



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Research Commons

<https://researchcommons.waikato.ac.nz/>

Research Commons at the University of Waikato

Copyright Statement:

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

The thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of the thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from the thesis.

**The Macroeconomic Factors and Political Environment: Analysis of
Balance of Payments, Foreign Exchange Reserves and Economic Growth**

A thesis
submitted in fulfilment
of the requirements for the degree
of
Doctor of Philosophy in Economics
at
The University of Waikato
by
Ayesha Iqbal



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2026

Abstract

This is a global study comprising three analyses of macroeconomic dynamics in world economies, focusing on key areas that influence the macroeconomic cycle and financial stability, taking into account institutional and governance factors.

The first study examines the policy impact of tariffs, interest rates, and political stability on the balance of payments among three income groups classified by the World Bank. The global panel data, sourced from the World Bank, covers the period from 2002 to 2022 and is divided into three groups based on per capita income: High Income, Upper Middle Income, and Lower Middle-Income countries. This study investigates how these variables influence the balance of payments across different economic conditions and whether their effects vary. The analysis employs Panel Least Squares, Fixed Effects Regression, GMM, and Dumitrescu panel Granger causality tests. The findings confirm that these variables exert different impacts in the selected groups, highlighting that the importance of tariffs and interest rates as policy tools cannot be overlooked. This research contributes to a deeper understanding of the complex relationship between macroeconomic variables within each income group and underscores the significance of political stability for economic outlook.

The second study investigates the influence of various macroeconomic variables and governance quality on foreign exchange reserve accumulation across high-income, upper middle-income, and lower middle-income countries from 2002 to 2023. A governance quality index is created using Principal Component Analysis (PCA) from six governance indicators from the World Governance Indicators. The data is divided into different sub-periods to explore effects during various economic phases such as the global financial crisis (2002-2008), the recovery period (2009-2019), and the COVID-19 pandemic (2020-2023). Panel data regression models (POLS, fixed effects, and random effects) and a Panel Vector Auto-Regression (PVAR) model are employed to examine the effects of these variables and analyse shocks in the

reserves. The findings reveal diverse results across income groups and time periods. For high-income countries (HICs), governance quality and institutional stability emerge as key drivers of economic resilience, especially following crises. Upper middle-income countries (UMICs) show a strong link between governance quality, inflation stabilisation, and monetary credit effectiveness, whereas lower middle-income countries (LMICs) are more vulnerable to external shocks, particularly through exchange rate volatility and external debt burdens. The overall analysis also highlights the significance of the digitisation era as a major contributor to reserve accumulation across all income groups and opens numerous avenues for future research. The PVAR analysis further supports these conclusions, indicating that governance quality has a substantial impact on macroeconomic variables across all income groups.

The third study analyses top remittance-receiving lower middle-income countries, divided into two groups based on their level of democracy. The aim is to examine the differential impact of remittance, the democracy index, their interaction, and the militarisation index on economic growth. The study employs Panel Regression (POLS), Fixed Effects (FE), and Random Effects (RE). To ensure the robustness of the results, an additional analysis using Two Stage Least Squares (2SLS) is also conducted. The results reveal a negative relationship between both democracy and remittances with growth in countries with stable democracies, whereas a positive relationship is observed in countries with less democratic institutions. The study also introduces a novel variable, the Gross Militarisation Index (GMI), and applies slope homogeneity and cointegration tests, which also yield favourable results. These outcomes highlight the importance of political context in modelling the economic impact of remittances and democratic institutions. The research recommends that tailored policy frameworks be implemented in each nation's institutional structure, focusing on effectiveness to promote inclusive and sustainable development.

Acknowledgements

My PhD journey has been a life-changing experience, filled with both challenges and rewarding moments. This accomplishment would not have been possible without the encouragement, guidance, and support of many individuals to whom I am extremely grateful. I thank everyone who devoted their time and effort to supporting my research.

First and foremost, I thank the Almighty for the countless blessings that enabled me to complete my doctoral studies. I am grateful to my chief supervisor, Dr. Martin Bai, for accepting me under his supervision and for his unwavering guidance and support throughout my PhD. His constant encouragement, timely feedback, and readiness to help whenever I needed assistance played a vital role in enabling me to complete my PhD on time. I appreciate his dedication and mentorship, and I wish him continued success and happiness in life. I would also like to express my gratitude to my second supervisor, Dr. Abhishek Mukherjee, who guided me not only as a supervisor but also as a mentor. His positive approach, valuable advice, and willingness to share his own PhD experiences helped shape my research journey from the very beginning. I wish him all the best in his future endeavours. I also appreciate the guidance from Dr. Gazi Hassan, with whom I began my PhD journey during the proposal confirmation stage. I value the time we spent working together and wish him a fulfilling and successful life ahead.

My sincere thanks go to Dr. Frank Scrimgeour for his support during his tenure as Head of School and for generously giving his time whenever I needed guidance. I am also thankful to Dr. Vijay Kumar, Dr. Greg Hou, Dr. Peter Huang, and Dr. Abhishek Mukherjee for giving me tutoring opportunities and for believing in my abilities. Teaching and interacting with students, as well as travelling to the Tauranga campus, were enriching learning experiences for me. I am

grateful to Maria Neal and Amanda Sircombe for their consistent guidance on university and academic matters.

Most importantly, I extend my heartfelt appreciation to my husband, Tayyab, for his love and support. He encouraged me to focus entirely on my studies and selflessly took on the financial responsibilities throughout my PhD. I am deeply thankful to my daughter, Enayah, who made many sacrifices during my studies yet always encouraged and cared for me during difficult times. I also lovingly acknowledge my newborn son, Ebaad, whose calm nature allowed me to continue my work and who supported me in his own special way. Finally, pursuing my PhD and relocating to New Zealand would not have been possible without the prayers, motivation, and support of my parents, who continuously reminded me of my capabilities, especially during moments of self-doubt. I also thank my parents in law for supporting our decision to come to New Zealand to pursue my doctoral studies.

Table of Contents

Abstract	i
Acknowledgements	iii
List of Tables	vii
Chapter 1: Introduction	1
Chapter 2: Economic Policies and Balance of Payments Across Global Income Groups	5
2.1 Introduction	5
2.2 Literature Review	12
2.3 Research Methodology	17
2.3.1 <i>Data Description</i>	17
2.3.2 <i>Structural Break Test</i>	21
2.3.3 <i>GMM & Endogeneity</i>	21
2.3.4 <i>Dumitrescu Granger Causality</i>	23
2.4. Results and Discussions	23
2.4.1 <i>Descriptive Statistics</i>	23
2.4.2 <i>Dynamic Panel Data Estimate</i>	24
2.4.3 <i>Dumitrescu Granger Causality</i>	25
2.4.4 <i>Robustness of Instruments</i>	26
2.5. Conclusions and Implications	30
References	35
Chapter 3: Multi-Period Approach to Foreign Exchange Reserves: The Influence of Macroeconomic and Government Performance Across Income Groups	46
3.1 Introduction	46
3.2 Literature Review	49
3.2.1 <i>Macroeconomic Determinants of Reserves</i>	49
3.2.2 <i>Governance and Institutional Quality</i>	51
3.3 Methodology	52
3.3.1 <i>Data Description</i>	52
3.3.2 <i>Panel Regression</i>	59
3.3.3 <i>Panel VAR</i>	59
3.4.1 <i>Descriptive Statistics</i>	60
3.4.2 <i>Panel Data Regression Analysis</i>	63
3.4.3 <i>Panel Vector Autoregression (PVAR) Analysis</i>	69
3.4.4 <i>Robust Analysis</i>	73
3.5 Conclusions and Implications	73
3.5.1 <i>Limitations and Future Research</i>	74
References	76

Chapter 4: Democracy, Militarisation, and Economic Growth: A Study of Top Remittance-Receiving Nations	86
4.1 Introduction	86
4.2 Literature Review	92
4.2.1 <i>Positive relation</i>	92
4.2.2 <i>Negative Relation</i>	93
4.2.3 <i>Institutional Mediation</i>	94
4.3 Methodology	96
4.3.1 <i>Description of Data</i>	96
4.3.2 <i>Estimation Method</i>	98
4.4 Results and Discussions	99
4.4.1 <i>Descriptive Statistics</i>	99
4.4.2 <i>Slope Homogeneity Test</i>	100
4.4.3. <i>Panel Regression</i>	101
4.4.4 <i>Endogeneity, 2SLS and Robustness</i>	105
4.4.5 <i>Kao and Pedroni Cointegration Tests</i>	107
4.5 Conclusions and Implications	107
4.5.1 <i>Limitations and Future Research</i>	110
References	112
Chapter 5: General Conclusions	119
References	122

List of Tables

Table 1 Sample Countries (Chapter 2).....	19
Table 2 Description of Data (Chapter 2).....	20
Table 3 Descriptive Statistics (Chapter 2).	20
Table 4 Structural Break Test (Chapter 2)	21
Table 5 Panel Regression, 2002 - 2022 (POLS) (Chapter 2).....	27
Table 6 Panel Regression (Fixed Effects), 2002 – 2022 (Chapter 2).....	28
Table 7 Generalized Moments Methods, 2002- 2022 (Chapter 2).....	29
Table 8 Dumitrescu and Hurlin (2012) Panel Granger Causality Test (Chapter 2)	30
Table 9 Description of Data (Chapter 3).....	54
Table 10 Sample Countries (Chapter 3).....	55
Table 11 PCA Eigenvalues and Variance (Chapter 3).....	57
Table 12 Component Loadings for PCA Index (PC1) (Chapter 3).....	58
Table 13 Correlation Between PCA Index and Variables (Chapter 3).....	58
Table 14 Descriptive Statistics (Chapter 3)	62
Table 15 HICs Fixed Effects Regression (Chapter 3).....	65
Table 16 UMICs Fixed Effects Regression (Chapter 3)	67
Table 17 LMICs Random Effects Regression (Chapter 3)	69
Table 18 Description of Data (Chapter 4).....	97
Table 19 Sample Countries (Chapter 4).....	99
Table 20 Descriptive Statistics (Chapter 4)	100
Table 21 Slope Homogeneity Tests (Chapter 4)	101
Table 22 High Democracy Index POLS (Chapter 4).....	102
Table 23 Table 20 Low Democracy Index POLS (Chapter 4).....	104

Table 24 Two Stage Least Squares (2SLS) (Chapter 4).....	106
Table 25 Panel Cointegration Results (Chapter 4).....	107

List of Figures

Figure 1 Mean Of Current Account Balances for 25 HICs.....	10
Figure 2 Mean of Current Account Balances for 26 UMICs.....	11
Figure 3 Mean of Current Account Balances for 31 LMICs..	11
Figure 4 Mean of FEX for 27 HICs	56
Figure 5 Mean values of FEX for 30 UMICs	56
Figure 6 Mean values of FEX for 19 LMICs.....	57
Figure 7 Impulse Response Functions Illustrations for HICs	71
Figure 8 Impulse Response Functions Illustrations for UMICs.	72
Figure 9 Impulse Response Functions Illustrations for LMICs.....	72
Figure 10 PVAR model stability tests Illustrations.....	73
Figure 11 Top Remittances receiving high democratic LMICs in Group 1.....	89
Figure 12 Graphs showing High Democracy Index scores of Group 1	89
Figure 13 Top Remittances receiving lower democratic LMICs in Group 2.....	90
Figure 14 Graphs exhibiting Lower Democracy Index scores of Group 2.....	90

Glossary of Terms

2SLS	Two Stage Least Square
BICC	Bonn International Centre for Conflict Studies
BOP	Balance of Payments
BRICS	Brazil, Russia, India, China South Africa
CS-ARDL	Cross-Sectional Autoregressive Distributive Lag
EIU	Economic Intelligence Unit
EU	European Union
FDI	Foreign Direct Investment
FE	Fixed Effects
FEX	Foreign Exchange Reserves
GCC	Gulf Cooperation Council (Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain and Oman)
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GMI	Global Militarization Index
GMM	Generalized methods of moments
HICs	High Income Countries
IMF	International Monetary Fund
LMICs	Lower Middle-Income Countries
MENA	Middle East North African
NARDL	Non-linear Autoregressive Distributed Lag Model
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development

OIC	Organization of Islamic Cooperation
OLS	Ordinary Least Square
PCA	Principal Component Analysis
PMG-ARDL	Pooled Mean Group with Autoregressive Distributed Lag
POLS	Panel Ordinary Least Square
PVAR	Panel Vector Autoregression Model
RE	Random Effects
SACU	South African Customs Union
SAMA	Saudi Arabian Monetary Authority
SSA	Sub-Saharan African
UMICs	Upper Middle-Income Countries

Chapter 1: Introduction

The global economy is facing numerous macroeconomic challenges in the post COVID-19 period and amid the Russian Ukrainian conflict. Due to these two factors, there was an ongoing economic crisis, with escalating interest rates, a deterioration in terms of trade and tourism, and economies heavily impacted by border closures. It was also noted that countries across different income levels, such as HICs, UMICs, and LMICs, face challenges related to current account imbalances, trade policy, institutional governance, and economic growth (Altayligil & Çetrez, 2020). Recently, the ongoing tariff wars have emerged since Trump took office, with the administration announcing baseline tariffs of 10% on all countries and higher rates, such as 20% on the EU and 54% on China, due to a surplus with the US (Ignatenko et al., 2025). This resulted in retaliation tariffs from other countries, and economists argue that it could further lead to recession and increase trade deficits (Auclert et al., 2025). According to the IMF, global debt levels have increased massively after the GFC and COVID-19. They are regarded as the highest since the Second World War in both developed and developing economies. Rafie and Lekhal (2025) conclude that the FEX acts as a buffer against external debt shocks and highlights its importance as a shield against uncertain events. Following the pandemic, most developing countries experienced a halt in their FEX due to the closure of industries, a decrease in exports, and a decline in foreign direct investment (Nwosa, 2020). FEX are used by central banks to monitor global financial and economic stability and to support monetary policy, thereby encouraging investor confidence and aiding government expenditures and trade (Djedaiet et al., 2025). Likewise, remittances emerged as a major source of financing, surpassing other forms of financial flows (Elorabi et al., 2025). Among the top remittance receiving countries, most of the countries are unable to utilise these for economic growth, even being a pivotal contributor towards the FEX.

Vural-Yavaş (2020) investigated the economic policy uncertainty variable developed by Baker et al. (2016) and said that economic policies play an important role in decision making, and uncertainty in policies may lead to contraction in the macroeconomic indicators. A stable political environment is a cornerstone of a country's macroeconomic performance (Abaidoo & Agyapong, 2021). Furthermore, government institutions, whether they are autocratic or democratic, influence the economic environment (Ibrahim & Cheri, 2013). Moreover, many studies have analysed the relationship between political stability and economic performance (Alper, 2018; Altayligil & Çetrez, 2020; Georgiou et al., 2015; Nomor & Iorember, 2017; Radu, 2015; Uddin et al., 2017). The ongoing geopolitical conflicts among countries and the political disruptions within them over the last decade have affected most global economies, making it difficult for them to formulate and implement consistent policies. Given its flashpoint status, it is essential to study tariffs, current accounts, FEX, and remittances in relation to institutional and political factors. Therefore, this thesis offers a blend of studies that analyse these macroeconomic factors along with various institutional variables. Although several studies have examined these issues, there remains a need for integrated, comparative research that captures the complexity of the interconnections among financial, economic, and institutional variables across different economies. Understanding the dynamics of macroeconomic stability, external sector performance, and institutional quality has become increasingly fundamental in an interconnected global economy. Therefore, this thesis addresses this gap by presenting three empirical studies, each focusing on a significant outlook of macroeconomic performance using a broad panel of global economies grouped by income level. The ultimate aim is to investigate how governance quality, institutional stability, and macroeconomic factors interact to influence key macroeconomic outcomes, including the balance of payments, foreign exchange reserves, remittances, and economic growth.

References

- Abaidoo, R., & Agyapong, E. (2021). Macroeconomic Risk and Political Stability: Perspectives from Emerging and Developing Economies. *Global Business Review*. <https://doi.org/10.1177/09721509211047650>
- Alper, A. E. (2018). BRICS-T Ülkelerinde Politik İstikrar ve Ekonomik Performans İlişkisi Üzerine Bir Analiz. *Business and Economics Research Journal*, 9(1), xxx-xxx. <https://doi.org/10.20409/berj.2017.88>
- Altayligil, Y. B., & Çetrez, M. (2020). Macroeconomic, institutional and financial determinants of current account balances: a panel data assessment. *Journal of Economic Structures*, 9(1). <https://doi.org/10.1186/s40008-020-00225-1>
- Auclert, A., Rognlie, M., & Straub, L. (2025). The macroeconomics of tariff shocks. *National Bureau of Economic Research*, w33726). <https://doi.org/10.3386/w33726>
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring Economic Policy Uncertainty*. *The Quarterly Journal of Economics*, 131(4), 1593-1636. <https://doi.org/10.1093/qje/qjw024>
- Djedaiet, A., Ayad, H., & Abdelkader, S. B. (2025). Bridging the divide: Exposing the intriguing link between international reserves and environmental status through the inverted U-shaped relationship. *Research in Economics*, 79(1). <https://doi.org/10.1016/j.rie.2025.101041>
- Elorabi, K., Ishak, S., Alhasnawi, M. Y., Somod Dapo, O., & Maher, M. (2025). Relationship between international remittances, political stability and income inequality: evidence from MENA countries. *Journal of Economic and Administrative Sciences*. <https://doi.org/10.1108/jeas-10-2024-0448>
- Georgiou, M. N., Kyriazis, N., & Economou, E. M. (2015). Democracy, political stability and economic performance. A panel data analysis. *Journal of Risk and Control*, 2(1).

- Ibrahim, A. A., & Cheri, L. (2013). Democracy, political instability and the African crisis of underdevelopment. *Journal of Power, Politics & Governance*, 1(1).
- Ignatenko, A., Lashkaripour, A., Macedoni, L., & Simonovska, I. (2025). Making America Great Again? The Economic Impacts of Liberation Day Tariffs. *National Bureau of Economic Research*, w33771. <https://doi.org/10.3386/w33771>
- Nomor, D. T., & Iorember, P. T. (2017). Political Stability and Economic Growth in Nigeria. *IOSR Journal of Economics and Finance*, 08(02), 45-53. <https://doi.org/10.9790/5933-0802034553>
- Nwosa, P. I. (2020). Oil price, exchange rate and stock market performance during the COVID-19 pandemic: implications for TNCs and FDI inflow in Nigeria. *Transnational Corporations Review*, 13(1), 125-137. <https://doi.org/10.1080/19186444.2020.1855957>
- Radu, M. (2015). Political Stability - A Condition for Sustainable Growth in Romania? *Procedia Economics and Finance*, 30, 751-757. [https://doi.org/10.1016/s2212-5671\(15\)01324-6](https://doi.org/10.1016/s2212-5671(15)01324-6)
- Rafie, F.-E., & Lekhal, M. (2025). Empirical investigation of the relationship between public external debt sustainability, foreign reserves and fixed exchange rate. *Cogent Economics & Finance*, 13(1). <https://doi.org/10.1080/23322039.2025.2457478>
- Uddin, M. A., Ali, M. H., & Masih, M. (2017). Political stability and growth: An application of dynamic GMM and quantile regression. *Economic Modelling*, 64, 610-625. <https://doi.org/10.1016/j.econmod.2017.04.028>
- Vural-Yavaş, Ç. (2020). Corporate risk-taking in developed countries: The influence of economic policy uncertainty and macroeconomic conditions. *Journal of Multinational Financial Management*, 54. <https://doi.org/10.1016/j.mulfin.2020.100616>

Chapter 2: Economic Policies and Balance of Payments Across Global Income Groups

2.1 Introduction

Recently, numerous economies have found themselves trapped in the predicament of negative current account balances. This is due to the severe impacts of the COVID-19 pandemic and the Russo-Ukrainian conflict, which were further exacerbated by rising interest rates. The global surge in interest rates has triggered inflation, driving it upward and catalysing associated crises (Liadze et al., 2022). Simultaneously, these international events have ignited political disruptions, with public discontent stemming from the soaring cost of living, government COVID-19 policies, and rising trade costs due to the post-Russo-Ukrainian conflict. It is no doubt that after these two notable events, there is a global rise in the cost of living, and it is not expected to be reduced any time soon. In light of this, this study undertakes a comprehensive exploration of the complex interplay among tariffs, interest rates, and political stability in the balance of payments.

Through international trade and competitive advantage, the country's economy earns foreign exchange, supports these inflows, and is a critical pillar in defining a country's economic strength (Singh, 2010). The deterioration of a nation's account balances can worsen economic conditions, generate unfavourable projections, and signal a need for intervention. Undoubtedly, the balance of payments challenges currently faced by several economies, following the recent global pandemic and war, have significantly contributed to poor economic performance. The balance of payments (BOP) is one of the most crucial factors that determine a country's economic position. Many developed and developing countries experience a negative BOP, and this shows a record of all transactions of an economy with the rest of the world. To achieve price stability and a favourable BOP, economies focus mainly on monetary policy. There are many empirical studies and findings about the macroeconomic variables

affecting BOP differently in both developing and least developed economies(Sultani & Faisal, 2024). A country cannot survive on its own and must trade with other countries to meet the needs of its people. However, sometimes doing so can be harmful as it increases the burden of dollarisation (Jamil et al., 2023). The BOP has long been a central focus of economists, and there was an increasing deficit in the 1980s, then again in the 2000s Bianchi et al. (2014) and recently due to the current global events. Therefore, countries should employ policies to promote growth. Countries should also make sustained efforts to align supply and demand and identify an economic growth model that supports them.

In the contemporary landscape of modernisation, a nation's economic progress is intricately tied to its BOP position. A balance BOP signifies a robust economic stance, and it sums up all international transactions with the rest of the world over a given period (Thirlwall, 2021). Historically, countries coping with weaker economies have often found themselves trapped in BOP challenges (Alejandro, 1963; Krugman & Taylor, 1978). During the mid-20th century, strategies such as import substitution policies and tariff imposition were prevalent in efforts to foster industrialisation and rectify BOP deficits (Irwin, 2021). Notable success stories like Japan and the Asian Tigers bear testimony that the efficacy of government interventions, with tariffs emerging, is the instrumental driver of economic growth (O'Rourke, 2000; Schularick & Solomou, 2011; Wade, 2018). However, in the late 20th century, the imposition of tariffs was discouraged; economists have argued that it is not an effective solution. They believed that the effectiveness of tariffs may falter in contexts where the export capacities are limited, and imports exhibit inelastic tendencies (Pinzón-Fuchs, 2019). But, in recent years, the trade openness support has declined, and the relevant parties have started speaking in favour of protectionist policies and imposition of tariffs, especially in developed countries like the USA(Kreuter & Riccaboni, 2023). Also, Delpeuch et al. (2024) conclude that protectionist practices are on the rise among G20 countries and are economically significant.

Furthermore, global interest rates have risen over the past 3 years. Nations often recalibrate their monetary policies during financial crises, aiming to channel domestic and foreign investment while mitigating inflationary pressures (Bernanke, 2020). In this intricate economic dance, interest rates exert considerable influence, shaping savings and investment and exerting substantial pressure on the BOP by modulating income levels. Moreover, the underpinning of political stability has emerged as a linchpin for economic equilibrium. Defined as the absence of political violence and social unrest that leads to regime change, political stability forms the bedrock on which economic stability is built. Nations characterised by political stability experience minimal disruptions across social and political institutions (World Bank). Conversely, political instability can undermine economic growth, stemming from discord between the political system and the quality of political institutions (Aisen & Veiga, 2013; Blanco & Grier, 2009; Goldstone et al., 2010).

Amidst a vast expanse of literature delving into the nexus between tariffs and BOP (Furceri et al., 2022; Roeger & Welfens, 2022), monetary policy and BOP (Knoester & Sinderen, 2007; Lahiri & Vegh, 2000; Mallick, 2022; Moreno-Brid, 2003), and political stability and economic growth (Aisen & Veiga, 2013; Altayligil & Çetrez, 2020; Hamdaoui et al., 2021; Okafor, 2015), this research distinguishes itself through its holistic examination of the interconnected relationship between tariffs, interest rates, political stability, and the BOP. Although past studies have broadly examined the connection between tariffs and BOP, the recent literature tends to ignore it. Additionally, the prevalent focus on exchange rates as a monetary tool has eclipsed investigations into the relationship between interest rates and BOP. Moreover, the inclusion of political stability in the analysis is essential, given the global rise in political instability. By addressing these gaps, this study aims to contribute to the existing literature and offer a comprehensive perspective on BOP, providing valuable insights for both academic research and policy formulation.

In addition, this study adopts a global viewpoint. It applies the latest dynamic panel data model based on the generalised method of moments developed by Arellano and Bover (1995) and Blundell and Bond (1998) spanning (21 years), 2002-2022 for three income groups classified by the World Bank: High-Income Countries (HICs), Upper-Middle Income Countries (UMICs), and Lower-Middle Income Countries (LMICs). A notable gap exists in the literature regarding the examination of the relationships between these variables on a global scale and their impact within these income groups. Thus, the study investigates the effects of tariffs, interest rates, and political stability on the BOP across these income groups over the specified period. For this purpose, several fundamental questions are posed: What is the impact of tariffs, interest rates, and political stability on the balance of payments? Are there any structural breaks in the balance of payments? If so, how do these breaks affect the model? Does the relationship between tariffs, interest rates, and political stability affect differently across income groups? To address these inquiries, the study employs Panel Ordinary Least Squares, Fixed Effects, Generalised Method of Moments estimation and Dumitrescu Panel Granger Causality tests.

Theoretically grounded in a post-Keynesian perspective, the study underscores global uncertainty and advocates government intervention to stabilise economies. Economic growth is basically nonuniform and is subject to influences, ranging from demand dynamics to political manoeuvres and governmental actions. The macroeconomic theories of Keynes and Friedman are significant in the current uncertain times experienced by economies. Many countries are now employing these tactics as the basis for making economic policies. In this era of economic uncertainty, changes in investment, consumption, and government spending can increase economic activity (Aganbegyan, 2022). The total output of the economy, also called the Gross Domestic Product, depends on four factors, which are consumption, investment, government spending and net exports. The governments of these economies aim to increase this through their policies, and such involvement can increase economic activity and bring stability (Jahan

et al., 2014). The monetary theory developed by Friedman and Schwartz after the Great US depression emphasised money supply to control inflation, achieve economic stability and for the government to take part in controlling the money and bringing stability. Different policies are implemented by adjusting interest rates and the money supply to promote economic growth. The expansionary monetary policy will increase aggregate demand, thereby supporting economic growth and, in turn, the central bank's money supply. The money demand is a function of variables like interest and inflation, and the theory presents that it can be predicted and controlled by these variables (Kantor, 2022). The Keynes theory asserts that aggregate demand by households, businesses and government is the primary driving force of the economy, and there is some recent discussion on the relationship of the Keynes theory by (Peacock & Shaw, 2024; Sultani & Faisal, 2024).

The theory of fiscal and monetary policy is associated with Keynes' economic perspective and encompasses the government's income and expenditure. It advocates that fiscal policy, such as government spending and tax cuts, stimulates demand and helps the economy exit a recession. It not only highlights the importance of monetary policy but also stresses that fiscal policy is more effective, since interest rates are already exceptionally low. The Monetary Approach to Balance of Payment Theory (MABOP theory) also sheds light on the country's money supply and BOP performance (Aghevli, 1975). These are among the tools widely accepted for controlling spending and consumption. The tariffs in the study might play an important role in controlling imports. They therefore can be related to the government's goal to reduce consumption of foreign goods and thereby foster the BOP, whereas the interest rates also control the money supply and may impact the country's BOP position (Blecker, 2021; Blecker & Setterfield, 2019; Lavoie, 2014; Marangos, 2004; Stockhammer, 2021). By demonstrating the intricate relationships among the variables under scrutiny, the study endeavours to untangle the causal forces shaping demand-driven economies, thereby aiding the

navigation of the inherent uncertainties that permeate global markets across the study's targeted income groups.

The graphs below show the current account balances of the income groups selected in the study from 2002 to 2022 (Figures 1-3).

