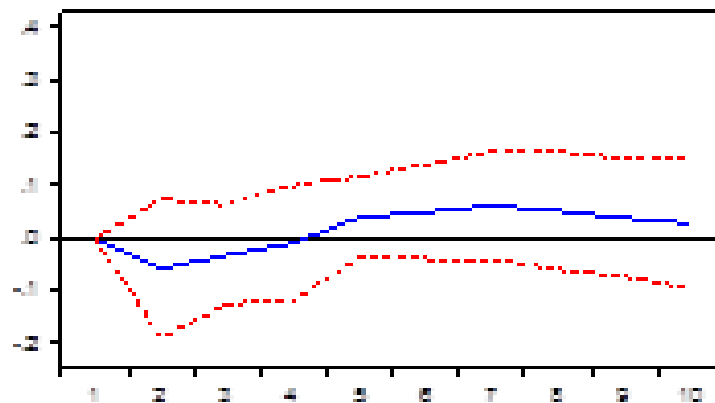
Similar to the pattern of response of remittance to stability, response of remittance to accountability is initially negative for up to three periods and positive thereafter. Nonetheless, the positive response lasts only up to Period 9 and it becomes negative after Period 9 (See Figure 31). The impulse response of remittance to socio-economic status is given in Figure 5.32. A one standard deviation shock to socio-economic stability has no impact on foreign remittance for two periods and it is positive for the rest of the eight periods.

Figure 5-31: Impulse Response of REM to One SD Shock to Accountability
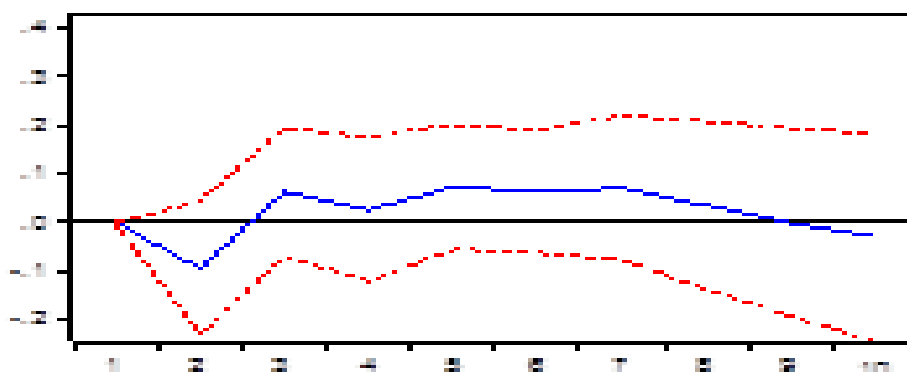
Figure 5-32: Impulse response of REM to one SD shock to Socio-economic Status
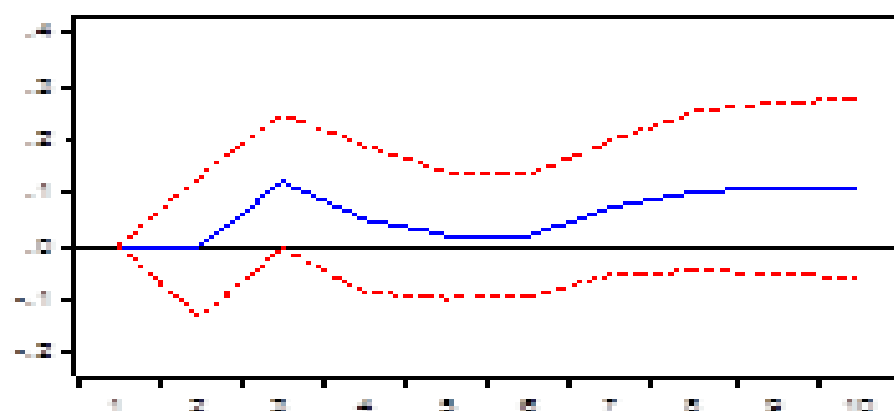
Table 5-16: Variance Decomposition

Period	REM	PCGDP	OIL	INTLEND	Stability	Accountability	Socio-economic Status
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	85.44310	8.126315	0.135672	0.706154	1.746512	3.835036	0.007213
3	67.78945	17.16778	0.231282	2.855257	2.713154	4.358722	4.884363
4	64.39909	19.98827	0.221504	2.775133	2.647352	4.605573	5.363069
5	58.57616	21.01961	0.261075	3.593146	4.664570	6.917088	4.968347
6	48.62247	23.15198	0.959618	6.271709	8.484827	8.253854	4.255537
7	38.51222	27.58653	1.581583	7.767959	10.81499	9.022930	4.713784
8	32.22793	31.70166	1.777445	8.803423	11.30969	8.185508	5.994350
9	28.85477	34.96739	2.049805	9.683710	10.46910	6.982299	6.992928
10	26.56523	37.02239	2.708291	11.23930	9.099531	6.054555	7.310698

Note: Cholesky Ordering: REM, PCGDP, OIL, INTLEND, Stability, Accountability, Socio-economic Status

As shown in Table 5.16, the remittance is explained purely by its own shock of 100% in Period 1. This gradually decreases over the time horizon and reaches 26.57% in Period 10. The fraction of remittance forecast error variance attributable to the variation in explanatory variables increase over the time horizon. At Period 2, it is 8.13%, 0.14%, 0.71% 1.75%, 3.8% and 0.007%, respectively for PCGDP, oil rent, lending interest rate, government stability, accountability and socio-economic condition. The largest

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proportion of the forecasting error variance in the inflow of foreign remittance to Sri Lanka is due to the shocks in the per capita GDP in Sri Lanka. The implication of this is that to produce better forecasts for inflow of foreign remittance to Sri Lanka, it is important to correctly forecast the per capita GDP of the country.

5.2.5 Acceptance or Rejection of the Hypotheses of the Study

Table 5.17 summarises the hypotheses of the study and the conclusions derived from the above analysis. The results of the study support the rejection of H_1, H_2 and H_4. However, the results of the study did not support the rejection of H_3, which hypothesised that foreign remittance to Sri Lanka is affected by host country macroeconomic conditions and changes in oil price.

Over the past decades, except for recent trends, Sri Lankan migrants were mostly housemaids or low-skilled or unskilled workers. Thus, their wage level has generally been at the bottom layer of the salary scales. Further, the service of a housemaid is a common feature of the GCC lifestyle. Thus, despite changes in economic performance or reduction in the oil price, residences in GCC countries may still need the services of housemaid. Because of this, demand for housemaids in GCC countries (and therefore their salaries) might not be sensitive to changes in economic performance.

Table 5-17: Summary of the Hypotheses and Conclusions

Hypothesis	Accept/Reject	Conclusion
H_0: Motive for remittance to Sri Lanka is static over the time (Motive for remittance to Sri Lanka is not dynamic over time)	Reject	Motive for remittance to Sri Lanka is dynamic over time
H_{0a}: Foreign remittance to Sri Lanka is not affected by home country macroeconomic conditions	Reject	In the long run, remittance to Sri Lanka is affected by per capita GDP and government stability of the country. In the short run it is affected by accountability and socio-economic status of the country
H_{0b}: Foreign remittance to Sri Lanka is not affected by host country macroeconomic conditions and the changes in oil price	Accept	Host country macroeconomic conditions do not affect the inflow of remittance to Sri Lanka
H_{0a}: There is no impact of country risk on foreign remittance to Sri Lanka	Reject	Country risk significantly influences inflow of foreign remittance in Sri Lanka, both in the long and the short run

5.2.6 Summary of the Discussion and Policy Implications

This study investigates the determinants of remittance inflow to Sri Lanka. The absence of studies with econometric analysis in the Sri Lankan context and the future research directions outlined in Ruiz-Arranz and Lueth (2007) provide the motivation for this research. The analysis started with pairwise correlation between country risk factors and the strong correlation suggested the use of factor analysis. Based on the results of factor analysis, government stability, accountability and socio-economic condition were identified as country risk components.

In the second step, correlation analysis was used to see the possible strong association between selected macroeconomic variables. Based on the correlation analysis, per capita

GDP and lending interest rate in oil rent in KSA were used as the other explanatory variables of the model.

The ARDL model was used in this study to identify the determinants of remittance inflow and the long- and short-run relationships among them. The study tested all the preliminary tests associated with the ARDL model to ensure accuracy of findings for policy directions. Thus, test of stationarity, lag order selection, stability and serial correlation tests were performed prior to and in the process of the main analysis.

The analysis found per capita GDP and government stability to be key determinants in the long run, and accountability and socio-economic condition to be the key short-run determinants in the model. These findings are based on the Wald test and ECM, respectively. Further to these two main analyses, variance decomposition and IRA were used to enhance the soundness of the research and they helped to ensure the important findings derived through the long-run and short-run dynamic models.

The second objective of the study was to assess whether GCC countries' income and oil price fluctuations influence the inflow of remittance to Sri Lanka. As explained in the analysis, the ARDL model does not provide enough evidence for this and it should be further investigated in a separate study.

Achieving the third objective of the study, analysis found that reduction of overall country risk helps Sri Lanka to increase the foreign remittance inflow. This is one of the key findings of this study. As a developing country, remittance to Sri Lanka is the main external finance flow. If government and policymakers could ensure the political stability of the country, migrants would remit more back to Sri Lanka instead of keeping their earnings in host country savings accounts.

The final objective of this study is to reassess the motives for remittance to Sri Lanka and answer the question posed by Ruiz-Arranz and Lueth (2007). This study found that remittance to Sri Lanka is highly dominated by investment and insurance motives as compared with altruistic motives. All these findings link together and help to prove each other's validity. For example, the political stability of the country signals that the country is a good place for new investments. It encourages prospective investors, including migrant workers, to invest in Sri Lanka.

The study found that migrants' motives for remittance are not static. They are dynamic and change according to changes in the economic, political and social conditions. This is evident in the change in the recursive estimate coefficient of per capita GDP from negative to positive, which occurred in the period from 1991 to 1992. Further, this study also found per capita GDP and political stability to be key determinants of foreign remittance in the long run, whereas accountability and socio-economic conditions are important in the short run.

This is the foremost study to examine the dynamic nature of motive for remittance at the aggregate level. Therefore, this study fills the gap in the literature to a certain extent. Further, by uncovering the key determinants and the behaviour involved with motives for remittance, this study has the potential to assist policymakers to develop more effective policies to ensure the sustainable inflow of remittance. Future researchers could extend the study on the dynamic nature of foreign remittance using country and cross-country-level data and improve the validity of the so-called dynamic nature of foreign remittance.

5.3 Analysis of the Impact of Foreign Remittance on Financial Development in Sri Lanka

Chapter 3 discussed the theoretical and empirical literature on the impact of foreign remittance on financial development. It described how it could vary from developed countries to developing countries. Further, it provided evidence of a range of impacts, ranging from significant impact to no impact. According to the literature, if there is a significant impact of foreign remittance on financial development, it could sometimes act as a substitute for financial services or else they could be complementary to one another. Thus, researchers introduced the so-called substitutability hypothesis and complementary hypothesis to explain the nexus between foreign remittance and financial development in another context.

However, despite the importance of foreign remittance to Sri Lanka, there are no studies that have sufficiently examined the nexus between foreign remittance and financial development in Sri Lanka. This may hinder the financial institutions' ability to understand whether and how they benefit from servicing foreign remittance and providing financial products to migrants and their family members. Further, it constrains the possible direct and indirect development impact of foreign remittance. Thus, by filling the gap in the empirical literature, this study examines the impact of foreign remittance on financial development in Sri Lanka. Section 5.3.1 shows the objectives and hypotheses of the study, which have been derived from the literature.

5.3.1 Objectives and Hypotheses of the Study

The following section summarises the objectives and the hypotheses. A detailed overview of the identified objectives and hypotheses has already given in Chapters 1 and 3, respectively.

Objective 1: Assess the impact of foreign remittance on financial development

H$_0$: There is no significant impact of foreign remittance on financial development in Sri Lanka

Objective 2: Assess the substitutability versus complementary hypotheses

H$_0$: The link between foreign remittance and financial development supports the substitutability hypothesis

Objective 3: Identify the causal relationship between foreign remittance and financial development

H$_2$: There is no causal relationship between inflow of foreign remittance and financial development in Sri Lanka

5.3.2 Data and Methodology

This study follows the work of Aggarwal, Demirgüç-Kunt et al. (2006) in examining the impact of foreign remittance on financial development. Equation 5.4 shows the variables of the study, followed by the long-run model in Equation 5.5.

$$FD = f(REM, PCGDP, SIZE, P, INTDEP, INTLEND, OPENCU, OPENCAP) \qquad (5.4)$$

$$FD_t = \alpha_0 + \beta_1 REM_t + \beta_2 PCGDP_t + \beta_3\ SIZE_t + \beta_4\ P_t\ + \beta_5\ INTDEP_t +$$

$$\beta_6\ INTLEND_t + \beta_7\ OPENCU_t + \beta_8\ OPENCAP_t + \varepsilon_t \qquad (5.5)$$

where *FD* is financial development measured with four proxies, namely (1) credit, (2) deposits, (3) money supply and (4) assets.

FD in Sri Lanka in the year *t* is regressed on an intercept α, remittance *REM* and other

determinants of financial development.[22] A detailed explanation of variables, definitions

and measurements is given in Table 5.18.

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[22] Data collection included world development indicators; World Bank PovcalNet database; the International Financial Statistics of the IMF; and annual reports and socio-economic data booklets of the CBSL.