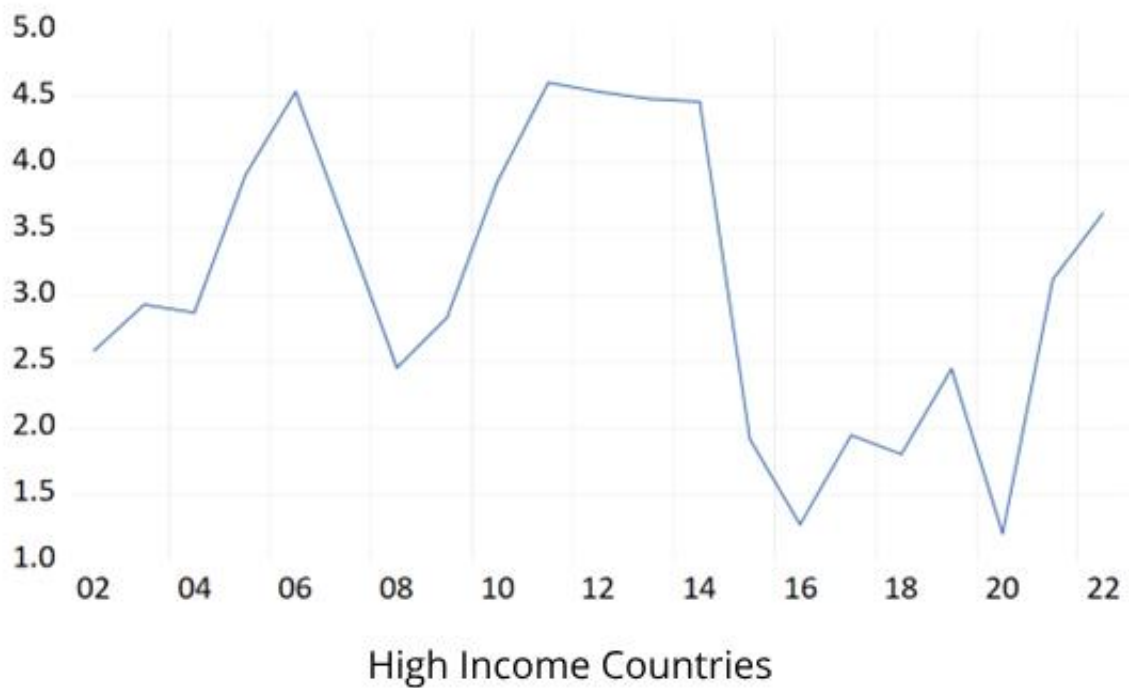


Figure 1 Mean of current account balances for 25 high income countries (HICs) shown in Table 1 included from 2002 to 2022.

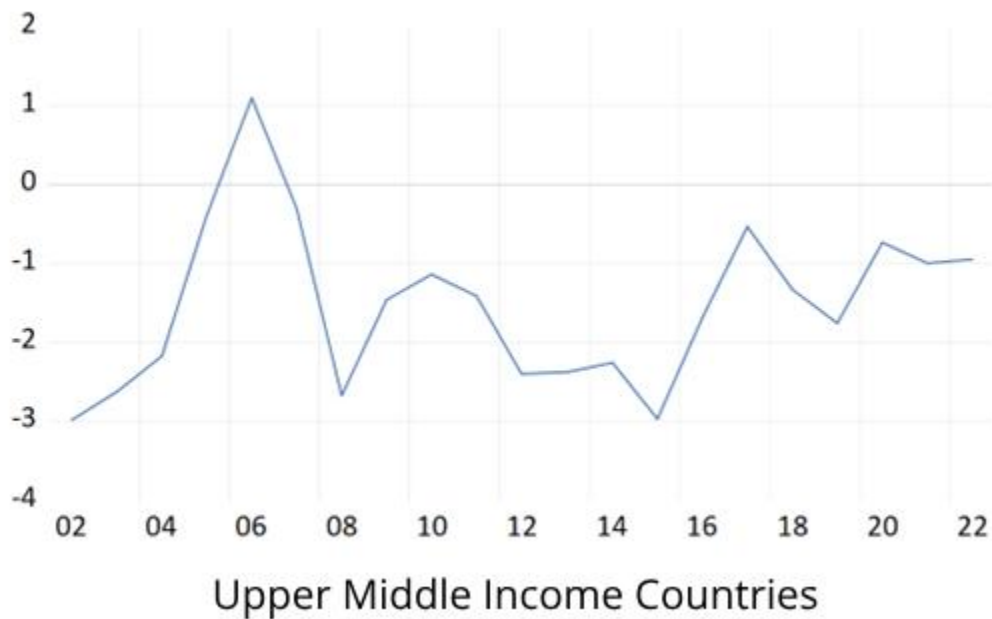


Figure 2 Mean of current account balances for 26 upper middle income (UMICs) countries shown in Table 1, from 2002 to 2022.

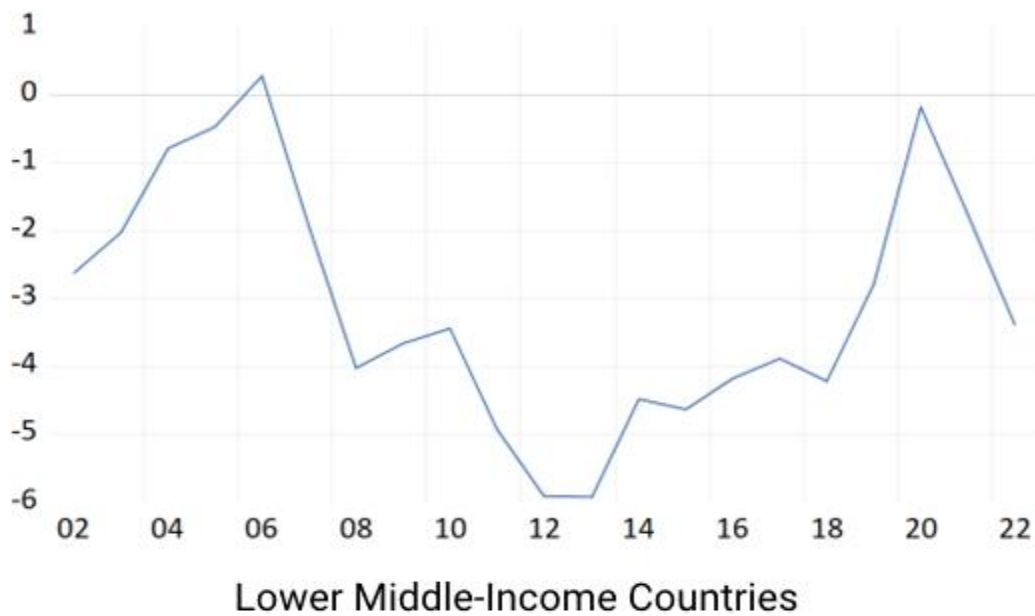


Figure 3 Mean of current account balances for 31 lower middle-income countries (LMICs) shown in Table 1, included from 2002 to 2022.

In these graphs, we observe a significant shift in current account balances. For HICs, these shifts can be seen in 2008, 2014 and 2020. These shifts may be attributable to the global financial crisis of 2008, the global oil crisis of 2014, and the COVID-19 pandemic of 2020.

For UMICs, the shifts are in 2005, 2014 and 2020. In LMICs, we observe shifts in 2006 to 2008 and 2020. The significant structural break will be tested through a structural break test and will be included in the research model. Bianchi et al. (2014) test for the structural break and analyse current account balance for different economies and concluded that the forecasts changed during structural breaks.

The rest of the paper is structured as follows: Section 2 presents the literature, Section 3 presents data and methodology, Section 4 presents results and discussion, and finally, Section 5 presents the conclusion.

2.2 Literature Review

In the comprehensive literature review, numerous studies seek to analyse the factors and determinants affecting the BOP. These factors include, but are not limited to, exchange rates, economic growth, public and private savings, and other pertinent variables. In this section, we discuss studies on tariffs, interest rates, and political stability.

There is mixed evidence on the efficacy of tariffs as a policy instrument. As mentioned, due to the high prevalence of tariffs as a promising growth strategy in the early 1950s, a considerable amount of research was available in the past; however, as the economic perspective evolved, the imposition of tariffs was discouraged, and trade openness was widely adopted, and policymakers discouraged tariffs (Irwin, 2021). Therefore, contemporary studies on this topic are comparatively limited. Hadili et al. (2020); Stiglitz (2000) argue that the results of trade liberalisation are still unclear on the BOP and may lead to deficits in the current account. It may also promote income inequality in the developing countries (Bumann & Lensink, 2016). Van Wijnbergen (1987) concludes that a permanent tariff has no effect on the current account, while a temporary increase can lead to current account improvement. Roeger and Welfens (2022) conclude that tariffs do not impact the current account balance. McCombie (1993) also quotes the Cambridge Policy Economic Group, saying that import controls are less

inflationary than the devaluation policies. Parikh (2006) asserts that trade liberalisation improves trade growth, but this growth negatively influences trade balance and causes deterioration in current accounts. Moreover, Pacheco-López and Thirlwall (2007) it is concluded that trade liberalisation leads to financial imbalances in the current account. Petersmann (2019) concludes that liberalisation from developed countries could resolve the debt issues of developing nations. Restrictive trade policy also leads to a decline in economic growth (IMF and World Bank), analysed by Manwa et al. (2019) through research on restrictive trade policy in 5 South African Customs Union (SACU) countries and conclude a weak relationship between trade liberalisation and economic growth. Hallwood (2021) studies two cases, one almost 50 years ago, when Nixon administration depreciated the dollar attributed to U.S. economy facing negative trade balance. This is due to overvaluation of the currency, and the second case concerns the Trump administration, which imposed tariffs on specific countries and manipulated the exchange rate to benefit its international trade. This study argues that tariffs don't improve GDP or consumer welfare because they affect industrial production, but they help maintain the country's trade balance by reducing imports. Therefore, tariffs are ranked as the second best policy after Nixon, and it is suggested that the government tax the foreign holdings of U.S. securities by foreign investors to address currency overvaluation, and that future research examine the long run effects of trade barriers. Barattieri et al. (2021) investigates the macroeconomic effects of protectionism in 21 small economies, using high frequency trade policy data from 1999 to 2016. Their outcomes disclose that protectionism can be used as a supply shock that causes a reduction in output and an increase in inflation, while exhibiting a partial positive impact on the trade balance. They also characterise protectionism as recessionary and inflationary, and it remains costly regardless of exchange rate traps. However, we should note that this study is restricted to small economy models; thus, future research is proposed to investigate the impact of tariffs on larger economies. The rise and fall

of import substitution was considered a promising strategy for developing countries at the beginning of the 1950s, but due to a lack of consensus, it gradually came under criticism and its effectiveness was questioned. The empirical studies further contributed to its decline as a policy idea. Although the primary goal of this policy is to restrict imports and promote industrialisation, it remains useful today (Irwin, 2021). Benz and Jaax (2022) use the OECD as a measure of the Services Trade Restrictiveness Index, which studies regulatory barriers that lead to slower services trade. Although trade has grown over the last 20 years, growth has been slower due to regulatory obstacles. Therefore, these barriers should be relaxed to promote trade in services. Importantly, Kreuter and Riccaboni (2023) investigate the impact of tariffs on intermediate goods in the U.S. following the global financial crisis. It employs network models and finds that tariffs can reduce GDP and consumer welfare due to direct and indirect network effects. It further proposes exploration into the long-term effects of trade barriers.

While numerous studies have investigated the impact of exchange rates on the BOP, research on the influence of interest rates remains comparatively limited. For the relationship between interest rate and BOP, there is mixed literature available. For instance, Lahiri and Vegh (2000) investigate the potential use of interest rates to delay the BOP crisis and observe that it can be an effective tool within certain limits. Still, beyond that point, it can have negative consequences and may lead to high inflation. The interest rate is a monetary instrument used to control inflation; however, in developing countries, higher interest rates increase the cost of borrowing, which in turn raises inflation and is passed on to consumers (Bird, 2010). Iacoviello and Navarro (2019) investigate the effects of changes in US monetary policy on foreign economies by using a massive 50-year data set comprising 50 countries. The research also considers factors such as the exchange rate, trade openness and external sensitivity. It tests the data for within and between countries determinants and thereby not using the fixed effects. They find that increases in interest rates reduce GDP in economies as much as in the US, and

that the effects are more pronounced in emerging economies than in advanced economies. Oluwole and Oloyede (2020) study a panel of West African countries from 1976 to 2016 to explore the impact of monetary policy on BOP. The results from the ARDL and FE models indicate a positive relationship between interest rate and net foreign assets. Sujianto (2020) also conclude that there is a positive relationship between interest rates and the BOP. Neaime and Gaysset (2022) investigate the role of monetary policy in challenges faced by the Middle East North African (MENA) countries after the Covid-19 pandemic, and suggest financial stability as the primary goal, and propose structural reforms to achieve macroeconomic stability and fiscal control. Alshubiri (2022) studies the relationship of interest rates, exchange rates and political stability with foreign direct investment. The results for the G7 and GCC countries are compared, and a common factor is identified in both groups. It was the long term positive relationship of real interest rates with foreign direct investment. M. A. Khan (2023) analyses of the relationship between monetary policy and BOP in 17 developing countries from 1982 to 2019. The research highlights monetary policy as a valuable tool in shaping BOP. It finds significant country level relationships and bidirectional causality, and that interest rates negatively affect net foreign assets. Hussain et al. (2024) study the current account deficit and trade balance deficit and conclude that the fiscal policy is effective when the interest rates are supportive of that. They explain this, considering the Mundell-Fleming model, that the higher capital inflows cause the appreciation of exchange rates, which undermines the current account. Moreover, liberalisation could cause a currency crisis in countries with weak financial systems, which further makes the current account weak (Baharumshah et al., 2019).

Political stability has not been strongly associated with the BOP in previous studies. However, we could find its association with variables like growth, investment, and inflation etc. The research of Aisen and Veiga (2006) investigates the causes of inflation globally. They use panel data from 100 countries from 1960 to 1999 and applied advanced techniques, such

as GMM estimation for dynamic panel data. The key factors used to examine the relationship are political stability, institutions and economic structures. The results reveal that political instability is associated with higher inflation, whereas economic freedom and democracy are associated with lower inflation. Therefore, for stable inflation rates, economic freedom and democracy are crucial factors, and there should be political reforms for reducing inflation, especially in developing countries. Bird (2010) also concludes that, due to instability in developing countries, conventional macroeconomic policies may be ineffective. Uddin et al. (2017) probe the impact of political stability on economic growth through 120 countries from 1996 to 2014 and employs Dynamic two-step GMM and quantile regression. The results indicate that political stability is a key factor in economic growth, and that many Organisation of Islamic Cooperation (OIC) countries experience high political instability, which impedes economic growth. The researchers recommend economic and political reforms to combat corruption and promote advanced economic diversification and harmony among OIC countries; otherwise, these countries may face the same fate as other Middle Eastern and North African countries. In another research for African countries, it was concluded that political instability negatively affects economic growth, which further leads to political uncertainty and conflict (Dalyop, 2018). Zeeshan et al. (2022) explore the relationship between corruption, political instability, natural resources, and economic growth for Pakistan. They applied ARDL & NARDL models and utilised secondary data from 1996 to 2018. The findings reveal that corruption has a short-term positive relationship with economic growth, but an overall negative effect. Political instability has negative relationships in both the short and the long run. Overall, the research provides valuable insights for policymakers and suggests future research using the same variables in the context of other variables. Alshubiri (2022) analyses the GCC and G7 countries and found a long term significant negative relationship between political stability and foreign direct investment for GCC countries, but an insignificant relationship for G7 countries.

It was concluded that market forces should determine interest rates and that sustainable foreign direct investment can promote political stability in both developing and developed countries. Okara (2023) examines 116 developing countries and concludes that FDI leads to political stability and highlighted that it promotes human rights and maintains stability, which not only leads to economic stability but also good governance and societal wellbeing. A sound government in industrialised countries formulates budgets that improve current account balances, and this improvement is achieved by increasing national savings (Chinn & Ito, 2007). More recently, Chletsos and Sintos (2024) examine the effect of political stability on financial development using a panel dataset of 123 countries from 1980 to 2017. They used the IMF's financial development index and applied GMM estimators to address endogeneity. The findings indicate a strong positive correlation between political stability and financial development and discuss the importance of political stability in fostering government effectiveness, financial liberalisation, and democratic governance, which promotes financial development. They also suggest future research on specific channels and mechanisms which are politically unstable.

2.3 Research Methodology

2.3.1 Data Description

Our research focuses on investigating the long-term associations among key economic indicators, namely the balance of payments (BoP), tariffs (TaF), interest rates (InT), and political stability (PoL), as outlined in Table 2. The study also included foreign direct investment and the population growth rate as control variables, as shown in Table 2. Several other control variables were also added with the help of literature, but the selected ones were identified by continuous trial and error methods and by checking their impact on the research model. Foreign direct investment is expressed as a percentage of GDP and is one of the most important indicators of the dominance of foreign investors in the Economy (Cole, 2015; Dixon

& Boswell, 1996; Kentor & Boswell, 2003; Kerrissey & Schuhrke, 2016). As per classical theory, there is a positive and negative relationship with economic growth according to the dependency theory (Mejia, 2024). Moreover, higher population growth rates increase the working-age population and may reduce economic growth (Mejia, 2024; Sheehey, 1996). The data set utilised encompasses the annual data for world countries, and we have divided the countries into high-income, upper-middle-income, and lower-middle-income countries, categorised by income levels as defined by the World Bank. The dataset is taken from World Bank Indicators and World Governance Indicators covering the period of 2002 to 2022. The starting date is selected based on the availability of data on political stability, as regular data is published only from 2002 onward. The sample countries in each income group selected for this research are depicted in Table 1. We have 25 high-income countries, 26 upper-middle-income countries, and 31 lower-middle-income countries. Descriptive statistics for all income groups are detailed in Table 3. We also planned to include low-income countries, but, unfortunately, due to data unavailability, this group is not included. Moreover, certain countries within the three researched groups were omitted due to limited or no data availability.

The variables under consideration include the dependent variable Current Account Balance as a percentage of GDP, independent variables Tariff Rate as the applied mean of all products percentage, Real Interest Rate as lending rate adjusted for inflation percentage, Political Stability as an index between -2.5 to +2.5 and control variables like Foreign Direct Investment as net inflows percentage and Population growth rate as percentage increase. These variables are denoted as BoP, TaF, InT, and PoL, respectively. The units of measurement and sources are outlined in Table 2, showcasing the comprehensive nature of the data.

Table 1 Sample Countries.

High Income Countries	Upper Middle-Income Countries	Lower Middle-Income Countries
Australia	Albania	Algeria
Bahrain	Argentina	Angola
Brunei Darussalam	Armenia	Bangladesh
Canada	Azerbaijan	Benin
Chile	Belarus	Bolivia
Croatia	Botswana	Cote d'Ivoire
Czechia	Brazil	Egypt, Arab Rep.
Hungary	Bulgaria	Eswatini
Iceland	China	Haiti
Italy	Colombia	Honduras
Japan	Costa Rica	India
Korea, Rep.	Dominican Republic	Jordan
Kuwait	Georgia	Kenya
Malta	Guatemala	Kyrgyz Republic
Netherlands	Indonesia	Lebanon
New Zealand	Malaysia	Lesotho
Norway	Mexico	Mauritania
Oman	Moldova	Mongolia
Panama	Namibia	Myanmar
Romania	North Macedonia	Nicaragua
Singapore	Paraguay	Nigeria
Sweden	Peru	Pakistan
Switzerland	Russian Federation	Papua New Guinea
United Kingdom	South Africa	Philippines
United States	Suriname	Senegal
	Thailand	Sri Lanka
		Tajikistan
		Tanzania
		Ukraine
		Viet Nam
		Zambia

Note: Sample countries divided into 3 groups by the World Bank based on Gross National Income (GNI) income. High-Income Countries having Gross National Income of \$13206 or more, Upper Middle-Income Countries between \$4256 to \$13205 and Lower-middle income countries between \$1086 to \$4255

Table 2 Description of Data.

Variables	Denoted as	Units	Source
Current Account Balance	BoP	% of GDP	World Development Indicator
Tariff Rate	TaF	Applied, simple mean all products %	World Development Indicator
Real Interest Rate	InT	Lending interest rate adjusted for inflation %	World Development Indicator
Political Stability	PoL	Absence of political violence (Index between -2.5 to +2.5)	World Governance Indicator
Foreign Direct Investment	FdI	Net inflows (% of GDP)	World Development Indicator
Population Growth	PoP	(annual %)	World Development Indicator

Table 3 Descriptive Statistics.

Groups	Variables	Mean	Std. Dev	Obs
High Income Countries	BoP	3.08	10.67	525
	TaF	3.32	1.83	525
	InT	2.72	8.81	525
	PoL	0.76	0.50	525
	FdI	8.40	32.54	525
	PoP	1.04	1.56	525
Upper Middle-Income Countries	BoP	-1.51	7.89	546
	TaF	6.99	3.40	546
	InT	6.06	9.78	546
	PoL	-0.25	0.62	546
	FdI	3.88	4.93	546
	PoP	0.69	0.91	546
Lower Middle-Income Countries	BoP	-3.08	8.71	651
	TaF	9.25	4.63	651
	InT	5.71	8.04	651
	PoL	-0.72	0.71	651
	FdI	3.24	4.73	651
	PoP	1.84	1.39	651

Source: Author's own computations. Countries grouped on World Bank classification. Std.Dev: Standard Deviation, Obs: Observation, BoP: Balance of Payments, TaF: Tariff, InT: Interest Rate, PoL: Political Stability Index, FdI: Foreign Direct Investment and PoP: Population Growth Rate.

2.3.2. Structural Break Test

Following the research question about the structural break and its impact, the structural break Bai and Perron (2003) is applied. The test gives a single break that will be included in the model. The results are shown in Table 4. These breaks can be verified from the graphs presented earlier, which show a significant shift from a rising to a declining trend near these break dates. We could have tested for more breaks, but given the limited number of years, obtaining more than two breaks is not feasible. We created a dummy variable assigning 0 to years before the break year and 1 to years after the break. For HICs, we observe a break in 2014; for UMICs, in 2004; and for LMICs, in 2003. As the time in the sample data set starts from 2002 to 2022, we expect the break in the HICs will have a significant impact on the model. This is because it is coming in the middle of our data, whereas the breaks in the other two groups are at the very beginning, so we don't expect them to have a significant impact on the research model.

Table 4 Structural Break Test.

Group	Test Statistics	Break Point	P Value
High Income Countries	-6.10*	2014	0.00
Upper Middle-Income Countries	-7.30*	2004	0.00
Lower Middle-Income Countries	-5.61*	2003	0.00

*Note: * Denotes failure to reject the null hypothesis of no break.*

2.3.3. GMM & Endogeneity

Prior to GMM, we study the Pooled Mean Group with Autoregressive Distributed Lag (PMG-ARDL) methodology developed by (Pesaran et al., 2001), the Cross-Sectional ARDL (CS-ARDL) method introduced by Pesaran (2006) and further refined by (Chudik & Pesaran, 2015). This dual-method approach considers that the variables under examination exhibited both I (0) and I (1) characteristics. When this mixed integration status is observed, the ARDL-PMG panel technique is appropriate. However, due to the presence of cross-sectional dependence, the studies also employ cross-sectional ARDL, an augmented and advanced

version of the conventional panel ARDL-PMG method (Raza et al., 2024; Sadiq et al., 2023; Yadav & Mahalik, 2024; Zhongwei & Liu, 2022). The techniques, however, are suitable when the time periods T of observations are more than cross sections N ; they don't address the endogeneity issues and are yet more effective for time series data. Given the potential for endogeneity in our dataset, with $N > T$, variables such as tariff, interest rate, political stability, and BOP may also be correlated. It is important to address endogeneity because variables such as political stability may increase with economic performance, whereas political instability could lead to a worse economy. Similarly, higher interest rates could lead to instability, and tariffs could increase or decrease following economic shocks.

Therefore, we use the Generalized Method of Moments (GMM model). It is founded by (Roodman, 2009a, 2009b), which is an extension of (Arellano & Bover, 1995). We select GMM for several reasons, including the ability to assess whether the previous level of inequality is related to the current level of inequality. This addresses the endogeneity problem and is well-suited when the number of cross-sections (N) exceeds the number of periods (T). In this study, there are 20 periods (i.e., 2022–2022) for 25 high-income countries, 26 upper-middle-income countries, and 34 lower-middle-income countries.

The GMM model can be used for dynamic panel data where the causal relationship evolves over time. As in our case, we can say that last year's BOP is affecting the current year's BOP. To capture this, the estimation technique uses lags of the dependent variable as explanatory variables and controls for endogeneity. The instruments are termed internal instruments because they are drawn from the same econometric model (Roodman, 2009b). Therefore, it yields consistent results despite endogeneity.

The research model of the study is presented as:

$$BoP_{it} = \beta_0 + \beta_1 BoP(-1)_{it} + \beta_2 TaF_{it} + \beta_3 InT_{it} + \beta_4 PoL_{it} + \beta_5 FdI_{it} + \beta_6 PoP_{it} + e_t \quad (1)$$

A step-by-step procedure is to determine how GMM offers robust estimates compared to

OLS and fixed-effects estimates. First, OLS is applied, followed by an FE model and a GMM specification with the lagged dependent variable (the previous year's balance of payments). This would address endogeneity concerns, and appropriate estimates would be obtained using a rigorous GMM procedure.

2.3.4. Dumitrescu Granger Causality

Furthermore, the study will conduct Dumitrescu and Hurlin (2012) causality tests to test the bidirectionality of the relationship. This test confirms bidirectional relationships among the variables, validating the causal connections among most of the variables considered. While it is not a direct test for testing endogeneity, it could serve as a component of it. We can test how the study variables are related and whether changes in one variable could lead to changes in another. Importantly, this causality test accounts for heterogeneity in its evaluation.

2.4. Results and Discussions

2.4.1. Descriptive Statistics

The descriptive statistics of the data are shown in Table 3. To know the nature of the data, descriptive statistics is an important assessment to be assumed in any research. The mean BOP for HICs is 3.08, for UMICs 1.51, and for LMICs -3.08. The tariff rate is the highest in the LMICs at about 9.25, followed by UMICs at 6.99, and lowest in HICs at 3.32. Accordingly, we can conclude that tariffs are more prevalent among LMICs than among HICs. Interest rates are lowest in HICs, at approximately 2.72%, due to stable inflation. Political stability is highest in HICs at approximately 0.76, followed by UMICs at approximately -0.25, and lowest in LMICs at approximately -0.72. Discussing foreign direct investment, we can see that it is highest in the HICs, followed by the UMICs and lowest in the LMICs. Moreover, the population growth rate is highest in LMICs, followed by HICs, and lowest in UMICs.

2.4.2. Dynamic Panel Data Estimate

The panel ordinary least squares (POLS), followed by fixed effects (FE), and GMM, is applied. The POLS is used to investigate many observations and combines cross-sectional and time series. Whereas the fixed effects account for individual features that do not change over time and control for time-invariant variables. The fixed effects are mostly used when there is omitted variable bias, which might be interrelated with the forecasters (Chinn & Ito, 2007).

The results of the study are important for determining the relationship between BOP and other variables in the model. The POLS results are depicted in Table 5, the fixed effects results in Table 6, and the GMM results in Table 7. Moreover, the GMM model that we have estimated for all income groups is the two-step difference GMM and the selection is based on the criteria that if the coefficient of the lag dependent variable is greater than the coefficient of the fixed effect, we consider the difference GMM to be appropriate method, if it is lower than the fixed effect then we go with the system GMM (Roodman, 2009a). The Panel ordinary least squares results have sound R-squared values of 0.87, 0.73, and 0.72 for higher-, upper-middle-, and lower-middle-income groups, respectively, and indicate overall strong model validity, with the F-stat also being statistically significant. In estimation of the fixed effects model, the overall R-squared is 0.85, 0.70 and 0.70 for the three income groups. In the GMM estimation, we can see that there is serial correlation in AR (1), but no serial correlation is present in AR (2). Moreover, the Sargan and Hansen statistics are also suitable, validating the instruments.

The POLS, FE, and GMM results confirm that the lagged BOP positively affects the current BOP across all income groups, thereby supporting the dynamic nature of the panel data. We find that interest rates negatively impact both BOP and political stability. Whereas the tariffs negatively impact the BOP in the case of HICs and positively impact the UMICs. These results are depicted in Tables 6, 7 and 8. We also found that the structural break in the HICs negatively impacts the BOP, but it was dropped in the other two groups due to the presence of

multicollinearity, and as stated earlier, it came at the beginning of the data, so there were high chances of it being insignificant as well.

2.4.3. Dumitrescu Granger Causality

Furthermore, as a robust check, we conduct Dumitrescu and Hurlin (2012) causality tests, and the results are presented in Table 8. The normal panel Granger test assumes that the coefficients are homogeneous. It applies a single model to the entire panel, whereas the test developed by Dumitrescu and Hurlin (2012) assumes heterogeneous coefficients; second, it aggregates individual tests across cross-sections; third, it is suitable for panels with diverse behaviours across entities; and finally, it yields robust findings. These tests confirmed bidirectional relationships among the variables, thereby validating causal connections among most of the variables considered. Specifically, for HICs, we could find four significant relationships; tariffs impact BOP; BOP impacts interest rates; political stability impacts BOP; and BOP impact political stability. For the UMICs, we find two significant relationships that tariff impacts BOP and BOP impacts interest rates. In LMICs, we find that tariffs affect BOP, interest rates affect BOP, BOP affects interest rates, political stability affects BOP, and BOP affects political stability. There is a bidirectional relationship between political stability and BOP in HICs and LMICs, and a bidirectional relationship between interest rates and BOP in LMICs. These findings contribute to the understanding of the intricate relationships among the variables within each income group. Additionally, the results indicate the presence of endogeneity due to two-way relationships. However, there is a one-way relationship between tariffs and BOP.