Table 5-18: Definition of Variables

Category	Variable	Measurement	Literature
Dependent variable	Financial intermediary development (FID)		
	Credit	Credit—private credit by deposit, banks and other financial institutions to GDP	(Aggarwal, Demirgüç-Kunt et al. 2006) (Aggarwal, Demirgüç-Kunt et al. 2011) and (Coulibaly 2015)
	Deposits	Deposits—the total value of demand, time and saving deposits at domestic deposit banks as a share of GDP	(Wagh and Pattillo 2007) (Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Coulibaly 2015)
	Money	Money—the ratio of liquid liabilities to GDP (M3/GDP)	(Wagh and Pattillo 2007) (Chowdhury 2011) and (Masuduzzaman 2014)
	Assets	Assets—total assets held by deposit banks as a share of the sum of deposit, money bank and Central Bank claim on the domestic nonfinancial real sector	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Coulibaly 2015)
Independent variable	Remittance (*REM*)	Official remittance received as a percentage of GDP	(Ruiz-Arranz and Giuliano 2005) (Wagh and Pattillo 2007) (Chowdhury 2011) and (Masuduzzaman 2014)
Control variables	Economic growth/quality of legal and institutional Development (*PCGDP*)	Per capita GDP (PCGDP)	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Chowdhury 2011)

Category	Variable	Measurement	Literature
	Size of the country (*SIZE*)	Log of GDP	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Chowdhury 2011)
	Price level (P)	Consumer price index (2010 = 100)	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Chowdhury 2011)
	Deposit interest rate (*INTDEP*)	Deposit interest rate is the rate paid by commercial or similar banks for demand, time or savings deposits	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Chowdhury 2011)
	Lending interest rate (*INTLEND*)	The bank rate that usually meets the short- and medium-term financing needs of the private sector	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) and (Chowdhury 2011) (Masuduzzaman 2014)
	Current account openness (*OPENCU*)	Exports and imports as a ratio of GDP	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) (Chowdhury 2011) and (Masuduzzaman 2014)
	Capital account openness (*OPENCAP*)	Flow of FDI and ODA as a ratio of GDP	(Aggarwal, Demirgüç-Kunt et al. 2006, Aggarwal, Demirgüç-Kunt et al. 2011) (Chowdhury 2011) and (Masuduzzaman 2014)

Source: Author compiled.

5.3.3 Data Analysis and Discussion

5.3.3.1 Analysis of Trend and Structural Breaks

First, this study examined the time series properties of the variables before the model estimates. The time series plots in Figure 5.33 show the possibility of structural breaks in the variables of the data set. Thus, the multiple breakpoints (MBP) test (Muggeo 2003) was used to identify the exact breakpoints. This is an alternative to the Chow Test (Chow 1960), which requires the pre-specification of breakpoints.

The results of the MBP Test are reported in Table 5.19. Dummy variables were introduced to assess whether the identified structural breaks were significant or not in the model. However, the breaks were not statistically significant to warrant including structural breaks in the further analysis.

Figure 5-33: Time Series Plots of Variables 1978–2016
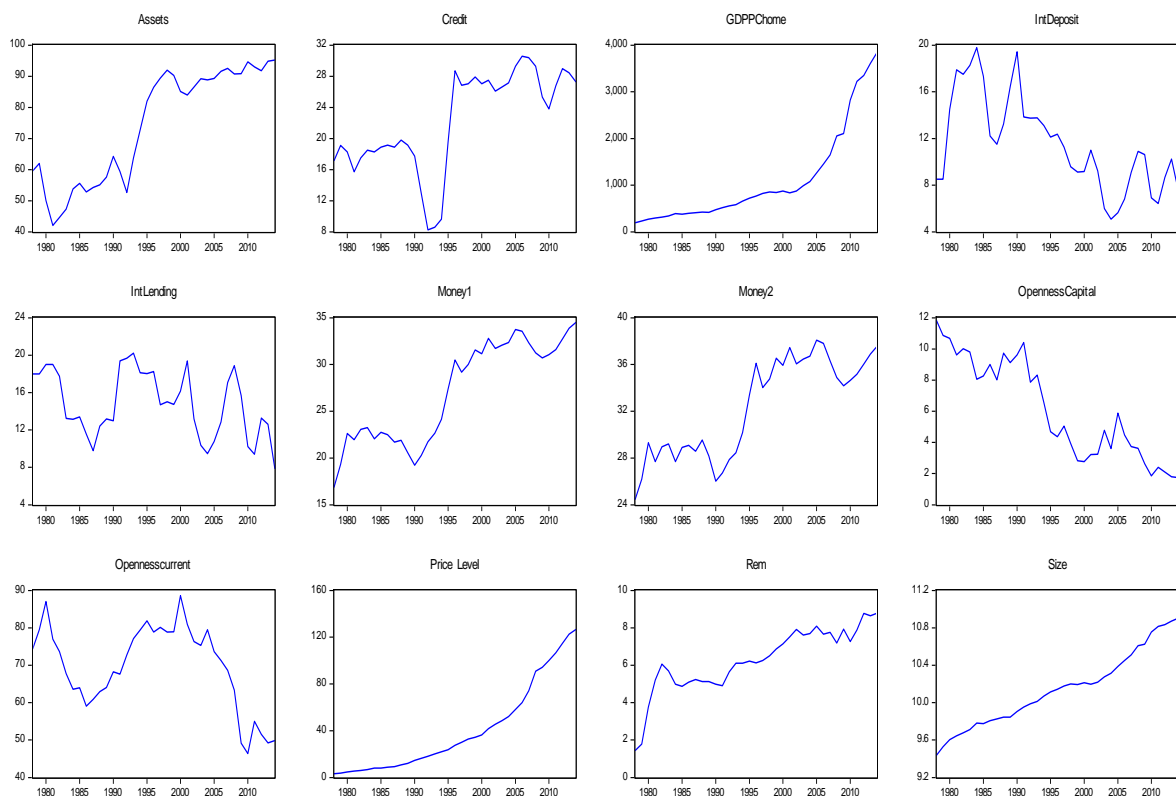
Table 5-19: Multiple Breakpoint Test Statistics

Variable	*F* Statistic	Critical Value**	Breakpoint
REM	64.14596	8.58	1998
	7.241482	10.13	
Assets	307.6076	8.58	1994
	10.66899	10.13	2003
	17.24605	11.14	2010
	6.527726	11.83	
Money 1	305.9929	8.58	1995
	13.27729	10.13	2000
	0.905128	11.14	
Money 2	286.1715	8.58	1995
	4.129792	10.13	
Int Lending	11.10606	8.58	2002
	7.133919	10.13	
P	107.247	8.58	1984
	70.14055	10.13	1991
	56.1338	11.14	1996
	27.92274	11.83	2001
	27.29821	12.25	2008
Size	77.32384	8.58	1983
	72.73308	10.13	1991
	39.4722	11.14	1996
	30.35122	11.83	2003
	24.67666	12.25	2008
OPENCAP	196.4211	8.58	1984
	46.05917	10.13	1995
	15.55563	11.14	2009
	1.535456	11.83	
OPENCU	168.6125	8.58	2009
	9.310248	10.13	

5.3.3.2 Unit Root Test and Lag Order Selection

The ADF test (Dickey and Fuller 1979) was used with all three forms such as constant, constant and linear trend and none were used to test the unit root of the variables. The Ng and Perron (2001) modified unit root test was used to verify the ADF results because it is powerful and reliable for the small sample over the ADF test. Both the ADF and Ng and Perron's modified unit root tests identified that *REM*, *INTDEP* and *OPENCAP* are I (0), whereas the others are I (1).

Table 5-20: Unit Root Test 1978–2016

	Null Hypothesis: Series has Unit Root						
	Augmented Dickey–Fuller (ADF) Test						
	None		*Constant*		*Constant and trend*		*Order of integration*
	Level	*First difference*	*Level*	*First difference*	*Level*	*First difference*	
Series	Prob	Prob	Prob	Prob	Prob	Prob	
ASSETS	0.9259	0.0001*	0.8735	0.0024*	0.0544	0.0128**	I(1)
CREDIT	0.5527	0.0004*	0.2216	0.0020*	0.0609	0.0388**	I(1)
INTDEP	0.2389	0.0000*	0.4092	0.0010*	0.0002*	0.0065*	I(0)
INTLEND	0.2563	0.0000*	0.0640	0.0006*	0.0988	0.0026*	I(1)
MONEY1	0.9850	0.0001*	0.6000	0.0006*	0.5431	0.0039*	I(1)
MONEY2	0.9523	0.0000*	0.5067	0.0001*	0.5520	0.0005*	I(1)
OPENCAP	0.0379*	0.0000*	0.5965	0.0000*	0.1412	0.0000*	I(0)
OPENCU	0.3143	0.0000*	0.8024	0.0001*	0.8920	0.0006*	I(1)
REM	0.9606	0.0002*	0.0671	0.0015*	0.0258**	0.0060*	I(0)
SIZE	1.0000	0.0649***	0.9797	0.0002*	0.9424	0.0012*	I(1)

*Significant at 1%. ** Significant at 5%. *** Significant at 10%.

Since the variables in the model are a mix of I (0) and I (1), the ARDL model was used in the analysis (Pesaran and Shin 1998, Pesaran, Shin et al. 2001). The lag selection of the ARDL model was based on AIC, and it confirmed the use of two lags in the model.

5.3.3.3 ARDR Model

The previous section justified the use of the ARDL model in analysis. Thus, with the confirmation of statistical pre-tests, Equations 5.6 to 5.9 show the basic ARDL models[23] to examine the nexus between foreign remittance and financial development. Financial development is measured with four proxy variables, namely credit, deposits, money supply and assets.

ARDL Model

Model 1

$$\Delta CREDIT_t = \alpha_0 + \sum_{j=1}^{2} \emptyset_j \, \Delta CREDIT_{t-j} + \sum_{j=o}^{2} \beta_j \, REM_{t-j} + \sum_{i=1}^{2} \gamma_j \, \Delta OPENCU_{t-1} +$$

$$\sum_{j=o}^{2} \vartheta_j \, OPENCAP_{t-j} + \sum_{j=o}^{2} \tau_j \, INTDEP_{t-j} + \sum_{i=1}^{2} \omega_j \, \Delta INTLEND_{t-j} +$$

$$\sum_{i=1}^{2} \varphi_j \, \Delta SIZE_{t-j} + \delta_1 CREDIT_{t-1} + \delta_2 OPENCU_{t-1} + \delta_3 INTLEND_{t-1} +$$

$$\delta_4 SIZE_{t-1} + \varepsilon \tag{5.6}$$

Model 2

$$\Delta DEPOSIT_t = \alpha_0 + \sum_{j=1}^{2} \emptyset_j \, \Delta DEPOSIT_{t-j} + \sum_{j=o}^{2} \beta_j \, REM_{t-j} +$$

$$\sum_{i=1}^{2} \gamma_j \, \Delta OPENCU_{t-1} + \sum_{j=o}^{2} \vartheta_j \, OPENCAP_{t-j} + \sum_{j=o}^{2} \tau_j \, INTDEP_{t-j} +$$

$$\sum_{i=1}^{2} \omega_j \, \Delta INTLEND_{t-j} + \sum_{i=1}^{2} \varphi_j \, \Delta SIZE_{t-j} + \delta_1 DEPOSIT_{t-1} + \delta_2 OPENCU_{t-1} +$$

$$\delta_3 INTLEND_{t-1} + \delta_4 SIZE_{t-1} + \varepsilon \tag{5.7}$$

---

[23] PCGDP and price were removed from all four models based on the Breusch–Godfrey serial correlation LM test.

Model 3

$$\Delta MONEY_t = \alpha_0 + \sum_{j=1}^{2} \emptyset_j \Delta MONEY_{t-j} + \sum_{j=o}^{2} \beta_j REM_{t-j} + \sum_{i=1}^{2} \gamma_j \Delta OPENCU_{t-1} +$$

$$\sum_{j=o}^{2} \vartheta_j OPENCAP_{t-j} + \sum_{j=o}^{2} \tau_j INTDEP_{t-j} + \sum_{i=1}^{2} \omega_j \Delta INTLEND_{t-j} +$$

$$\sum_{i=1}^{2} \varphi_j \Delta SIZE_{t-j} + \delta_1 MONEY_{t-1} + \delta_2 OPENCU_{t-1} + \delta_3 INTLEND_{t-1} +$$

$$\delta_4 SIZE_{t-1} + \varepsilon \hspace{6cm} (5.8)$$

Model 4

$$\Delta ASSETS_t = \alpha_0 + \sum_{j=1}^{2} \emptyset_j \Delta ASSETS_{t-j} + \sum_{j=o}^{2} \beta_j REM_{t-j} + \sum_{i=1}^{2} \gamma_j \Delta OPENCU_{t-1} +$$

$$\sum_{j=o}^{2} \vartheta_j OPENCAP_{t-j} + \sum_{j=o}^{2} \tau_j INTDEP_{t-j} + \sum_{i=1}^{2} \omega_j \Delta INTLEND_{t-j} +$$

$$\sum_{i=1}^{2} \varphi_j \Delta SIZE_{t-j} + \delta_1 ASSETS_{t-1} + \delta_2 OPENCU_{t-1} + \delta_3 INTLEND_{t-1} +$$

$$\delta_4 SIZE_{t-1} + \varepsilon \hspace{6cm} (5.9)$$

where CREDIT, DEPOSITS, MONEY and ASSETS are proxies for financial development, Δ is the first difference, the right-hand side of the equation shows the remittance and the other determinants of financial development, j is the number of lags and t is the time.

5.3.3.4 Model Validity Tests: Test of Serial Correlation and Stability

Followed by the model estimation, the Breusch–Godfrey serial correlation LM test and the CUSUM test were examined for the serial correlation and the stability of the models, respectively. Table 5.21 reports the summary results of the Breusch–Godfrey serial correlation LM test of the identified four models followed by the stability of the models in Figure 5.34.

According to the Breusch–Godfrey serial correlation LM test results in Table 5.21, the probability of chi-square values of four models are higher than a 5% significance level.

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Therefore, the null hypothesis of no serial correlation was not rejected, and it was concluded that there are no series correlation in any of the models.

According to Figure 5.34, the CUSUM test statistics are within the 95% critical bounds and this indicates that all the coefficients in the estimated ECM models are stable over the sample period of the study. Thus, the Breusch–Godfrey serial correlation LM test together with the CUSUM test confirmed the validity of the models.

Table 5-21: Test of Serial Correlation: Breusch–Godfrey Serial Correlation LM Test

Model	Prob. chi-square Value	Decision	Conclusion
Model 1	0.4847	Accept H_0	No serial correlation
Model 2	0.8226	Accept H_0	No serial correlation
Model 3	0.4234	Accept H_0	No serial correlation
Model 4	0.0556	Accept H_0	No serial correlation

Note: H_0: No serial correlation. H_1: Serial correlation.