2.4.4. Robustness of Instruments

Robustness using GMM is essential for ensuring the consistency and validity of econometric models, particularly in the presence of endogeneity, heteroskedasticity and autocorrelation. GMM is an estimation technique that controls moment conditions derived from the data, making it suitable for a variety of economic models. It uses instrumental variables correlated with the endogenous regressors but uncorrelated with the error terms. Additionally, robust standard errors can be used to correct for heteroskedasticity or autocorrelation in the data, thereby enhancing the results' robustness. This methodological rigour ensures that the estimated coefficients are not only unbiased but also efficient, providing more accurate and dependable inferences. Thus, robust GMM analysis is a useful tool for econometricists to derive insights from datasets while mitigating potential biases and inadequacies that may arise. The Pooled OLS, Fixed Effect, and Difference GMM estimates were applied, including the robust commands. Tables 5, 6, and 7 present the Pooled OLS, the Fixed Effect Model, and the two-step difference GMM estimates. It is upward-skewed when the lag of the dependent variable's estimate is greater than, or close to, the FE estimate. The estimated difference GMM is therefore valid and accurate, as shown by the robustness check results in Table 6 (Fixed Effects) and 7 (two-step difference GMM), which show that the coefficient of lagged values of the BOP of the Difference-GMM lies above the values of the fixed effect estimates. Moreover, the results report the Sargan and Hansen J statistics. The Sargan test assumes homoscedasticity and is not robust, whereas the Hansen test takes robustness into consideration and assumes the presence of heteroscedasticity. The null hypothesis of the Sargan test states that all instruments are valid, but relying solely on it might produce unreliable results, as it does not take heteroscedasticity into consideration. While the P-value of the Sargan test in Table 7 for all income groups is less than 0.05, this indicates instrument invalidity; we prefer Hansen over Sargan, as it is more robust and allows for

heteroscedasticity. The P-values of the Hansen J statistics for all income groups in Table 7 exceed 0.05, indicating that all instruments are valid and that robustness is ensured, thereby supporting efficiency and consistency. The values of AR (1) and AR (2) also prove that the residuals are not serially correlated with the error term and therefore address endogeneity. Subsequently, the results are robust, reliable and valid.

Table 5 Panel Regression, 2002 - 2022 (POLS).

Variables	High Income Countries	Upper Middle-Income Countries	Lower Middel Income Countries
L.BoP	0.94*** (0.03)	0.75*** (0.04)	0.77*** (0.03)
TaF	-0.090 (0.08)	0.110 (0.14)	-0.010 (0.05)
InT	-0.15*** (0.06)	-0.07*** (0.02)	-0.058* (0.03)
PoL	-0.843** (0.42)	-0.57* (0.33)	0.090 (0.27)
FdI	0.001 (0.005)	0.18* (0.09)	-0.34*** (0.09)
PoP	-0.050 (0.14)	0.55*** (0.23)	-0.030 (0.16)
D	-0.330 (0.35)	-	-
Observations	500	520	620
R-squared	0.870	0.730	0.720
Number of Countries	25	26	31
F-stat	0.000	0.000	0.000

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Balance of Payments, TaF: Tariff, InT: Interest Rate, PoL: Political Stability Index, FdI: Foreign Direct Investment, PoP: Population Growth Rate and D: Dummy variable at structural break.*

Table 6 Panel Regression (Fixed Effects), 2002 – 2022.

Variables	High Income Countries	Upper Middle-Income Countries	Lower Middle Income Countries
L.BoP	0.734*** (0.04)	0.61*** (0.03)	0.67*** (0.04)
TaF	-0.130 (0.29)	-0.040 (0.10)	0.090 (0.08)
InT	-0.19** (0.093)	-0.15** (0.07)	-0.04 (0.06)
PoL	0.78 (1.3)	-1.48*** (0.51)	-1.14** (0.53)
FdI	-0.003 (0.002)	-0.4*** (0.05)	-0.33*** (0.07)
PoP	-0.310 (0.23)	0.88 (0.57)	-0.230 (0.20)
D	-0.61 (0.36)	-	-
Observations	500	520	620
R-squared	0.85	0.70	0.70
Number of Countries	25	26	31
F-stat	0.000	0.000	0.000

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Balance of Payments, TaF: Tariff, InT: Interest Rate, PoL: Political Stability Index, FdI: Foreign Direct Investment, PoP: Population Growth Rate and D: Dummy variable at structural break.*

Table 7 Generalized Moments Methods, 2002- 2022.

Variables	High Income Countries	Upper Middle-Income Countries	Lower Middle Income Countries
L.BoP	0.75*** (0.085)	0.62*** (0.04)	0.69*** (0.04)
TaF	-1.7* (0.93)	2.59*** (0.90)	0.070 (0.09)
InT	-0.21* (0.11)	-0.10 (0.08)	-0.010 (0.05)
PoL	-1.1 (1.89)	-3.01** (1.21)	-1.26** (0.50)
FdI	-0.02* (0.01)	-0.397*** (0.07)	-0.31*** (0.07)
PoP	-1.000** (0.44)	0.940 (0.8)	-0.308 (0.23)
D	-8.33** (3.84)	-	-
Observations	475	494	589
Number of Groups	25	26	31
AR (1)	0.004	0.006	0.001
AR (2)	0.994	0.124	0.06
Sargan Test	0.026	0.000	0.000
Hansen J	0.558	0.258	0.438
Number of Instruments	25	25	25

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Balance of Payments, TaF: Tariff, InT: Interest Rate, PoL: Political Stability Index, FdI: Foreign Direct Investment, PoP: Population Growth Rate and D: Dummy variable at structural break. Xtabond2 robust command used in STATA to get the GMM estimates.*

Table 8 Dumitrescu and Hurlin (2012) Panel Granger Causality Test.

Group	Hypothesis	W-Stat	Z-Stat	Result
High Income Countries	TaF ==> BoP	3.30	1.76*	Yes
	BoP ==> TaF	1.95	-0.68	No
	InT ==> BoP	2.60	0.49	No
	BoP ==> InT	3.71	2.49**	Yes
	PoL ==> BoP	3.80	2.66***	Yes
	BoP ==> PoL	3.89	2.82***	Yes
Upper Middle-Income Countries	TaF ==> BoP	3.69	2.52**	Yes
	BoP ==> TaF	2.78	0.82	No
	InT ==> BoP	3.06	1.35	No
	BoP ==> InT	3.70	2.57**	Yes
	PoL ==> BoP	3.17	1.51	No
	BoP ==> PoL	3.03	1.29	No
Lower Middle-Income Countries	TaF ==> BoP	3.23	1.80*	Yes
	BoP ==> TaF	2.46	0.25	No
	InT ==> BoP	3.46	2.29**	Yes
	BoP ==> InT	4.65	4.68***	Yes
	PoL ==> BoP	5.31	6.02***	Yes
	BoP ==> PoL	3.50	2.40***	Yes

*Note: Significant at 10%, 5% and 1% denoted by *, ** and ***. Source: Author.*

2.5. Conclusions and Implications

The paper investigates the link between BOP, tariffs, interest rate and political stability. Based on three panel datasets covering high-income, upper-middle-income, and lower-middle-income countries distinguished by the World Bank, this research highlights the role of tariffs, interest rates and political stability in shaping the balance of payments. The POLS, fixed effects, GMM and Dumitrescu Hurlin Granger Causality are used to determine the relationships and further strengthen the reliability of the findings by assessing causality relationships.

As the analysis continues, the existence of dynamic relationships across all income groups is confirmed, thereby enhancing the model's reliability and robustness across different economic contexts. One important point to note is that the relationships among the groups vary. For instance, in HICs, tariffs and interest rates are negatively associated with the BOP, whereas political stability is not significantly associated. However, in the UMICs, there is a positive relationship with tariffs and a negative relationship with political stability and interest rates,

with no significant impact. In LMICs, we find no relationship between tariffs and BOP, whereas interest rates and political stability have negative effects.

The findings in HICs can support the argument that higher interest rates typically raise borrowing costs, thereby discouraging investment and consumption. This reduction in economic activity can lead to decreased demand for imports and lower domestic production, potentially worsening the BOP position. This is consistent with M. A. Khan (2023) but unlike, and Hussain et al. (2024); Oluwole and Oloyede (2020); Sujianto (2020) mainly because these studies do not target high-income countries. For tariffs that negatively affect BOP, they increase import costs but do not affect consumers with high wages in HICs, leading to a negative BOP. These findings are consistent with Roeger and Welfens (2022); Van Wijnbergen (1987) but different from Barattieri et al. (2021) because it aims at small economies and Hallwood (2021) as it targets the USA economy. Political stability does not have a relationship since the HICs are highly politically stable, and changes in regime in a short period of duration might not have any impact on the country's BOP. The structural break included in the model also showed a statistically significant relationship with the BOP. The break year identified by the structural break test was 2014, following a major oil price collapse that led to economic imbalances for both oil-exporting and oil-importing countries.

The results for UMICs show a positive and significant relationship between tariffs and the BOP, implying that controlling imports and encouraging exports by imposing tariffs improve the BOP and indicating that the tariff structure followed by this group is effective. Also, political stability increases investor confidence, ultimately increasing investment, demand and consumption and thus influences BOP. These findings indirectly confirm Alshubiri (2022); however, they are indirectly against, Chletsos and Sintos (2024); Okara (2023); Zeeshan et al. (2022) as these studies do not investigate the direct relationship between BOP and political stability.

The findings in LMICs reveal a negative relationship of political stability with BOP like UMICs but have no significant relationship with tariffs and interest rates. It can be assumed that traditional fiscal and monetary tools are not effective for these countries, as they require sound economic policies to revive, which can be achieved through a robust political system. The control variable, foreign direct investment, results in negative relationships in all income groups, which can be reasoned as the income generated from this investment is taken back to the investor countries, and most of the material required for these investments is imported. This results in an increase in public and government spending and an increase in jobs. The population growth rate also has a negative relationship with BOP.

The study provides valuable insights into the dynamics of BOP and highlights the importance of considering the specific economic conditions of different income groups when formulating policy responses. At the same time, there are some limitations due to the non-availability of data in low-income countries. However, relating the results to lower-middle-income countries would be beneficial, as they often struggle with the BOP and budget deficits and rely primarily on traditional fiscal and monetary policies. However, these policies are ineffective because they have limited influence over industrialisation and experience political instability; these countries rely on unavoidable imports. Therefore, it emphasises the need for further research to explore other potential determinants of external balances in low-income countries where traditional macroeconomic factors might not be influential. This finding confirms what Bird (2010) suggests that developing countries need to focus on long-term structural change, as well as on traditional policies, such as deepening financial markets, to enable governments to efficiently implement fiscal policies. Recognising distinct causal relationships between variables and the BOP across income groups underscores the importance of policy responses that address the specific economic challenges each group faces. We found a bilateral relationship between interest rates and BOP for lower middle-income countries,

which explains that high public debt increases interest rates, which affects the current account balance. These findings are the same as those reported Afonso and Coelho (2024) in their study. We also find a bidirectional relationship between political stability and the BOP in high- and lower-middle-income countries, treating political stability as an important factor for growth; these findings are consistent with (Alesina et al., 1996; Haider et al., 2011). This indicates that upper-middle-income policymakers implement trade policies aimed at promoting exports or maintaining political stability to enhance investor confidence and economic activity, and they should carefully consider the potential impact of interest rate changes on the BOP.

Interest rate adjustments to manage inflation or promote economic growth should be done carefully to avoid falling external imbalances. In combination with monetary policy, trade policies can play a role in lowering the negative effects of interest rate changes on the BOP. Implementing measures to promote exports or reduce import dependence can help mitigate the adverse impact of higher interest rates. Maintaining stable monetary policies is crucial for investor confidence. Fluctuations in interest rates can create uncertainty among investors, potentially affecting capital flows and the balance of payments (BOP) (Bird, 2010; Lahiri & Vegh, 2000). Businesses and investors should be wary of the risks posed by interest rate fluctuations. Sudden changes in interest rates, especially in response to external shocks or domestic economic conditions, can significantly impact the BOP and overall macroeconomic stability. Higher interest rates increase capital flows by attracting foreign investment seeking higher returns. This may increase demand for the domestic currency and appreciate the exchange rate, thereby making exports more expensive and imports cheaper. Higher interest rate is applied to control inflation and stabilise the currency, but these actions affect the current account balances and weaken them. We can confirm these findings through the Mundell-Fleming model, which states that the increase in capital inflows causes current account deterioration (Baharumshah et al., 2019; Hussain et al., 2024).

The relationship between political stability and BOP provides valuable insights into the broader implications of governance and institutional quality for economic performance, as we have seen that political stability deteriorates BOP in upper-middle-income countries. It confirms the Keynesian point of view that high stability leads to high consumption and demand that might lead to negative imbalances. We also found two-way relationships among interest rate, political stability, and BOP in the Dumitrescu panel Granger causality test, which confirms the presence of relationships among variables across economic contexts and may inform proactive policy rather than reactive responses. Investors can monitor interest rates and predict political stability through them and make their decisions accordingly. Policymakers should coordinate monetary, fiscal, and trade policies to ensure consistency and effectiveness in managing external balances. Collaboration among relevant government agencies and stakeholders is essential to implement coherent policy measures that support economic stability and growth. The role of population growth rate and foreign direct investment as control variables is important and warrants consideration in future studies, as direct and interaction effects influence the BOP across economic contexts and for countries experiencing negative population growth rates. The significance of the structural break for the high-income countries shows the importance of breaks in the model. We could have significant breaks in other groups as well, but due to the short time span of the sample dataset, we excluded them from the model and left that for future research with longer time periods.

References

- Afonso, A., & Coelho, J. C. (2024). Fiscal and current account imbalances: the cases of Germany and Portugal. *The World Economy*, 47(1), 145-168. <https://doi.org/10.1111/twec.13528>
- Aganbegyan, A. G. (2022). The two main macroeconomic theories of Keynes and Friedman and their use in the economic policy of the world's major countries and Russia. *Studies on Russian Economic Development*, 33(5), 471-479. <https://doi.org/10.1134/S1075700722050021>
- Aghevli, B. B. (1975). The balance of payments and money supply under the gold standard regime: US 1879-1914. *The American Economic Review*, 65(1), 40-58. <https://www.jstor.org/stable/1806395>
- Aisen, A., & Veiga, F. J. (2006). Does political instability lead to higher inflation? A panel data analysis. *Journal of money, Credit and Banking*, 38(4), 1379-1389. <https://www.jstor.org/stable/3839011>
- Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth? *European Journal of Political Economy*, 29, 151-167. <https://doi.org/10.1016/j.ejpoleco.2012.11.001>
- Alejandro, C. F. D. (1963). A Note on the Impact of Devaluation and the Redistributive Effect. *Journal of Political economy*, 71(6), 577-580. <https://doi.org/10.1086/258816>
- Alesina, A., Özler, S., Roubini, N., & Swagel, P. (1996). Political instability and economic growth. *Journal of Economic Growth*, 1, 189-211. <https://doi.org/10.1007/BF00138862>
- Alshubiri, F. (2022). The Impact of the Real Interest Rate, the Exchange Rate and Political Stability on Foreign Direct Investment Inflows: A Comparative Analysis of G7 and GCC Countries. *Asia-Pacific Financial Markets*, 29(3), 569-603. <https://doi.org/10.1007/s10690-022-09360-0>

- Altayligil, Y. B., & Çetrez, M. (2020). Macroeconomic, institutional and financial determinants of current account balances: a panel data assessment. *Journal of Economic Structures*, 9(1). <https://doi.org/10.1186/s40008-020-00225-1>
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/https://doi.org/10.1016/0304-4076(94)01642-D)
- Baharumshah, A. Z., Soon, S. V., & Wohar, M. E. (2019). Fiscal stance, foreign capital inflows and the behavior of current account in the Asian countries. . *Empirical Economics*, 56, 523-549. <https://doi.org/10.1007/s00181-017-1368-5>
- Bai, J., & Perron, P. (2003). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics*, 18(1), 1-22. <https://doi.org/10.1002/jae.659>
- Barattieri, A., Cacciatore, M., & Ghironi, F. (2021). Protectionism and the business cycle. *Journal of International Economics*, 129. <https://doi.org/10.1016/j.jinteco.2020.103417>
- Benz, S., & Jaax, A. (2022). The costs of regulatory barriers to trade in services: New estimates of ad valorem tariff equivalents. *Economics Letters*, 212. <https://doi.org/10.1016/j.econlet.2021.110057>
- Bernanke, B. S. (2020). The new tools of monetary policy. *American Economic Review*, 110(4), 943-983. <https://doi.org/10.1257/aer.110.4.943>
- Bianchi, P., Deschamps, B., & Kiani, K. M. (2014). Fiscal Balance and Current Account in Professional Forecasts. *Review of International Economics*, 23(2), 361-378. <https://doi.org/10.1111/roie.12165>
- Bird, G. (2010). Conducting macroeconomic policy in developing countries: Piece of cake or mission impossible? *Third World Quarterly*, 22(1), 37-49. <https://doi.org/10.1080/713701139>

- Blanco, L., & Grier, R. (2009). Long live democracy: The determinants of political instability in Latin America. *The Journal of Development Studies*, 45(1), 76-95. <https://doi.org/10.1080/00220380802264788>
- Blecker, R. A. (2021). New advances and controversies in the framework of balance-of-payments-constrained growth. *Journal of Economic Surveys*, 36(2), 429-467. <https://doi.org/10.1111/joes.12463>
- Blecker, R. A., & Setterfield, M. (2019). *Heterodox macroeconomics: Models of demand, distribution and growth*. Edward Elgar Publishing.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Bumann, S., & Lensink, R. (2016). Capital account liberalization and income inequality. *Journal of International Money and Finance*, 61, 143-162. <https://doi.org/10.1016/j.jimonfin.2015.10.004>
- Cheung, C., Furceri, D., & Rusticelli, E. (2013). Structural and Cyclical Factors behind Current Account Balances. *Review of International Economics*, 21(5), 923-944. <https://doi.org/10.1111/roie.12080>
- Chinn, M. D., & Ito, H. (2007). Current account balances, financial development and institutions: Assaying the world “saving glut”. *Journal of International Money and Finance*, 26(4), 546-569. <https://doi.org/10.1016/j.jimonfin.2007.03.006>
- Chletsos, M., & Sintos, A. (2024). Political stability and financial development: An empirical investigation. *The Quarterly Review of Economics and Finance*(94), 252-266. <https://doi.org/10.1016/j.qref.2024.02.003>
- Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of*

- Econometrics*, 188(2), 393-420. <https://doi.org/10.1016/j.jeconom.2015.03.007>
- Cole, W. M. (2015). International human rights and domestic income inequality: A difficult case of compliance in world society. *American sociological review*, 80(2), 359-390. <https://doi.org/10.1177/0003122415571582>
- Dalyop, G. T. (2018). Political instability and economic growth in Africa. *International Journal of Economic Policy Studies*, 13(1), 217-257. <https://doi.org/10.1007/s42495-018-0008-1>
- Delpuech, S., Fize, E., & Martin, P. (2024). Trade Imbalances, Fiscal Imbalances and the Rise of Protectionism: Evidence from G20 Countries. *IMF Economic Review*, 1-38. <https://doi.org/10.1057/s41308-024-00247-w>
- Dixon, W. J., & Boswell, T. (1996). Dependency, disarticulation, and denominator effects: Another look at foreign capital penetration. *American Journal of sociology*, 102(2), 543-562. <https://doi.org/10.1086/230956>
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450-1460. <https://doi.org/10.1016/j.econmod.2012.02.014>
- Furceri, D., Hannan, S. A., Ostry, J. D., & Rose, A. K. (2022). The macroeconomy after tariffs. *The World Bank Economic Review*, 36(2), 361-381. <https://doi.org/10.1093/wber/lhab016>
- Goldstone, J. A., Bates, R. H., Epstein, D. L., Gurr, T. R., Lustik, M. B., Marshall, M. G., & Woodward, M. (2010). A global model for forecasting political instability. *American journal of political science*, 54(1), 190-208. <https://doi.org/10.1111/j.1540-5907.2009.00426.x>
- Hadili, A., Raab, R., & Wenzelburger, J. (2020). Trade liberalisation, governance, and the balance of payments: evidence from the Arab Maghreb Union. *Middle East*

Development Journal, 12(1), 101-130.

<https://doi.org/10.1080/17938120.2020.1731200>

Haider, A., ud Din, M., & Ghani, E. (2011). Consequences of political instability, governance and bureaucratic corruption on inflation and growth. *The Pakistan Development Review*, 50(4), 773-807. <https://www.jstor.org/stable/23617732>

Hallwood, C. P. (2021). Correcting US payments imbalances: Taxing foreign holders of its treasury securities is better than import tariffs. *The World Economy*, 44(8), 2228-2237. <https://doi.org/10.1111/twec.13113>

Hamdaoui, M., Ayouni, S. E., & Maktouf, S. (2021). Capital Account Liberalization, Political Stability, and Economic Growth. *Journal of the Knowledge Economy*, 13(1), 723-772. <https://doi.org/10.1007/s13132-021-00723-y>

Hussain, I., Hayat, U., Alam, M. S., & Khan, U. (2024). A dynamic analysis of the twin-deficit hypothesis: The case of a developing country. *Asia-Pacific Financial Markets*, 31(1), 25-52. <https://doi.org/10.1007/s10690-023-09405-y>

Iacoviello, M., & Navarro, G. (2019). Foreign effects of higher U.S. interest rates. *Journal of International Money and Finance*, 95, 232-250. <https://doi.org/10.1016/j.jimonfin.2018.06.012>

Irwin, D. A. (2021). The rise and fall of import substitution. *World Development*, 139. <https://doi.org/10.1016/j.worlddev.2020.105306>

Jahan, S., Mahmud, A. S., & Papageorgiou, C. (2014). What is Keynesian economics. *International Monetary Fund*, 51(3), 53-54.

Jamil, M. N., Rasheed, A., Maqbool, A., & Mukhtar, Z. (2023). Cross-cultural study the macro variables and its impact on exchange rate regimes. *Future Business Journal*, 9(1). <https://doi.org/10.1186/s43093-023-00189-1>

- Kantor, B. (2022). Recent Monetary History: A Monetarist Perspective. *Journal of Applied Corporate Finance*, 34(2), 82-99. <https://doi.org/10.1111/jacf.12508>
- Kentor, J., & Boswell, T. (2003). Foreign capital dependence and development: A new direction. *American sociological review*, 68(2), 301-313. <https://doi.org/10.1177/000312240306800206>
- Kerrissey, J., & Schuhrke, J. (2016). Life chances: Labor rights, international institutions, and worker fatalities in the Global South. *Social Forces*, 95(1), 191-216. <https://doi.org/10.1093/sf/sow050>
- Khan, M. A. (2023). Does Monetary Policy Solely Correct Disequilibrium in the Balance of Payment? Evidence From the Developing World. *Journal of Central Banking Theory and Practice*, 12(1), 57-85. <https://doi.org/10.2478/jcbtp-2023-0004>
- Knoester, A., & Sinderen, J. V. (2007). Money, the balance of payments and economic policy. *Applied Economics*, 17(2), 215-240. <https://doi.org/10.1080/00036848500000019>
- Kreuter, H., & Riccaboni, M. (2023). The impact of import tariffs on GDP and consumer welfare: A production network approach. *Economic Modelling*, 126. <https://doi.org/10.1016/j.econmod.2023.106374>
- Krugman, P., & Taylor, L. (1978). Contractionary effects of devaluation. *Journal of international economics* 8(3), 445-456. [https://doi.org/10.1016/0022-1996\(78\)90007-7](https://doi.org/10.1016/0022-1996(78)90007-7)
- Lahiri, A., & Vegh, C. A. (2000). Delaying the Inevitable: Optimal Interest Rate Policy and BOP Crises. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.228707>
- Lavoie, M. (2014). *Post-Keynesian Economics: New Foundations*. Edward Elgar Publishing. <https://doi.org/10.4337/9781783475827>
- Liadze, I., Macchiarelli, C., Mortimer-Lee, P., & Sanchez Juanino, P. (2022). Economic costs of the Russia-Ukraine war. *The World Economy*, 46(4), 874-886. <https://doi.org/10.1111/twec.13336>

- Mallick, H. (2022). Factors driving current account performance of South Asian economies: A comparative empirical analysis. *The Journal of International Trade & Economic Development*, 32(4), 575-611. <https://doi.org/10.1080/09638199.2022.2124436>
- Manwa, F., Wijeweera, A., & Kortt, M. A. (2019). Trade and growth in SACU countries: A panel data analysis. *Economic Analysis and Policy*, 63, 107-118. <https://doi.org/10.1016/j.eap.2019.05.003>
- Marangos, J. (2004). A post-keynesian approach to the transition process. *Eastern Economic Journal*, 30(3), 441-465. <https://www.jstor.org/stable/40326405>
- McCombie, J. S. (1993). Economic growth, trade interlinkages, and the balance-of-payments constraint. *Journal of Post Keynesian Economics*, 15(4), 471-505. <https://doi.org/10.1080/01603477.1993.11489956>
- Mejia, S. A. (2024). The effects of debt dependence on economic growth in less-developed countries, 1990-2019. *Soc Sci Res*, 117, 102943. <https://doi.org/10.1016/j.ssresearch.2023.102943>
- Moreno-Brid, J. C. (2003). Capital Flows, Interest Payments and the Balance-of-Payments Constrained Growth Model: A Theoretical and Empirical Analysis. *Metroeconomica*, 54(2-3), 346-365. <https://doi.org/10.1111/1467-999x.00170>
- Neaime, S., & Gaysset, I. (2022). Macroeconomic and monetary policy responses in selected highly indebted MENA countries post Covid 19: A structural VAR approach. *Res Int Bus Finance*, 61, 101674. <https://doi.org/10.1016/j.ribaf.2022.101674>
- O'Rourke, K. H. (2000). Tariffs and Growth in the Late 19th Century. *The Economic Journal*, 110(463), 456-483. <https://doi.org/10.1111/1468-0297.00533>
- Okafor, G. (2015). The impact of political instability on the economic growth of ECOWAS member countries. *Defence and Peace Economics*, 28(2), 208-229. <https://doi.org/10.1080/10242694.2015.1092206>

- Okara, A. (2023). Does foreign direct investment promote political stability? Evidence from developing economies. *Economic Modelling*(123, 106249). <https://doi.org/10.1016/j.econmod.2023.106249>
- Oluwole, F. O., & Oloyede, J. A. (2020). Test of monetary approach to balance of payments in West Africa Monetary Zone. *Australian Finance & Banking Review*, 4(1), 9-17. <https://doi.org/10.46281/afbr.v4i1.578>
- Pacheco-López, P., & Thirlwall, A. P. (2007). Trade Liberalisation and the Trade-Off Between Growth and the Balance of Payments in Latin America. *International Review of Applied Economics*, 21(4), 469-490. <https://doi.org/10.1080/02692170701474587>
- Parikh, A. (2006). Relationship Between Trade Liberalization, Growth, and Balance of Payments in Developing Countries: An Econometric Study. *The International Trade Journal*, 20(4), 429-467. <https://doi.org/10.1080/08853900600941092>
- Peacock, A., & Shaw, G. K. (2024). *The economic theory of fiscal policy*. Taylor & Francis.
- Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica*, 74(4), 967-1012. <https://doi.org/10.1111/j.1468-0262.2006.00692.x>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326. <https://doi.org/https://doi.org/10.1002/jae.616>
- Petersmann, E. U. (2019). Trade restrictions for balance-of-payments purposes and the GATT strengthening the soft international law of balance-of-payments adjustment measures. In *In Foreign Debts in the Present and a New International Economic Orde* (pp. 181-212). Routledge.
- Pinzón-Fuchs, E. (2019). Lawrence R. Klein and the Making of Large-Scale Macroeconometric Modeling, 1938–55. *History of Political Economy*, 51(3), 401-423.