Figure 5-34: Test of Stability of the Model (CUSUM Test)
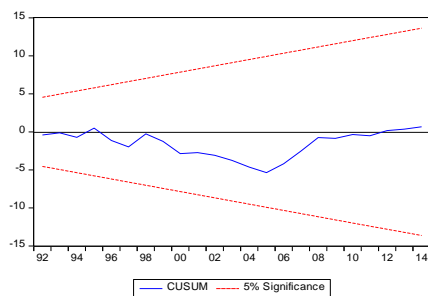
Model 1: *CREDIT*　　　　　　　　　　Model 2: *DEPOSITS*
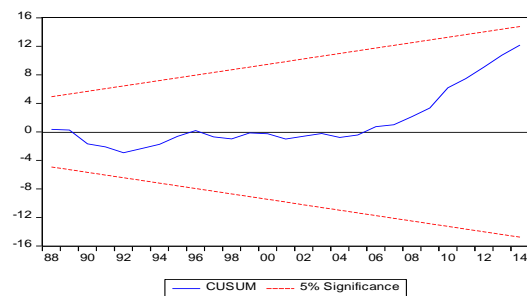
Model 3: *MONEY*　　　　　　　　　　Model 4: *ASSETS*

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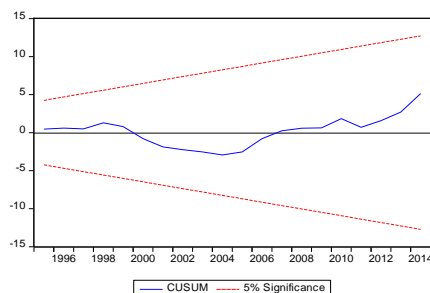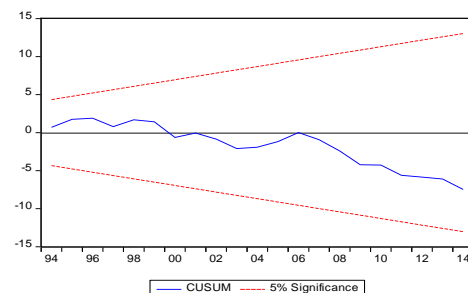
5.3.3.5 Bound Test of Co-Integration

Having estimated the models, this section discusses the bound test results that were used to examine the co-integration among the variables. Table 5.22 shows the bound test results to check the null hypothesis of no co-integration, against the alternative hypothesis of co-integration among the variables in the models. The F statistics of each model were compared with the critical values introduced by Narayan (2004), which is appropriate for a small sample.

Table 5-22: Bound Test: Co-integration

Mode	Dependent Variable	F Statistic	Decision	Conclusion
Model 1	*CREDIT*	5.1437	Reject H_0	Co-integration
Model 2	*DEPOSITS*	1.4210	Do not reject H_0	No co-integration
Model 3	*MONEY*	4.4812	Reject H_0	Co-integration
Model 4[a]	*ASSETS*	3.4379	Do not reject H_0	No co-integration

Note: Null hypothesis: There is no co-integration among the variables
Alternative hypothesis: There is co-integration among the variables bound test critical values are based on Narayan (2004).
Restricted intercept and no trend, upper bound critical values for the first three models at 1%, 5% and 10% are 5.286, 3.923 and 3.361, respectively. The lower bound critical values at 1%, 5% and 10% are 3.619, 3.619 and 2.24, respectively.
Restricted intercept and trend, upper bound critical values for first three models at 1%, 5% and 10% are 5.806, 4.271 and 3.634, respectively. The lower bound critical values at 1%, 5% and 10% are 3.909, 2.836 and 2.38, respectively.
a. This model does not include size variables. So, in Narayan's critical value table, k is different from other models. At k = 5, 5% level, restricted intercept and no trend, I (1) = 3.973 and I (0) = 2.770, and at 10% level I (1) = 3.396 and I (0) = 2.339.
Restricted intercept and trend at 5% level, I (1) = 4.398 and I (0) = 3. 005. At 10% level, I (1) and I (0) are 3.735 and 2.505, respectively.

The F statistic ($F = 5.1437$) of Model 1, which is higher than the Narayan (2004) upper bound critical value, leads to the rejection of the null hypothesis, confirming the co-integration among the variables (*CREDIT, REM, OPENCU, OPENCAP, INTDEP, INTLEND,* and *SIZE*) of Model 1.

However, in Model 2 the F statistic ($F = 1.421044$) is below the upper and lower critical values of Narayan (2004), leading bound test statistics to the non-rejection of the null hypothesis. Therefore, it is concluded that there is no co-integration between the variables (*DEPOSITS, REM, OPENCU, OPENCAP, INTDEP, INTLEND,* and *SIZE*) in Model 2.

In Model 3, the F statistic is higher than the bound test, upper bound critical values and hence the null hypothesis of no co-integration among variables was rejected at the 5% level. It was concluded that there was co-integration among the variables *(MONEY*, *REM, OPENCU, OPENCAP, INTDEP, INTLEND,* and *SIZE*) in Model 3. The F statistic ($F = 3$.43791) of Model 4 leads to inconclusive evidence on co-integration.

In summary, the bound test results confirmed the co-integration among the variables in Models 1 and 3. They suggested that there is a long-run relationship between foreign remittance and financial development in Sri Lanka.

5.3.3.6 Long-run Model Estimation 1978–2016

Having identified the co-integration in Models 1 and 3 in the previous section, this section estimates the long-run models. Table 5.23 and 5.24 summarises the results from OLS estimates for two models.

Table 5-23: Model 1: Long-Run Elasticity

Model 1 (Credit)	Constant	REM	INTLEND	OPENCU
Coefficient	9.4224	2.1226	−0.5248	0.1040
t statistic		4.071660***	−1.847850*	1.204221

Note: ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

Model 1: Long-run elasticity

As shown in Table 5.23, remittance and lending interest rates are the significant variables in the model. The respective elasticities are +2.1226 and −0.5248. According to the estimate, a 1% increase in inflow of remittance to Sri Lanka increases the private credit by deposit, banks and other financial institutions to GDP by 2.1226%. The finding is consistent with Chowdhury (2011) and Brown and Carmignani (2015). The significant positive coefficient indicates the importance of foreign remittance in increasing credit to the private sector, including credits to remittance recipients, non-remittance recipients and the business sector at large.

The inflow of foreign remittance acts as a guarantee for loans to remittance recipients and their households. Without it, they are generally excluded from the traditional banking system because of their weak repayment capacity. Conversely, remittance enhances the financial institutions' lending capacity and thereby increases the lending opportunities for non-remittance recipients and the business sector at large.

The identified positive impact of the credit–remittance nexus, together with the self-interest motive for remittance in Sri Lanka, leads to some important policy recommendations. For instance, since1992, the motive for foreign remittance to Sri Lanka has been self-interest. This indicates that migrants are more investment-oriented today than previously. Hence, the government can introduce new policies to encourage investment avenues whereby banks and financial institutions can create customised financial services to stimulate the investment-oriented migrants to remit more. This has a long-run growth impact because credit enhances investment and ultimately improves the economic growth of the country. For example, the money transferred between the Organisation for Economic Co-operation (OECD) and recipient countries such as the

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Philippines and African countries has been facilitated with cell phone encryption technology and it helps migrants to remit at low transaction cost (Bhattacharya, Inekwe et al. 2018). Thus, Sri Lanka also could introduce new technologies to reduce the cost and improve the efficiency of the remittance.

Moreover, significant positive impact of remittance on credit infers the acceptance of the complementary hypothesis, and it validates the self-interest motive for foreign remittance to Sri Lanka, which has dominated since 1992. Therefore, this study argues that inflow of remittance to Sri Lanka leads to an increase of the credit by enhancing the repayment capability of borrowers and acting as a guarantee to obtain loans.

The lending interest rate is significant at the 10% level. This is consistent with Chowdhury (2011), who focused on Bangladesh. The lending interest rate shows the cost of borrowing and the identified inverse relationship is compatible with the economic theory. According to the long-run estimate, a 1% decline in the lending interest rate leads to an increase in credit of 0.5248%.

Table 5-24: Model 3: Long-Run Elasticity

Model 2 (Money)	Constant	REM	INTLEND	OPENCU
Coefficient	13.2844	2.2190	−0.1690	0.1095
t statistic		10.85241 ***	−1.516848	3.234732***

Note: ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

As shown in Table 5.24, remittance and current account openness are the significant variables in Model 3. The respective slope coefficients are 2.2190 and 0.1095, respectively and are significant at the 1% level.

According to the model, the inflow of remittance has a significant long-run positive impact on the money supply of the country. A 1% increase in inflow of remittance to Sri Lanka increases the money supply by 2.2190%. Moreover, a 1% increase in current account openness increases the money supply by 0.1095%. The identified nexus between money supply and current account openness reinforced the findings of Gupta, Pattillo et al. (2009) and Chowdhury (2011), who studied this in the context of sub-Saharan African countries and Bangladesh, respectively.

In summary, the above analysis confirmed the co-integration among variables in Models 1 and 3, which used credit and money supply as proxies for financial development. Further, the long-run elasticities from OLS estimation measured the impact of foreign remittance on financial development in the long run and the review of results confirmed that the relationship between foreign remittance and financial development in Sri Lanka supports the complementary hypothesis. Following the above co-integration and the long-run model estimation, Section 5.3.2.7 analyses the short-run model.

5.3.3.7 Short-run Model Estimation 1978–2016

The ARDL model is incomplete without the estimation of the short-run dynamics of the model. Hence, the study estimated the short-run dynamics with the ECT derived from the long-run model and it can be specified as follows:

$$\Delta FD_t = \alpha_0 + \sum_{j=1}^{2} \emptyset_j \, \Delta FD_{t-j} + \sum_{j=o}^{2} \beta_j \, REM_{t-j} + \sum_{i=1}^{2} \gamma_j \, \Delta OPENCU_{t-1} +$$

$$\sum_{j=o}^{2} \vartheta_j \, OPENCAP_{t-j} + \sum_{j=o}^{2} \tau_j \, INTDEP_{t-j} + \sum_{i=1}^{2} \omega_j \, \Delta INTLEND_{t-j} +$$

$$\sum_{i=1}^{2} \varphi_j \, \Delta SIZE_{t-j} + \psi ECT_{t-1} + \varepsilon_t \qquad \qquad (5.10)$$

Table 5-25: ECT (−1) of the Model

Model	ECT (−1) Coefficient	Standard Error	t statistic	Prob
Model 1(CREDIT)	−0.336810	0.079814	−4.219921	0.0002
Model 3(MONEY)	−0.465664	0.134749	−3.455777	0.0018

Table 5.25 summarised the lagged ECT coefficient and the significance level. The ECT (−1) of Models 1 and 3 are −0.336810 and −0.465664, respectively, with 0.0002 and 0.0018 probability values. The negative lagged error term at a 1% level of significance gives the high rate of the convergence or the speed of adjustment towards the long-run equilibrium (Jenkıns and Katırcıoglu 2010). Accordingly, Model 1 has 34% speed of adjustment towards the long-run equilibrium and Model 3 has 47% speed of adjustment.[24.]

Tables 5.26 and 5.27 show the short-run coefficients in Models 1 and 3, respectively. This study followed the steps of Duasa (2007), and used the Hendry 'general to specific approach' to derive the parsimonious specification by removing the insignificant variables from the short-run dynamic model.

Table 5-26: Estimated Short-Run Dynamic Model for Model 1

Dependent variable: Credit

Variable	Coefficient	Std. Error	t statistic	Prob
C	−4.900973	3.188052	−1.537294	0.1351
D (CREDIT (−1))	0.504859**	0.126507	3.990771	0.0004
REM (−1)	0.385344	0.245920	1.566946	0.1280
D (INTLEND (−1))	−0.278951*	0.136527	−2.043188	0.0502
OPENCU (−1)	0.034865	0.034082	1.022992	0.3148
ECT (−1)	−0.336810	0.079814	−4.219921	0.0002

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[24] Serial correlation and the stability of the model results confirm the non-availability of the serial correlation (Breusch–Godfrey serial correlation LM test) and the stability of the model (CUSUM test).

Note: *** significance at 1%, ** significance at 5% and * significance at 10%.

According to the results in Table 5.26, *CREDIT* and *INTLEND* are the significant explanatory variables in the short run and are significant at 1% and 10%, respectively. *REM* and *OPENCU* are not significant in the short run. The existence of long-run impact along with the non-existence of short-run impact of remittances on credit might be due to the time gap. For example, recipients of remittance take time to apply for a loan because migrants need to be stable in their foreign employment. Similarly, banks process loans by examining the creditworthiness of their customers. Hence, it takes considerable time to assess the impact of remittances on credit at the macro level.

Table 5-27: Estimated Short-Run Dynamic Model for Model 3

Dependent variable: money supply

Variable	Coefficient	Std. Error	t statistic	Prob
C	−2.826130	1.930780	−1.463724	0.1548
D (MONEY (−1))	0.105059	0.158196	0.664103	0.5123
REM (−1)	0.366412	0.174791	2.096287	0.0456
D (INTLEND (−2))	−0.119633	0.076916	−1.555374	0.1315
OPENCU (−1)	0.035986	0.042902	0.838792	0.4090
OPENCU (−2)	−0.027679	0.043638	−0.634300	0.5312
ECT (−1)	−0.465664	0.134749	−3.455777	0.0018

The results in Table 5.27 show that remittance is the only variable significant at the 5% level. The finding is supported by Fromentin (2017). He found that significant long-run impact of foreign remittance on financial development exists only in low and upper middle income countries, whereas short-run significant impact does not exist in low-income countries. The findings of the present study are compatible with Fromentin (2017) in many aspects despite the significant differences between the focus countries of the two studies.

Following the analysis of the long-run and short-run relationships between foreign remittance and financial development, the following section extends the analysis to identify the causality between variables in the models.

5.3.3.8 Causality Test

Following the long-run and short-run impact assessments, this section further examines the Granger causality between foreign remittances and financial development in Sri Lanka. Table 5.28 depicts the results of Granger causality.

Table 5-28: Granger Causality Test: Remittance and Financial Development

Null Hypothesis	*F* Statistic	Prob	Causality
REM does not Granger cause CREDIT	4.68979	0.0169**	Unidirectional
CREDIT does not Granger cause REM	1.94738	0.1603	
REM does not Granger cause DEPOSITS	0.09049	0.9137	Unidirectional
DEPOSIT does not Granger cause REM	7.01928	0.0032**	
REM does not Granger cause MONEYSUPPLY	0.31612	0.7314	Unidirectional
MONEYSUPPLY does not Granger cause REM	3.75116	0.0352*	

Note: ** Significant at 1% and * significant at 5%.

According to the results, remittance Granger cause credit and there is no reverse causality. Therefore, there is a unidirectional causality between remittances and credit. The level of deposits Granger causing the remittances and non-availability of reserve causation confirmed the unidirectional causality. Similar kinds of causation exist between remittances and money supply, where money supply Granger causes remittance and not vice versa.

5.3.4 Acceptance/Rejection of the Hypotheses

This section summarises the hypothesis that are examined in the study and the conclusion derived based on the statistical analysis.

Table 5-29: Acceptance/Rejection of the Hypotheses

Hypothesis	Accept/Reject	Conclusion
H_0 Remittance has no long-run positive impact on financial development in Sri Lanka		
H_{0a}: Remittance has no long-run positive impact on money supply	Reject	In the long run, foreign remittance to Sri Lanka has significant positive impact on money supply of the country
H_{0b}: Remittance has no long-run positive impact on deposits in banks and financial institutions	Accept	Inflow of foreign remittance to Sri Lanka has no significant positive impact on deposits in banks and financial institutions in Sri Lanka
H_{0c}: Remittance has no long-run positive impact on the assets of the banks and financial institutions	Accept	Inflow of foreign remittance to Sri Lanka has no significant positive impact on assets of banks and financial institutions in Sri Lanka
H_{0d}: Remittance has no long-run positive impact on credits at banks and financial institutions	Reject	In the long run, foreign remittance to Sri Lanka has significant positive impact on private credit by deposit, banks and other financial institutions and confirms the complementary hypothesis
H_2 Remittance has no positive impact on financial development in the short-run[25]		
H_{2a}: Remittance has no short-run positive impact on money supply	Reject	In the short run, foreign remittance to Sri Lanka has significant positive impact on money supply of the country
H_{2d}: Remittance has no short-run positive impact on credit in banks and financial institutions	Accept	In the short run, foreign remittance to Sri Lanka has significant positive impact on credit in deposit, banks and other financial institutions
H_3: The link between foreign remittance and financial development does not support the complementary hypothesis	Reject	Foreign remittance to Sri Lanka supports the complementary hypothesis

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[25] Hypotheses on short-run impact of foreign remittance on deposits and assets were not tested as there was no co-integration in the long-run models.

Hypothesis	Accept/Reject	Conclusion
H_4: There is no causal relationship between inflow of foreign remittance and financial development in Sri Lanka		
H_{4a}: There is no bidirectional causality between remittance and money supply	Accept	Remittance does not Granger cause money supply, but money supply does Granger cause remittance
H_{4b}: There is no bidirectional causality between remittance and deposits in banks and financial institutions	Accept	Remittance does not Granger cause remittance but deposits do Granger cause remittance
H_{4c}: There is no bidirectional causality between remittance and assets of the banks and financial institutions	Reject	Remittance does Granger cause assets and assets Granger cause remittance
H_{4d}: There is no bidirectional causality between remittance and credit in banks and financial institutions	Accept	REM does Granger cause credit, but credit does not Granger cause remittance

5.3.5 Discussion and Policy Implications

Foreign remittance is one of the main currency flows to Sri Lanka, accounting for more than 10% of country's GDP. This study found that the inflow of remittance has a significant positive long-run impact on certain aspects of financial development in Sri Lanka, namely credit and money. Nonetheless, remittance does not have a significant impact on deposits and assets in the long run.

Moreover, remittance has a positive significant short-run impact only on money, whereas there is no statistically significant short-run impact of remittance on the rest of the financial development proxies. The finding of the study is partially consistent with Aggarwal, Demirgüç-Kunt et al. (2011) and Chowdhury (2011). For instance, Aggarwal, Demirgüç-Kunt et al. (2011) found significant impact of foreign remittance on bank

deposits and credit. However, this study found no significant impact on deposits. The absence of significant impact of foreign remittance on deposits implies that the savings accounts are mostly used to remit foreign currency to Sri Lanka and neither migrants nor recipients accumulate the remittances in savings accounts.

The Granger causality test showed that remittances Granger cause private credit through deposits in banks and other financial institutions in Sri Lanka. Also, it revealed that the total value of demand, time and savings deposits at domestic deposit banks and the liquid liabilities (money) Granger cause foreign remittance to Sri Lanka.

The long-run positive relationship between remittance and financial development, specifically credit, implies that the complementary hypothesis is more suitable to explain the nexus between remittance and financial development in Sri Lanka. As foreign remittance increases private credit through deposits in banks and other financial institutions, it increases the possibility of increasing either consumption or investment. According to the findings of Section 5.2, the motive for foreign remittance to Sri Lanka is currently dominated by self-interest. Therefore, increase in credit could be mostly associated with investment.

As explained in Aggarwal, Demirgüç-Kunt et al. (2011), the presence of a significant long-run association with and the impact of foreign remittance on financial development is vital for any country, because the growth-enhancing and poverty-reducing effect of financial development is evidenced through the empirical literature. This study only considers the official remittance inflow data. However, unofficial remittance flow is comparatively high in developing countries (Gupta, Pattillo et al. 2009). This is applicable to Sri Lanka as well. Therefore, the results of this analysis should be considered the minimum impact of remittance on the financial development of the country. If total inflow

of remittance via both formal and informal sources was considered, the impact would be higher than the existing level. These finding prove the importance of strong policies to enhance the sustainable inflow of foreign remittance to Sri Lanka. Hence, policymakers should develop strategies to increase the inflow of foreign remittance to Sri Lanka.

5.4 Analysis of the Foreign Remittance–Poverty and Foreign Remittance–Income Inequality Nexus in Sri Lanka

5.4.1 Introduction

The focus of this section is to examine the causal relationships between foreign remittance and poverty, and foreign remittance and income inequality. The literature review in Chapter 2 presented the gaps in the empirical literature. As explained in Chapter 2, there is ambiguity about the causal 'foreign remittance–poverty' and 'foreign remittance–income inequality' relationships. Moreover, most of the existing studies were based on a $1.90 poverty line. However, with the introduction of moderate poverty lines of $3.30 and $5.50, there is a necessity to revisit the above relations because analysis based on a $1.90 poverty line only assesses extreme poverty.

The analysis of remittance–poverty and remittance–income inequality has been divided into three main sections. Section 5.4.2 outlines the objectives and hypothesis of the study. Section 5.4.3 discusses the variables and their measurements and is followed by data analysis in Section 5.4.4. Section 5.4.5 tests the hypotheses based on the results of the study and is followed by conclusions in Section 5.4.6.

5.4.2 Objectives and Hypothesis

To develop an econometric model to assess the short-run and long-run impacts of remittances on poverty and income inequality the following hypothesis are proposed:

H_5: Remittance inflows do not affect poverty

H_6: Remittance inflows do not influence income inequality

To assess the causal relationship between remittances and poverty and between remittances and income inequality in Sri Lanka the following hypothesis are proposed:

H[7]: There is no causal relationship between remittance and poverty

H[8]: There is no causal relationship between remittance and income inequality

5.4.3 Data and Variables of the Study

Annual poverty and income inequality data were collected from the World Bank PovcalNet database from 1980 to 2016. Because of the lack of poverty data in chronological order, this study used interpolation techniques to interpolate some of the time series data. The following section discusses the variables of interest in this study.

This study used poverty headcount ratio, poverty gap ratio and squared poverty gap ratio. The poverty headcount ratio acts as a proxy for the level of poverty. It measures the percentage of the population living below the poverty line. The poverty gap, the mean distance below the poverty line as a proportion of the poverty line, acts as a proxy for depth of poverty. It shows how far below the poverty line the average poor person's income is. The proxy for severity of poverty is the squared poverty gap, which is the mean of the squared distance below the poverty line as a proportion of the poverty line (Adams and Page 2005, Wagh and Pattillo 2007). Apart from these three poverty measures, per capita expenditure (Quartey 2008, Odhiambo 2009) was added as another proxy for poverty.

The most common poverty line for the poverty measurements above was the $1.9 poverty line. As stated in IBRD (2017)**,** it measures only extreme poverty, and so is not suitable to measure moderate poverty. Moreover, there was a necessity to measure the moderate poverty in both developed and developing countries, including Sri Lanka. Thus, the World Bank introduced two more poverty lines. They measure the poverty at $3.2 and $5.5. This study intended to measure whether remittance helps reduction of both extreme

and moderate poverty or not. Therefore, this study used $1.90 and $5.5 poverty lines and the abovementioned level, depth and severity of poverty was assessed at both the poverty lines.

Income inequality was measured with the most commonly used income inequality measurement, the Gini coefficient (Wagh and Pattillo 2007, Acosta, Calderon et al. 2008, Adams, Lopez-Feldman et al. 2008, Gupta, Pattillo et al. 2009).

Along with the poverty and income inequality measures in the above, the following section discusses determinants of poverty and income inequality, which are used as explanatory variables in the model.

5.4.3.1 Determinants of Poverty and Income Inequality

The level of poverty is influenced by many factors—economic, social, political, demographical and spatial (Rupasingha and Goetz 2007). Of these, poverty is most strongly affected by economic factors (Levernier, Partridge et al. 2000).

As mentioned in (Gupta, Pattillo et al. 2009) and (Wagh and Pattillo 2007), per capita income and income inequality are the key economic determinants of poverty. Further, inflation, growth volatility, corruption, political stability, financial development and trade openness also influence the level of poverty in a country (Akhter and Daly 2009). The measurement of inflation and trade openness in (Akhter and Daly 2009) is the same as mentioned in Section 5.2. The growth volatility is measured through standard deviation of GDP per capita growth. Further, they measured corruption using the corruption perception index prepared by Berlin-based Transparency International and the World Bank political stability index was used as proxy for political stability.

Gunatilaka and Chotikapanich (2006) conducted a study to identify inequality trends and determinants in Sri Lanka. In their study, they found rapid income growth to be a major contributor to income inequality in Sri Lanka during the period from 1980 to 2002. Gunatilaka and Chotikapanich (2006) also identified infrastructure, education and occupation status as significant determinants of income inequality. Growth volatility has also been considered another important determinant for causing income inequality (Breen and García-Peñalosa 2005).

Based on the literature and the availability of data, the proposed determinants of poverty and income inequality are shown in Equations 5.11 and 5.12 and summarised in Table 5.30.[26]

$$Poverty = \mathfrak{f}(PCGDP, REM, Inflation, OPENCAP, OPENCU) \tag{5.11}$$

$$Income\ Inequality = \mathfrak{f}(PCGDP, REM, Inflation, OPENCAP, OPENCU) \tag{5.12}$$

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[26] As stated in Levernier, W., M. D. Partridge and D. S. Rickman (2000). 'The Causes of Regional Variations in US Poverty: A Cross-County Analysis.' Journal of Regional Science **40**(3): 473–497. Poverty is severely affected by economic factors. This study used per capita GDP as a proxy to represent all the other main macroeconomic determinants of poverty.

Table 5-30: Determinants of Poverty and Income Inequality

Determinant	Measurement
Economic development (PCGDP)	Per capita GDP
Inflation (Inf)	Annual percentage change in the GDP deflator
	Consumer price index
Openness in current account (OPENCU)	Imports and exports as a ratio of GDP
Openness in capital Account (OPENCAP)	Flow of FDI plus ODA as a ratio of GDP
Lending interest rate	Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector
Foreign Remittances	Rem/GDP

Source: Author compiled.

5.4.4 Data Analysis and Discussion

This section has two parts. The first part presents the data analysis and discussion on the impact of foreign remittance on poverty and income inequality. It analyses the impact of foreign remittance on poverty using poverty headcount ratio, poverty gap ratio, squared poverty gap ratio and per capita expenditure. The impact of foreign remittance on income inequality is assessed using the Gini index as a proxy.

The second part of the analysis examines the causal relationship between foreign remittance and poverty, and foreign remittance and income inequality. Table 5.31 summarises the determinants of poverty and income inequality. As shown in Table 5.31, there are four analyses. Analysis 1 examines the relationship between remittance and extreme poverty. It has three models because this study focuses on level, depth and severity of poverty. Analysis 2 examines the relationship between remittance and moderate poverty, and like Analysis 1, it uses three poverty measures.

Analysis 3 attempts to examine poverty using an alternative measure to the measures in the first two analyses. Therefore, it uses per capita expenditure as proxy for the poverty measure. Analysis 4 is intended to examine the remittance and income inequality nexus in Sri Lanka.

Table 5-31: Determinants of Poverty and Income Inequality with Different Measures

Analysis	Dependent Variable	Measurements
Measure	*Dependent variable*	*Function*
Analysis 1: Remittance—extreme poverty (based on $1.90 poverty line)		
Level of poverty	Poverty headcount ratio (PHC1)	$PHC1$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Depth of poverty	Poverty gap ratio (PGAP1)	$PGAP1$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Severity of poverty	Squared poverty gap ratio (SPGAP1)	$SPGAP1$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Analysis 2: Remittance –moderate poverty (based on $5.50 poverty line)		
Level of poverty	Poverty headcount ratio (PHC2)	$PHC2$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Depth of poverty	Poverty gap ratio (PGAP2)	$PGAP2$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Severity of poverty	Squared poverty gap ratio (SPGAP2)	$SPGAP2$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Analysis 3: Remittance – per capita expenditure (alternative for poverty analysis		
Per capita expenditure	Log of per capita expenditure	PCE $= \int(PCGDP, REM, OPENCAP, OPENCU)$
Analysis 4: Remittance – income inequality		
Income inequality	Gini index (GINI)	$GINI$ $= \int(PCGDP, REM, OPENCAP, OPENCU)$

5.4.4.1 Stationarity of the Data

The data analysis begins with deriving the time series plots and assessing the stationarity of the time series. With the overview of time series plots shown in Figures 5.35 to 5.37, this study used the ADF test and PP test to assess the stationarity of the data. Based on the stationarity test results, in Appendix it is concluded that variables of interest are I(1).