<https://doi.org/10.1215/00182702-7551840>

- Raza, A., Ali, M., Tursoy, T., Seraj, M., & Habeeb, Y. O. (2024). Evaluating the Scandinavian economy's transition to a sustainable environment. Fresh evidence from newly developed CS-ARDL approach. *Resources Policy*, 89. <https://doi.org/10.1016/j.resourpol.2023.104566>
- Roeger, W., & Welfens, P. J. J. (2022). The macroeconomic effects of import tariffs in a model with multinational firms and foreign direct investment. *International Economics and Economic Policy*, 19(2), 245-266. <https://doi.org/10.1007/s10368-022-00538-5>
- Roodman, D. (2009a). An introduction to difference and system GMM in Stata. *The stata journal*, 9(1), 86-136. <https://doi.org/10.1177/1536867X0900900106>
- Roodman, D. (2009b). A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics*, 71(1), 135-158. <https://doi.org/10.1111/j.1468-0084.2008.00542.x>
- Sadiq, M., Hassan, S. T., Khan, I., & Rahman, M. M. (2023). Policy uncertainty, renewable energy, corruption and CO2 emissions nexus in BRICS-1 countries: a panel CS-ARDL approach. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-023-03546-w>
- Schularick, M., & Solomou, S. (2011). Tariffs and economic growth in the first era of globalization. *Journal of Economic Growth*, 16(1), 33-70. <https://doi.org/10.1007/s10887-011-9061-6>
- Sheehey, E. J. (1996). The growing gap between rich and poor countries: A proposed explanation. *World Development*, 24(8), 1379-1384. [https://doi.org/10.1016/0305-750X\(96\)00037-X](https://doi.org/10.1016/0305-750X(96)00037-X)
- Singh, T. (2010). Does International Trade Cause Economic Growth? A Survey. *The World Economy*, 33(11), 1517-1564. <https://doi.org/10.1111/j.1467-9701.2010.01243.x>

- Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. *World Development*, 28(6), 1075-1086. [https://doi.org/10.1016/S0305-750X\(00\)00006-1](https://doi.org/10.1016/S0305-750X(00)00006-1)
- Stockhammer, E. (2021). Post-Keynesian Macroeconomic Foundations for Comparative Political Economy. *Politics & Society*, 50(1), 156-187. <https://doi.org/10.1177/00323292211006562>
- Sujianto, A. E. (2020). Macroeconomic factors and balance of payment: Evidence from Indonesia. *Industrial Engineering & Management Systems*, 19(1), 266-272. <https://doi.org/10.7232/iems.2020.19.1.266>
- Sultani, A. H., & Faisal, U. (2024). Exploring the dynamics of the balance of payments problems: the case of Afghanistan. *International Economics and Economic Policy*. <https://doi.org/10.1007/s10368-024-00613-z>
- Thirlwall, A. P. (2021). Thoughts on balance-of-payments constrained growth after 40 years. *Edward Elgar Publishing., In Thirlwall's Law at 40*, 128-142. <https://doi.org/10.4337/9781800881471.00012>
- Uddin, M. A., Ali, M. H., & Masih, M. (2017). Political stability and growth: An application of dynamic GMM and quantile regression. *Economic Modelling*, 64, 610-625. <https://doi.org/10.1016/j.econmod.2017.04.028>
- Van Wijnbergen, S. (1987). Tariffs, employment and the current account: Real wage resistance and the macroeconomics of protectionism. <https://doi.org/10.3386/w2261>
- Wade, R. (2018). *Governing the market: Economic theory and the role of government in East Asian industrialization*.
- Yadav, A., & Mahalik, M. K. (2024). Does renewable energy development reduce energy import dependency in emerging economies? Evidence from CS-ARDL and panel causality approach. *Energy Economics*, 131. <https://doi.org/10.1016/j.eneco.2024.107356>

Zeeshan, M., han, J., Rehman, A., Ullah, I., Hussain, A., & Alam Afridi, F. E. (2022). Exploring symmetric and asymmetric nexus between corruption, political instability, natural resources and economic growth in the context of Pakistan. *Resources Policy*, 78. <https://doi.org/10.1016/j.resourpol.2022.102785>

Zhongwei, H., & Liu, Y. (2022). The role of eco-innovations, trade openness, and human capital in sustainable renewable energy consumption: Evidence using CS-ARDL approach. *Renewable Energy*, 201, 131-140. <https://doi.org/10.1016/j.renene.2022.10.039>

Chapter 3: Multi-Period Approach to Foreign Exchange Reserves: The Influence of Macroeconomic and Government Performance Across Income Groups

3.1 Introduction

The recent rise in the accumulation of foreign currency reserves has become a trending discussion in international economics. These reserves correspond to the assets stored in form of foreign currencies, government securities denominated in foreign currencies, gold, oil, metal and Special Drawing Rights (SDRs) in the IMF (Cashman et al., 2022; Frenkel, 1974; Jena & Sethi, 2020; Kenen & Yudin, 1965; Li et al., 2021; Senibi et al., 2016). SDRs are a right held by member countries of the International Monetary Fund (IMF) that consists of five main currencies: the US Dollar, the Yen, the Yuan, the pound sterling, and the Euro. It is deposited by countries with current account surpluses (International Monetary Fund). COVID-19 triggered a global economic crisis, causing substantial disruptions across countries. The shutdowns led to a severe global recession, with a 4.9% decline in global GDP in the second quarter of 2020, ongoing disruptions from the Russia-Ukraine war, and rising inflation. The pandemic has exacerbated economic issues, leading to increased public spending but reduced revenue due to the economic slowdown. Sectors such as tourism, manufacturing, and agriculture have been heavily affected, and remittance flows, which are crucial for many households, have declined significantly. Foreign exchange reserves are the backbone of economic stability, protecting against both domestic political disruptions and external shocks such as COVID-19 or the Russian-Ukrainian war (Bussière et al., 2015). Due to the recent global events, there is a significant FEX crisis globally (Matsumoto, 2022). Developing countries are more susceptible to economic shocks due to their greater dependence on imports, weak industrialisation, weak exports, and limited access to financial markets (Arize et al., 2017;

Bordo & Levy, 2021; Krušković & Maričić, 2015). They face a risky economic system, high volatility, fluctuating exchange rates and current account deficits (Krušković & Maričić, 2015).

Following Covid-19 and the Russian-Ukrainian war, we saw a series of political disruptions in developing countries like Sri Lanka, Pakistan, Egypt, Bangladesh and Lebanon and developed countries like the USA, the UK and Europe. Due to these political events and frequent changes in government, we observed elevated inflation and public discontent (The World Bank, 2022). Political uncertainty can cause financial uncertainty and lead to inflation uncertainty (Benchimol & El-Shagi, 2020). The COVID-19 pandemic and the Russian-Ukrainian War affected the tourism Skare et al. (2021), agriculture Workie et al. (2020), and household Davis (2021). At the same time, it positively influenced economies by integrating digital processes (Nagel, 2020), resulting in a new era of digitisation and online platforms in developing countries, thereby generating employment opportunities (Gluhov et al., 2021; He, 2021).

As discussed above, if a country has a stable political environment, it will have a stable financial system that contributes to surplus reserves and supports a sound financial condition for the economy. There is a plethora of research on the relationship between macroeconomic factors and foreign exchange reserves like (Aizenman et al., 2024; Benigno et al., 2022; Cezar & Monnet, 2023; Dominguez, 2010; Jeanne, 2016; Jiang & Yoon, 2024; Korinek & Servén, 2016; Lutz & Zessner-Spitzenberg, 2023; Ma, 2020; Matsumoto, 2022; Obstfeld et al., 2010), and between political variables and macroeconomic like (Chletsos & Sintos, 2024; Hui, 2021; Mathieu, 2022; Rodriguez, 2016; Ugurlu & Razmi, 2023). Aizenman et al. (2012); Aizenman and Riera-Crichton (2008) assert that the relationship differs between developed and developing countries, and that there remains a need to investigate FEX, as recommended by (Céspedes & Chang, 2024; Matsumoto, 2022). Therefore, this study poses several questions 1. What is the impact of macroeconomic variables on foreign exchange reserves? 2. What is the

impact of the governance quality index on foreign exchange reserves? 3. Is the impact of these variables different during different economic periods? 4. How does the digitisation variable contribute towards the accumulation of foreign exchange reserves? 5. What set of variables acts as an impulse and generates a response across the three income groups? To answer these, we have three income groups: High Income Countries (HICs), Upper middle-income countries (UMICs), Lower Middle-income countries (LMICs) and multiperiod between 2002 to 2023, before the global financial crisis GFC (2002 to 2009), following GFC (2010-2019) and after Covid-19 (2020 to 2023). We will generate a new governance quality index (GQI) using PCA analysis from six existing world governance indicators and incorporate it in the analysis. No prior study has examined the collective effects of these variables on FEX across multiple periods, and the inclusion of GQI and internet usage will contribute to the existing literature. Therefore, this study aims to fill that gap by offering a comprehensive analysis of FEX and offering important insights for future decisions and policies.

The theoretical foundation of the study is based on precautionary and mercantilist theories. These two theories are in contrast, yet they also complement each other. The precautionary theory is a proactive approach and emphasises the need to maintain substantial FEX to safeguard the economy from uncertain shocks and maintain currency stability. From this perspective, reserve storage is a precautionary measure, as it protects against capital flows (Basu et al., 2010; Choi & Taylor, 2022; Ghosh & Ostry, 1997). Developing countries keep FEX as a precautionary tool against unexpected events and to stabilise exchange rates. On the other hand, the mercantilist theoretical model emphasises the accumulation of foreign exchange reserves to attain economic status and power. They consider it a tool for maintaining lower exchange rates and thereby promoting trade and competition. Supporters of the precautionary approach link reserve accumulation to capital flight and instability, whereas mercantilists argue that it promotes exports and further increases reserves (Aizenman & Lee,

2007). Aizenman and Lee (2008) explore the reserve accumulation by East Asian countries, particularly China, Japan, and Korea, to examine mercantilism. They argue that Japan and Korea initially relied on subsidising sectors to achieve growth, but later shifted to mercantilism. According to Schröder (2017) China has built up an exceptional level of reserves since 1990 and successfully maintained the undervalued exchange rate to support growth via trade. It is a two-stage process in which, firstly, reserves are determined for precautionary purposes, and then any excess is attributed towards mercantilism. Foreign exchange reserves are central to economic resilience, yet the motives for holding them, precautionary versus mercantilist, remain contested, particularly when comparing across different income groups. While prior studies often focus on single-country or single-period analysis, little is known about how macroeconomic, governance, and digitisation factors jointly shape reserve accumulation across different stages of global economic upheaval. We will elaborate on this further in the results section.

3.2 Literature Review

3.2.1 Macroeconomic Determinants of Reserves

While there is a wide literature empirically examining the relationships between FEX and macroeconomic variables, there are insufficient studies that have analysed the set of variables in this research across multiple time periods and three income groups. Foreign exchange reserves (FEX) are held to stabilise and maintain a favourable level of exchange rate, reduce the chances of volatility, and ensure adequate economic protection in uncertain times (Bird & Mandilaras, 2011; Halliday & Archer, 1998). Aizenman and Marion (2003) investigating the reasons for the high demand for reserves in 125 developing countries from 1980 to 1996, conclude that exchange rates, international transactions, the political environment, and corruption were significant variables. Olokoyo et al. (2009) study the link between FEX of Nigeria with other macroeconomic variables like Gross Domestic Product

(GDP), Trade openness (TO), Foreign capital flows, inflation rate and exchange rate, find a long-term relationship between all the variables where GDP and Trade openness have a positive impact. In contrast, the exchange rate and inflation have a negative impact. Gereziher and Nuru (2021) also, study the relationship between macroeconomic variables and FEX for Ethiopia and concluded that inflation, the exchange rate, and external debt have positive effects. Aizenman and Jinjark (2020) analyse FEX as a precautionary tool for the BRICS (Brazil, Russia, India, China, South Africa), and Indonesia, Mexico and Turkey, these countries being emerging economies and a mix of UMICs and LMICs. They conclude that the international reserves serve as a shield during economic crises and help stabilise the economy during uncertain times, when there are chances of experiencing unpredictable exchange rates and hoarding the reserves during good times and using them in bad times, minimising the risks of external shocks and keeping trade management effective. Law (2022) studies monetary independence as an important instrument in times of crisis and asserts that reserves are a significant tool in achieving monetary independence for emerging economies; however, this relationship can reverse over time and requires effective reserve management to maintain monetary independence. Alsayari (2019) writes in a policy note of the Saudi Arabian Monetary Authority (SAMA) that the central bank keeps sufficient FEX to ensure exchange rate stabilisation in case of uncertain oil output and oil prices, moreover, keeping the riyal exchange rate stable.

Additionally, in response to inflation in 2022, the US Federal Reserve aggressively tightened the monetary policy, which last happened in 1983. Discussing that (Ahmed et al., 2023) investigate the role of FEX in currency depreciation, where they conclude that less financially developed countries face less depreciation in 2020, having larger reserves. In contrast, interest rates were effective in open economies. Wu and Lee (2016) probe the nonlinear relationship between macroeconomic variables and international reserves for G-20

countries from 1991 to 2012. Their results indicate that the effects of savings, terms of trade, public debt, capital account liberalisation, GDP, and trade openness are nonlinear and vary over time. Lower interest rates strengthen the positive impacts of public debt, trade openness and GDP on reserves. Therefore, the study concludes that lower interest rates are a more effective monetary policy instrument than exchange rates. Moreover, Cheung and Ito (2009) uncover the unstable link between FEX and macroeconomic variables over the sample periods from (1975–1981, 1983–1993, and 1999–2005) in both developed and developing countries. Studies have also found structural breaks in the accumulation of reserves during the financial crisis (Aizenman & Lee, 2007; Cheung & Ito, 2009; Obstfeld et al., 2010). Mijiyawa and Oloufade (2022) study the impact of remittance on external debt in 50 LMICs from 1970 to 2017 and highlight international reserves as a potential transmission channel. They conclude that foreign reserves negatively affect external debt and suggest that reserves serve as self-insurance against external debt.

3.2.2 Governance and Institutional Quality

Blackman (1981) regards the political environment as one of the most important components of the reserve portfolio and suggests that investments should be made in nations that have experienced political stability for a long time, and less in those with a higher risk of civil disorder. Hussain et al. (2020); Mehлум et al. (2006); Ploeg (2011); Ross (2011) emphasise that, in wealthy countries, financial development depends on institutional conditions, and that strong institutions are crucial for economic progress. Political risks require strategic approaches to reserve management, and countries facing such risks tend to diversify their reserves and hold currencies considered more stable (Hui, 2021). Jiang et al. (2021) explore how political instability in the US impacts foreign reserve hoardings in China. They examined that high political instability in the US leads to an increase in the Chinese reserves. They infer that the Chinese reserve hoarding is a safety measure in response to US political

instability, and therefore, it is not purely a mercantilist move. Ngo et al. (2024) study the impact of geopolitical risks on country's reserves. They use data from 108 countries from 1990 to 2021 and treated gold, oil, and financial reserves as national reserves. The findings reveal a negative relationship between the geopolitical shocks on reserve holding, and different reserves act differently in an uncertain situation. Amit and Kafy (2024) study FEX of Bangladesh considering the recent COVID-19 and the Russian-Ukrainian war. They investigate structural and institutional weaknesses and socio-economic impacts of these crises. Through a systematic review, they propose that the government develop long term strategies to attract FDI and remittances, increase exports, and implement a multi-currency system to reduce dependence on the dollar by adopting a free-floating exchange rate. Bianchi and Lorenzoni (2022) study capital controls and reserves for a small open economy to bring macroeconomic stability to the emerging economies. They particularly analyse the institutional role in managing policy interventions and argue that government intervention can minimise the negative impacts of the crisis, such as recessions and currency depreciation, through monetary policy, financial stability, and exchange rate management. Hussain et al. (2021) study HICs and conclude that resources certainly contribute towards financial development when supported by strong institutions. Bag and Chandra Das (2024) examine foreign currency reserves in BRICS, given their increasing share of global GDP, and concluded that effective policies are needed to stabilise them.

From the above studies we can infer that many LMIC studies support the precautionary hypothesis, while studies on East Asia tend to reinforce the mercantilist logic. Our analysis will highlight this and the role of macroeconomic and institutional variables.

3.3 Methodology

3.3.1 Data Description

We took secondary data for global economies from 2002 to 2023. The details and

sources of the variable are depicted in Table 9. We first got the annual data from World Bank Indicators and then divided it into three income groups, such as HICs, UMICs and LMICs, based on the income classification of the World Bank. This filtering process resulted in many countries being excluded due to insufficient data. We identified 27 countries in the high-income group, 30 in the upper-middle-income group, and 19 in the lower-middle-income group. Low-income countries were excluded from the research due to limited data availability. The list of countries included is provided in Table 10. In addition to macroeconomic variables, we constructed the GQI index using PCA from 6 governance variables. PCA, also known as Principal Component Analysis, is a statistical method for deriving a single index from multiple variables based on correlations Saisana and Tarantola (2002). Firstly, the PCA generates principal components that are related to the errors in the data to a minimal extent. Another advantage of PCA is that it reduces the dimensionality of the data. Most of the variance in the data is captured by the first few principal components. The eigenvalues, loadings, and percentage variance and correlation values are given in Tables 11, 12 and 13. Additionally, internet usage variable is included to test the impact of digitisation on the reserves. Internet penetration does not directly capture fintech adoption or digital payment flows, but it provides a useful proxy for the broader digital infrastructure necessary for reserve-related transactions. The external debt variable is part of the LMICs analysis because HICs and mostly UMICs do not report external debt because they are not World Bank borrowers.

Table 9

Description of Data				
Variables	Denoted as	Units	Source	
Foreign Exchange Reserves	Fex	Total reserves including gold US\$	IMF, International Financial Statistics	
Real Interest Rate	InT	Lending interest rate adjusted for inflation %	World Development Indicator	
Inflation	InF	GDP deflator (annual %)	World Development Indicator	
Official exchange rate	Exch	(LCU per US\$, period average)	World Governance Indicator	
Foreign Direct Investment	FdI	Net inflows (% of GDP)	World Development Indicator	
Current account balance	Cab	(% of GDP)	International Monetary Fund, Balance of Payments Statistics Yearbook and data files, and World Bank and OECD GDP estimates.	
GDP Growth	GdP	(annual %)	World Development Indicator	
Population Growth	PoP	(annual %)	World Development Indicator	
General government final consumption expenditure (% of GDP)	GovCons	(annual % of GDP)	World Bank national accounts data, and OECD National Accounts data files.	
Monetary Sector credit to private sector	MoneC	(% GDP)	International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.	
Individuals using the Internet (% of population)	Internet	(% of population)	International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database	
Governance Index	Quality GQI	Index made by using PCA from 6 index governance variables like Control of corruption, Government Effectiveness, Political Stability, Regulatory Quality, Rule of Law and Voice and Accountability between -2.5 to +2.5	World Governance Indicators	
External debt stocks	ExtDebt	(% of GNI)	World Bank, International Debt Statistics.	

Variable description, Units and Source

Table 10**Sample Countries**

High Income Countries	Upper Middle-Income Countries	Lower Middle-Income Countries
Australia	Albania	Angola
Bahrain	Algeria	Bangladesh
Bulgaria	Argentina	Bhutan
Canada	Armenia	Congo, Dem. Rep
Chile	Azerbaijan	Egypt, Arab Rep.
Croatia	Belarus	India
Czechia	Belize	Jordan
Hungary	Botswana	Kenya
Iceland	Brazil	Lebanon
Italy	China	Lesotho
Japan	Colombia	Nicaragua
Korea, Rep.	Costa Rica	Pakistan
Latvia	Dominican Republic	Philippines
Macao SAR, China	Georgia	Samoa
Malta	Indonesia	Sri Lanka
Netherlands	Iraq	Tajikistan
New Zealand	Jamaica	Tanzania
Norway	Malaysia	Viet Nam
Panama	Maldives	Zambia
Qatar	Mauritius	
Romania	Mexico	
Russian Federation	Moldova	
Singapore	Mongolia	
Switzerland	Namibia	
United Kingdom	Paraguay	
United States	Peru	
Uruguay	Serbia	
	South Africa	
	Thailand	
	Ukraine	

Sample countries are divided into 3 groups by the World Bank based on Gross National Income (GNI) income.

High-Income Countries having Gross National Income of \$13206 or more, Upper Middle-Income Countries between \$4256 to \$13205 and Lower-middle income countries between \$1086 to \$4255.

The figures 4, 5 and 6 show the graph of the FEX in the income groups from 2002 to 2023.

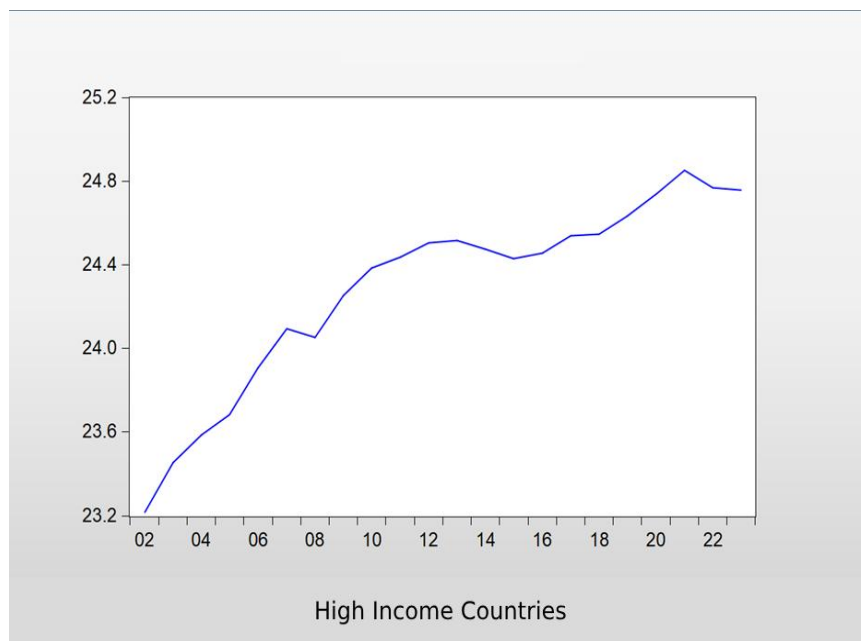


Figure 4 Mean values of foreign exchange reserves for 27 high income countries from 2002 to 2023

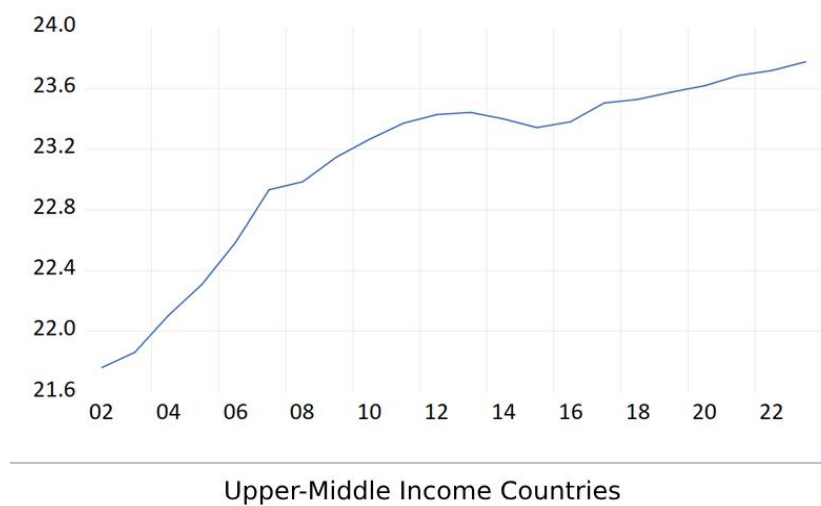


Figure 5 Mean values of foreign exchange reserves for 30 upper middle-income countries from 2002 to 2023

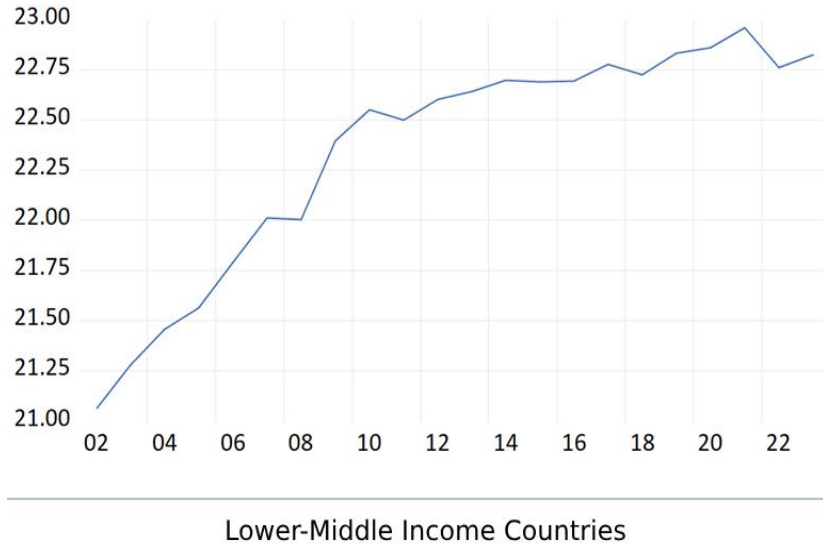


Figure 6 Mean values of foreign exchange reserves for 19 lower middle-income countries from 2002 to 2023

We can notice that the FEX of the high-income group are in an increasing trend, but there was a slight decrease in the years 2008 and 2020. Whereas The UMICs didn't experience such a decline and is in a continuous increasing pattern. In contrast, the LMICs experienced many breaks that might be due to their sensitivity towards uncertain periods also reflective of the precautionary perspective.

Table 11

PCA Eigenvalues and Percentage Variance

Component	Eigenvalue	% of Variance	Cumulative %
PC1	5.05	0.8418	0.8418
PC2	0.38	0.0627	0.9044
PC3	0.33	0.0558	0.9602
PC4	0.13	0.0224	0.9827
PC5	0.06	0.0104	0.9931
PC6	0.04	0.0069	1

The first component has eigenvalue greater than 1, therefore retained for the index construction

Table 12**Component Loadings for PCA Index (PC1)**

Variable	Loading on PC1
Control of corruption	0.4228
Government Effectiveness	0.4255
Political Stability	0.3761
Regulatory Quality	0.4147
Rule of Law	0.4343
Voice and Accountability	0.3718

All values indicate a strong contribution towards index

Table 13**Correlation Between PCA Index and Variables**

Variable	GQI (PCA Index)
GQI (PCA Index)	1
Control of corruption	0.9501
Government Effectiveness	0.9562
Political Stability	0.8453
Regulatory Quality	0.9319
Rule of Law	0.9759
Voice and Accountability	0.8355

High correlation present between variables and the index proving reason for the index construction

3.3.2 Panel Regression

Following the summary statistics, we intend to apply panel regression. In panel data analysis, various methods, such as Pooled Ordinary Least Squares (POLS), Fixed Effects (FE), and Random Effects (RE), are used to analyse the regression. POLS consider the panel data as one entity and assume no difference between different cross sections, but it may give biased results. Therefore, the fixed effects control time-invariant behaviours across cross sections, whereas the random effects assume that individual effects are random and uncorrelated with the variables, using both within- and between-subjects data. After dividing the data into income groups and multiple periods, we will apply panel regression, fixed-effects, and random-effects models to each group's periods. Using the Hausman test and the Breusch-Pagan LM test, we select among OLS, Fixed Effects, and Random effects. These tests guarantee that the chosen model goes with the data's underlying structure, leading to more reliable, accurate and robust results.

The regression equation for the model is.

$$FeX_{it} = \beta_0 + \beta_1 InT_{it} + \beta_2 InF_{it} + \beta_3 Exch_{it} + \beta_4 Fdi_{it} + \beta_5 Cab_{it} + \beta_6 GdP_{it} + \beta_7 PoP_{it} + \beta_8 GovCons_{it} + \beta_9 MoneC_{it} + \beta_{10} Internet_{it} + \beta_{11} GQI_{it} + \beta_{12} ExtDebt_{it} + e_{it}$$

We will apply panel regression to the entire sample and to the time periods separately to examine differences and evaluate the results.

3.3.3 Panel VAR

Once we apply panel regression to the overall sample from 2002 to 2023 across the three income groups, we will also apply Panel Vector Autoregression (PVAR) based on the regression results. Among the study's variables, some can be used as shock variables in the model. We will select the significant variables from the panel regression results, then apply the PVAR to the FEX and examine the relationship between them. The Panel VAR combines with Generalized Method of Moments (GMM) and studies the dynamic relationships in multiple

variables across different cross sections. It captures time-series and cross-sectional variation and employs GMM estimation to address endogeneity and unobserved heterogeneity. The shocks will be assessed using impulse response functions, and the model's validity will be tested using PVAR stability tests, in which all eigenvalues should be <1 and the values should lie within the circle.

3.4 Results and Discussions

In this chapter, we present an empirical analysis of economic variables across the income groups in our study: HICs, UMICs, and LMICs. We first present summary statistics to gain a basic understanding of the data. Second, we apply the panel regression models to identify the significant relationships among the variables. Finally, we employ the PVAR to examine the dynamic interactions and shocks within each income group. The analysis is extended to multiple time periods to depict time-based relationships and to understand economic dynamics. These time periods are 2002 to 2008 (before the Global Financial Crisis), 2009 to 2019 (after the Global Financial Crisis or the post-crisis recovery phase), 2020 to 2023 (after and during COVID and the Russian-Ukraine War), with the help of the application of different techniques and the analysis of multiple periods, our findings ensure a robust analysis.

3.4.1 Descriptive Statistics

Descriptive statistics are a very important tool for observing data and its characteristics. It also helps us identify outliers and mean values, and provides initial insights into the nature of the data. The descriptive statistics in Table 14 provide an outlook for the economic profiles of the three income groups.

For the HICs, the data indicate relatively stable economic conditions and greater productivity than the other two income groups. The Foreign exchange reserves (FEX), Internet usage, Current account (Cab), Foreign direct investment (Fdi), Government consumption (GovCons), Monetary credit to private sector (MoneyC) and Governance Quality Index (GQI)

are the highest, exchange rate (Exch), Interest rate (InT), and Inflation (InF) being the lowest. This also indicates that HICs have the highest government expenditure and the highest monetary credit lending to the private sector. Moreover, the GQI is also the highest, indicating a stable political and governance system in these countries.

Compared with the former, the descriptive statistics for UMICs indicate a moderate level of economic stability, as the data differ between HICs and LMICs. All mean values are higher than those of LMICs and lower than those of HICs, except for the population growth variable, which is the lowest of all. Individually, the statistics are stable, like average interest rates and inflation, which are not very high, but the exchange rate and current account balance are deteriorating compared to the HICs. GQI has also become negative, indicating a flawed governance quality index. Internet usage shows 40% of the total population uses the internet, which is a good average.

The LMICs data show the highest standard deviation for the exchange rate variable, indicating greater volatility. All variables are at their lowest functional levels; only 20% of the population uses the internet. This income group has one additional variable: external debt. This is included because the other two groups are primarily lenders rather than borrowers, and we observe that the average external debt held is 53.6%. The mean values in Table 14 indicate that these countries face economic challenges such as low FDI, rising CABS, poor GQI, high inflation, high exchange rates, and external debt.

Table 14

Descriptive Statistics				
Groups	Variables	Mean	Std. Dev	Obs
High Income Countries	Fex	24.30	1.80	594
	InT	3.24	9.57	594
	InF	3.91	5.34	594
	Exch	87.78	243.27	594
	FdI	8.31	30.75	594
	Cab	2.11	9.58	594
	GdP	3.12	6.10	594
	PoP	0.90	1.98	594
	GovCons	17.45	4.26	594
	MoneC	89.84	45.72	594
	Internet	69.90	23.59	594
	GQI	2.35	1.71	594
	ExtDebt	-	-	-
	Upper-Middle-Income Countries	Fex	23.12	2.15
InT		5.08	17.15	660
InF		7.89	10.60	660
Exch		817.06	2331.99	660
FdI		4.38	5.59	660
Cab		-2.58	8.78	660
GdP		3.93	5.97	660
PoP		0.85	1.21	660
GovCons		15.41	4.78	660
MoneC		43.43	32.09	660
Internet		40.64	27.30	660
GQI		-0.67	1.31	660
ExtDebt		-	-	-
Lower-Middle-Income Countries		Fex	22.30	2.01
	InT	5.83	8.54	418
	InF	10.01	17.62	418
	Exch	1309.55	4446.85	418
	FdI	2.98	3.61	418
	Cab	-4.53	8.63	418
	GdP	4.66	3.74	418
	PoP	1.89	1.41	418
	GovCons	13.08	7.23	418
	MoneC	35.65	27.04	418
	Internet	23.12	23.88	418
	GQI	-1.78	1.48	418
	ExtDebt	53.65	37.54	397

Source: Author's own computations. Countries grouped on World Bank classification. Std.Dev: Standard Deviation, Obs: Observation, Fex: Foreign exchange reserves, InT: Interest rates, InF: Inflation Rate, Exch: Exchange Rate, FdI: Foreign Direct Investment, Cab: Current Account Balance, GdP: GDP growth rate, PoP: Population growth rate, GovCons: Government consumption, MoneyC: Monetary credit to private sector, Internet: Internet Usage, GQI: Governance Quality Index, ExtDebt: External Debt

3.4.2 Panel Data Regression Analysis

After performing descriptive statistics, we conduct panel regression analyses to examine relationships among variables across the entire period (2002 to 2023) and within subperiods (2002 to 2008, 2009 to 2019, and 2020 to 2023). We perform the Pooled Ordinary Least Squares (POLS), Fixed Effects, and Random Effects. In panel data analyses, it is necessary to perform the Hausman test to choose between fixed effects and random effects, and the Breusch-Pagan Lagrange Multiplier (LM) test to choose between OLS and random effects. The null hypothesis of the Hausman test assumes that random effects are better, and the Breusch-Pagan Lagrange Multiplier (LM) is used to choose Pooled OLS over the random effects model. HICs and UMICs, except the LMICs, use fixed effects, whereas the LMICs use random effects, meaning that the model parameters are not fixed and vary.

3.4.2.1 High-Income Countries

The results of HICs are listed in Table 15. The interest rate is found to have a significant negative relationship only during 2002 to 2008, indicating that interest rates may have led to capital outflows as investors sought higher returns abroad. The exchange rate has a positive impact during the entire period and a negative impact from 2020 to 2023. The positive relationship throughout the period suggests favourable exchange rate movements that help accumulate reserves, whereas the negative relationship observed after COVID might be due to volatility and instability. The foreign direct investment is found to have a positive impact on FEX during the entire period and negative relationships between 2009 to 2019 suggesting a positive relationship between FDI and reserves. However, a negative impact during 2009 to 2019 reflects a post-recovery time where investor confidence was low, leading to a decrease in FDI. The current account balance has a positive impact on the overall sample, but a negative impact from 2002 to 2008. The overall results indicate a long-run relationship in which surplus builds reserves. GDP growth rate, population growth rate, government consumption, and

monetary credit to the private sector have negative effects. Most importantly, the internet is found to have significant relationships with FEX across all multi-periods, and the GQI has a positive effect only during the 2009 to 2019 period. From these results, we infer that foreign direct investment, exchange rates, and current account balances are among the most important variables contributing to the accumulation of foreign exchange reserves in the high-income group. This pattern reflects a mercantilist strategy as HICs use FDI inflows and current account surpluses to build reserves strategically, while government consumption and GDP growth are less critical. In other words, reserve accumulation is not about precaution but about maintaining competitiveness and global financial status. The fact that internet usage significantly affects reserves in HICs suggests that digitisation is reinforcing mercantilist motives, enabling faster capital mobility and reserve management.

Table 15

**High Income Countries
Regression Results, 2002 - 2023 (Fixed Effects)**

Variables	2002-2023	2002-2008	2009-2019	2020-2023
InT	0.01 (0.01)	-0.01*** (0.003)	-0.01* (0.005)	-0.003 (0.007)
InF	-0.014 (0.011)	-0.005 (0.01)	-0.013 (0.008)	0.002 (0.007)
Exch	0.001* (0.000)	-0.001 (0.001)	-0.001 (0.000)	-0.001* (0.0004)
FdI	0.003** (0.001)	-0.0000 (0.008)	-0.001** (0.000)	-0.001 (0.007)
Cab	0.011* (0.006)	-0.03** (0.01)	0.003 (0.004)	0.01 (0.006)
GdP	-0.033*** (0.008)	0.004 (0.01)	0.008 (0.006)	0.004* (0.002)
PoP	-0.04*** (0.13)	0.045*** (0.01)	-0.003 (0.03)	-0.014 (0.025)
GovCons	-0.08** (0.034)	-0.04 (0.04)	-0.01 (0.03)	0.03 (0.022)
MoneC	-0.006** (0.002)	0.001 (0.001)	0.000 (0.003)	-0.001 (0.002)
Internet	-0.023** (0.01)	0.02*** (0.005)	0.009** (0.003)	0.008*** (0.003)
GQI	-0.0886 (0.17)	-0.157 (0.14)	0.272** (0.11)	0.078 (0.127)
Observations	546	182	286	104
R-squared	0.13	0.6	0.2	0.07
Number of Groups	26	26	26	26
F-stat	0.000	0.000	0.000	0.000

*Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. , Fex: Foreign exchange reserves, InT: Interest rates, InF: Inflation Rate, Exch: Exchange Rate, FdI: Foreign Direct Investment, Cab: Current Account Balance, GdP: GDP growth rate, PoP: Population growth rate, GovCons: Government consumption, MoneyC: Monetary credit to private sector, Internet: Internet Usage, GQI: Governance Quality Index*

3.4.2.2 Upper Middle-Income Countries

The results are listed in Table 16. The UMICs exhibit distinct dynamics throughout the periods examined. Interest rates are found to have a negative relationship from 2002 to 2008 and from 2009 to 2019. Inflation is found to negatively impact the FEX during all periods except from 2009 to 2019 depicting that inflationary burden erodes purchasing power and depletes the reserves due to increase in cost of imports and less competitiveness, foreign direct investment shows positive impact during 2009 to 2019 only, current account balance shows positive impact during 2002 to 2008 and 2009 to 2019, the government consumption has positive influence in the entire sample and during 2002 to 2008. Most importantly, the internet usage variable and the GQI give positive and significant results across all time periods. Therefore, the GQI plays a major role in the accumulation of reserves; internet usage is a contributing factor, and inflation may be one of the shock variables exerting a negative influence. Moreover, the government consumption contributes positively towards the accumulation of reserves. The strong role of governance in UMICs underscores that these countries stand at an institutional crossroads: better governance boosts investor confidence and stabilises inflation, thereby strengthening reserves. In this sense, governance operates as both a precautionary tool (reducing risk) and a mercantilist enabler (attracting investment). This dual role is rarely captured in the literature and represents an important insight.

Table 16

Upper Middle-Income Countries
Regression Results, 2002 - 2023 (Fixed Effects)

Variables	2002-2023	2002-2008	2009-2019	2020-2023
InT	-0.006 (0.004)	-0.03** (0.01)	-0.001 (0.001)	0.000 (0.002)
InF	-0.009* (0.005)	-0.03*** (0.01)	0.000 (0.003)	-0.004*** (0.001)
Exch	0.000 (0.0001)	-0.0001 (0.000)	0.000 (0.000)	-0.001 (0.000)
FdI	-0.009 (0.02)	0.009 (0.01)	0.017*** (0.000)	-0.002 (0.009)
Cab	-0.006 (0.008)	0.024*** (0.008)	0.01* (0.006)	0.006 (0.004)
GdP	-0.02** (0.005)	-0.002 (0.004)	0.012** (0.006)	0.006** (0.002)
PoP	0.06*** (0.01)	0.04 (0.12)	-0.07 (0.08)	-0.004 (0.013)
GovCons	0.03*** (0.009)	0.025 (0.16)	0.021 (0.23)	0.03 (0.007)
MoneC	-0.019** (0.008)	0.012 (0.009)	0.002 (0.003)	-0.004 (0.005)
Internet	0.03*** (0.01)	-0.00*** (0.01)	0.004* (0.002)	0.007** (0.003)
GQI	0.54*** (0.17)	0.34** (0.14)	0.18* (0.1)	0.194* (0.10)
Observations	609	203	319	116
R-squared	0.27	0.65	0.26	0.43
Number of Groups	29	29	29	29

*Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. , Fex: Foreign exchange reserves, InT: Interest rates, InF: Inflation Rate, Exch: Exchange Rate, FdI: Foreign Direct Investment, Cab: Current Account Balance, GdP: GDP growth rate, PoP: Population growth rate, GovCons: Government consumption, MoneyC: Monetary credit to private sector, Internet: Internet Usage, GQI: Governance Quality Index*

3.4.2.3 Lower Middle-Income Countries

The results are listed in Table 17. The results for the LMICs reflect the challenges faced by this income group. For example, we observe a negative relationship between interest rates and the overall sample for 2020 to 2023; the inflation rate also has a negative relationship during 2002 to 2008; and foreign direct investment shows a negative relationship across the entire sample. Since the foreign direct investment returns are taken back to the host countries due to having uncertain situations, the GDP growth rates have a positive relationship within the divided time periods, and the monetary credit contributes towards the accumulation of reserves. The internet overall has a negative influence, and it might be because it is used in imports, transferring of wealth overseas and buying digital currencies that are not part of their economies. Moreover, we observe that monetary credit to the private sector has a positive influence on reserves in most periods, except during 2009 to 2019, which may be due to the post-recovery period when the private sector struggled to recover. The external debt variable is found to have a negative influence on the FEX in the entire sample. During 2002 to 2008, it indicates that external debt negatively influences the FEX, suggesting that the debt is used to service foreign-currency-denominated interest payments and to cover trade and capital flight. The negative link between digitisation and reserves in LMICs indicates that, rather than enabling reserve accumulation, digital channels facilitate capital flight, import growth, or remittance outflows. This is a highly nuanced finding that digitisation does not always strengthen reserves, and its effect depends on the maturity of domestic financial systems. This adds a new layer to precautionary theory, suggesting that in LMICs, digitisation might undermine rather than protect reserve positions.

Table 17

Lower Middle-Income Countries
Regression Results, 2002 - 2023 (Random Effects)

Variables	2002-2023	2002-2008	2009-2019	2020-2023
InT	-0.02* (0.009)	-0.02 (0.011)	0.004 (0.006)	-0.05** (0.019)
InF	-0.15 (0.01)	-0.019*** (0.003)	-0.003 (0.004)	-0.02 (0.012)
Exch	-0.0003* (0.0001)	-0.000 (0.000)	0.0001*** (0.000)	-0.000 (0.000)
FdI	-0.05*** (0.013)	-0.013 (0.014)	0.02** (0.008)	0.008 (0.09)
Cab	0.016 (0.012)	0.005 (0.005)	0.013 (0.01)	0.008 (0.013)
GdP	-0.002 (0.015)	0.024*** (0.009)	0.035** (0.015)	0.04** (0.016)
PoP	0.03** (0.01)	-0.07 (0.06)	0.004 (0.014)	-0.07 (0.21)
GovCons	0.004 (0.015)	0.01 (0.02)	0.016 (0.017)	-0.037 (0.061)
MoneC	0.036*** (0.005)	0.02*** (0.01)	0.006 (0.005)	0.06*** (0.02)
Internet	-0.016* (0.01)	0.05*** (0.01)	0.007 (0.005)	-0.046** (0.02)
GQI	-0.13 (0.13)	-0.08 (0.1)	0.084 (0.13)	-0.09 (0.45)
External Debt	-0.01** (0.003)	-0.004*** (0.001)	0.002 (0.003)	-0.001 (0.005)
Observations	378	133	209	55
R-squared	0.396	0.71	0.32	0.49
Number of Groups	19	19	19	19
F-stat	0.000	0.000	0.000	0.000

*Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. , Fex: Foreign exchange reserves, InT: Interest rates, InF: Inflation Rate, Exch: Exchange Rate, FdI: Foreign Direct Investment, Cab: Current Account Balance, GdP: GDP growth rate, PoP: Population growth rate, GovCons: Government consumption, MoneyC: Monetary credit to private sector, Internet: Internet Usage, GQI: Governance Quality Index, ExtDebt: External Debt*

3.4.3 Panel Vector Autoregression (PVAR) Analysis

We employ the PVAR model, and the impulse response functions are shown in Figures 7, 8, and 9. Impulse response functions (IRFs) illustrate the macroeconomic variables' responses to structural shocks. We also presented the graphs of the PVAR stability, in which all the eigenvalues are less than 1, validating the stability of the model in Figure 10.

To begin with, the high-income group illustrations reveal a stable response of the variables to the exogenous shocks. The inflation rate shows minimal fluctuations in response to interest rates shocks. The interest rates show a massive response to the governance quality index (GQI) shocks, initially increasing and then stabilising. Foreign direct investment initially declines and then increases in response to the GQI shocks, and it shows a significant response to the FEX shocks. These impulse response functions also highlight the nature of the relationships in this group, as we observe that GQI, FDI, and FEX exhibit potential impulse-shock relationships with one another.

Next, in UMICs, inflation initially declines and then rises in response to GQI shocks, while private-sector credit also increases in response to GQI and then stabilises. We also observe inflation stabilising in response to foreign reserves: initially increasing and then stabilising, and monetary credit to the private sector initially decreasing and then stabilising. For this income group, GQI, inflation, foreign reserves and monetary credit are important. The impulse-response results suggest that sudden governance improvements generate shocks to interest rates and FDI, which then stabilise over time. This dynamic indicates that governance acts as a credibility shock, prompting investors to respond quickly to improved governance, whereas macroeconomic stability takes longer to consolidate. This insight is crucial for policymakers in UMICs, who must recognise that governance reforms can create short-term volatility even as they strengthen reserves in the long run.

In the third group, the exchange rate fluctuates in response to foreign exchange reserves that initially decline and then increase. Most importantly, we observe shocks in external debt

in response to the FEX: they increase substantially, then decline and stabilise. The other variables do not show any significant shocks. This finding aligns with persistent debates on debt sustainability, which argue that increasing external debt weakens a country's reserves. When reserves decline in response to debt pressures, policymakers often resort to measures such as tightening capital controls or increasing IMF support.

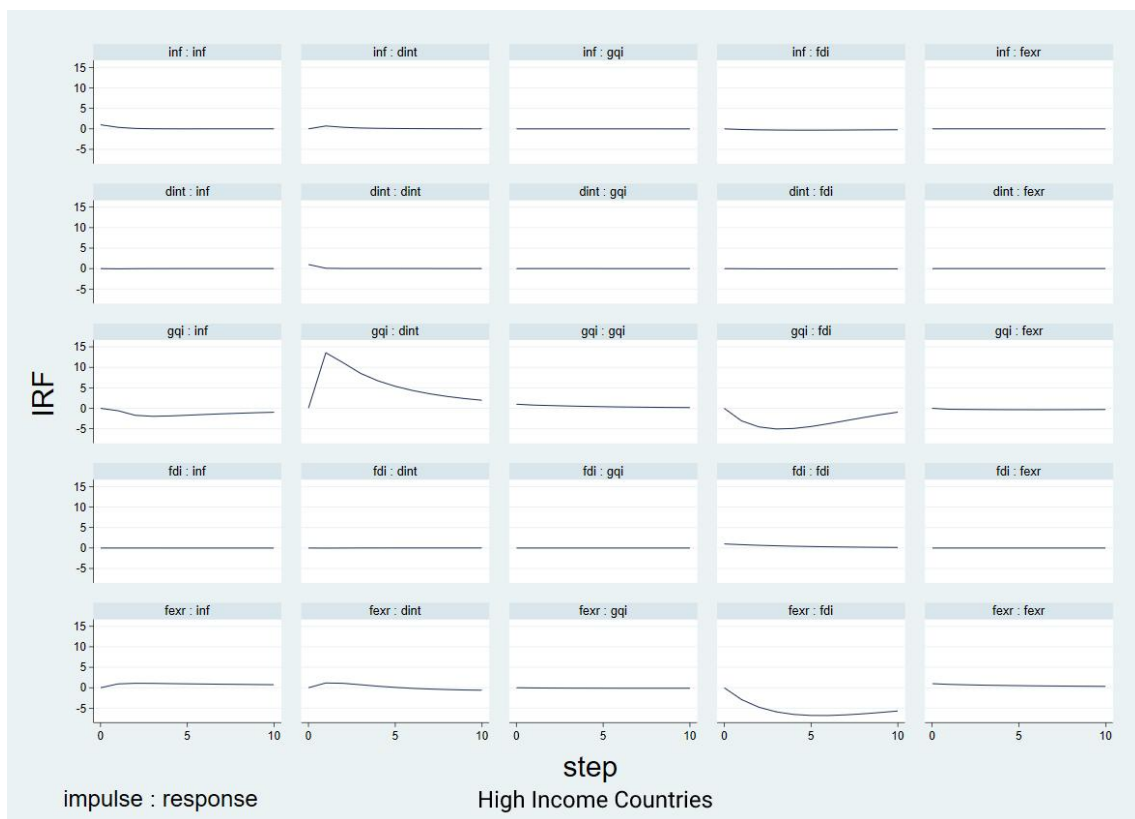


Figure 7 Impulse response function illustrations for high income countries *Fex*: Foreign exchange reserves, *InT*: Interest rates, *InF*: Inflation Rate, *FdI*: Foreign Direct Investment, *GQI*: Governance Quality Index.

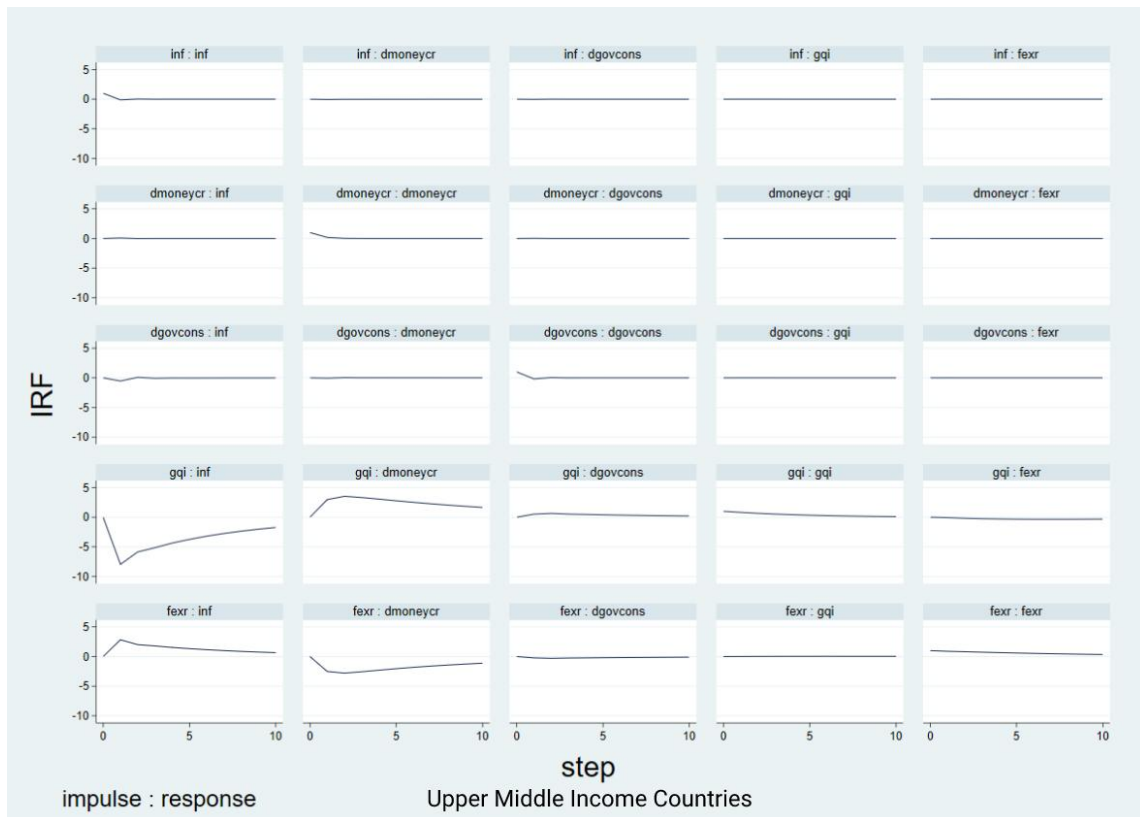


Figure 8 Impulse response function illustrations for upper middle income countries *Fex*: Foreign exchange reserves, *InF*: Inflation Rate, *GQI*: Governance Quality Index, *GovCons*: Government consumption, *MoneyC*: Monetary credit to private sector.

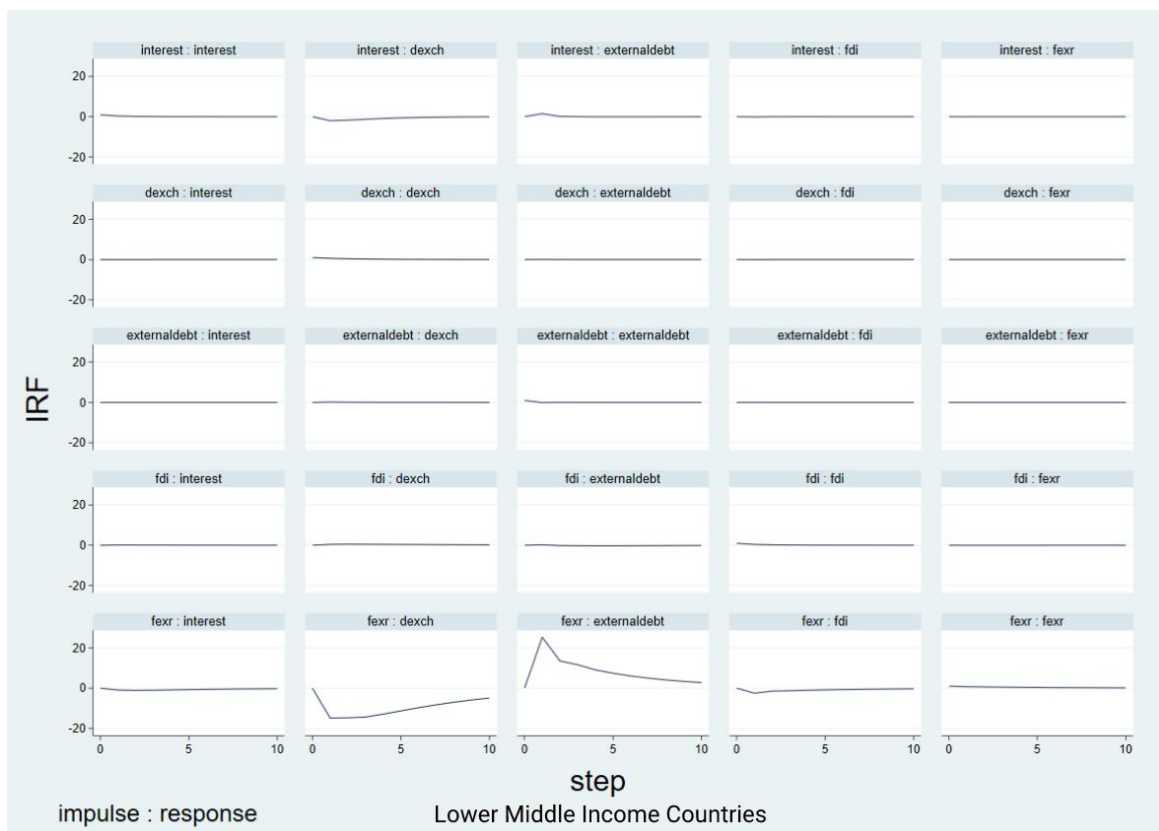


Figure 9 Impulse response function illustrations for lower middle income countries *Fex*: Foreign exchange reserves, *Fdi*: Foreign Direct Investment, *InT*: Interest Rate, *Exch*: Exchange Rate, *ExtDebt*: External debt

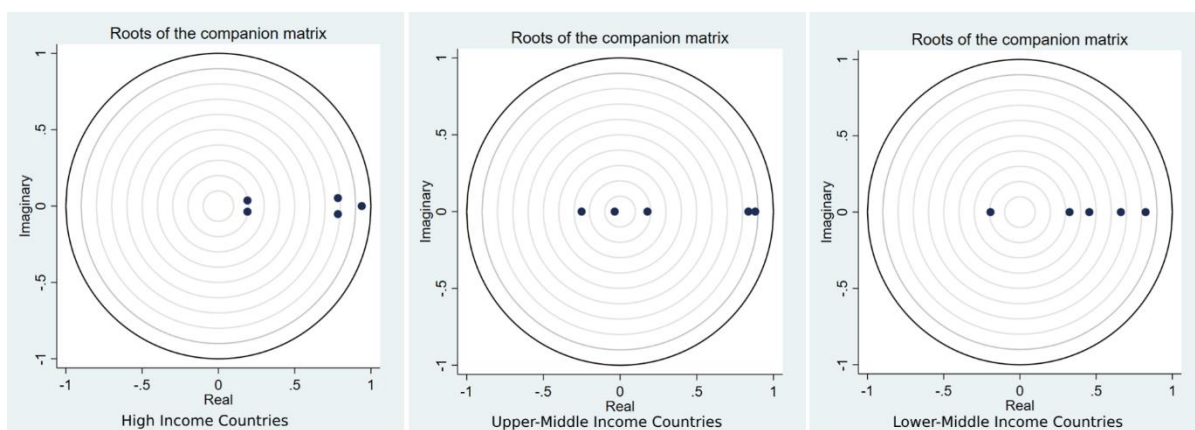


Figure 10 Unit circle PVAR model stability test, all values are less than 1 and lie within the circle

3.4.4 Robust Analysis

Considering the techniques used in the data, such as PCA analysis, panel regression with robust standard errors, and panel VAR, reassures the robustness of the analysis. Most importantly, the use of multiple periods makes this claim more worthy and by studying the differences in the three income groups, we confirm that the results are robust in nature.