Thus, co-integration analysis is used to examine the relationship between remittance–poverty and remittance–income inequality.

Figure 5-35: Time Series Plot 1—Remittance and Poverty 1981–2016
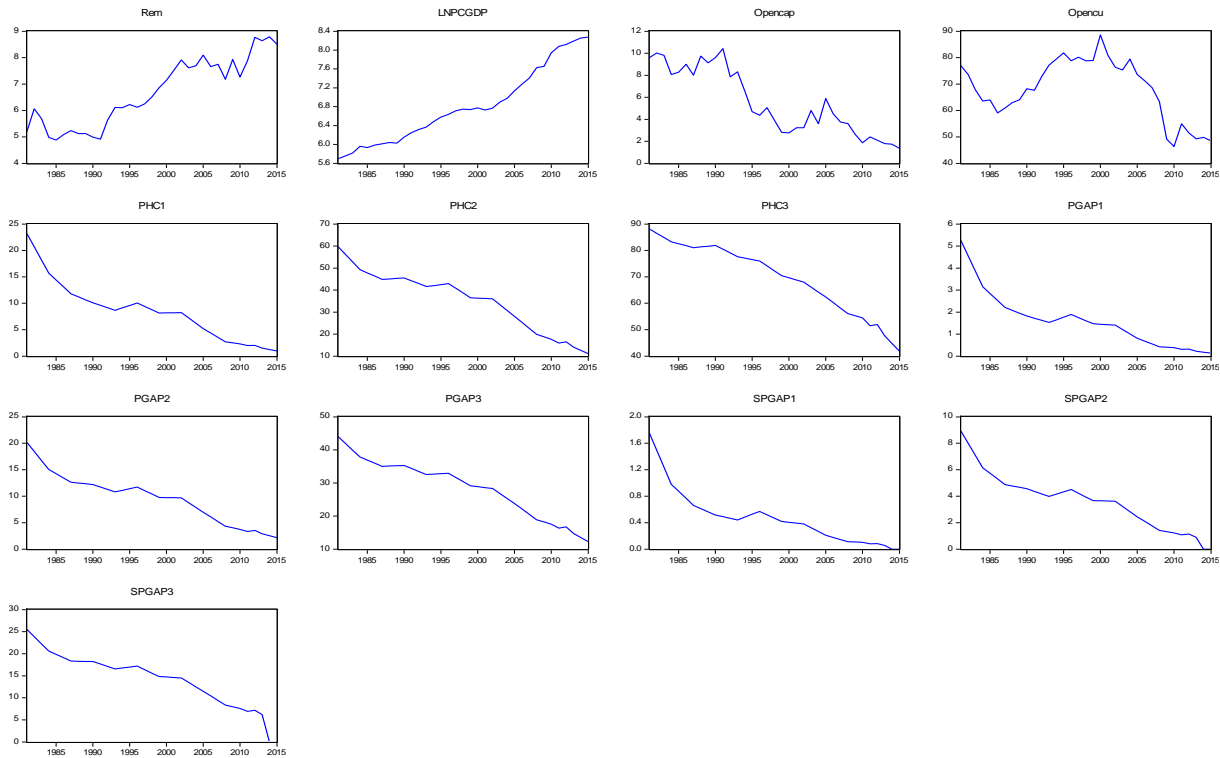
Figure 5-36: Time Series Plot 2—Remittance and Per Capita Expenditure 1980–2016
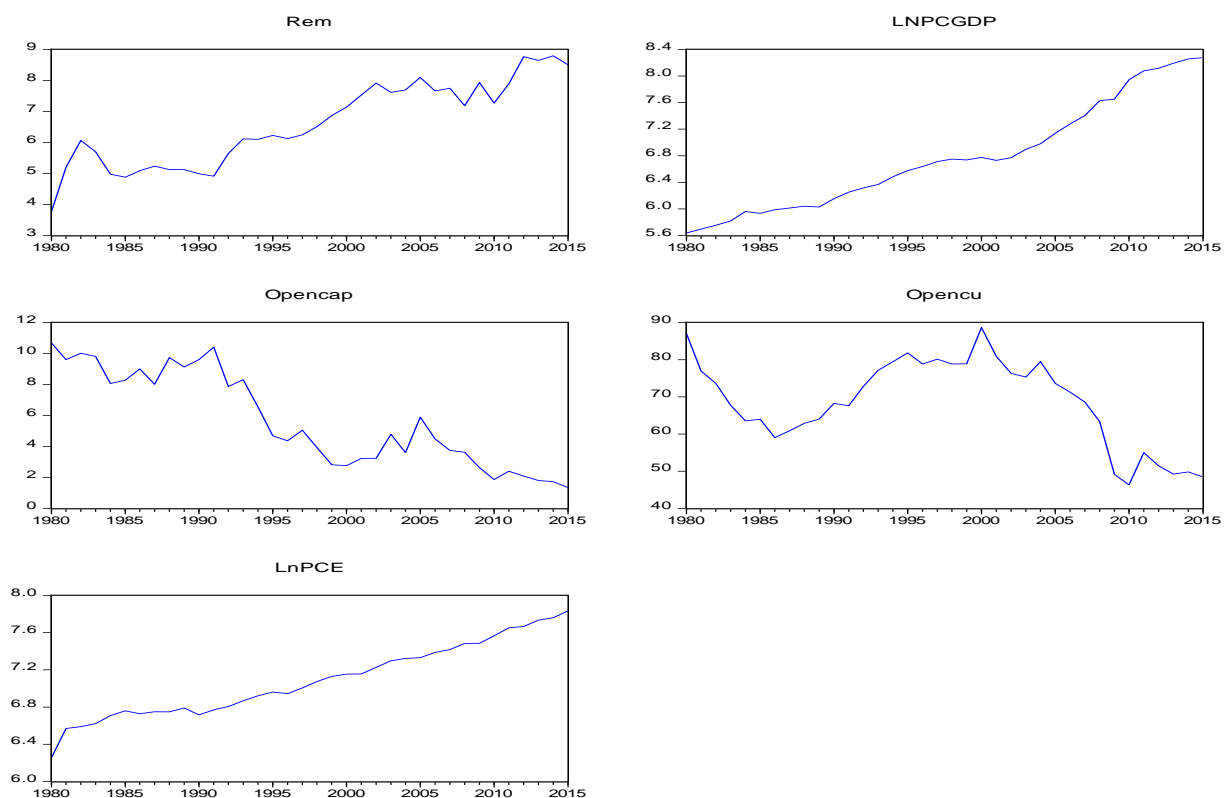
Figure 5-37: Time Series plot 3—Remittance and Income Inequality 1980–2016
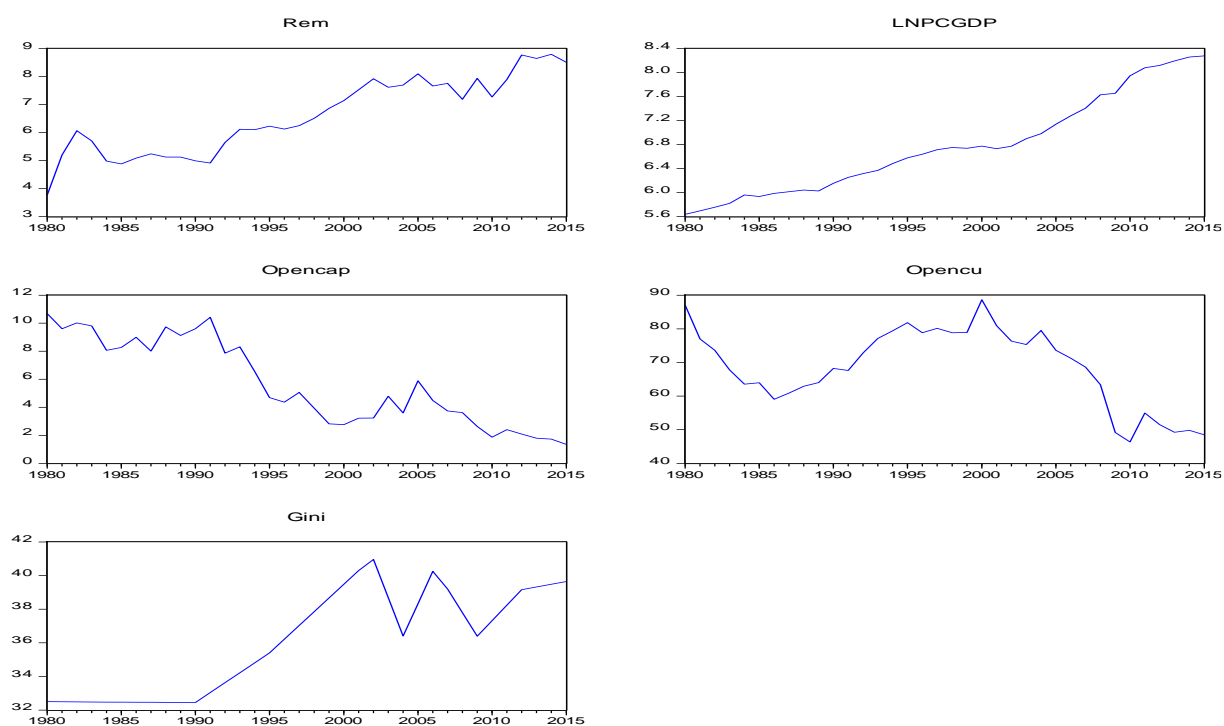
5.4.4.2   Co-integration: Remittance–Poverty and Remittance–Income Inequality

Based on the level of stationarity, this study used VAR analysis to examine the impact of foreign remittance on poverty and income inequality.

As shown in Table 5.31 above, there are four main analyses. The first analysis was intended to examine the relationship between remittance and extreme poverty, followed by remittance and moderate poverty in the second analysis. The third analysis was to examine the relationship between remittance and per capita expenditure. The last analysis was to examine the relationship between remittance and income inequality. Each of the first two analyses has three sub models since this study expected to measure level, depth and severity of poverty.

Table 5.32 summarises the co-integration results of the above four analyses. As shown in the table, there is no co-integration in the models in analysis 1. As a result, it can be concluded that there is no significant long-run association between remittance and extreme poverty. The results of Table 5.32 show that there is a co-integration between remittance and moderate poverty. Moreover, it shows the existence of co-integration between remittance and per capita expenditure. However, there is no co-integration between remittance and income inequality.

Table 5-32: Summary of the Co-integration

Type	Analysed Factors	Investigated Variables of Interest	Availability of Co-integration
Analysis 1	Remittance and extreme poverty ($1.90 poverty line)	REM and PHC REM and PGAP REM and SPGAP	No co-integration
Analysis 2	Remittance and moderate poverty ($5.5 poverty line)	REM and PHC REM and PGAP REM and SPGAP	Co-integration
Analysis 3	Remittance and per capita expenditure	REM and SPGAP	Co-integration
Analysis 4	Remittance and income inequality	REM and GINI	No co-integration

Based on the summary in Table 5.32, the following section discusses the co-integration results in Analyses 2 and 3. Analyses 1 and 4 did not have co-integration and so did not proceed to long-run analysis.

Analysis 2.1: Foreign remittance and level of moderate poverty (poverty headcount)

Table 5-33: VAR Model—REM and Poverty Head Count Ratio

	PHC	REM	PCGDP	OPENCAP	OPENCU
PHC2(−1)	0.650502	−0.100170	0.012348	0.110048	0.782676
	(0.19510)	(0.07426)	(0.01461)	(0.19706)	(1.21731)
	[3.33417]***	[−1.34884]	[0.84504]	[0.55845]	[0.64296]
PHC2(−2)	0.020217	0.071124	−0.021150	−0.279010	0.147517
	(0.18051)	(0.06871)	(0.01352)	(0.18233)	(1.12629)
	[0.11200]	[1.03511]	[−1.56438]	[−1.53029]	[0.13098]
REM(−1)	−0.567729	0.564177	0.043518	0.591436	−0.259574
	(0.53511)	(0.20369)	(0.04008)	(0.54048)	(3.33875)
	[−1.06096]	[2.76982]***	[1.08582]	[1.09428]	[−0.07775]
REM(−2)	−1.006028	−0.155415	−0.024243	−0.213707	1.345752
	(0.55862)	(0.21264)	(0.04184)	(0.56423)	(3.48546)

	PHC	REM	PCGDP	OPENCAP	OPENCU
	[−1.80090]*	[−0.73090]	[−0.57944]	[−0.37876]	[0.38610]
PCGDP(−1)	−2.957652	1.043370	1.101600	−1.801513	4.083811
	(2.96266)	(1.12772)	(0.22190)	(2.99239)	(18.4851)
	[−0.99831]	[0.92521]	[4.96450]***	[−0.60203]	[0.22092]
PCGDP(−2)	−1.347194	−0.846429	−0.158114	−3.644394	5.407354
	(3.42756)	(1.30468)	(0.25672)	(3.46195)	(21.3857)
	[−0.39305]	[−0.64876]	[−0.61591]	[−1.05270]	[0.25285]
OPENCAP(−1)	−0.124070	−0.017651	0.001497	0.297109	−0.534309
	(0.17324)	(0.06594)	(0.01298)	(0.17498)	(1.08093)
	[−0.71616]	[−0.26766]	[0.11537]	[1.69793]*	[−0.49430]
OPENCAP(−2)	−0.079337	−0.078770	0.021847	0.164403	0.036495
	(0.15696)	(0.05975)	(0.01176)	(0.15854)	(0.97936)
	[−0.50544]	[−1.31837]	[1.85834]*	[1.03698]	[0.03726]
OPENCU(−1)	0.040013	0.030222	−0.004062	0.040846	0.944995
	(0.03458)	(0.01316)	(0.00259)	(0.03493)	(0.21578)
	[1.15701]	[2.29581]**	[−1.56811]	[1.16936]	[4.37951]***
OPENCU(−2)	−0.023557	−0.016671	0.005797	−0.117996	−0.134811
	(0.03824)	(0.01455)	(0.00286)	(0.03862)	(0.23858)
	[−0.61607]	[−1.14541]	[2.02414]**	[−3.05522]***	[−0.56506]
C	61.23240	4.169750	0.702211	54.45907	−121.3556
	(20.9768)	(7.98469)	(1.57111)	(21.1873)	(130.882)
	[2.91905]***	[0.52222]	[0.44695]	[2.57036]**	[−0.92722]

Note: ***, **, and * indicate 1%, 5% and 10% significance levels, respectively. Values in ( ) are standard errors and values in [ ] are *t* statistics.