3.5 Conclusions and Implications

The analysis was segmented into multiple periods to capture distinct economic stages, including the global financial crisis, the post-recovery period, and the COVID-19 pandemic. The results indicate significant heterogeneity in the influence of these variables, reflecting the varying structural characteristics and economic challenges faced by each group.

Based on the theories discussed, we may assert that HICs retain FEX as a mercantilist measure. This supports our results, as we observed that the current account balance positively affects reserves and foreign direct investment. We also find a strong impulse response in FDI to changes in FEX, thereby again validating the mercantilist theory that maintaining reserves will ensure further accumulation of reserves, growth, and stability. The results for the UMICs reveal that governance quality and inflation are essential factors. The key message is that governance reforms are essential for stabilising inflation and reserves. In LMICs, we observe

that credit to the private sector positively influences reserves, indicating that the private sector contributes to reserve accumulation. Moreover, significant relationships among interest rates, inflation, and exchange rates support the precautionary theory, which maintains that maintaining a stable exchange rate and low inflation are prudent. External debt management and strengthening the private sector should be the pressing priorities

It is also confirmed Ito and McCauley (2020) that the share of foreign exchange reserves is higher in countries where the domestic currency does not vary much against the dollar. It means that with a volatile exchange rate, it is difficult to accumulate the reserves as compared to a stable exchange rate. Davis et al. (2021) also commented that higher capital controls in the countries restrict buying foreign bonds. Matsumoto (2022) also concluded that countries with high entry costs for foreign direct investment experience no effect or slower growth in foreign exchange reserves. The level of external debt also negatively affects reserves, indicating that reserves are drawn out of the economy through interest and loan repayments. The PVAR graphs also confirmed that.

The findings of this study have several important implications for policymakers. Policymakers across all income groups must prioritise governance reforms to ensure a safe and sound political space with high investor confidence, even during periods of crisis. We also need to recognise that the macroeconomic impact of the variables across income groups differs. While HICs need to focus more on digital transformation, UMICs need to enhance the quality of governance to stabilise inflation and the effectiveness of monetary policy. In contrast, LMICs should focus on external debt and support their financial markets. LMICs could achieve economic stability through effective management of external shocks and by promoting credit access to the private sector.

3.5.1 Limitations and Future Research

Developing a governance quality index, applying a multi-period approach across

income groups, and integrating digitisation variables are unique contributions; however, there were limitations, including the exclusion of low-income countries due to data unavailability. This research also opens avenues for future research, such as digital transformation and sectoral analyses of macroeconomic variables across manufacturing, services, and agriculture.

References

- Ahmed, R., Aizenman, J., Saadaoui, J., & Uddin, G. S. (2023). On the effectiveness of foreign exchange reserves during the 2021-22 U.S. monetary tightening cycle. *Economics Letters*, 233. <https://doi.org/10.1016/j.econlet.2023.111367>
- Aizenman, J., Cheung, Y.-W., & Qian, X. (2020). The currency composition of international reserves, demand for international reserves, and global safe assets. *Journal of International Money and Finance*, 102. <https://doi.org/10.1016/j.jimonfin.2019.102120>
- Aizenman, J., Edwards, S., & Riera-Crichton, D. (2012). Adjustment patterns to commodity terms of trade shocks: The role of exchange rate and international reserves policies. *Journal of International Money and Finance*, 31(8), 1990-2016. <https://doi.org/10.1016/j.jimonfin.2012.05.003>
- Aizenman, J., Ho, S.-H., Huynh, L. D. T., Saadaoui, J., & Uddin, G. S. (2024). Real exchange rate and international reserves in the era of financial integration. *Journal of International Money and Finance*, 141. <https://doi.org/10.1016/j.jimonfin.2024.103014>
- Aizenman, J., & Jinjarak, Y. (2020). Hoarding for stormy days—Test of international reserves adjustment providing financial buffer stock services. *Review of International Economics*, 28(3), 656-675. <https://doi.org/10.1111/roie.12466>
- Aizenman, J., & Lee, J. (2007). International Reserves: Precautionary Versus Mercantilist Views, Theory and Evidence. *Open Economies Review*, 18(2), 191-214. <https://doi.org/10.1007/s11079-007-9030-z>
- Aizenman, J., & Lee, J. (2008). Financial versus monetary mercantilism: long-run view of large international reserves hoarding. *World Economy*, 31(5), 593-611. <https://doi.org/10.1111/j.1467-9701.2008.01095.x>
- Aizenman, J., & Marion, N. (2003). The high demand for international reserves in the Far East:

- What is going on? *Journal of the Japanese and International Economies*, 17(3), 370-400. [https://doi.org/10.1016/s0889-1583\(03\)00008-x](https://doi.org/10.1016/s0889-1583(03)00008-x)
- Aizenman, J., & Riera-Crichton, D. (2008). Real exchange rate and international reserves in an era of growing financial and trade integration. *The Review of Economics and Statistics*, 90(4), 812-815. <https://doi.org/10.1162/rest.90.4.812>
- Aliu, F., Hašková, S., & Bajra, U. Q. (2022). Consequences of Russian invasion on Ukraine: evidence from foreign exchange rates. *The Journal of Risk Finance*, 24(1), 40-58. <https://doi.org/10.1108/jrf-05-2022-0127>
- Alsayari, A. (2019). Reserves management. *BIS Paper*, (104u). <https://ssrn.com/abstract=3501143>
- Amit, S., & Kafy, A. A. (2024). Addressing the dollar crisis by investigating underlying causes, effects, and strategic solutions in emerging economies. *Research in Globalization*, 8. <https://doi.org/10.1016/j.resglo.2023.100187>
- Arize, A. C., Malindretos, J., & Igwe, E. U. (2017). Do exchange rate changes improve the trade balance: An asymmetric nonlinear cointegration approach. *International Review of Economics & Finance*, 49, 313-326. <https://doi.org/10.1016/j.iref.2017.02.007>
- Bag, R., & Chandra Das, R. (2024). Associations of Trade Openness With Growth and Foreign Currency Reserve: A New Insight for the BRICS Nations. In T. Chatterjee (Ed.), *International Trade, Economic Crisis and the Sustainable Development Goals* (pp. 243-256). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83753-586-620241017>
- Basu, S. S., Bi, R., & Kannan, P. (2010). Regional reserve pooling arrangements. *Economic Dynamics*, 265, 1-29.
- Ben-Bassat, A., & Gottlieb, D. (1992). On the effect of opportunity cost on international reserve holdings. *The Review of Economics and Statistics*, 329-332.

<https://doi.org/10.2307/2109666>

- Benchimol, J., & El-Shagi, M. (2020). Forecast performance in times of terrorism. *Economic Modelling*, 91, 386-402. <https://doi.org/10.1016/j.econmod.2020.05.018>
- Benigno, G., Fornaro, L., & Wolf, M. (2022). Reserve accumulation, growth and financial crises. *Journal of International Economics*, 139. <https://doi.org/10.1016/j.jinteco.2022.103660>
- Bianchi, J., & Lorenzoni, G. (2022). The prudential use of capital controls and foreign currency reserves. In *Handbook of International Economics Elsevier*, 6, 237-289. <https://doi.org/10.1016/bs.hesint.2022.02.011>
- Bird, G., & Mandilaras, A. (2011). The effect of IMF programs on subsequent reserve behavior. *Review of Development Economics*, 15(2), 264-278. <https://doi.org/10.1111/j.1467-9361.2011.00607.x>
- Blackman, C. N. (1981). The management of foreign exchange reserves in small developing countries. *Social and Economic Studies*, 156-171. <https://www.jstor.org/stable/27861968>
- Bordo, M. D., & Levy, M. D. (2021). Do enlarged fiscal deficits cause inflation? The historical record. *Economic Affairs*, 41(1), 59-83. <https://doi.org/10.1111/ecaf.12446>
- Bussière, M., Cheng, G., Chinn, M. D., & Lisack, N. (2015). For a few dollars more: Reserves and growth in times of crises. *Journal of International Money and Finance*, 52, 127-145. <https://doi.org/10.1016/j.jimonfin.2014.11.016>
- Cashman, K., Arauz, A., & Merling, L. (2022). Special Drawing Rights: The Right Tool to Use to Respond to the Pandemic and Other Challenges. *Challenge*, 65(5-6), 176-198. <https://doi.org/10.1080/05775132.2022.2134638>
- Céspedes, L. F., & Chang, R. (2024). Optimal Foreign Reserves and Central Bank Policy under Financial Stress. *American Economic Journal: Macroeconomics*, 16(3), 230-267.

<https://doi.org/10.1257/mac.20210117>

Cezar, R., & Monnet, E. (2023). Capital controls and foreign reserves against external shocks: Combined or alone? *Journal of International Money and Finance*, 137.

<https://doi.org/10.1016/j.jimonfin.2023.102906>

Cheung, Y.-W., & Ito, H. (2009). A Cross-Country Empirical Analysis of International Reserves. *International Economic Journal*, 23(4), 447-481.

<https://doi.org/10.1080/10168730903372208>

Chletsos, M., & Sintos, A. (2024). Political stability and financial development: An empirical investigation. *The Quarterly Review of Economics and Finance*(94), 252-266.

<https://doi.org/10.1016/j.qref.2024.02.003>

Choi, W. J., & Taylor, A. M. (2022). Precaution versus mercantilism: Reserve accumulation, capital controls, and the real exchange rate. *Journal of International Economics*, 139.

<https://doi.org/10.1016/j.jinteco.2022.103649>

Cova, P., Pagano, P., & Pisani, M. (2016). Foreign exchange reserve diversification and the “exorbitant privilege”: Global macroeconomic effects. *Journal of International Money and Finance*, 67, 82-101. <https://doi.org/10.1016/j.jimonfin.2015.06.012>

Davis, G. (2021). The many ways COVID-19 affects households: consumption, time, and health outcomes. *Rev Econ Househ*, 19(2), 281-289. <https://doi.org/10.1007/s11150-021-09563-w>

<https://doi.org/10.1007/s11150-021-09563-w>

Davis, J. S., Fujiwara, I., Huang, K. X. D., & Wang, J. (2021). Foreign exchange reserves as a tool for capital account management. *Journal of Monetary Economics*, 117, 473-488.

<https://doi.org/10.1016/j.jmoneco.2020.02.006>

Dominguez, K. M. (2010). International reserves and underdeveloped capital markets. *In NBER International Seminar on Macroeconomics (Vol. 6, No. 1, pp. 193-221)*. Chicago, IL: The University of Chicago Press.

<https://doi.org/10.1086/648705>

- Durdu, C. B., Mendoza, E. G., & Terrones, M. E. (2009). Precautionary demand for foreign assets in Sudden Stop economies: An assessment of the New Mercantilism. *Journal of Development Economics*, 89(2), 194-209. <https://doi.org/10.1016/j.jdeveco.2008.01.010>
- Frenkel, J. A. (1974). The demand for international reserves by developed and lessdeveloped countries. . *Economica*, 41(161), Frenkel, J.A., 1974. The demand for international reserves by developed and lessdeveloped countries. *Economica* 1941 (1161), 1914. <https://doi.org/1910.2307/2553419>.
- Gerezihier, H. Y., & Nuru, N. Y. (2021). Determinants of foreign exchange reserve accumulation: empirical evidence from foreign exchange constrained economy. *Journal of Economic and Administrative Sciences*, 37(4), 596-610. <https://doi.org/10.1108/jeas-06-2020-0093>
- Ghosh, A. R., & Ostry, J. D. (1997). Macroeconomic uncertainty, precautionary saving, and the current account. *Journal of Monetary Economics*, 40(1), 121-139. [https://doi.org/10.1016/S0304-3932\(97\)00031-7](https://doi.org/10.1016/S0304-3932(97)00031-7)
- Gluhov, V., Kartavenko, O., Kamyshova, A., Popova, E., & Kapustin, N. (2021). Structural shifts on derivatives markets at the time of increasing digitalization and post-pandemic transformation of the market. In *International Conference on Next Generation Wired/Wireless Networking* (pp. 201-211). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-97777-1_17
- Gylfason, T. (2001). Nature, power and growth. *Scottish Journal of Political Economy*, 48(5), 558-588. <https://doi.org/10.1111/1467-9485.00215>
- Halliday, J., & Archer, D. (1998). The rationale for holding foreign currency reserves. *Reserve Bank of New Zealand Bulletin*, 61.
- He, D. (2021). Digitalization of cross-border payments. *China Economic Journal*, 14(1), 26-

38. <https://doi.org/10.1080/17538963.2020.1870272>

Heller, H. R. (1966). Optimal international reserves. *The Economic Journal*, 76(302), 296-311.

Hui, H. C. (2021). The long-run effects of geopolitical risk on foreign exchange markets: evidence from some ASEAN countries. *International Journal of Emerging Markets*, 17(6), 1543-1564. <https://doi.org/10.1108/ij OEM-08-2020-1001>

Hussain, M., Ye, Z., Bashir, A., Chaudhry, N. I., & Zhao, Y. (2021). A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies. *Resources Policy*, 74. <https://doi.org/10.1016/j.resourpol.2021.102259>

Hussain, M., Ye, Z., Usman, M., Mir, G. M., Usman, A., & Abbas Rizvi, S. K. (2020). Re-investigation of the resource curse hypothesis: The role of political institutions and energy prices in BRIC countries. *Resources Policy*, 69. <https://doi.org/10.1016/j.resourpol.2020.101833>

Ito, H., & McCauley, R. N. (2020). Currency composition of foreign exchange reserves. *Journal of International Money and Finance*, 102. <https://doi.org/10.1016/j.jimonfin.2019.102104>

Jeanne, O. (2016). The Macprudential Role of International Reserves. *American Economic Review*, 106(5), 570-573. <https://doi.org/10.1257/aer.p20161013>

Jena, N. R., & Sethi, N. (2020). Determinants of foreign exchange reserves in Brazil: An empirical investigation. *Journal of Public Affairs*, 21(2). <https://doi.org/10.1002/pa.2216>

Jiang, X., Shi, Y., & Zhang, Z. (2021). Does US partisan conflict affect China's foreign exchange reserves? *International Review of Economics & Finance*, 75, 21-33. <https://doi.org/10.1016/j.iref.2021.03.025>

Jiang, Z., & Yoon, S.-M. (2024). Interdependence between foreign exchange rate and

- international reserves: Fresh evidence from China. *Research in International Business and Finance*, 69. <https://doi.org/10.1016/j.ribaf.2024.102255>
- Kenen, P. B., & Yudin, E. B. (1965). The demand for international reserves. *Review of Economics and Statistics*, 47(3), 242-250. <https://doi.org/10.1515/9780691196602-010>
- Korinek, A., & Servén, L. (2016). Undervaluation through foreign reserve accumulation: Static losses, dynamic gains. *Journal of International Money and Finance*, 64, 104-136. <https://doi.org/10.1016/j.jimonfin.2016.02.012>
- Krušković, B. D., & Maričić, T. (2015). Empirical Analysis of the Impact of Foreign Exchange Reserves to Economic Growth in Emerging Economics. *Applied Economics and Finance*, 2(1). <https://doi.org/10.11114/aef.v2i1.653>
- Kuehnlentz, S., Orsi, B., & Kaltenbrunner, A. (2023). Central bank digital currencies and the international payment system: The demise of the US dollar? *Research in International Business and Finance*, 64. <https://doi.org/10.1016/j.ribaf.2022.101834>
- Law, C.-H. (2022). The Impacts of International Reserves on Monetary Independence in Emerging Countries: An Asymmetric Analysis. *Global Journal of Emerging Market Economies*, 15(1), 53-71. <https://doi.org/10.1177/09749101211073933>
- Levy Yeyati, E. (2008). The cost of reserves. *Economics Letters*, 100(1), 39-42. <https://doi.org/10.1016/j.econlet.2007.10.027>
- Li, Y., Huang, J., Gao, W., & Zhang, H. (2021). Analyzing the time-frequency connectedness among oil, gold prices and BRICS geopolitical risks. *Resources Policy*, 73. <https://doi.org/10.1016/j.resourpol.2021.102134>
- Lutz, F., & Zessner-Spitzenberg, L. (2023). Sudden stops and reserve accumulation in the presence of international liquidity risk. *Journal of International Economics*, 141. <https://doi.org/10.1016/j.jinteco.2023.103729>
- Ma, C. (2020). Financial stability, growth and macroprudential policy. *Journal of International*

Economics, 122. <https://doi.org/10.1016/j.jinteco.2019.103259>

Mathieu, A. (2022). International Political Economy and Exchange Rate Regime: A Question of Sustainability. *Review of Political Economy*, 36(1), 256-267.

<https://doi.org/10.1080/09538259.2022.2037931>

Matsumoto, H. (2022). Foreign reserve accumulation, foreign direct investment, and economic growth. *Review of Economic Dynamics*, 43, 241-262.

<https://doi.org/10.1016/j.red.2021.02.002>

Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal*, 116(508), 1-20. <https://doi.org/10.1111/j.1468-0297.2006.01045.x>

Mijiyawa, A. G., & Oloufade, D. K. (2022). Effect of Remittance Inflows on External Debt in Developing Countries. *Open Economies Review*, 34(2), 437-470.

<https://doi.org/10.1007/s11079-022-09675-5>

Mookerjee, R., & Yu, Q. (1997). Macroeconomic variables and stock prices in a small open economy: The case of Singapore. *Pacific-Basin Finance Journal*, 5(3), 377-388.

[https://doi.org/10.1016/S0927-538X\(96\)00029-7](https://doi.org/10.1016/S0927-538X(96)00029-7)

Moore, W., & Glean, A. (2015). Foreign exchange reserve adequacy and exogenous shocks. *Applied Economics*, 48(6), 490-501. <https://doi.org/10.1080/00036846.2015.1083085>

Nagel, L. (2020). The influence of the COVID-19 pandemic on the digital transformation of work. *International Journal of Sociology and Social Policy*, 40(9/10), 861-875.

<https://doi.org/10.1108/ijssp-07-2020-0323>

Ngo, V. M., Nguyen, P. V., & Hoang, Y. H. (2024). The impacts of geopolitical risks on gold, oil and financial reserve management. *Resources Policy*, 90.

<https://doi.org/10.1016/j.resourpol.2024.104688>

Obstfeld, M., Shambaugh, J. C., & Taylor, A. M. (2010). Financial Stability, the Trilemma, and International Reserves. *American Economic Journal: Macroeconomics*, 2(2), 57-94.

<https://doi.org/10.1257/mac.2.2.57>

- Olokoyo, F. O., Osabuohien, E. S., & Salami, O. A. (2009). Econometric analysis of foreign reserves and some macroeconomic variables in Nigeria (1970–2007). *African Development Review*, 21(3), 454-475. <https://doi.org/10.1111/j.1467-8268.2009.00218.x>
- Ploeg, F. v. d. (2011). Natural Resources: Curse or Blessing? *Journal of Economic Literature*, 49(2), 366-420. <https://doi.org/10.1257/jel.49.2.366>
- Rodriguez, C. M. (2016). Economic and political determinants of exchange rate regimes: The case of Latin America. *International Economics*, 147, 1-26. <https://doi.org/10.1016/j.inteco.2016.03.001>
- Rodrik, D. (2006). The social cost of foreign exchange reserves. *International Economic Journal*, 20(3), 253-266. <https://doi.org/10.1080/10168730600879331>
- Ross, M. L. (2011). Does Oil Hinder Democracy? *World Politics*, 53(3), 325-361. <https://doi.org/10.1353/wp.2001.0011>
- Saisana, M., & Tarantola, S. (2002). State-of-the-art report on current methodologies and practices for composite indicator development. *Ispira: European Commission, Joint Research Centre, Institute for the Protection and the Security of the Citizen, Technological and Economic Risk Management Unit.*, 214, 4-15. <https://doi.org/10.13140/RG.2.1.1505.1762>
- Schröder, M. (2017). Mercantilism and China's hunger for international reserves. *China Economic Review*, 42, 15-33. <https://doi.org/10.1016/j.chieco.2016.11.004>
- Senibi, V., Oduntan, E., Uzoma, O., Senibi, E., & Oluwaseun, A. (2016). Public Debt and External Reserve: The Nigerian Experience (1981–2013). *Economics Research International*, 2016, 1-7. <https://doi.org/10.1155/2016/1957017>
- Skare, M., Soriano, D. R., & Porada-Rochon, M. (2021). Impact of COVID-19 on the travel

- and tourism industry. *Technol Forecast Soc Change*, 163, 120469.
<https://doi.org/10.1016/j.techfore.2020.120469>
- Thommandru, A., Espinoza-Maguiña, M., Ramirez-Asis, E., Ray, S., Naved, M., & Guzman-Avalos, M. (2023). Role of tourism and hospitality business in economic development. *Materials Today: Proceedings*, 80, 2901-2904.
<https://doi.org/10.1016/j.matpr.2021.07.059>
- Ugurlu, E. N., & Razmi, A. (2023). Political economy of real exchange rate levels. *Journal of Comparative Economics*, 51(3), 918-940. <https://doi.org/10.1016/j.jce.2023.03.004>
- Workie, E., Mackolil, J., Nyika, J., & Ramadas, S. (2020). Deciphering the impact of COVID-19 pandemic on food security, agriculture, and livelihoods: A review of the evidence from developing countries. *Curr Res Environ Sustain*, 2, 100014.
<https://doi.org/10.1016/j.crsust.2020.100014>
- Wu, P.-C., & Lee, C.-C. (2016). The non-linear impact of monetary policy on international reserves: macroeconomic variables nexus. *Empirica*, 45(1), 165-185.
<https://doi.org/10.1007/s10663-016-9353-3>

Chapter 4: Democracy, Militarisation, and Economic Growth: A Study of Top Remittance-Receiving Nations

4.1 Introduction

Economic stability is a primary objective of any country, as it facilitates further economic growth and improves the overall standard of living for its people. A country's economy is considered stable and growing if its people have adequate access to health and education, can meet basic needs, and can generate a reliable source of income (Safadar, 2022). However, this is not the case for developing countries, which face significant social, economic, and political challenges and experience substantial economic leakages. Many economic, social, financial, and political factors contribute to economic growth (Sabir et al., 2019). In developed countries, exports and foreign direct investment (FDI) constitute a major share of a country's foreign exchange, whereas in most developing economies, remittances constitute a major share due to limited imports and FDI (Cao & Kang, 2020). Remittances help these countries maintain foreign reserves and, indirectly, finance and sustain their economies. The share of remittances to countries receiving aid is so significant that it ranks second only to FDI in terms of foreign exchange inflows (Eggoh et al., 2019; Ratha, 2019).

Most of the top remittance recipients are LMICs; in addition, large populations are among the reasons a considerable portion of these nations' residents emigrate for employment opportunities, to alleviate poverty in their households, and to improve the standard of living (Adams & Page, 2005). Some examples of these LMICs are India, Philippines, Pakistan, Bangladesh, Sri Lanka and Lebanon. Remittances are funds sent by immigrants to their home countries to support family expenses. Economists widely recognise it as a tool for economic growth and financial stability in countries where other foreign exchange instruments are insufficient. Remittance flows have been increasing steadily in LMICs, and in 2024 they reached \$685 billion (World Bank). Moreover, the International Remittance total is more than

the total of Foreign Direct Investment (FDI) and Official Development Assistance (ODA) worldwide as stated by the World Bank. If governments are successful in channelising these transfers, the remittance number would be significantly larger in the LMICs as most of these transactions are done through unofficial private means and not through the banking channels (Adams & Page, 2005; Adugna Chomen et al., 2023; Dutta & Saikia, 2022; McFarlane et al., 2025; Ofor et al., 2023).

There are many studies on the relationship between remittances and economic growth, which have shown positive outcomes and indicate that remittances play a major role in reducing poverty and driving economic growth (Adams & Page, 2005; Azizi et al., 2023; Chami et al., 2005). However, many studies reiterate that it does not contribute to economic growth and results in inequality among households (Cazachevici et al., 2020; Pradhan et al., 2025). Several studies have attributed this to the role of institutions and governance bodies in not taking an active part in the strategic allocation of remittances for growth and productive investments (Islam & Alhamad, 2022; I. Khan, 2023; Mohammed & Karagöl, 2023).

Democratic governance is characterised by constitutional freedom, accountability, and the protection of civil liberties. Countries with democratic governance have witnessed long term economic growth and prioritise public education, health and infrastructure. In some cases, regardless of being democracies, some countries are worse than dictatorships, and seldom does a single party's prolonged democratic rule become like a dictatorship where favouritism and corruption become the norm, and those challenging it face the same fate as faced in dictatorships (McLaren & Cop, 2013; Murat Tuncer, 2023). Nonetheless, remittances also create overreliance on private transfers and may reduce government accountability, thereby failing to improve political institutions (Williams, 2024). Increasing militarisation is also notable in today's world, defined as the extent to which a country prioritises military expenditure over human development expenditure. The level of democratic governance can be

measured by democracy index with a score between 0 to 10, developed by the Economic Intelligence Unit (EIU) in 2006 and updated every year whereas militarization is measured with the Global militarization index developed by Bonn International Centre for Conversion (BICC), measured based on expenditure on military, military personnels and weapons (Elveren & Moghadam, 2022; Rahman & Alam Choudhury, 2014). Although remittances often surpass FDI and ODA in LMICs, their impact on economic growth remains contested. Why do some remittance-heavy economies thrive, while others experience stagnation? This chapter argues that the answer lies in the institutional context of democracy and militarisation, which determines whether remittances are channelled into productive investment or absorbed by unproductive expenditure.

To assess the impact of remittances on economic growth within the institutional context, the study poses the following questions: 1. What is the impact of remittances on economic growth? 2. What is the impact of democracy on economic growth? What is the impact of militarisation on economic growth? How does the level of democracy moderate the relationship between remittances and economic growth? To answer these questions, we will select the top remittance-receiving LMICs and divide them into two groups based on their democracy indices: one with a high democracy index and the other with a lower democracy index. Following that we will be analysing the data through graphs, figures and mean values and will be applying the panel regression, fixed effects and random effects and will be discussing the results. Examining remittances alongside democracy and militarisation will be an important contribution to this research.

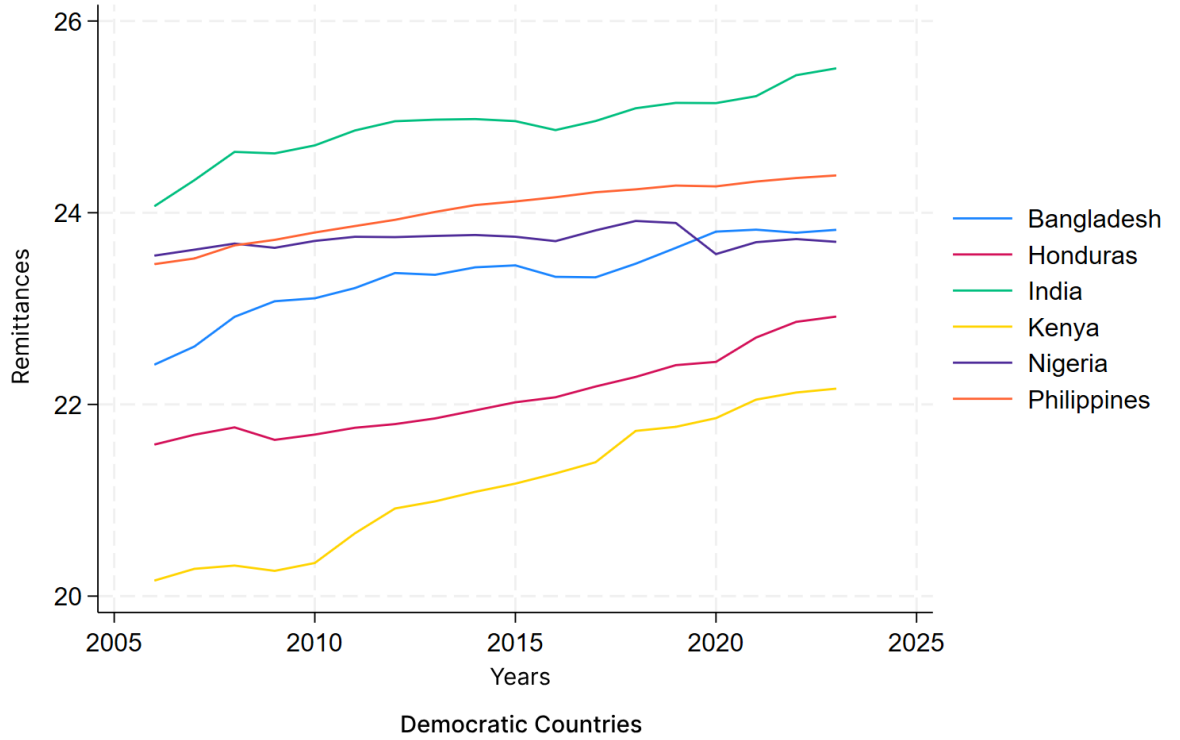


Figure 11 Top Remittances receiving high democratic LMICs in Group 1

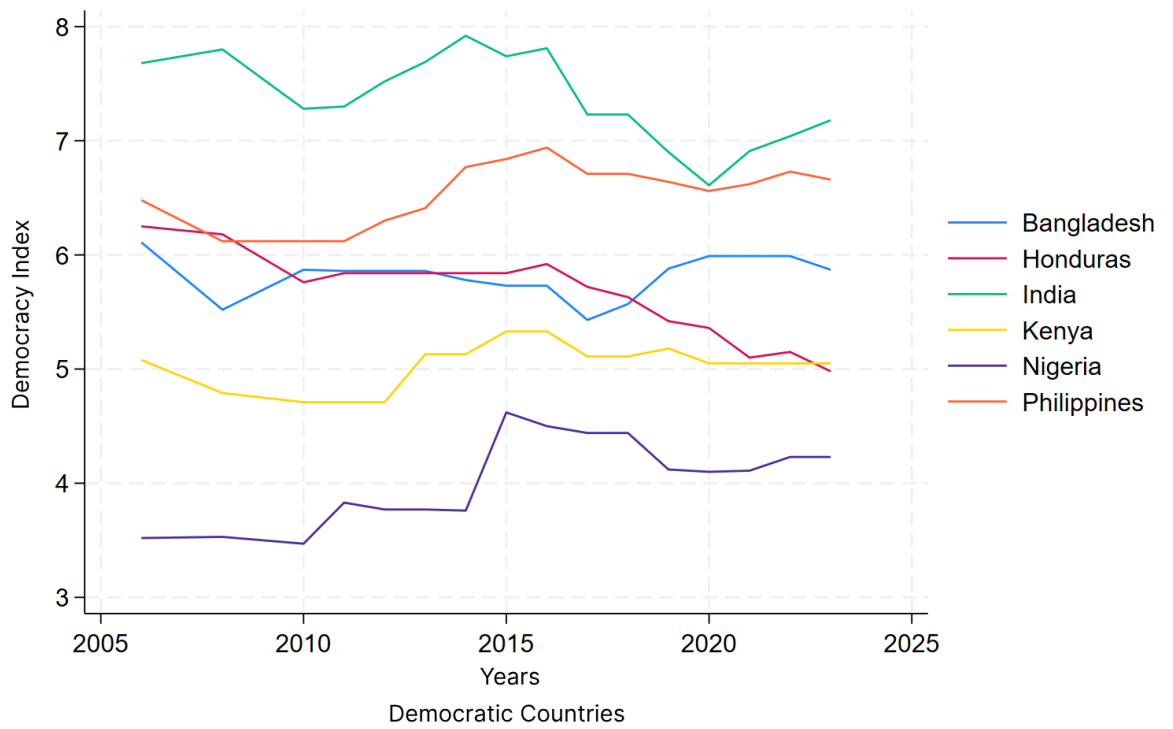


Figure 12 Graphs showing High Democracy Index scores of Group 1

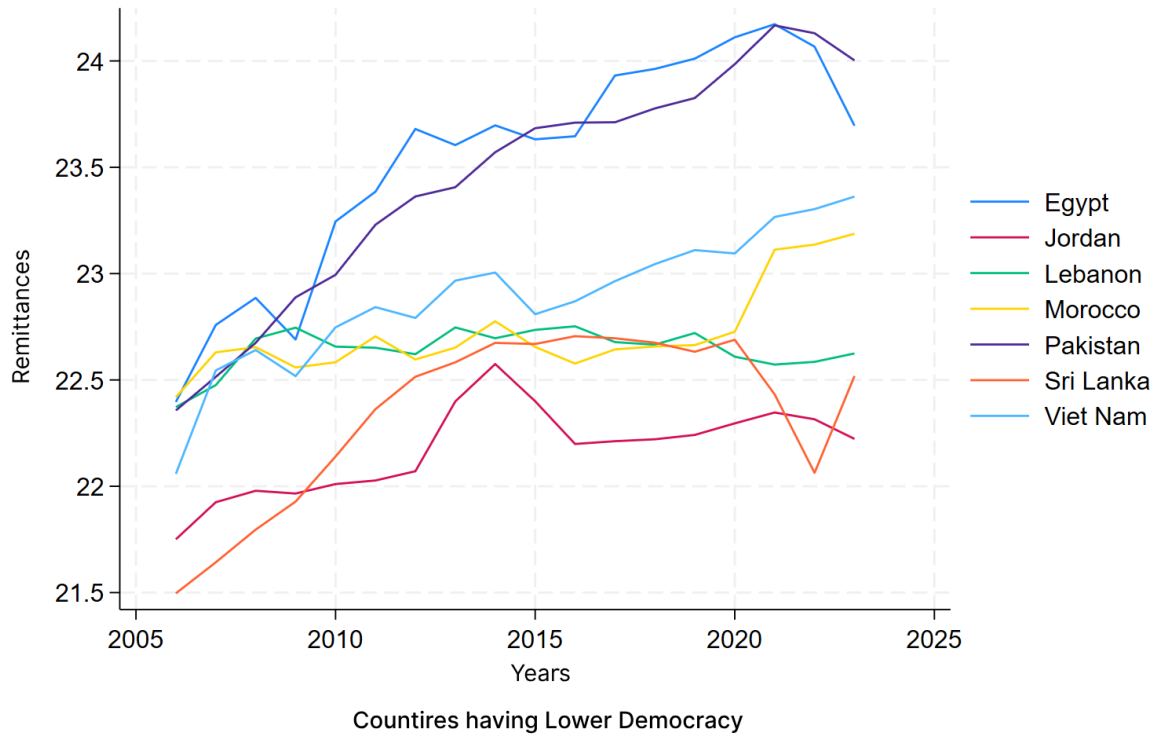


Figure 13 Top Remittances receiving lower democratic LMICs in Group 2

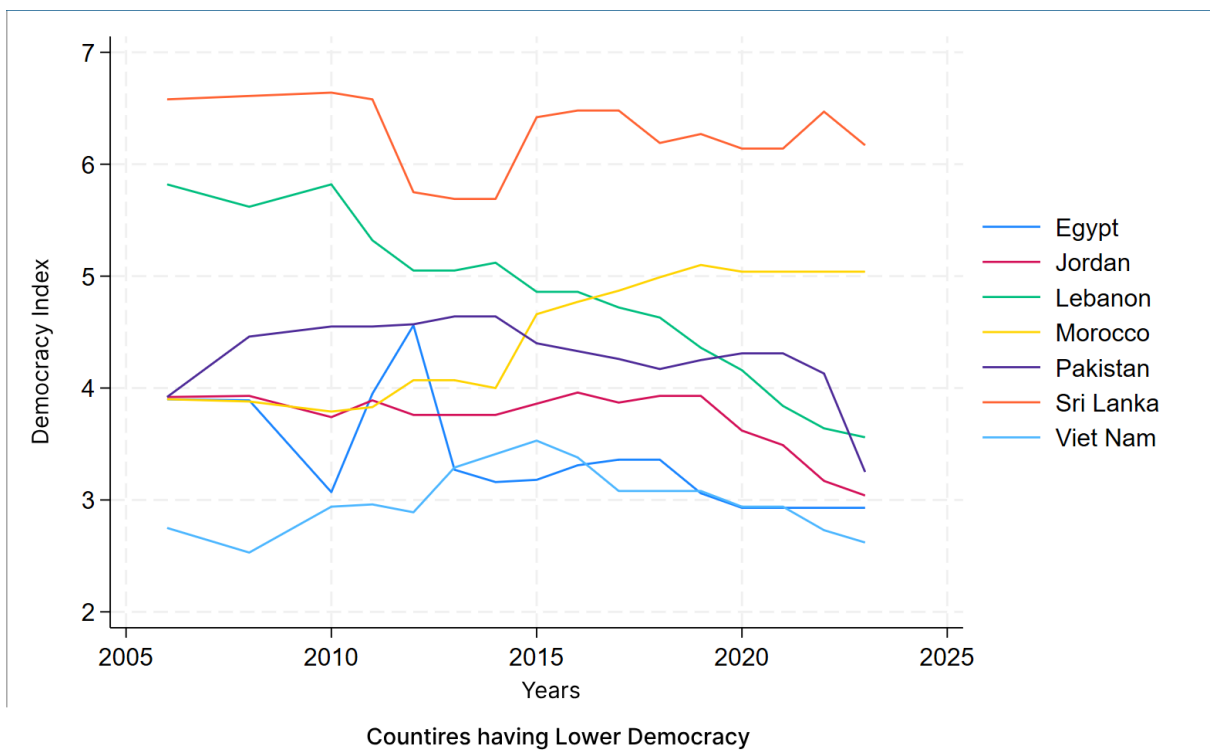


Figure 14 Graphs exhibiting Lower Democracy Index scores of Group 2

Discussing the theoretical foundations, Neoclassical theory is among the first theories to explain migration, and there are many studies that contributed to this theory, like (Arango, 2000; Faist, 2011; Harris & Todaro, 1970; Massey et al., 1993; Todaro, 1969). This theory posits that the wage rate and poor supply-and-demand conditions in migrants' home countries are the primary drivers of migration, and that migration would cease if these conditions were balanced and wage differences were absent. Therefore, countries with high demand for human capital and high wages will continue to attract labour from countries with lower wages and abundant labour, and people seeking a good quality of life will continue to seek migration opportunities. Institutional theory explains that high-quality institutions are essential for effectively channelling remittances into growth and driving economic expansion. Strong governance structures influence how remittances are used, whether they contribute to investment or simply support consumption. For instance, the public elects the government it trusts, and a strong democratic system demonstrates its legitimacy and public confidence, thereby contributing to economic growth more than an autocracy. When the institutes are not well managed, they are ineffective in managing the businesses as well (North, 2018; North DC & BR., 1989; North & Thomas, 1973; Tang & Tang, 2018). This study is grounded in Neoclassical Growth Theory and Institutional Theory, which posit that democracy augments the growth impact of remittances through efficient markets, while militarisation undermines resource use and weakens this effect and promotes inefficiency. We will be elaborating on this theoretical framework in the results section.

The rest of the paper is shaped as follows: Section 2 presents the literature review, Section 3 presents the methodology, Section 4 presents the results and discussion, and finally Section 5 presents the conclusions.

4.2 Literature Review

Numerous studies have analysed the relationship between remittances and economic growth. But there is still less evidence that shows that remittances have a positive impact on economic growth, and mixed results have been noticed during reviewing literature, depending on different variables, countries and models.

4.2.1 Positive relation

Some studies have found a positive relationship between remittances and economic growth, attributable to factors such as consumption, poverty reduction, and investment. I. Khan (2023) studies the positive and negative impacts of remittances on India's economy and finds that positive shocks boost economic activity. In contrast, negative shocks have no impact, implying that the government should prioritise remittances for SME (Small and Medium-sized Enterprises) investment and partner with sending countries to channel them effectively. Azizi et al. (2023) examine 113 countries from 1990 to 2015 and find a positive impact in countries having high human capital, whereas no impact on countries with low human capital. This is attributed to the fact that countries with high human capital treat remittances as investment rather than consumption, whereas those with lower human capital do not. Khan (2024) investigates 61 developing countries and concludes that remittances contribute to growth by increasing domestic capital, enhancing consumption, reducing poverty, and playing a crucial role in human capital development, particularly in health. Pradhan et al. (2025) study this relationship in BRICS countries and find a positive relationship only when they are below a certain level, and it affects negatively if it exceeds it. In conclusion, these studies attribute the positive relationship between remittances and economic growth towards consumption, investment and poverty reduction.

4.2.2 Negative Relation

Conversely, Clemens and McKenzie (2018) investigate the reason why remittances don't impact growth despite a great increase in incoming payments in recent years. They give three main reasons. Firstly, the measurement error due to improper channelling. Secondly, there may be statistical reasons that led to the failure to detect positive results, and thirdly, it could be endogeneity bias. Despite these challenges, remittances have contributed to poverty alleviation and improved household welfare and global GDP. Cazachevici et al. (2020) perform meta-analysis from 538 studies on remittances and growth, their results reveal mixed results in which 20% of the results show negative impact and 40% showing no impact. Offor et al. (2023) study African economies post-COVID and find a negative relationship, exacerbated by harmful shocks from inflation and restricted private-sector credit. The results reveal structural financial weaknesses but still consider remittances vital for household welfare and proved beneficial during the crisis, surpassing FDI and ODA. They recommend formalising remittance flows by enhancing financial inclusion; similarly, the same recommendations are given in another African study, Adugna Chomen et al. (2023) finding insignificant relationship between remittances and growth. Habib (2024) attributes the negative relation towards consumption rather than investment. Moreover, inequality could be one of the reasons for remittances not positively contributing towards economic growth, as suggested by McFarlane et al. (2025) the fact that remittances help the lower-income households' consumption. Pradhan et al. (2025) also state that remittances have a negative relationship with economic growth when they exceed a certain level. Since remittance discourages participation in the labour force, it increases reliance on foreign income, increases people's household spending and promotes inequality. The studies above link this negative relationship to these factors.

4.2.3 Institutional Mediation

Several studies have analysed the institutional perspective on the relationship between remittances and growth. Like Catrinescu et al. (2009) probe the role of remittances in economic growth, incorporating the role of institutions. Mixed results from past studies indicate that it can boost growth or create dependency, reducing labour force participation. Inferring that remittances positively affect growth in the long term, but only in developing countries with strong institutions. Nevertheless, countries with weak institutions fail to realise their benefits, use them for consumption, and fall prey to corruption and inefficiency. Islam and Alhamad (2022) take the top ten remittance receiving countries between 1996 and 2019 to study the impact of financial development and institutional quality on the relationship between remittances and growth. They find that financial development and institutional quality are crucial for enhancing long-run economic growth. The causality results also reveal that remittances directly drive growth, suggesting that strengthening financial markets and institutions could improve remittance inflows.

Habib (2024) analyses other variables such as political stability, government effectiveness, and regulatory quality and finds negative and insignificant effects, indicating that weak institutional mechanisms lead to increased informal transfers. The study concludes that improving these factors could lead to productive investments. Williams (2017b) states that remittances contribute to democracy, reduce poverty, increase investment in education, and enhance government accountability in SSA countries. Williams (2017a) in another study states that the political environment is crucial for remittances and economic growth to prosper; therefore, strengthening democratic institutions would support this. Likewise, Akobeng (2021) the same conclusion holds for SSA countries. Acemoglu et al. (2019) find the positive impact of democracy on GDP per capita by 20 to 25% over 25 years and argue that it improves growth by supporting investments, reforms, health and education. It is also noted that democracy

supports economic growth more in countries with higher levels of human capital, but overall, the results indicate that democratic institutions enhance growth. Moreover, Crisman-Cox and Park (2023) examine how regime type impacts the relationship between remittances and terrorism. They argue that democracies foster healthy political participation, whereas autocracies encourage terrorism as a means of political expression due to limited electoral freedom. The study also discusses that terrorism can be mitigated through an effective institutional design. Makhoul (2024) also finds that democracy, political stability and trust level in origin countries increase remittances and promote transfers. Analysing the direct impact of democracy on economic growth, studies have reported both positive and negative relationships. For example, De Haan and Siermann (1996) evaluate both direct and indirect effects of democracy on growth and conclude that the relationship between them is not robust. Heo and Tan (2001) study the causal relationship between democracy and growth in 32 developing countries finds mixed results: Turkey, Chile, and the Dominican Republic show a two-way relationship, whereas India shows a one-way relationship in which growth leads to democracy; Pakistan, Iran, and Sri Lanka show no causal links. It is argued that the relationship cannot be generalised, and that different economic and institutional settings may have different impacts. One more study states that democracy does not affect growth directly but indirectly through many channels like property rights, political stability and technological innovation, which is also concluded Doucouliagos and Ulubaşoğlu (2008) in their meta-analysis.

Evidence suggests that remittances enhance growth only under conditions of strong institutions and high human capital (Azizi et al., 2023; Catrinescu et al., 2009; Islam & Alhamad, 2022). Where institutions are weak, however, remittances are absorbed into household consumption and fail to stimulate productive investment (Ahmed, 2013; Habib, 2024). Furthermore, the link between democracy and economic growth remains unclear (De Haan & Siermann, 1996; Doucouliagos & Ulubaşoğlu, 2008; Ghardallou & Sridi, 2019; Heo

& Tan, 2001; Makhoul, 2024), and there is a lack of studies linking militarisation to the remittance-growth nexus. This divergence highlights the importance of institutional variables, democracy and militarisation, which this study will integrate.

4.3 Methodology

4.3.1 Description of Data

We have obtained secondary data from the sources listed in Table 18. The target for this study is lower-middle-income countries from 2006 to 2023, which are the highest remittance-receiving countries. We took LMICs, then we selected the top remittance-receiving countries and divided them into two groups. The first group has a higher democracy index, whereas the other group has a lower one. Countries are grouped by their average democracy index, which ranges from 1 to 10; those with an average > 5 are assigned to the higher democracy index group, and those with an average < 5 are assigned to the lower democracy index group. This selection is consistent with the EIU as it classifies countries into 4 regime types based on their democracy index. Full democracies have a democracy index of 8 to 10; flawed democracies, 6 to 8; hybrid regimes, 4 to 6; and authoritarian regimes, below 4.00 (Unit, 2024). This variation represents institutional quality, and the quality of democracy can be evaluated by the extent to which regimes discuss important issues with the public (Unit, 2024), thereby impacting the institutional capacity to absorb remittances. The countries selected in both groups are listed in Table 19. The graphs of total remittances and democracy indices for both groups are also shown in Figures 11 to 14. In Figure 11, we observe the overall increase in remittances from 2006 to the present, and in Figure 12, we observe the overall rise in democracy among the selected countries in Group 1. While Figure 13 and Figure 14 also show the increase in remittances and the declining democracy trend in the selected countries of Group 4.

We have Gross Domestic Product (GDP) variable is taken as a measure of economic growth which is the sum of final value of all goods and services produced, remittances (REM) which

are the personal remittances received by a country on an annual basis, Democracy Index (DEM) which is calculated and published by Economic Intelligence Unit (EIU) and are in the ranges from 1 to 10, Global Militarization Index (GMI) published by Bonn International Centre for Conflict Studies (BICC) that calculates the level of government expenditure on the military and weapons. Countries facing war, border security, and geopolitical conflicts have higher GMI scores (von Boemcken et al., 2025). Higher GMI scores may crowd out health and education spending, diverting remittances toward consumption or sustaining military priorities rather than development. Population (POP) is included in the study. The POP variable denotes the country's total annual population.

Table 18

Description of Data, 2006-2023

Variables		Denoted as	Units	Source
Gross Domestic Product		GDP	Sum of final value of all producers (current US\$ annual)	World Development Indicator
Remittances		REM	Personal remittances, received (current US\$ annual)	World Development Indicator
Democracy Index		DEM	Index (Ranges 1 to 10)	Economic Intelligence Unit processed by Our World in Data
Global Militarization Index		GMI	GMI score value	Bonn International Centre for Conflict Studies
Population		POP	Total (Annual)	United Nations Population Division. World Population Prospects

Variable description, Units and Source.

4.3.2 Estimation Method

The main objective of this research is to examine the impact of remittances on economic growth, taking into account the nature and environment of institutions. For that we will use the baseline panel regression method like Panel Ordinary Least Square (POLS), Fixed effects (FE) and Random Effects (RE). The selection criteria depend on the Hausman Test between fixed and random effects. We will apply the estimation methods to two groups, one with a higher democracy index and the other with a lower democracy index. To ensure robust findings, we will use different sets of equations to validate the results and employ robust commands in panel regression. To further enhance the robustness of the analysis, we will apply Two-Stage Least Squares (2SLS) and test for endogeneity. This will be helpful in determining whether there is a need for the two-stage least squares or the panel regression results are valid. Slope homogeneity and cointegration tests will also be applied in both groups to further confirm the results and ensure the robustness of the analysis.

The regression equations can be written as,

$$GDP_{it} = \beta_0 + \beta_1 REM_{it} + \beta_2 DEM_{it} + \beta_3 GMI_{it} + \beta_4 DEM * REM_{it} + \beta_5 POP_{it} + e_{it}$$

$$REM_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 DEM_{it} + \beta_3 GMI_{it} + \beta_4 DEM * REM_{it} + \beta_5 POP_{it} + e_{it}$$

Table 19

Sample Countries	
Higher Democracy Index	Lower Democracy Index
Bangladesh	Egypt
Honduras	Jordan
India	Lebanon
Kenya	Morocco
Nigeria	Pakistan
Philippines	Sri Lanka
	Vietnam

Top remittance receiving lower middle economies divided into 2 groups based on the level of Democracy Index.

4.4 Results and Discussions

4.4.1 Descriptive Statistics

The descriptive statistics are listed in Table 20. Understanding the nature of the data firsthand is important before proceeding with analysis.

The mean GDP for the higher democracy index group is 5.46, and for the lower democracy index group it is 5.55, confirming that both groups belong to the same economic category, namely LMICs. Secondly, the mean remittances received by the first group are 23.20 and from the second are 22.80; this value also exhibits that both groups have around the same level of remittance, both belonging to the top remittance receiving countries. The third variable, democracy mean value, is 5.73 in the first group and 4.29 in the second group. Both groups consist of countries listed in Table 19. Next comes the GMI score, and the first group has a mean value of 69.31, and the other one has a mean value of 168.1. We can say that the democratic countries have an overall lower Gross Militarisation Index, whereas the weaker democracies have higher GMI values. Last comes the population mean values, and both groups show a similar level of values, 18.51 for the first group and the second group having 17.38, showing both groups have a positive population growth.

Table 20**Descriptive Statistics, 2006-2023**

Groups	Variables	Mean	Std. Dev	Obs
Higher Democracy Index	GDP	5.46	1.35	108
	REM	23.2	1.32	108
	DEM	5.73	1.13	108
	GMI	69.31	15.91	108
	POP	18.51	1.51	108
Lower Democracy Index	GDP	5.55	1.4	126
	REM	22.82	0.6	126
	DEM	4.29	1.11	126
	GMI	168.1	32.36	126
	POP	17.38	1.26	126

Source: Author's own computations. Countries are grouped based on democracy index. Std.Dev: Standard Deviation, Obs: Observation, GDP: Gross Domestic Product, REM: Personal Remittances, DEM: Democracy Index, GMI: Gross Militarization Index, POP: Population.

4.4.2 Slope Homogeneity Test

A critical step in the analysis involves the application of the slope homogeneity test, as introduced by (Bersvendsen & Ditzen, 2021; Hashem Pesaran & Yamagata, 2008). This test plays an essential role in confirming the presence of variations between cross-sections and it is essential to confirm before proceeding with the analysis. Establishing the presence of differing slopes across countries is crucial for the validity and reliability of the overall analysis, providing a basis for correct interpretations of the empirical results and rigor. It is a measure towards robustness and validating that the model has homogenous slopes and are valid.

Table 21**Slope Homogeneity Tests**

Group	Delta	P-Value	Adj Delta	P-Value
Higher Democracy Index	0.367	0.714	0.535	0.593
Lower Democracy Index	-0.429	0.668	-0.559	0.576

Slope homogeneity tests results show slope coefficients are homogeneous

4.4.3. Panel Regression

4.4.3.1 Higher Democracy Index

Following slope homogeneity tests, we applied panel regression. The paramount finding is that remittances have a negative relationship with GDP. In the second model we also took remittances as dependent variable, and the results are still negative. Another crucial finding in groups of democratic countries is that democracy is negatively associated with GDP and remittances. The GMI is found to have no relationship with GDP, but it gave a negative relationship with remittances. Perhaps in these LMICs, military spending is disconnected from economic production, or remittances are a household-level flow that is immune to government expenditure priorities. The mediating relationship between democracy and remittances is found to be critical as democracy positively mediates and both impact GDP positively. The positive interaction means that in more democratic countries within this group, remittances are more effective. This nuances the negative individual coefficient. This paradox suggests that while remittances and democracy on their own may create inefficiencies, remittances fuelling consumption and democracy slowing decision-making, their combination enables accountability. When democratic oversight is applied to remittance flows, governments may be pressured to channel them toward long term investments in health, education, or infrastructure, yielding growth. Population has no relationship with GDP and remittances. The results are presented in Table 22.

Table 22**Higher Democracy Index
Panel Regression Results, 2006-2023**

Variables	GDP Fixed Effects	REM Fixed Effects
GDP	-	-0.03** (0.01)
REM	-6.4** (1.65)	-
DEM	-21.2** (7.1)	-3.70*** (0.32)
GMI	-0.02 (0.03)	-0.004* (0.002)
REM*DEM	0.88** (0.33)	0.16*** (0.016)
POP	5.79 (3.68)	0.371 (0.371)
Observations	108	108
R-squared	0.0036	0.9265
Number of Groups	6	6
F-stat (5,5)	6528.03 0.000	155.78 0.000

*Source: Author's own computations. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Countries are grouped based on democracy index. GDP: Gross Domestic Product, REM: Personal Remittances, DEM: Democracy Index, GMI: Gross Militarization Index, POP: Population.*

4.4.3.2 Lower Democracy Index

The second group, comprising low-democratic countries, however, shows distinct results, as shown in Table 23. Remittances positively affect GDP, and democracy is a crucial factor for these countries, as it is also positively associated with GDP. GMI also exhibits a negative relationship with GDP, and the mediating relationship of democracy and remittances is negative. The negative interaction suggests that attempts to democratise might currently disrupt the efficient (perhaps autocratic) channelling of remittances. In weaker democracies, remittances contribute to growth by directly financing consumption and small business activity.

Yet when democratisation increases, it may initially destabilise fragile institutional structures, disrupting the allocation of remittances. Thus, the interaction becomes negative, suggesting that partial democratisation without institutional maturity can reduce the growth benefits of remittances. Population also impacts GDP negatively.

Discussing the theoretical expectations, we affirm that our results support them. For example, neoclassical theory posits that remittances boost growth by strengthening investment, whereas institutional theory posits that the effect depends on institutional quality. So, the relationship in the second group between remittances and economic growth confirms this. Institutional theory is also supported by mediating relationships in both groups. Therefore, it suggests that while remittances can be considered a growth factor, their full capability is realised only under a favourable institutional environment.

Table 23

**Lower Democracy Index
Panel Regression Results, 2006 - 2023**

Variables	GDP Random Effects	REM Fixed Effects
GDP	-	0.04 (0.03)
REM	2.29*** (0.51)	-
DEM	5.81** (2.55)	-4.35** (0.72)
GMI	-0.015*** (0.005)	0.000 (0.002)
REM*DEM	-0.26** (0.11)	0.19** (0.03)
POP	-0.92*** (0.29)	0.476 (0.411)
Observations	126	126
R-squared	0.1569	0.8065
Number of Groups	7	7
Wald/F-stat	0.000	67.53 0.000

*Source: Author's own computations. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Countries are grouped based on democracy index. GDP: Gross Domestic Product, REM: Personal Remittances, DEM: Democracy Index, GMI: Gross Militarization Index, POP: Population*

4.4.4 Endogeneity, 2SLS and Robustness

To ensure the robustness and reliability of the regression results, both fixed-effects and random-effects models were employed to capture unobserved heterogeneity across panels. However, addressing endogeneity concerns is essential for analysis, as FE and RE don't address endogeneity. Therefore, to ensure that no endogeneity is present, and our results of panel regression are valid, we applied the Two Stage Least Square (2SLS) method on our model. If endogeneity is present, we use the 2SLS results, as fixed-effects and random-effects estimates can be biased. The results of the analysis can be seen in Table 24 where we have taken both groups and after application of the baseline regression, we applied 2SLS. First, the 2SLS results complement our panel regression results in Tables 22 & Table 23, confirming robustness. Second, we tested for endogeneity and couldn't reject the null hypothesis as the Durbin & Wu Hausman test statistics are greater than 0.05, indicating no presence of endogeneity and variables being exogenous. Third, the Sargan and Basman tests support instrument validity and are not correlated with the error term. We therefore proceed with our panel regression results, which were previously estimated to be valid and robust. The absence of endogeneity strengthens our confidence that the results in Group 1 and Group 2 are not spurious but reflect structural inefficiencies in democratic contexts. Additionally, Robust standard errors were applied throughout the estimations to address potential heteroskedasticity and serial correlation. Likewise, tests for slope homogeneity confirmed that the slope coefficients are homogeneous across panels. The existence of a long-run relationship among the variables was demonstrated through the Kao and Pedroni cointegration tests.