Table 5.33 shows the system of equations (five equations in total) of the VAR model for remittance and level of moderate poverty. As shown in the table, PHC2 (−1), and REM (−2) are the significant variables in Equation 1. The significant variables in Equation 2 are REM (−1), and OPENCU (−1). According to the results, LNPCDGP (−1), OPENCAP (−2) and OPENCU (−2) are the significant variables for PCGDP. Moreover, it shows the significant variables in the rest of the two equations in the VAR model with their respective significance levels.

According to the results of Table 5.33, REM (−2) is significant to the model at the 10% level only and REM (−1) is not significant to the model. Nonetheless, this study used the Wald test to examine whether REM (−1) and REM (−2) jointly affect the level of moderate poverty. The result of the Wald test is given in Table 5.34.

Table 5-34: VAR Model 2.1—Wald Test Statistics

Test Statistic	Value	Probability
Chi-square	9.316406	0.0095

Note: H_0: REM (−1) and REM (−2) jointly do not affect level of moderate poverty $c(3) = C(4) = 0$

H_1: REM (−1) and REM (−2) jointly affect level of moderate poverty $c(3) = c(4) \neq 0$

According to the Wald test statistics in Table 5.34, chi-square is 9.316406 and the probability value is 0.0095. Based on the Wald test results, the null hypotheses of REM (−1) and REM (−2) jointly do not affect level of moderate poverty, which is rejected at the 1% significance level. This leads to the conclusion that REM (−1) and REM (−2) jointly affect the reduction of the level of moderate poverty in Sri Lanka.

Analysis 2.2: Foreign remittance and depth of moderate poverty (poverty gap ratio)

Table 5-35: VAR Model—REM and Poverty Gap Ratio

	PGAP2	REM	PCGDP	OPENCAP	OPENCU
PGAP2(−1)	0.997677	−0.127774	0.005227	0.094595	1.216023
	(0.18233)	(0.10122)	(0.01927)	(0.27320)	(1.68622)
	[5.47177]***	[−1.26238]	[0.27126]	[0.34624]	[0.72115]
PGAP2(−2)	−0.197696	0.101578	−0.020050	−0.239506	−1.055200
	(0.15841)	(0.08794)	(0.01674)	(0.23736)	(1.46501)
	[−1.24799]	[1.15511]	[−1.19767]	[−1.00903]	[−0.72027]
REM(−1)	−0.374204	0.562279	0.061889	0.849787	−0.752633
	(0.36583)	(0.20308)	(0.03866)	(0.54815)	(3.38323)
	[−1.02289]	[2.76876]***	[1.60086]	[1.55027]	[−0.22246]
REM(−2)	−0.333397	−0.116361	−0.026136	−0.075053	−0.000756
	(0.35555)	(0.19737)	(0.03757)	(0.53275)	(3.28814)

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	PGAP2	REM	PCGDP	OPENCAP	OPENCU
	[−0.93770]	[−0.58955]	[−0.69559]	[−0.14088]	[−0.00023]
PCGDP(−1)	−2.471625	0.838192	1.109616	−1.268347	2.736258
	(2.07101)	(1.14966)	(0.21886)	(3.10318)	(19.1529)
	[−1.19344]	[0.72908]	[5.06998]***	[−0.40872]	[0.14286]
PCGDP(−2)	0.929564	−0.450902	−0.238068	−3.989369	−3.104329
	(2.35473)	(1.30716)	(0.24884)	(3.52831)	(21.7768)
	[0.39476]	[−0.34495]	[−0.95670]	[−1.13067]	[−0.14255]
OPENCAP(−1)	−0.106431	−0.012839	−0.001310	0.278869	−0.628685
	(0.11918)	(0.06616)	(0.01259)	(0.17858)	(1.10218)
	[−0.89303]	[−0.19407]	[−0.10398]	[1.56162]	[−0.57040]
OPENCAP(−2)	−0.031845	−0.084189	0.020614	0.141080	0.239299
	(0.10790)	(0.05990)	(0.01140)	(0.16168)	(0.99787)
	[−0.29513]	[−1.40555]	[1.80785]*	[0.87261]	[0.23981]
OPENCU(−1)	0.045027	0.033529	−0.005353	0.021759	0.968490
	(0.02314)	(0.01285)	(0.00245)	(0.03468)	(0.21403)
	[1.94557]*	[2.60977]**	[−2.18883]**	[0.62748]	[4.52499]***
OPENCU(−2)	−0.039591	−0.019579	0.006263	−0.114725	−0.101334
	(0.02605)	(0.01446)	(0.00275)	(0.03903)	(0.24087)
	[−1.52009]	[−1.35421]	[2.27549]**	[−2.93973]***	[−0.42070]
C	20.67193	1.359643	0.952935	44.02029	14.17881
	(9.92162)	(5.50771)	(1.04850)	(14.8665)	(91.7563)
	[2.08352]**	[0.24686]	[0.90886]	[2.96104]***	[0.15453]

Note: ***, * and * indicates 1%, 5% and 10% significance levels, respectively. Values in ( ) are standard errors and values in [ ] are *t* statistics.

Table 5.35 above shows the system of equation of the VAR model for remittance and poverty gap at $5.5 poverty line. As shown in the table, PGAP3 (−1), and OPENCU (−1) are the significant variables in Equation 1. The significant variables in Equation 2 are REM (−1), and OPENCU (−1). According to the results, LNPCDGP (−1), OPENCAP (−2), OPENCU (−1) and OPENCU (−2) are the significant variables for PCGDP. Moreover, Table 5.35 shows the significant variables in the rest of the equation in the VAR model with their respective significance levels.

According to the results, REM (−1) and REM (−2) are not individually significant to depth of moderate poverty. Nonetheless, as in the previous model, the Wald test was used to examine whether REM (−1) and REM (−2) jointly affect the depth of moderate poverty. The result of the Wald test is given in Table 5.36.

Table 5-36: VAR Model 2.2: Wald Test Statistic

Test Statistic	Value	Probability
Chi-square	5.968745	0.0506

Note: H_0: REM (−1) and REM (−2) jointly do not affect depth of moderate poverty $c(3) = C(4) = 0$

H_1: REM (−1) and REM (−2) jointly affect depth of moderate poverty $c(3) = c(4) \neq 0$

According to the Wald test statistics in Table 5.36, chi-square and the probability values are 5.9687 and 0.0506, respectively. The probability value is slightly higher than the 5% significance level; however, it is less than the 10% significance level. Based on the Wald test results, the null hypothesis that REM (−1) and REM (−2) jointly do not affect the depth of moderate poverty was rejected, concluding that REM (−1) and REM (−2) jointly affect the depth of moderate poverty in Sri Lanka.

Analysis 2.3: Foreign remittance and severity of moderate poverty (squared poverty gap)

Table 5-37: VAR Model—REM and Squared Poverty Gap Ratio

	SPGAP3	REM	PCGDP	OPENCAP	OPENCU
SPGAP2(−1)	0.534780	0.043805	0.013148	0.068277	0.148796
	(0.18178)	(0.06612)	(0.01187)	(0.17479)	(1.07734)
	[2.94192]***	[0.66247]	[1.10726]	[0.39062]	[0.13811]
SPGAP2(−2)	−0.079825	−0.022957	−0.029344	−0.242232	−0.641782
	(0.18619)	(0.06773)	(0.01216)	(0.17903)	(1.10347)
	[−0.42873]	[−0.33896]	[−2.41271]**	[−1.35301]	[−0.58160]
REM(−1)	0.613672	0.562111	0.065580	0.887056	−0.551113
	(0.58179)	(0.21163)	(0.03800)	(0.55943)	(3.44806)
	[1.05480]	[2.65610]***	[1.72559]*	[1.58565]	[−0.15983]
REM(−2)	−1.657590	0.005754	−0.012263	−0.020286	−0.684988
	(0.56049)	(0.20388)	(0.03661)	(0.53895)	(3.32186)
	[−2.95737]***	[0.02822]	[−0.33493]	[−0.03764]	[−0.20621]
PCGDP(−1)	4.512246	1.032690	1.073566	−1.517888	−1.270026
	(3.19234)	(1.16124)	(0.20853)	(3.06965)	(18.9199)
	[1.41346]	[0.88930]	[5.14814]***	[−0.49448]	[−0.06713]
PCGDP(−2)	−8.561676	−0.302056	−0.174399	−3.544292	−3.968207
	(3.81086)	(1.38623)	(0.24894)	(3.66439)	(22.5857)
	[−2.24665]**	[−0.21790]	[−0.70057]	[−0.96723]	[−0.17570]
OPENCAP(−1)	−0.265054	0.003880	−0.000107	0.279626	−0.752984
	(0.18858)	(0.06860)	(0.01232)	(0.18134)	(1.11768)
	[−1.40550]	[0.05656]	[−0.00865]	[1.54203]	[−0.67371]
OPENCAP(−2)	−0.123819	−0.071162	0.020865	0.134090	0.176187
	(0.16820)	(0.06118)	(0.01099)	(0.16174)	(0.99688)
	[−0.73613]	[−1.16306]	[1.89900]*	[0.82906]	[0.17674]
OPENCU(−1)	0.008489	0.032880	−0.005593	0.019012	0.970755
	(0.03649)	(0.01327)	(0.00238)	(0.03509)	(0.21626)
	[0.23266]	[2.47720]**	[−2.34633]**	[0.54186]	[4.48891]***
OPENCU(−2)	0.014363	−0.021794	0.005578	−0.118761	−0.103698
	(0.04161)	(0.01513)	(0.00272)	(0.04001)	(0.24658)

	SPGAP3	REM	PCGDP	OPENCAP	OPENCU
	[0.34522]	[−1.44006]	[2.05232]**	[−2.96855]***	[−0.42054]
C	41.40978	−2.669047	0.522875	40.93901	62.61802
	(13.4035)	(4.87564)	(0.87556)	(12.8884)	(79.4381)
	[3.08947]***	[−0.54742]	[0.59719]	[3.17643]***	[0.78826]

Note: ***, **, and * indicate 1%, 5% and 10% significance levels, respectively. Values in ( ) are standard errors and values in [ ] are *t* statistics.

Table 5.37 above shows the system of equation of the VAR model for remittance and severity of moderate poverty. As shown in the table, SPGAP2 (−1), REM (−2) and PCGDP (−2) are the significant variables in Equation 1. The significant variables in Equation 2 are REM (−1) and OPENCU (−1). According to the results, SPGAP2 (−2), REM (−1), PCGDP (−1), OPENCAP (−2), OPENCU (−1) and OPENCU (−2) are the significant variables for PCGDP. Moreover, the table shows the significant variables in the rest of the equations in the VAR model with their respective significance levels.

According to the results of Table 5.37, REM (−2) is significant at the 1% level; however, REM (−1) is not significant in the model. The negative significant coefficient of REM (−2) confirmed that remittance helps in the reduction of the severity of moderate poverty. As in previous models, this study used the Wald test to examine whether REM (−1) and REM (−2) jointly affect the severity of moderate poverty. The result of the Wald test is given in Table 5.38.

Table 5-38: VAR Model 2.3—Wald Test Statistic

Test Statistic	Value	Probability
Chi-square	10.95764	0.0042

Note: H$_0$: REM (−1) and REM (−2) jointly do not affect severity of moderate poverty $c(3) = C(4) = 0$
H$_1$: REM (−1) and REM (−2) jointly affect severity of moderate poverty $c(3) = c(4) \neq 0$

According to the Wald test statistics, chi-square and the probability values are 10.9576 and 0.0042, respectively. Based on the Wald test results, the null hypothesis that REM

(−1) and REM (−2) jointly do not affect the severity of the moderate poverty was rejected at the 1% significance level, leading to the conclusion that REM (−1) and REM (−2) jointly affect the severity of the moderate poverty.

Analysis 3: Foreign remittance and per capita expenditure

Analysis 3 attempts to examine the relationship between remittance and per capita expenditure. It is an alternative to verify the results of the above remittance and poverty analysis. Table 5.39 shows the system of equation in remittance–per capita expenditure VAR model.