Table 24

Two Stage Least Squares (2SLS)
GDP (Dependent Variable)

Variables	Higher Democracy Index		Lower Democracy Index	
	Baseline Regression	Two stage Least Square	Baseline Regression	Two stage Least Square
GDP (-1)	0.71*** (-0.095)	0.70*** (0.09)	0.80*** (0.075)	0.81*** (0.086)
REM	-1.20 (0.78)	-1.06 (0.73)	1.34* (0.731)	1.55** (0.631)
DEM	-6.78* (4.05)	-6.1* (3.51)	6.13** (2.92)	7.27** (3.38)
GMI	-0.004 (0.004)	-0.002 (0.008)	0.008* (0.004)	0.009** (0.005)
REM*DEM	0.27* (0.17)	0.25* (0.146)	-0.263** (0.125)	-0.312** (0.147)
POP	-0.32* (0.17)	-0.28* (0.14)	0.094 (0.132)	0.112 (0.144)
Observations	102	96	119	112
Durbin	-	0.5430	-	0.6534
Wu-Hausman	-	0.5611	-	0.6658
Sargan	-	0.9345	-	0.1409
Basmann	-	0.9489	-	0.1565
R-squared	0.61	0.6295	0.7487	0.7405
F-stat	0.00	0.00	0.00	0.00

Source: Author's own computations. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Countries are grouped based on democracy index. GDP: Gross Domestic Product, REM: Personal Remittances, DEM: Democracy Index, GMI: Gross Militarization Index, POP: Population

4.4.5 Kao and Pedroni Cointegration Tests

To estimate if there is a presence of a long-run relationship in the panels, we applied (Kao, 1999) and (Pedroni, 1999; Pedroni, 2004) cointegration tests. These tests have been widely used in recent empirical work. The Kao test assumes slope homogeneity, whereas the Pedroni test assumes only limited heterogeneity. As our slope came out homogeneous in the slope homogeneity test, both tests are appropriate. After testing the results showed the presence of cointegration in all the panels. The results are listed in Table 25.

Table 25

Panel cointegration results	(KAO & PEDRONI)
Dependent variable GDP	
Groups	
Higher Democracy Index	All panels are cointegrated
Lower Democracy Index	All panels are cointegrated

Cointegration tests showing the existence of a long-run relationship between cross sectional variables

4.5 Conclusions and Implications

This research focused on the top remittance-receiving countries, ranked by the level of democratic practices, as measured by the Democracy Index. The top remittance-receiving countries were selected among the LMICs. This is because this income group is among the highest recipients relative to HICs and UMICs. Given the economic opportunities and large population, a substantial proportion of people prefer to migrate to high-income countries and UMICs to improve their households' financial situation back home. Following this grouping, we aimed to examine the relationship among remittances, democracy, and economic growth. In addition, the Gross Militarisation Index (GMI) was added in the model as a potentially influential variable, considering that countries having high GMI are sidelining the public interest and spending on the military; therefore, it could be closely tied to institutional structure, stability and economic benefit.

The analysis reveals a pronounced contrast in key variables between the two groups. Firstly, in democratic countries, both remittances and democracy give a negative correlation with economic growth. This may appear self-contradictory at first, as both remittances and democracy are generally considered favourable to development, but it reflects structural inefficiencies and institutional rigidities that prevent the effective utilisation of remittances and democratic tools for promoting productivity. Democracy alone does not guarantee effective use of remittances; institutional inefficiencies can turn remittances into a burden (Abdih et al., 2012; Acemoglu et al., 2019; Catrinescu et al., 2009; Doucouliagos & Ulubaşođlu, 2008). What matters is the governance capacity to link remittances to investment, not merely the presence of elections. In some democracies, institutional inefficiencies are so entrenched that remittance inflows fail to trigger reform or investment. For example, in democratic settings, greater institutional scrutiny and procedural delays may reduce the speed and flexibility of public investment and policy responsiveness, particularly when addressing informal income sources such as remittances. Democracy and remittances negatively affect economic growth; these findings align with (Chami et al., 2005; Doucouliagos & Ulubaşođlu, 2008; McFarlane et al., 2025; Ofor et al., 2023; Pradhan et al., 2025; Sutradhar, 2020). Secondly, the mediating relationship between remittances and democracy in the first group shows a positive significant relationship with economic growth. In these countries, remittances may support growth only when democratic institutions effectively channel them into productive use. This implies that while democracy and remittances may individually impose constraints under certain conditions, their combination can produce synergistic effects when effectively managed. These countries might enhance accountability in the use of remittances and channel them toward developmental areas such as health, education, and infrastructure for long term growth. This aligns with the studies of (Abdih et al., 2012; Catrinescu et al., 2009; Habib, 2024).

On the other hand, the results from the second group show an opposite pattern; both

remittances and democracy present a positive correlation with economic growth. It may have a more direct growth effect by supporting household consumption, small businesses, and basic investment. It indicates that democratic institutions, no matter how limited, assist in economic progress. We may also infer that, if the democracy index is low in this group, these countries are autocratic and that these institutions perform better at allocating remittances to productive investment avenues. If not a great little effort in bringing democratic measures would be beneficial for these countries and could lead to growth. We can affirm this statement by examining the mediating relationship between democracy and remittances, which proved negative for this group. Remittances can drive growth even in weak democracies, but attempts to democratise without institutional readiness may backfire. Policymakers should therefore pursue gradual, capacity-building reforms alongside democratisation. This could also contribute to instability in these countries, as attempts to democratise may disrupt and reduce economic growth due to insufficient institutional capacity. These research findings align with studies on similar groups of countries, like (Makhlouf, 2024; Ojeyinka & Ibukun, 2024; Safadar, 2022). Another important result is for GMI. The insignificance of GMI suggests that migrants continue to send money regardless of state spending priorities. However, this may mask deeper inefficiencies, as remittances risk being indirectly diverted to military-led projects rather than to development.

These findings from this study have several policy implications, particularly for governments and international organisations working with LMICs that are highly dependent on remittances to sustain their economies. Firstly, democratic countries should implement institutional reforms, such as reducing bureaucratic red tape for remittance-funded investments, creating special investment zones or tax incentives for diaspora investments, and assessing their efficiency. There may be circumstances in which their governance is causing delays and increasing burdens that limit the productive use of remittances. It is also suggested Bianchi et

al. (2014); Cao and Kang (2020) that remittances have a negative impact on growth in countries with a high level of financial development and positive impact with a lower level of financial development. Therefore, institutional reforms are more important than financial reforms. Moreover, reforms should be implemented to strengthen local government and encourage its participation in allocating remittances for education, health, and infrastructure. Secondly, the countries having fewer democratic institutions result in stability and effective governance, even if not fully democratic, can channel remittances effectively. Therefore, the focus should first be on building effective and transparent state capacity and the rule of law, which may be a precursor to broader democratic reforms. Thirdly, policymakers should be curtailed in allocating large amounts of remittance funds to military spending, while simultaneously ignoring human development expenditures; doing so could yield better long-term outcomes.

This chapter contributes to the existing literature by providing a comparative framework between different democracies and it extends the remittance-growth literature by showing that the effect of remittances on economic growth is dependent on the institutional environment. It also contributes to the democracy-growth literature by showing that democracy does not operate independently and its effect depends on how effectively institutions convert remittances into productive economic activity. Including Gross Militarisation Index, also addressed a gap in the literature where militarisation has rarely been analysed alongside remittances and democratic institutions.

4.5.1 Limitations and Future Research

Institutional quality is complex, and the available data on GMI and democracy indices pose challenges to its full measurement. Therefore, measuring institutional quality through such proxies might not fully represent real institutional performance or differences between countries. There may be other cofactors that affect growth alongside military expenditure. Moreover, the lack of an insignificant relationship is not irrelevant; the outcomes may be

context dependent. Future studies could explore the relationship between militarisation and variables such as political stability, internal security, and defence spending, and whether this relationship affects the level of public trust in institutions. Moreover, disaggregating remittances into investment and consumption at the country level and using a longer time series linked to financial inclusion could also be a valuable option for future research.

References

- Abdih, Y., Chami, R., Dagher, J., & Montiel, P. (2012). Remittances and Institutions: Are Remittances a Curse? *World Development*, 40(4), 657-666. <https://doi.org/10.1016/j.worlddev.2011.09.014>
- Acemoglu, D., Naidu, S., Restrepo, P., & Robinson. (2019). Democracy does cause growth. *Journal of Political economy*, 127(1), 47-100. <https://doi.org/10.1086/700936>
- Acevedo, J. (2023). Do Remittances Contribute to Presidential Instability in Latin America? *Latin American Politics and Society*, 65(3), 72-94. <https://doi.org/10.1017/lap.2022.68>
- Adams, R. H., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? *World Development*, 33(10), 1645-1669. <https://doi.org/10.1016/j.worlddev.2005.05.004>
- Adugna Chomen, D., Danquah, R., & Chen, F. (2023). The short-run and long-run impacts of foreign aid and remittances on economic growth: Evidence from African countries. *The Journal of International Trade & Economic Development*, 33(4), 644-664. <https://doi.org/10.1080/09638199.2023.2205967>
- Ahmed, F. Z. (2013). Remittances Deteriorate Governance. *The Review of Economics and Statistics*, 95(4), 1166–1182. https://doi.org/10.1162/REST_a_00336
- Akobeng, E. (2021). Harnessing remittances for the poor: the role of institutions. *Journal of Economic Policy Reform*, 26(2), 160-176. <https://doi.org/10.1080/17487870.2021.1976178>
- Arango, J. (2000). Explaining migration: a critical view. *International Social Science Journal*, 52(165), 283-296. <https://doi.org/10.1111/1468-2451.00259>
- Azizi, S., Aftabi, A., Azizkhani, M., & Yektansani, K. (2023). Remittances and economic growth: a blessing for middle-income countries, ineffective for low-income countries. *Journal of Economic Studies*, 51(6), 1285-1303. <https://doi.org/10.1108/jes-04-2023-0207>

- Bersvendsen, T., & Ditzen, J. (2021). Testing for slope heterogeneity in Stata. *The stata journal*, 21(1), 51-80.
- Bianchi, P., Deschamps, B., & Kiani, K. M. (2014). Fiscal Balance and Current Account in Professional Forecasts. *Review of International Economics*, 23(2), 361-378. <https://doi.org/10.1111/roie.12165>
- Cao, S., & Kang, S. J. (2020). Personal Remittances and Financial Development for Economic Growth in Economic Transition Countries. *International Economic Journal*, 34(3), 472-492. <https://doi.org/10.1080/10168737.2020.1765187>
- Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). Remittances, Institutions, and Economic Growth. *World Development*, 37(1), 81-92. <https://doi.org/10.1016/j.worlddev.2008.02.004>
- Cazachevici, A., Havranek, T., & Horvath, R. (2020). Remittances and economic growth: A meta-analysis. *World Development*, 134. <https://doi.org/10.1016/j.worlddev.2020.105021>
- Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are Immigrant Remittance Flows a Source of Capital for Development? *IMF Econ Rev*, 52, 55–81. <https://doi.org/10.2307/30035948>
- Clemens, M. A., & McKenzie, D. (2018). Why Don't Remittances Appear to Affect Growth? *The Economic Journal*, 128(612), F179–F209. <https://doi.org/10.1111/eoj.12463>
- Crisman-Cox, C., & Park, Y. (2023). Remittances, terrorism, and democracy. *Conflict Management and Peace Science*, 41(5), 598-622. <https://doi.org/10.1177/07388942231207029>
- De Haan, J., & Siermann, C. L. J. (1996). New evidence on the relationship between democracy and economic growth. *Public Choice*, 86, 175-198. <https://doi.org/10.1007/BF00114881>
- Doucouliağos, H., & Ulubaşoğlu, M. A. (2008). Democracy and Economic Growth: A Meta-

- Analysis. *American journal of political science*, 52(1), 61-83.
<https://doi.org/10.1111/j.1540-5907.2007.00299.x>
- Dutta, U. P., & Saikia, B. (2022). Remittances and Economic Growth: Empirical Analysis from a Panel of Selected Asian Nations. *Millennial Asia*, 15(1), 5-23.
<https://doi.org/10.1177/09763996221086745>
- Eggoh, J., Bangake, C., & Semedo, G. (2019). Do remittances spur economic growth? Evidence from developing countries. *The Journal of International Trade & Economic Development*, 28(4), 391-418. <https://doi.org/10.1080/09638199.2019.1568522>
- Elveren, A. Y., & Moghadam, V. M. (2022). Militarization and Gender Inequality: Exploring the Impact. *Journal of Women, Politics & Policy*, 43(4), 427-445.
<https://doi.org/10.1080/1554477x.2022.2034430>
- Faist, T. (2011). *The Volume and Dynamics of International Migration and Transnational Social Spaces* Oxford, 2000; online edn, Oxford Academic, 3 Oct. 2011.
<https://doi.org/10.1093/acprof:oso/9780198293910.001.0001>
- Ghardallou, W., & Sridi, D. (2019). Democracy and Economic Growth: a Literature Review. *Journal of the Knowledge Economy*, 11(3), 982-1002. <https://doi.org/10.1007/s13132-019-00594-4>
- Habib, H. (2024). Are Institutions Improving the Contribution of Remittances to Economic Growth? A Panel Data Analysis. *Jurnal Institutions and Economies*, 16(1), 29-52.
<https://doi.org/10.22452/IJIE.vol16no1.2>
- Harris, J. R., & Todaro, M. P. (1970). Migration, Unemployment and Development: A Two-Sector Analysis. *The American Economic Review*, 60(1), 126-142.
<http://www.jstor.org/stable/1807860>
- Hashem Pesaran, M., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics*, 142(1), 50-93.

<https://doi.org/10.1016/j.jeconom.2007.05.010>

- Heo, U., & Tan, A. C. (2001). Democracy and Economic Growth: A Causal Analysis. *Comparative Politics*, 33(4), 463–473. <https://doi.org/10.2307/422444>
- Islam, M. S., & Alhamad, I. A. (2022). Impact of financial development and institutional quality on remittance-growth nexus: evidence from the topmost remittance-earning economies. *Heliyon*, 8(12), e11860. <https://doi.org/10.1016/j.heliyon.2022.e11860>
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1-44. [https://doi.org/10.1016/S0304-4076\(98\)00023-2](https://doi.org/10.1016/S0304-4076(98)00023-2)
- Khan, I. (2023). Analyzing the impact of positive and negative remittance inflow shocks on economic growth of India. *Journal of Economic Studies*, 51(2), 338-356. <https://doi.org/10.1108/jes-02-2023-0089>
- Khan, M. A. (2024). The impact of migrant remittances on economic development: empirical evidence from the developing world. *Journal of Social and Economic Development*. <https://doi.org/10.1007/s40847-024-00329-5>
- Makhlouf, F. (2024). Does democracy stimulate remittances? *Review of Development Economics*, 29(1), 476-498. <https://doi.org/10.1111/rode.13133>
- Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). Theories of International Migration: A Review and Appraisal. *Population and Development Review*, 19(3), 431–466. <https://doi.org/10.2307/2938462>
- McFarlane, A., Brown, L., & Das, A. (2025). Remittances and Inequality in Jamaica. *Journal of Poverty*, 1-19. <https://doi.org/10.1080/10875549.2025.2455716>
- McLaren, L., & Cop, B. (2013). The Failure of Democracy in Turkey: A Comparative Analysis. *Government and Opposition*, 46(4), 485-516. <https://doi.org/10.1111/j.1477-7053.2011.01344.x>
- Mohammed, U., & Karagöl, E. T. (2023). Remittances, institutional quality and investment in

- Sub-Saharan Africa. *Journal of Business and Socio-economic Development*, 3(4), 322-338. <https://doi.org/10.1108/jbsed-07-2022-0077>
- Murat Tuncer, A. (2023). Democracy to Dictatorship: Lessons from Turkey 2023 Presidential Election. *International Journal of Science and Research (IJSR)*, 12(6), 45-62. <https://doi.org/10.21275/sr23529121448>
- North, D. C. (2018). *Institutional change: a framework of analysis*. Routledge.
- North DC, & BR., W. (1989). Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England. *The journal of economic history*, 49(4), 803-832. <https://doi.org/10.1017/S0022050700009451>
- North, D. C., & Thomas, R. P. (1973). *The rise of the western world: A new economic history*. Cambridge University Press.
- Offor, K. O., Ngong, C. A., Onyejiaku, C. C., Enemu, J., Ugbam, C. O., Ibe, G. I., & Onwumere, J. U. J. (2023). Remittances and emerging African economies' growth nexus in a post COVID-19 era. *Natural Resources Forum*, 48(1), 171-183. <https://doi.org/10.1111/1477-8947.12319>
- Ojeyinka, T. A., & Ibukun, C. O. (2024). Do remittances mitigate poverty? Evidence from selected countries in Africa, Asia and Latin America. *Economic Change and Restructuring*, 57(3). <https://doi.org/10.1007/s10644-024-09666-1>
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(S1), 653-670. <https://doi.org/10.1111/1468-0084.0610s1653>
- Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric theory*, 20(3), 597-625. <https://doi.org/10.1017/S0266466604203073>
- Pradhan, K. C., Mallick, L., & Naik, K. (2025). Remittance and economic growth nexus in

- BRICS countries: Evidence from PSTR with endogeneity. *Research in Economics*, 79(2). <https://doi.org/10.1016/j.rie.2025.101032>
- Rahman, M. S., & Alam Choudhury, M. (2014). Statistical analysis of democracy index. *Humanomics*, 30(4), 373-384. <https://doi.org/10.1108/h-09-2013-0058>
- Ratha, D. (2019). Remittances on track to become the largest source of external financing in developing countries.
- Sabir, S., Rafique, A., & Abbas, K. (2019). Institutions and FDI: evidence from developed and developing countries. *Financial Innovation*, 5(1). <https://doi.org/10.1186/s40854-019-0123-7>
- Safadar, N. (2022). Interrelationship between Remittances and Economic Growth: Evidence from SAARC Countries. *Pakistan Social Sciences Review*, 6(II). [https://doi.org/10.35484/pssr.2022\(6-II\)01](https://doi.org/10.35484/pssr.2022(6-II)01)
- Sutradhar, S. R. (2020). The impact of remittances on economic growth in Bangladesh, India, Pakistan and Sri Lanka. *International Journal of Economic Policy Studies*, 14(1), 275-295. <https://doi.org/10.1007/s42495-020-00034-1>
- Tang, R., & Tang, S. (2018). Democracy's unique advantage in promoting economic growth. *Quantitative evidence for a new institutional theory*, 71(4), 642-666. <https://doi.org/10.1111/kykl.12184>
- Todaro, M. P. (1969). A Model of Labor Migration and Urban Unemployment in Less Developed Countries. *The American Economic Review*, 59(1), 138-148. <http://www.jstor.org/stable/1811100>
- Unit, T. E. I. (2024). *Democracy Index 2024: Methodology and findings* <https://www.eiu.com/n/campaigns/democracy-index-2024/>
- von Boemcken, M., B., J., R., J., & Rohleder, P. (2025). *GMI 2024 - Global Militarisation*

Index (Version 1).

Williams, K. (2017a). Are remittances good for economic growth? The role of political institutions. *Applied Economics Letters*, 25(1), 56-60.

<https://doi.org/10.1080/13504851.2017.1293781>

Williams, K. (2017b). Do remittances improve political institutions? Evidence from Sub-Saharan Africa. *Economic Modelling*, 61, 65-75.

<https://doi.org/10.1016/j.econmod.2016.12.004>

Williams, K. (2024). Remittances and government expenditures on human capital in developing countries. *International Economics*, 178.

<https://doi.org/10.1016/j.inteco.2024.100508>

Chapter 5: General Conclusions

The main motivation to conduct this study was the recurring global macroeconomic events that were happening due to political instability in most countries, after the advent of COVID-19 and the Russian-Ukrainian war, which resulted in inflation and economic instability (László, 2025). We also observed regime changes in many countries, regardless of their economic status or the presence of protests, resulting in chaos and economic meltdowns. These protests are the result of numerous issues that have led to public discontent (Dirks & Schmidt, 2024; Grasso & Gubernat, 2025; von Uexkull et al., 2024). Overall, the thesis provides valuable conclusions and policy implications from the three chapters.

Across the three studies, a central theme emerges: that macroeconomic outcomes in LMICs, UMICs, and HICs are critically shaped not only by traditional variables such as interest rates, inflation, and remittances, but also by institutional and governance contexts. This thesis shows that macroeconomic shocks cannot be understood in isolation; they must be analysed through the lens of governance, democracy, and policy frameworks that mediate whether such shocks translate into resilience or vulnerability. It demonstrates that external resources, whether reserves or remittances, only generate growth when embedded in effective institutional frameworks. Weak institutions convert inflows into dependency, while strong ones channel them into investment. The thesis also confirmed Keynes's view that high stability leads to high consumption, which may create negative imbalances, and refined precautionary and mercantilist theories of reserves by showing that their validity is income-group-specific: precautionary motives predominate in LMICs, whereas mercantilist strategies are more relevant in HICs. Similarly, institutional theory is extended by demonstrating that democracy does not always enhance growth; in stronger democracies, remittances may exacerbate inefficiencies, whereas in weaker democracies, even limited democratic structures can facilitate growth.

The results indicate significant heterogeneity in the influence of these variables across the income groups in our study, reflecting the varying structural characteristics and economic challenges faced by each group. This heterogeneity challenges one-size-fits-all policy advice. Instead, it underscores the need for differentiated strategies, like HICs must focus on trade balance and digital transformation, UMICs on governance reforms and LMICs on debt management and institutional development. The HICs should work on their local production and work for minimising the trade deficits rather than increasing tariffs, as being industrially sound, it is attainable for them (Clausing & Lovely, 2024; Contractor, 2025), as tariffs also lead to unemployment (Vinocur, 2024; York, 2024).

We have several policy implications, such as the coordination of monetary, fiscal, and trade policies, which should be done to ensure consistency and effectiveness in managing external balances. Therefore, collaboration between relevant government agencies and stakeholders is essential for implementing coherent policy measures that support economic stability and investing in digital infrastructure should be considered by all income groups. Specifically, high-income countries (HICs) should avoid mercantilist traps like tariffs and instead leverage domestic production and digital transformation, upper middle-income countries (UMICs) should bring governance reform to stabilize inflation and create investor confidence and lower middle income countries (LMICs) should manage external debt carefully, strengthen financial markets, and ensure remittances are channelled into productive uses rather than consumption.

This study also emphasizes the need for further research to explore other potential determinants of external balances, in low-income countries where traditional macroeconomic factors might not be influential, moreover after the current tariff increase by USA the relationship between tariffs and layoffs and unemployment can also be studied. As we find

uneven effects of digitization, future research should disaggregate digital infrastructure like mobile banking, internet penetration, fintech adoption. Lastly, chapter 4 suggests whether militarization interacts with political stability or corruption rather than treating it as a standalone predictor and stages of democratization could be studied to see when remittances shift from growth-enhancing to growth-dampening.

References

- Clausing, K. A., & Lovely, M. E. (2024). Why Trump's Tariff Proposals Would Harm Working Americans. *Peterson Institute for International Economics Policy Brief*(24-1). <https://doi.org/10.2139/ssrn.4834397>
- Contractor, F. J. (2025). Assessing the economic impact of tariffs: adaptations by multinationals and traders to mitigate tariffs. *Review of International Business and Strategy*, 35(2/3), 190-213. <https://doi.org/10.1108/ribs-01-2025-0013>
- Dirks, M. W., & Schmidt, T. (2024). Political instability and economic growth: Causation and transmission. *European Journal of Political Economy*, 85. <https://doi.org/10.1016/j.ejpoleco.2024.102586>
- Grasso, M., & Gubernat, R. (2025). Socio-Economic Development, Class, and Protest. In: Crăciun, C., Rammelt, H.P. (eds) Power and Protest in Central and Eastern Europe. In *Power and Protest in Central and Eastern Europe. Palgrave Studies in European Political Sociology*. Palgrave Macmillan, Cham. . https://doi.org/10.1007/978-3-031-77888-9_14
- László, T. (2025). Structural divergences in the European economy: A cluster approach to macroeconomic performance (2013–2023). *Sustainable Futures*, 10. <https://doi.org/10.1016/j.sftr.2025.100996>
- Vinocur, G. (2024). Did the trump tariffs increase US manufacturing jobs? <https://econofact.org/factbrief/did-the-trump-tariffs-increase-us-manufacturing-jobs>
- von Uexkull, N., Rød, E. G., & Svensson, I. (2024). Fueling protest? Climate change mitigation, fuel prices and protest onset. *World Development*, 177. <https://doi.org/10.1016/j.worlddev.2024.106536>
- York, E. (2024). Tracking the economic impact of the trump tariffs. <https://taxfoundation.org/research/all/federal/tariffs/>



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Co-Authorship Form

School of Graduate Research
The University of Waikato
Private Bag 3105
Hamilton 3240, New Zealand
Phone +64 7 838 5096
Email: SGR@waikato.ac.nz
Website: <http://www.waikato.ac.nz/students/research-degree>

This form is to accompany the submission of any PhD that contains research reported in published or unpublished co-authored work. **Please include one copy of this form for each co-authored work.** Completed forms should be included in your appendices for all the copies of your thesis submitted for examination and library deposit (including digital deposit).

Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.

Chapter 2: Economic Policies and Balance of Payments Across Global Income Groups, Published in Journal of Economic Analysis.

Nature of contribution by PhD candidate

Conceptualizing, designing empirical methodology, data filtering, analysis, producing and revising of paper.

Extent of contribution by PhD candidate (%)

70%



CO-AUTHORS

Name	Nature of Contribution
Martin Bai	Provided guidance and critical feedback on paper's structure, methodology, analysis and results. Revising and editing the draft.
Abhishek Mukherjee	Guidance and critical feedback

Certification by Co-Authors

The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- ❖ that the candidate wrote all or the majority of the text.

Name	Signature	Date
Martin Bai		20 Jan 2026
Abhishek Mukherjee		20/01/2026



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waiāto

Co-Authorship Form

School of Graduate Research
The University of Waikato
Private Bag 3105
Hamilton 3240, New Zealand
Phone +64 7 838 5096
Email: SGR@waikato.ac.nz
Website: <http://www.waikato.ac.nz/students/research-degree>

This form is to accompany the submission of any PhD that contains research reported in published or unpublished co-authored work. **Please include one copy of this form for each co-authored work.** Completed forms should be included in your appendices for all the copies of your thesis submitted for examination and library deposit (including digital deposit).

Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.

Chapter 3: Multi-Period Approach to Foreign Exchange Reserves: The Influence of Macroeconomic and Government Performance Across Income Groups

Nature of contribution by PhD candidate

Conceptualizing, designing empirical methodology, data filtering, analysis, producing and revising of paper.

Extent of contribution by PhD candidate (%)

70%


CO-AUTHORS

Name	Nature of Contribution
Martin Bai	Provided guidance and critical feedback on paper's structure, methodology, analysis and results. Revising and editing the draft.
Abhishek Mukherjee	Guidance and critical feedback

Certification by Co-Authors

The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate’s contribution to this work, and the nature of the contribution of each of the co-authors; and
- ❖ that the candidate wrote all or the majority of the text.

Name	Signature	Date
Martin Bai		20 Jan 2026
Abhishek Mukherjee		20/01/2026



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Co-Authorship Form

School of Graduate Research
The University of Waikato
Private Bag 3105
Hamilton 3240, New Zealand
Phone +64 7 838 5096
Email: SGR@waikato.ac.nz
Website: <http://www.waikato.ac.nz/students/research-degree>

This form is to accompany the submission of any PhD that contains research reported in published or unpublished co-authored work. **Please include one copy of this form for each co-authored work.** Completed forms should be included in your appendices for all the copies of your thesis submitted for examination and library deposit (including digital deposit).

Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.

Chapter 4: Democracy, Militarisation, and Economic Growth: A Study of Top Remittance-Receiving Nations

Nature of contribution by PhD candidate

Conceptualizing, designing empirical methodology, data filtering, analysis, producing and revising of paper.

Extent of contribution by PhD candidate (%)

70%


CO-AUTHORS

Name	Nature of Contribution
Martin Bai	Provided guidance and critical feedback on paper's structure, methodology, analysis and results. Revising and editing the draft.
Abhishek Mukherjee	Guidance and critical feedback

Certification by Co-Authors

The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- ❖ that the candidate wrote all or the majority of the text.

Name	Signature	Date
Martin Bai		20 Jan 2026
Abhishek Mukherjee		20/01/2026