Table 5-39: VAR Model—Remittance and Per Capita Expenditure

	LNPCE	REM	PCGDP	OPENCAP	OPENCU
PCE(−1)	0.456346	4.756454	−0.023644	3.990232	−4.437379
	(0.14149)	(1.44996)	(0.30175)	(4.34642)	(25.8858)
	[3.22532]***	[3.28040]***	[−0.07836]	[0.91805]	[−0.17142]
PCE(−2)	0.054025	−2.700173	0.450684	2.591301	−6.388638
	(0.10687)	(1.09519)	(0.22792)	(3.28296)	(19.5522)
	[0.50552]	[−2.46547]**	[1.97738]*	[0.78932]	[−0.32675]
REM(−1)	0.033890	0.580385	0.036029	0.908253	−1.335028
	(0.01772)	(0.18160)	(0.03779)	(0.54437)	(3.24206)
	[1.91247]*	[3.19595]***	[0.95333]	[1.66846]*	[−0.41178]
REM(−2)	0.013354	−0.263876	−0.037478	−0.913558	0.963965
	(0.01716)	(0.17588)	(0.03660)	(0.52723)	(3.13998)
	[0.77808]	[−1.50030]	[−1.02391]	[−1.73276]*	[0.30700]
PCGDP(−1)	0.239721	0.787427	1.109573	0.027388	−2.446697
	(0.10137)	(1.03883)	(0.21619)	(3.11400)	(18.5459)
	[2.36482]**	[0.75800]	[5.13241]***	[0.00880]	[−0.13193]
PCGDP(−2)	−0.095823	−0.761076	−0.203751	−5.522249	4.229604
	(0.11656)	(1.19449)	(0.24859)	(3.58062)	(21.3250)
	[−0.82209]	[−0.63715]	[−0.81964]	[−1.54226]	[0.19834]

	LNPCE	REM	PCGDP	OPENCAP	OPENCU
OPENCAP(−1)	−0.001266	0.025681	−0.001483	0.267559	−0.609740
	(0.00603)	(0.06179)	(0.01286)	(0.18524)	(1.10320)
	[−0.20994]	[0.41559]	[−0.11532]	[1.44443]	[−0.55270]
OPENCAP(−2)	−0.004779	−0.072530	0.025644	0.222657	−0.047717
	(0.00564)	(0.05775)	(0.01202)	(0.17312)	(1.03105)
	[−0.84800]	[−1.25586]	[2.13363]**	[1.28614]	[−0.04628]
OPENCU(−1)	−0.002228	0.025441	−0.004979	0.000672	1.028711
	(0.00110)	(0.01126)	(0.00234)	(0.03375)	(0.20099)
	[−2.02775]**	[2.25982]**	[−2.12530]**	[0.01992]	[5.11829]***
OPENCU(−2)	0.001759	−0.009108	0.006421	−0.078382	−0.172353
	(0.00127)	(0.01297)	(0.00270)	(0.03889)	(0.23163)
	[1.38913]	[−0.70198]	[2.37813]**	[−2.01535]**	[−0.74409]
C	2.285849	−11.18370	−2.556910	−1.883839	80.31120
	(0.71470)	(7.32417)	(1.52423)	(21.9550)	(130.757)
	[3.19834]***	[−1.52696]	[−1.67751]*	[−0.08580]	[0.61420]

Note: ***, **, and * indicate 1%, 5% and 10% significance levels, respectively. Values in ( ) are standard errors and values in [ ] are *t* statistics.

As shown in Table 5.39, PCE (−1), REM (−1), PCGDP (−1) and OPENCU (−2) are the significant variables in the first model. The significant variables in Model 2 are PCE (−1), PCE (−2), REM (−1) and OPENCU (−1). Moreover, the table shows the significant variables in the rest of equations in the VAR model with the respective significance levels. According to the results of the table, REM (−2) is not significant to per capita expenditure. Nonetheless, REM (−1) and REM (−2) both have positive coefficients. This study further used the Wald test to examine whether REM (−1) and REM (−2) jointly affect PCE. Results of the Wald test are given in Table 5.40.

Table 5-40: Wald Test Statistic

Test Statistic	Value	Probability
Chi-square	7.337103	0.0255

Note: H_0: REM (−1) and REM (−2) jointly do not affect per capita expenditure $c(3) = C(4) = 0$

H_1: REM (−1) and REM (−2) jointly affect per capita expenditure $c(3) = c(4) \neq 0$

According to the Wald test statistics, chi-square and the probability values are 7.3371 and 0.0255, respectively. Based on the test results, the null hypothesis was rejected at the 5% significance level, concluding that REM (−1) and REM (−2) jointly positively affect per capita expenditure in Sri Lanka.

In summary, the co-integration analysis helps to identify that there is co-integration between remittance and moderate poverty (Analysis 2). The existence of co-integration could be seen in all three models—the models for poverty headcount, poverty gap and squared poverty gap. Further, the same co-integration exists between the remittance and per capita expenditure model (Model 3). Based on the co-integration, the VAR model was used to assess impact of remittance. According to the results of the VAR model, remittance significantly affects reduction of moderate poverty in Sri Lanka. Moreover, it helps increase the per capita expenditure of the country. Non-availability of co-integration in Analyses 1 and 4 led to the conclusion that there is no long-run relationship between remittance and extreme poverty or between remittance and income inequality in Sri Lanka.

5.4.4.3 Causality Analysis—Granger Causality Test

Following the VAR model above, this section assesses whether there is causality between remittance and poverty and between remittance and income inequality. To assess the causality, this study used the Granger causality test.

According to the causality analysis, if there is co-integration, it is possible to assess the long-run causality, otherwise, short-run causality should be tested. Table 5.41 shows the results of the Granger causality test. It was used to test the null hypothesis of no causality against the alternative of causality. The arrows in Column 2 show the direction of causality. *F* statistics and the probability values in Columns 3 and 4, respectively, were used to test the null hypothesis of the study.

Table 5-41: Summary of the Granger Causality Test

H_0: There is no causality between variables

H_1: There is a causality between variables

		Variables		*F* statistic	Probability	Causality
Measure		*Analysis 1: Remittance and extreme poverty*				
	Level	REM →	PHC 1	3.94534	0.0309**	Bidirectional (short-run)
		REM ←	PHC1	3.81037	0.0344**	
Poverty	Depth	REM →	PGAP 1	4.61165	0.0186***	Bidirectional (short-run)
		REM ←	PGAP 1	3.68252	0.0380**	
	Severity	REM →	SPGAP 1	3.68466	0.0380**	Bidirectional (short-run)
		REM ←	SPGAP 1	5.39292	0.0104**	
		Analysis 2: Remittance and moderate poverty				
	Level	REM →	PHC 3	2.30161	0.1187	Unidirectional (long-run)
		REM ←	PHC 3	2.96780	0.0678*	
Poverty	Depth	REM →	PGAP 3	3.57563	0.0414**	Unidirectional (long-run)
		REM ←	PGAP 3	2.59164	0.0928	
	Severity	REM →	SPGAP 3	3.49679	0.0441**	Bidirectional (long-run)
		REM ←	SPGAP 3	2.83889	0.0754*	
		Analysis 3: Remittance and per capita expenditure				
Poverty	PCE	REM →	PCE	1.71873	0.1971	Unidirectional (long-run)
		REM ←	PCE	10.0232	0.0005***	
		Analysis 4: Remittance and income inequality				
Income Inequality	GINI	REM →	INEQU	2.03741	0.1486	No causality (short-run)
		REM ←	INEQU	2.20532	0.1284	

Note: *** Significant at 1%, ** significant at 5% and * significant at 10% levels.

As shown in Table 5.41, in the short run, there is a bidirectional causality between remittance and extreme poverty. Importantly, the identified short-run bidirectional

causality exists with level, depth and severity of extreme poverty. It means remittance causes the reduction in extreme poverty and extreme poverty causes the inflow of foreign remittance to Sri Lanka.

The analysis of causality between remittance and moderate poverty shows there are long-run causal relationships between remittance and moderate poverty in Sri Lanka. For example, a moderate level of poverty causes remittance to Sri Lanka and remittance causes the depth of moderate poverty. Further, there is a bidirectional causality between remittance and the severity of moderate poverty in Sri Lanka.

As explained in the Section 5.4.4, per capita expenditure is used as an alternative measure of poverty and the analysis of VAR shows the availability of co-integration between foreign remittance and per capita expenditure in Sri Lanka. Hence, this study assessed the long-run causality between remittance and per capita expenditure. As shown in Table 5.41, there is a long-run unidirectional causality between per capita expenditure and foreign remittance. According to the results in Table 5.41, per capita expenditure Granger causes remittance to Sri Lanka. Furthermore, results shown in Table 5.41 show that there is no causality between foreign remittance and income inequality in Sri Lanka in the short run.

5.4.5 Acceptance/Rejection of the Hypotheses on Remittance, Poverty and Income Inequality

The above AR model examined the impact of foreign remittance on poverty and income inequality. Further, Granger causality helped identify the causal relationships between them. Based on the analysis, the following table summarises the decisions on the hypotheses outlined in Section 5.4.2.

Table 5-42: Acceptance/Rejection of Hypotheses

Hypothesis	Accept/Reject	Conclusion
H₅: Remittance inflows do not impact poverty reduction		
Level (PHC)	Accept	Remittance inflows do not affect reduction of the level, depth and/or the severity of extreme poverty
Depth (PGAP)	Accept	
Severity (SPGAP)	Accept	
Level (PHC)	Reject	Remittance inflows affect the reduction of the level, depth and severity of moderate poverty
Depth (PGAP)	Reject	
Severity (SPGAP)	Reject	
Per capita Expenditure	Reject	Inflow of foreign remittance affect increase of per capita expenditure
H₆: International remittance inflows do not influence income inequality.		
Gini	Accept	Inflow of foreign remittance does not have a significant effect on income inequality
H₇: There is no causal relationship between foreign remittance and poverty		
Level (PHC)	Reject	Level of extreme poverty Granger causes remittance and remittance Granger causes level of extreme poverty in the short run
Depth (PGAP)	Reject	Depth of extreme poverty Granger causes remittance and remittance Granger causes depth of extreme poverty in the short run
Severity (SPGAP)	Reject	Severity of extreme poverty Granger causes remittance and remittance Granger causes severity of extreme poverty in the short run
Level (PHC)	Reject	Level of moderate poverty Granger causes remittance in the long run
Depth (PGAP)	Reject	Remittance Granger causes depth of moderate poverty in the long run
Severity (SPGAP)	Reject	Severity of moderate poverty Granger causes remittance and remittance Granger causes severity of moderate poverty in the long run
Per capita expenditure	Reject	Per capita expenditure Granger causes remittance
H₈: There is no causal relationship between foreign remittance and income inequality		

Hypothesis	Accept/Reject	Conclusion
Gini index	Accept	There is no causal relationship between foreign remittance and poverty

5.4.6 Discussion and Conclusion

This study intended to examine the relationship between remittance and poverty and between remittance and income inequality. Co-integration and Granger causality tests were used to assess the impact and the causality, respectively.

According to the analysis, the relationship between remittance and poverty varies depending on the measurement of poverty. The results of the study show that inflow of foreign remittance to Sri Lanka does not help reduction of the level, depth or severity of extreme poverty, which is measured with a $1.9 poverty line. Nonetheless, it helps the reduction of the level, depth and severity of moderate poverty, which is measured with a $5.5 poverty line. Use of both poverty lines showed potential for policy implications, unlike the previous studies, which were based only on the $1.9 poverty line.

The findings of the study partially support the findings of (Kageyama 2008). He argued that foreign remittance to Sri Lanka is not a viable long-term solution to reduce poverty; he emphasised that it helps only in the short run. His findings are valid only with the $1.9 poverty line. The use of the $5.5 poverty line supports the argument that remittance to Sri Lanka helps the reduction of moderate poverty in the long run. The findings of the study show that the government of Sri Lanka cannot depend on foreign remittance to elevate extreme poverty. Hence, they must initiate alternative strategies to overcome extreme poverty in the country. Nonetheless, remittance helps the reduction of moderate poverty in the country. The findings of the study are supported by the findings of Adams and Page (2005). Further, it confirmed the findings of (Viet 2008) and (Acosta, Calderon et al. 2008).

The analysis of the relationship between remittance and income inequality concluded that remittance to Sri Lanka does not significantly influence income inequality. It does not lead to an increase in or reduction of income inequality. As stated in Barham and Boucher (1998) and Acosta, Calderon et al. (2008), remittance increases income inequality only if it is skewed towards the richer households. According to the theory of positive selection for migration by Chiswick (1999), the skewness of income towards better-off families could occur if they gain prominence in migration. In Sri Lanka, employment migration is spread across households in all the income levels. Thus, remittance is not skewed towards the better-off families. Therefore, the identified relationship between remittance and income inequality in Sri Lanka is justifiable based on the given context in the country. However, the finding is contradictory to the findings of Adams Jr (1989) and Rodriguez (1998), who examined Egypt and the Philippines, respectively. According to them, remittance contributes to income inequality in Egypt and the Philippines.

As mentioned in McKenzie and Rapoport (2007) and Massey and Espinosa (1997), availability of proper information and support from existing migrants to new migrants helps to reduce the cost of migration. By breaking the cost barriers of migration, it reduces poverty and acts as an income equaliser. Further, Knowles and Anker (1981) found that there is no significant impact of foreign remittance on income inequality in Kenya.

As stated in Beyene (2014), the nexus between remittance and income inequality depends on whether it is skewed towards high-income households or low-income households. According to his analysis, remittance increases income inequality when it is skewed towards high-income households, whereas it reduces income inequality when it is skewed towards low-income households. According to his findings, foreign remittance might become evenly distributed among households across all income categories. However,

lack of data for distribution patterns of remittance hindered analysis of the reasons for the identified remittance–income inequality relationship.

Notwithstanding the limitations of the data, this study shows significant findings on the remittance–poverty and remittance–income inequality relationships. In particular, the analysis has shown that inflow of foreign remittance to Sri Lanka is statistically significant in terms of poverty reduction. However, unlike in many developing countries, foreign remittance has no significant effect on income inequality in Sri Lanka. These findings strengthen previous evidence on the importance of the economic and government stability of the country in enhancing the sustainable inflow of foreign remittance to Sri Lanka.

6 Conclusion and Implications of the Study

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6.1 Overview

The aim of this thesis was to (i) examine the determinants of foreign remittance to Sri Lanka, (ii) analyse the dynamic nature of the motive for foreign remittance and (iii) identify the impact of foreign remittance on financial development, poverty and income inequality in Sri Lanka. Chapter 1 focused on explaining the research problems and objectives of the study, and this was followed by an overview of the key concepts of migration and remittance in Chapter 2. The overall discussion in this chapter also attempted to provide an overview on evolution of migration in the world and the importance of remittance.

In addition to the above, Chapter 3 reviewed the theoretical and empirical studies with the aim of identifying gaps in the existing literature. It examined the migration theories, research on motives for foreign remittance alongside empirical literature on the impact of foreign remittance on financial development, poverty and income inequality. This chapter highlighted the paucity of research on dynamic nature of motive for remittance. Further, it discussed the lack of empirical studies on motive for remittance and its impact on financial development, poverty and income inequality in Sri Lanka.

Chapter 4 explained the research methodology. It discussed how this study used time series secondary data, which was collected from various local and international data bases. Different statistical tools such as Auto Regressive Distributed Lag (ARDL) model, Co-integration, Granger causality, Recursive estimation and Impulse response analysis were investigated in this chapter and their relevance to the undertaken research was portrayed. Chapter 4 was followed by discussion on data analysis in Chapter 5. This

chapter summarised the key findings, conclusions and policy implications of the study, and recognised its significance and contribution to knowledge. Chapter 5, highlighted the findings that motive for foreign remittance is not static and it varies over time. Furthermore, it discussed that per capita GDP and government stability are the main long-run determinants whereas accountability and socio economic status are the short-run determinants. Next, it discussed that there is significant impact of foreign remittance on financial development and poverty reduction. It also reported that there is no significant evidence to prove that foreign remittance has an impact on income inequality of the country.

The current chapter summarises the research findings and discusses the significance and contribution alongside the limitations of the study. It also proposes future research directions.

6.2 Thesis Summary

The findings of the study fall into four main categories of analysis.

6.2.1 Analysis of determinants and motives for remittance

This study examined the determinants and motives of foreign remittance to Sri Lanka. Remittance as a percentage of GDP over the past four decades was used as the measure of remittance. Per capita GDP, lending interest, stability, accountability and socio-economic status were used as determinants of remittance (in the home country). According to the systematic theory of migration (Ravenstein 1885), the above factors acted as push factors for migration. Oil rent in KSA was used to represent the host country determinant of foreign remittance and it acted as a pull factor.

A review of time series properties of the above mentioned data showed that the data are a mix of I (1) and I (0) and suggested the ARDL model. The results of bound test statistics proved the co-integration; hence long- and short-run model estimations were used to identify the determinants of foreign remittance to Sri Lanka. According to the analysis, push factors such as per capita GDP and stability are long-run determinants, whereas accountability and socio-economic status are short-run determinants of foreign remittance. The positive coefficient of per capita GDP and government stability highlighted the significance of progressive economic growth and a stable country context to attract more remittance to Sri Lanka. This study concludes that remittance to Sri Lanka is pro-cyclical; thus, it increases with the increases in economic performance of the country. This contrasts with some countries in South Asia that have counter-cyclical remittance flow.

As per the analysis, the pull factors of migration, such as labour-importing countries' economic conditions and oil rent, are not significant in determining the inflow of foreign remittance to Sri Lanka. The majority of migrants in Sri Lanka fall into the unskilled, semi-skilled or housemaid category. The salary level of these migrants is less sensitive to the economic changes of the host country. For instance, GCC countries continue to acquire the services of housemaids, despite changes in economic conditions. The work they perform and the wages and salaries they earn are not sensitive to the economic changes in labour-importing countries. This justifies the identified relationship between inflow of foreign remittance and the pull factors of migration to Sri Lanka.

This study also examined the dynamic nature of the motive for foreign remittance. The nexus between remittance and per capita GDP was used to identify the motive for foreign remittance and its nature. According to the analysis, the long-run model of determinants

of remittance to Sri Lanka showed the positive coefficient of per capita GDP. Therefore, it suggested that motives for foreign remittance to Sri Lanka are dominated by self-interest. Nevertheless, going beyond the assumption of a constant slope coefficient in the long-run model, this study used recursive estimation to examine the dynamic nature of the motive for foreign remittance. As per the analysis, the coefficient of per capita GDP was negative until 1991 and positive thereafter. Based on these estimated values, the undertaken research concluded that the motive for foreign remittance to Sri Lanka was mainly altruistic until 1991 and mainly self-interested thereafter. Thus, this study proved that motive for foreign remittance is a dynamic concept that can change over time with the economic and country risk characteristics. The identified dynamic nature of motive implied the need to analyse the motive for remittance in individual country contexts when there are significant economic changes, and adjust policies accordingly.

As explained at the outset, foreign remittance helps the Sri Lankan economy at both micro- and macroeconomic levels. It helps relax the burden of deficits in external balances. Thus, it is important to secure a sustainable flow of foreign remittance to Sri Lanka. The self-interest motive for foreign remittance to Sri Lanka emphasises the need for an investment-friendly environment that supports the investors, mainly migrants who wish to save and invest for their future. These facilities could initially be in the form of low fees for remittance and customised financial products in the form of savings and loans. In addition, these benefits could be extended towards diverse concessions and government support such as subsidies, loans and technical support for start-up businesses. In countries like Sri Lanka, migrants invest greatly on housing and other basic infrastructure for their families. Therefore, offering government duty concessions for migrants when they return from their jobs could be another strategy that could motivate them to earn more and remit to Sri Lanka. Nonetheless, government stability is more

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important than the incentives. Therefore, eliminating country risk and strengthening government stability together with economic stability should be the most effective strategy to ensure sustainable inflow of foreign remittance to Sri Lanka.

6.2.2 Analysis of the impact of remittance on financial development

This study used the ARDL model and the Granger causality test to examine the impact of foreign remittance on financial development and to identify the causal relationship between foreign remittance and financial development. The study used credits, deposits, money and assets as proxies for financial development. Per capita GDP, log of GDP, price level, deposit interest rate, lending interest rate, current account openness and capita account openness were used together with inflow of foreign remittance as a percentage of GDP in the model.

According to the findings of the study, inflow of foreign remittance has a significant positive impact on private credit by banks and other financial institutions (credit) as well as the liquid liabilities (money) of the country. The findings of the study matched with the findings of early researches, which identified a significant positive impact of foreign remittance on financial development.

Moreover, this study examined whether the complementary or the substitutability hypothesis is more suitable to explain the impact of foreign remittance on financial development in Sri Lanka. It demonstrated that the relationship is complementary and remittance leads to an increase in the lending capacity of banks and financial institutions besides supporting the migrants and their family members to enter into the credit market. The reason behind this is that regular remittance inflow acts as a collateral and showcases payment capacity of borrowers. This highlights the capacity of foreign remittance to support development of the country by increasing the credit availability for investments.

The study was based only on official foreign remittance, and as reported in the literature, unofficial remittance flow is significantly higher in developing countries. Thus, the mechanism to encourage prioritisation of foreign remittance through official channels over unofficial channels has the capacity to increase the development impact of foreign remittance in Sri Lanka.

6.2.3 Analysis of the impact of remittance on poverty

The relationship between remittance and poverty was assessed using auto regressive model. Unlike other studies, this study assessed the impact of foreign remittance on both extreme and moderate poverty in Sri Lanka. It used a $1.9 poverty line to measure the extreme poverty and a $5.5 poverty line to measure the moderate poverty. According to the findings of the study, inflow of remittance helps reduction of moderate poverty; however, it does not support the reduction of extreme poverty. This highlights the government's role in intervening to alleviate extreme poverty despite depending on external funding. The findings of the study emphasised the importance of the government having its own strategy to face the problem of extreme poverty in Sri Lanka.

Further, the Granger causality test proved the presence of a causal relationship between foreign remittance and poverty. It was seen from the outcome of the analysis that, short-run bidirectional causality exists between remittance and extreme poverty when level, depth and severity of poverty is considered. Nonetheless, bidirectional causality exists only when severity is considered in moderate poverty. The identified impact of remittance on poverty in Sri Lanka was further verified with the use of per capita expenditure as an alternative measure of poverty.

6.2.4 Analysis of the impact of remittance on income inequality

This research examined the relationship between foreign remittance and income inequality in Sri Lanka using auto regressive model. The Gini coefficient was used as a measure of income inequality in the model. According to the analysis, there is no co-integration in the model. It concludes that foreign remittance to Sri Lanka does not affect either reduction or increase in income inequality. These findings have important implications because, despite its poverty reduction ability, foreign remittance does not cause an increase in income inequality, which leads to social unrest. This shows that migration in Sri Lanka is evenly spread across all levels of income categories. Unlike some developing countries, Sri Lanka has a low cost of migration to oil-exporting countries. This is one of the key reasons behind the identified relationship between remittance and income inequality in Sri Lanka.

6.3 Contribution to Knowledge and Statement of Significance

The undertaken research contributes to the empirical literature by exploring several aspects of foreign remittance. It appears to be the first comprehensive study with in-depth statistical analysis of Sri Lanka. The contribution of the study is in four parts. First, it contributes by examining the overall context of foreign remittance in Sri Lanka including motive for remittance and impact of remittance. Second, unlike other previous research that argues that motive for foreign remittance is a static concept, this thesis highlights the dynamic nature of motive for foreign remittance. So far, no in-depth analysis has examined this aspect; thus, this work has filled a research gap and contributed to remittance-related literature.

Third, this study addressed some of the key limitations in the current literature. For instance, most of the reported works concentrated on remittance and its relationship with

one key economic aspect at a time and were ineffective in making links between and interdependencies among financial development, poverty and income inequality. Moreover, the panel data based cross-country studies were deficient in fully explaining relationships. Other than this, most of the studies targeted the impact of remittances on an economy in terms of social measures with qualitative approaches rather than country-specific quantitative analysis.

Moreover, existing cross-country studies constrained the replicability of findings to various contexts, and were not sufficient for proposing policy directions because of the heterogeneity of the geographic, demographic, macroeconomic and financial environments of the countries. Overcoming the above constraints, this thesis attempted to develop a country-specific comprehensive model that discusses the link and causal relationship between the identified key aspects and remittance. Therefore, it provided relevant information to help government authorities to develop economic policies and enhance a sustainable flow of foreign currency and positive impact of remittance to the country.

Thus, this research has addressed the research gaps in four ways. First, it developed a comprehensive model (including both internal and external factors) to identify key determinants of foreign remittance to Sri Lanka. Second, it opened a new debate by introducing motive for remittance as a dynamic concept. Third, the study examined the impact of foreign remittance on three main economic phenomena and proposed policy implications accordingly. Finally, this research carried out an in-depth quantitative econometric analysis to interpret the findings, using a time series approach (as opposed to a cross-sectional approach) to guide policymakers in the development of risk

management tools to guard against shocks in remittance inflow, which could happen as a result of labour-importing countries' economic and policy changes.

Therefore, through this work practical implication on financial services sector and policy formulations have been highlighted. It was demonstrated how strategies to harvest the maximum benefits from foreign remittance could be implemented and how government authorities can take initiatives to increase the volume of remittance inflow. Additionally, it created opportunities for further research in the field of economics and finance together.

6.4   Limitations and Future Research Directions

Two major types of limitations are identified in this study. The undertaken research adopted all possible actions to overcome the impact of these limitations on the validity and applicability of the findings. However, suitable caution is recommended when policy decisions are based on the study. First, there is no sound foreign remittance theory other than the available migration theories and the theories on motive for foreign remittance. Unlike in other studies, this make it harder to lay a strong theoretical foundation; however, this study connected the theories on migration and motives to construct the theoretical foundation of the study.

Second, there is a gap in the availability of data. This is very common in developing countries, including Sri Lanka. A mechanism to collect, record and disseminate reliable and accurate data on migration and foreign remittance should be one of the key concerns of the respective responsible authorities. Currently, some international organisations are trying to construct databases on migration and foreign remittance; however, lack of comprehensive data gathered based on different time intervals, such as monthly and quarterly, is still a key point of concern.

While emphasising attention to the above limitations, this study proposes the following for future research. First, because of constraints related to data collection and the time frame of the study, this study examined only financial intermediary development. However, it is suggested that a study be conducted that covers both financial intermediary development and stock market development. Second, based on the experience of this study and the availability of literature, it is suggested that a comprehensive study be conducted that could develop foreign remittance theory.

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Appendix

Major Remittance sending countries in the world in 2017

Country	USD (Million)
USA	148488.65
KSA	46724.65
UAE	32977.78
UK	26801.5
Germany	24670.87
Canada	24559.05
France	21758.02
Spain	17874
Italy	17369.11
Hong Kong SAR, China	17121.1

Major Remittance Recipients in the World in 2017

Country	USD (Million)
India	68,968
China	63,860
Philippines	32,808
Mexico	30,600

France	25,372
Nigeria	21,967
Egypt, Arab Rep.	19,983
Pakistan	19,665
Germany	16,833
Vietnam	13,781
Bangladesh	13,469
Spain	10,692

Inflow of Remittance to South Asia in 2017

Country	USD (Million)	% of GDP
India	68,968	2.77
Pakistan	19,665	6.97
Bangladesh	13,469	6.12
Sri Lanka	7,190	8.92
Nepal	6,947	31.25
Afghanistan	410	2.21
Bhutan	40	1.54

ADF Test results summary: Poverty Analysis

ADF test : Variables in Model 1 -9						
	Level			First Difference		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Stationarity
Series	Prob.	Prob.	Prob.	Prob.	Prob.	Prob.	
Rem	0.825	0.2227	0.9385	0	0	0.0000	I(1)
LNPCGDP	0.9981	0.9156	1	0.0006	0.0017	0.1377	I(1)
Opencap	0.7418	0.2942	0.0904	0	0.0000	0.0000	I(1)
Opencu	0.8369	0.9349	0.2270	0.0003	0.0013	0.0000	I(1)
PHC1	0.5621	0.0437	0.0630	0.0678	0.3002	0.0081	I(1)
PGAP1	0.3522	0.0111	0.0549	0.0462	0.2752	0.0028	I(1)

SPGAP1	0.2314	0.0046	0.0399	0.0414	0.2418	0.0020	I(1)
PHC2	0.9659	0.6238	0.0521	0.0206	0.0817	0.0225	I(1)
PGAP2	0.8161	0.1414	0.0573	0.0381	0.1716	0.0128	I(1)
SPGAP2	0.0663	0.0189	0.0305	0.018	0.0788	0.0053	I(1)
PHC3	1.0000	0.9988	0.1623	0.0025	0.0005	0.4026	I(1)
PGAP3	0.9637	0.9335	0.026	0.0096	0.0387	0.0268	I(1)
SPGAP3	0.9852	0.9427	0.0014	0.5116	0.3077	0.4435	I(1)